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Electromagnetic Emissions Test Report for Information Technology Equipment Handspring Model: Treo 600 (GSM Version) In Accordance With FCC Part 15, Class B, ICES-003 Class B, VCCI Class B, EN 55022 Class B and AS/NZS 3548 Class B

MANUFACTURER: Handspring
189 Bernardo Avenue
Mountain View, CA 94043

TEST SITE: Elliott Laboratories, Inc.
684 W. Maude Avenue
Sunnyvale, CA 94086

REPORT DATE: July 1, 2003

FINAL TEST DATE: June 27, 2003

AUTHORIZED SIGNATORY: David W Bare

David W. Bare
Chief Technical Officer

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SCOPE

Governments and standards organizations around the world have published requirements regarding the electromagnetic emissions of information technology equipment. Electromagnetic emissions testing has been performed on the Handspring model Treo 600 (GSM Version), to establish compliance with these requirements.

Electromagnetic emissions data has been taken pursuant to the following standards. Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with these specifications, test procedures, and measurement guidelines as outlined in Elliott Laboratories test procedures. Please note that the accreditation specified on the cover page of this report does not include the methods used in performing the tests in accordance with VCCI Regulations.

Standard	Title	Standard Date
FCC Part 15, Subpart B	Radio Frequency Devices	October 2002 as Amended
ICES-003	Digital apparatus	Issue 3, November 1997
VCCI V-3/2003.04	VCCI Regulations For Voluntary Control Measures of radio interference generated by Information Technology Equipment	April 2003
EN 55022	Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment	September 1998
AS/NZS 3548	Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment	1995

In order to demonstrate compliance with the requirements, the manufacturer or a contracted laboratory makes measurements and takes the necessary steps to ensure that the equipment complies with the appropriate technical standards.

OBJECTIVE

The objective of the manufacturer is to declare conformity for the Treo 600 (GSM Version) with the conducted and radiated emissions limits specified in the standards listed above.

STATEMENT OF COMPLIANCE

The tested sample of Handspring model Treo 600 (GSM Version) complied with the requirements of:

Standard/Regulation	Equipment Type/Class	Standard Date
Subpart B of Part 15 of the FCC Rules (CFR title 47)	Class B	2002 as amended
ICES-003	Class B	1997
VCCI Regulations V-3/2003.04	Class B	2003
EN 55022	Class B	September 1998
AS/NZS 3548	Class B	1995

The test results recorded herein are based on a single type test of the Handspring model Treo 600 (GSM Version) and therefore apply only to the tested sample. The sample was selected and prepared by David Waitt of Handspring.

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

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

EMISSION TEST RESULTS

The following emissions tests were performed on the Handspring model Treo 600 (GSM Version). The measurements were extracted from the data recorded during testing and represent the highest amplitude emissions relative to the specification limits. The actual test results are contained in an appendix of this report.

CONDUCTED EMISSIONS (MAINS PORT)

Test	Standard/Section	Requirement	Measurement	Result	Compliance Status
CE, 0.15-30 MHz, 120V, 60Hz	FCC § 15.107(a) VCCI Table 4.2	0.15-0.5 MHz, 66-56 dBµV QP 0.5-5.0 MHz, 56 dBµV QP 5.0-30.0 MHz, 60 dBµV QP 0.15-0.5 MHz, 56-46 dBµV Av 0.5-5.0 MHz, 46 dBµV Av 5.0-30.0 MHz, 50 dBµV Av	36.9dBµV @ 2.073MHz	-9.1dB	Complied
CE, 0.15-30 MHz, 230V, 50Hz	EN 55022 Table 2 AS/NZS 3548 Table 2	0.15-0.5 MHz, 66-56 dBµV QP 0.5-5.0 MHz, 56 dBµV QP 5.0-30.0 MHz, 60 dBµV QP 0.15-0.5 MHz, 56-46 dBµV Av 0.5-5.0 MHz, 46 dBµV Av 5.0-30.0 MHz, 50 dBµV Av	40.0dBµV @ 2.072MHz	-6.0dB	Complied

Note 1: Receiver settings were set to RBW= 9kHz and VBW= 30kHz for measurements below 30 MHz.

RADIATED EMISSIONS

Test	Standard/Section	Requirement	Measurement	Result	Compliance Status
RE, 30-1000 MHz	EN 55022 Table 6, FCC §15.109(g), VCCI Table 4.4, AS/NZS 3548, Table 4	30 – 230, 30 dBµV/m 230 – 1000, 37 dBµV/m	18.5 dBµV/m @ 37.200 MHz	-11.5 dB	Complied
RE, 1000 - 2000 MHz	FCC §15.109(a)	>960 MHz 54 dBµV/m	All readings 10-dB below the limit	All readings 10-dB below the limit -	Complied

Note 1: Receiver settings were set to RBW= 120kHz and VBW= 300kHz for measurements below 1 GHz.
Note 2: Receiver settings were set to RBW= 1MHz and VBW= 1MHz for measurements above 1GHz.

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 are based on a 95% confidence level and were calculated in accordance with NAMAS document NIS 81.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.2
Radiated Emissions	30 to 1000	± 3.6

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Handspring model Treo 600 (GSM Version) is a personal digital assistant with a built-in cellular phone. Normally, the EUT would be hand-held during operation. The EUT was, however, treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the power supply for EUT is 120/240 V, 50/60 Hz, 1 Amps.

The sample was received on June 19, 2003 and tested on June 19 and June 26, 2003. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number
Handspring	Trio 600	Batman	N/A
Motorola	MU12-1052100-A1	Power Supply	N/A

ENCLOSURE

The EUT enclosure is primarily constructed of molded plastic. It measures approximately 6 cm wide by 1.5 cm deep by 13 cm high.

MODIFICATIONS

The EUT did not require modifications in order to comply with the emission specifications.

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for emissions testing:

Manufacturer	Model	Description	Serial Number	FCC ID
Epson	P110A	printer	AGR1320291	ANBKMFBP110A
IBM	2635-3AV	laptop	78-GY734 97/11	AN09611TBOON

No remote support equipment was used during emissions testing.

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)
Docking Port(EUT)	Serial (Computer) and AC Mains	Multiconductor (Y-cabe)	Shielded	1.9
Parallel(Computer)	Printer	Multiconductor	Shielded	3

EUT OPERATION

The EUT was looping data traffic between itself and the local computer.

EMISSIONS TEST SITE

GENERAL INFORMATION

Final test measurements were taken on June 19 and June 26, 2003 at the Elliott Laboratories Open Area Test Site(s) listed below. The test sites contain separate areas for radiated and conducted emissions testing. The sites conform to the requirements of ANSI C63.4: 1992 - Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz and CISPR 16-1:1999. They are registered with the VCCI and are on file with the FCC. Ambient levels are at least 6 dB below the specification limits with the exception of predictable local TV, radio, and mobile communications traffic. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements.

	Site	VCCI Registration #	Location
	Chamber 3	C-1795	41039 Boyce Road
	Chamber 4	R-1684	Fremont, CA 94538-2435

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4 and CISPR 22. Mains port measurements are made with the EUT connected to the public power network through nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord. Telecommunication port measurements are made with the network cable connected through an ISN appropriate to the type of cable employed.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiated measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an Open Area Test Site, as defined in ANSI C63.4. The test site is maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4 guidelines. Site correction factors for antennas, cables, amplifiers, etc. used during measurements are given in an appendix of this report.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure 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 CISPR 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. Average measurements above 1000 MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer runs automated data collection programs that control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted emission measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

IMPEDANCE STABILIZATION NETWORK (ISN)

Telecommunication port conducted emission measurements utilize an Impedance Stabilization Network with a 150 ohm termination impedance and specific longitudinal conversion loss as the voltage monitoring point. This network provides for calibrated radio frequency noise measurements by the design of the internal circuitry on the EUT and measurement ports, respectively. For current measurements, a current probe with a uniform frequency response and less than 1 ohm insertion impedance is used.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude 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 entire 30 to 1000 MHz frequency range for precision measurements of field strength. Above 1000 MHz, a horn antenna is used. The antenna calibration factors are included in site factors that are 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.

ANSI C63.4 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

EUT AND CABLE PLACEMENT

The standards require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4, and the worst case orientation is used for final measurements.

CONDUCTED EMISSIONS (MAINS)

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord. Emissions that have peak values close to the specification limit are also measured in the quasi-peak and average detection modes to determine compliance except when the amplitude of the emission when measured with the quasi-peak detector is more than 10 dB below the specification limit for average measurements. In this case only quasi-peak measurements are performed.

CONDUCTED EMISSIONS (TELECOMMUNICATION PORTS)

Conducted emissions voltages are measured at a point 80 cm from the EUT. If conducted emission currents are measured, the current probe is located 70 cm from the EUT. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted. Emissions that have peak values close to the specification limit are also measured in the quasi-peak and average detection modes to determine compliance except when the amplitude of the emission when measured with the quasi-peak detector is more than 10 dB below the specification limit for average measurements. In this case only quasi-peak measurements are performed.

RADIATED EMISSIONS

Radiated emissions measurements are performed in two phases as well. A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed from 30 MHz up to the frequency required by the regulation specified on page 1. One or more of these is with the antenna polarized vertically while the one or more of these is 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. A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT. Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth that results in the highest emission is then maintained while varying the antenna height from one to four meters. The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain. Emissions that have values close to the specification limit may also be measured with a tuned dipole antenna to determine compliance.

SAMPLE CALCULATIONS

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form). The calculation is as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements. A distance factor, when used for electric field measurements, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

APPENDIX A: Test Equipment Calibration Data

1 Page

Radiated Emissions, 30 - 1000 MHz, 19-Jun-03
Engineer: jmartinez

Manufacturer	Description	Model #	Assett #	Cal interval	Last Calibrated	Cal Due
Com-Power	Pre Amplifier , 30-1000MHz	PA-103	1543	12	3/25/2003	3/25/2004
EMCO	Biconical Antenna, 30-300 MHz	3110B	1498	12	1/17/2003	1/17/2004
EMCO	Log Periodic Antenna, 0.2-2 GHz	3148	1404	12	11/11/2002	11/11/2003
Rohde & Schwarz	Test Receiver, 20-1300MHz	ESVP	273	12	2/13/2003	2/13/2004
Hewlett Packard	Spectrum Analyzer 9kHz-26.5Ghz	8563E	284	12	3/3/2003	3/3/2004

Conducted Emissions, 26-Jun-03
Engineer: mfaustino

Manufacturer	Description	Model #	Assett #	Cal interval	Last Calibrated	Cal Due
Rohde & Schwarz	EMI Test Receiver, 20Hz-7GHz	ESIB 7	1538	12	3/28/2003	3/28/2004
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	1401	12	2/24/2003	2/24/2004

Conducted Emissions, 26-Jun-03
Engineer: mfaustino

Manufacturer	Description	Model #	Assett #	Cal interval	Last Calibrated	Cal Due
EMCO	LISN, 10kHz-100MHz	3825/2	1292	12	4/24/2002	6/30/2003
EMCO	LISN, 10kHz-100MHz	3825/2	1293	12	6/2/2002	6/30/2003

APPENDIX B: Test Data Log Sheets

ELECTROMAGNETIC EMISSIONS

TEST LOG SHEETS

AND

MEASUREMENT DATA

T51679 14 Pages

Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Emissions Spec:	FCC	Class:	B
Immunity Spec:	-	Environment:	-

EMC Test Data

For The

Handspring

Model

Batman

Date of Last Test: 7/21/2003

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Emissions Spec:	FCC	Class:	B
Immunity Spec:	-	Environment:	-

EUT INFORMATION

General Description

The EUT is a personal digital assistant with a built-in cellular phone. Normally, the EUT would be hand-held during operation. The EUT was, however, treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 120/240 V, 50/60 Hz, 1 Amps.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Handspring	Trio 600	Batman	N/A	TBD
Motorola	MU12-1052100-A1	Power Supply	N/A	N/A

EUT Enclosure

The EUT enclosure is primarily constructed of molded plastic. It measures approximately 6 cm wide by 1.5 cm deep by 13 cm high.

Modification History

Mod. #	Test	Date	Modification
1			

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

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Emissions Spec:	FCC	Class:	B
Immunity Spec:	-	Environment:	-

Test Configuration #1

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Epson	P110A	printer	AGR1320291	ANBKMFBP110A
IBM	2635-3AV	laptop	78-GY734 97/11	AN09611TBOON

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
none				

Interface Cabling and Ports

		Cable(s)		
Port	Connected To	Description	Shielded or Unshielded	Length(m)
Docking Port(EUT)	Serial (Computer) and AC Mains	Multiconductor (Y-cabe)	Shielded	1.9
Parallel(Computer)	Printer	Multiconductor	Shielded	3

EUT Operation During Emissions

The EUT was looping data traffic between itself and the local computer.

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Radiated Emissions

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: 6/19/2003
Test Engineer: jmartinez
Test Location: FTChamber #4
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 emissions testing.

In Chamber# 4 , the measurement antenna was located 3 meters from the EUT for the measurement range 30 - 1000 MHz.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 54 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
2	RE, 30 - 1000MHz, Maximized Emissions	FCC B	Pass	-11.0dB @ 37.200MHz
3	RE, 30 - 1000MHz, Maximized Emissions	EN55022 B	Pass	-11.5dB @ 37.200MHz

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.

Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

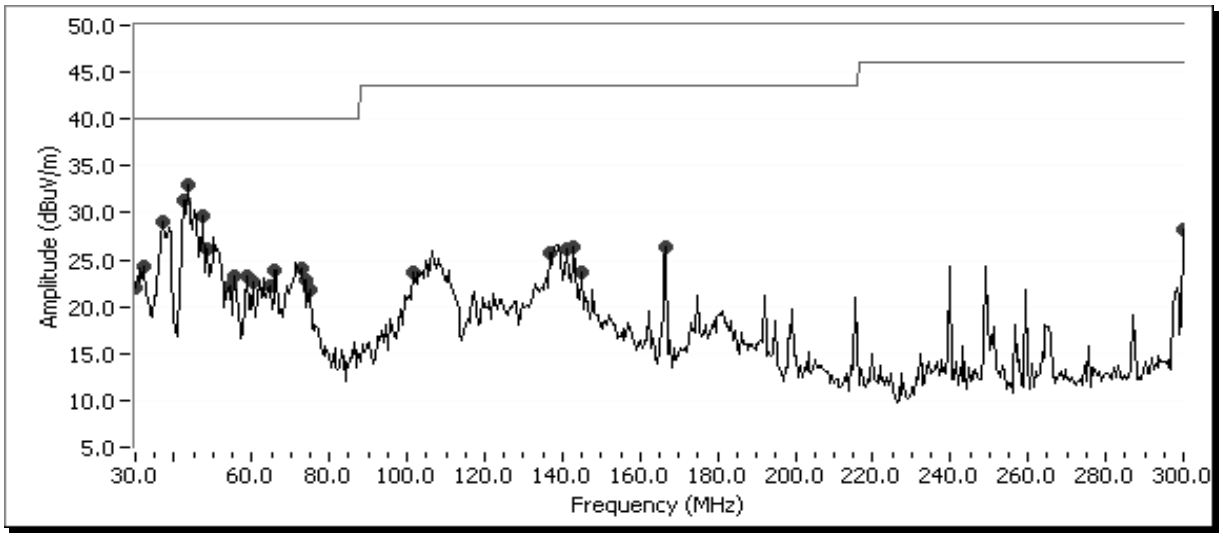
Run #1: Preliminary Radiated Emissions, 30-1000 MHz
Motorola (M/N: mu12-1052100-a1) GSM unit

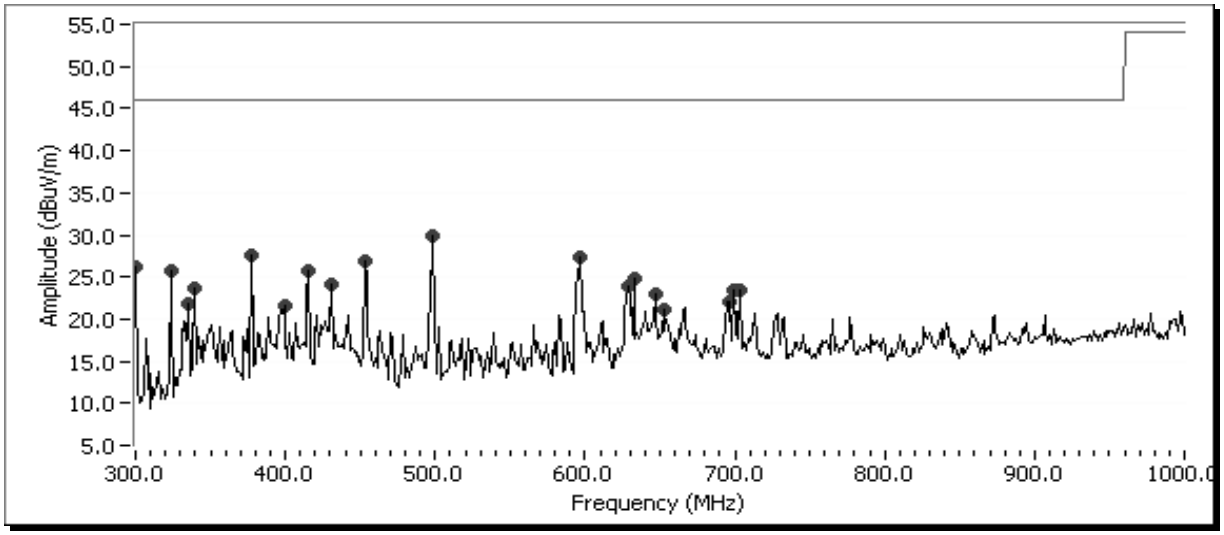
Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
37.200	29.0	V	40.0	-11.0	Peak	291	1.0	
43.500	27.4	V	40.0	-12.6	Peak	352	1.0	
48.450	26.1	V	40.0	-13.9	Peak	315	1.0	
32.250	24.3	V	40.0	-15.7	Peak	188	1.0	
72.750	24.1	V	40.0	-15.9	Peak	161	1.0	
66.000	23.8	V	40.0	-16.2	Peak	187	1.0	
58.800	23.3	V	40.0	-16.7	Peak	316	1.0	
55.650	23.2	V	40.0	-16.8	Peak	333	1.0	
166.800	26.4	V	43.5	-17.1	Peak	203	1.0	
142.950	26.3	V	43.5	-17.2	Peak	82	1.0	
73.650	22.8	V	40.0	-17.3	Peak	185	1.0	
141.150	26.2	V	43.5	-17.3	Peak	36	1.0	
60.150	22.7	V	40.0	-17.4	Peak	230	1.0	
300.000	28.3	V	46.0	-17.7	Peak	174	1.5	
64.650	22.3	V	40.0	-17.7	Peak	143	1.5	
54.300	22.3	V	40.0	-17.8	Peak	345	1.0	
136.650	25.7	V	43.5	-17.8	Peak	127	1.0	
30.000	21.9	V	40.0	-18.1	Peak	41	1.0	
75.000	21.7	V	40.0	-18.3	Peak	141	1.0	
42.600	20.7	V	40.0	-19.3	QP	334	1.0	
101.550	23.7	V	43.5	-19.8	Peak	69	1.0	
145.200	23.7	V	43.5	-19.9	Peak	19	1.0	
300.000	26.1	V	46.0	-19.9	Peak	163	1.5	
323.333	25.6	V	46.0	-20.4	Peak	159	1.0	
415.500	25.6	V	46.0	-20.4	Peak	212	1.0	
47.550	19.2	V	40.0	-20.8	Peak	347	1.0	
632.500	24.9	V	46.0	-21.1	Peak	84	1.0	
430.667	24.2	V	46.0	-21.8	Peak	260	1.0	
629.000	23.8	V	46.0	-22.2	Peak	50	1.0	
339.667	23.8	V	46.0	-22.2	Peak	202	1.5	
703.667	23.4	V	46.0	-22.6	Peak	325	4.0	
699.000	23.4	V	46.0	-22.6	Peak	291	1.5	
646.500	22.9	V	46.0	-23.1	Peak	86	1.0	
696.667	22.0	V	46.0	-24.0	Peak	291	1.5	
335.000	21.9	H	46.0	-24.1	Peak	96	1.0	
399.167	21.5	V	46.0	-24.5	Peak	204	1.0	
652.333	21.1	V	46.0	-24.9	Peak	35	1.0	
Continue on next page…								

EMC Test Data

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

596.333	20.5	V	46.0	-25.5	QP	92	1.0	
377.000	8.2	H	46.0	-37.8	QP	252	1.0	
452.833	8.1	V	46.0	-37.9	QP	197	1.0	
498.333	7.1	V	46.0	-38.9	QP	201	1.5	





Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #2: Maximized Readings From Run #1

Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
37.200	29.0	V	40.0	-11.0	Peak	291	1.0	
43.500	27.4	V	40.0	-12.6	Peak	352	1.0	
48.450	26.1	V	40.0	-13.9	Peak	315	1.0	
32.250	24.3	V	40.0	-15.7	Peak	188	1.0	
72.750	24.1	V	40.0	-15.9	Peak	161	1.0	
66.000	23.8	V	40.0	-16.2	Peak	187	1.0	

Run #3: Maximized Readings From Run #1

Readings extrapolated to 10 meter distance by subtracting 10.5 dB to the reading.

Frequency	Level	Pol	EN55022 B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
37.200	18.5	V	30.0	-11.5	Peak	291	1.0	
43.500	16.9	V	30.0	-13.1	Peak	352	1.0	
48.450	15.6	V	30.0	-14.4	Peak	315	1.0	
32.250	13.8	V	30.0	-16.2	Peak	188	1.0	
72.750	13.6	V	30.0	-16.4	Peak	161	1.0	
66.000	13.3	V	30.0	-16.7	Peak	187	1.0	

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Conducted Emissions - Power Ports

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:	6/26/2003	Config. Used:	1
Test Engineer:	Marissa Faustino	Config Change:	none
Test Location:	Chamber #3	EUT Voltage:	Refer to individual run

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment.

Ambient Conditions:

Temperature:	21 °C
Rel. Humidity:	33 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	EN 55022B	Pass	-9.1dB @ 2.073MHz
2	CE, AC Power,230V/50Hz	EN 55022B	Pass	-6.0dB @ 2.072MHz

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

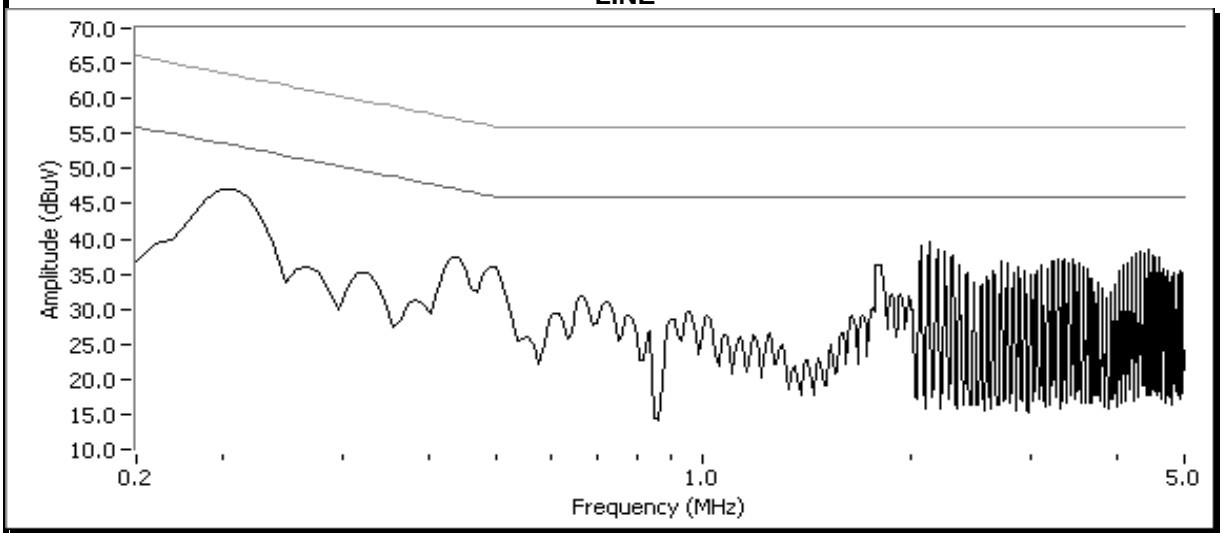
No deviations were made from the requirements of the standard.

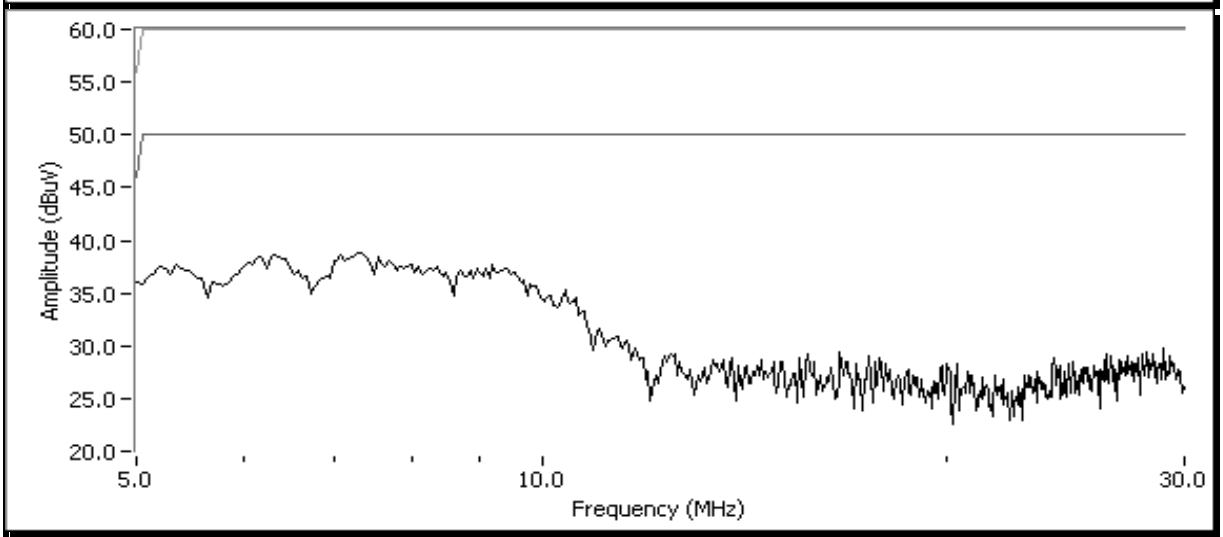
EMC Test Data

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

LINE



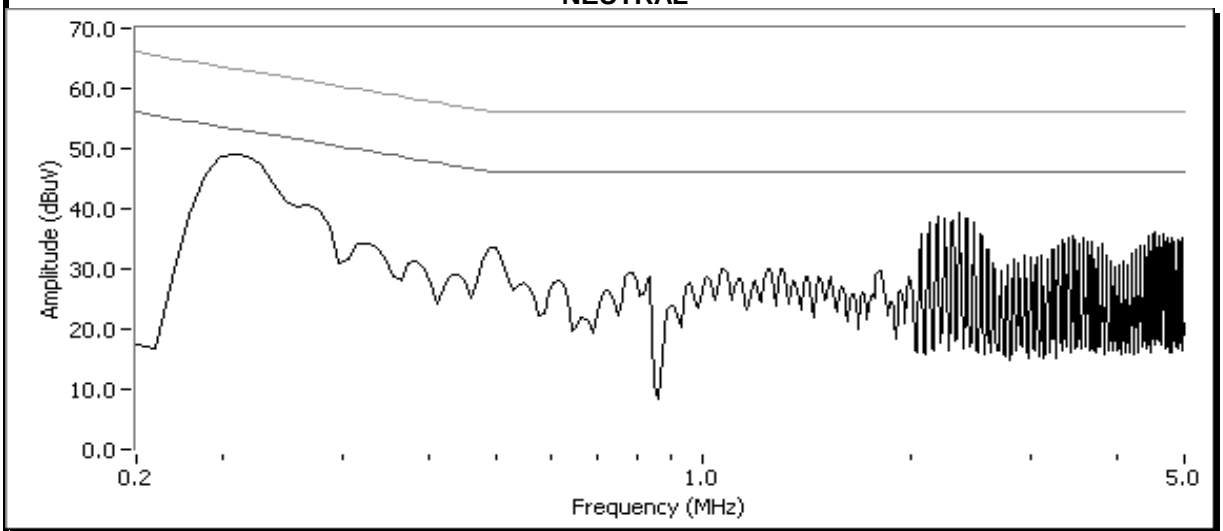


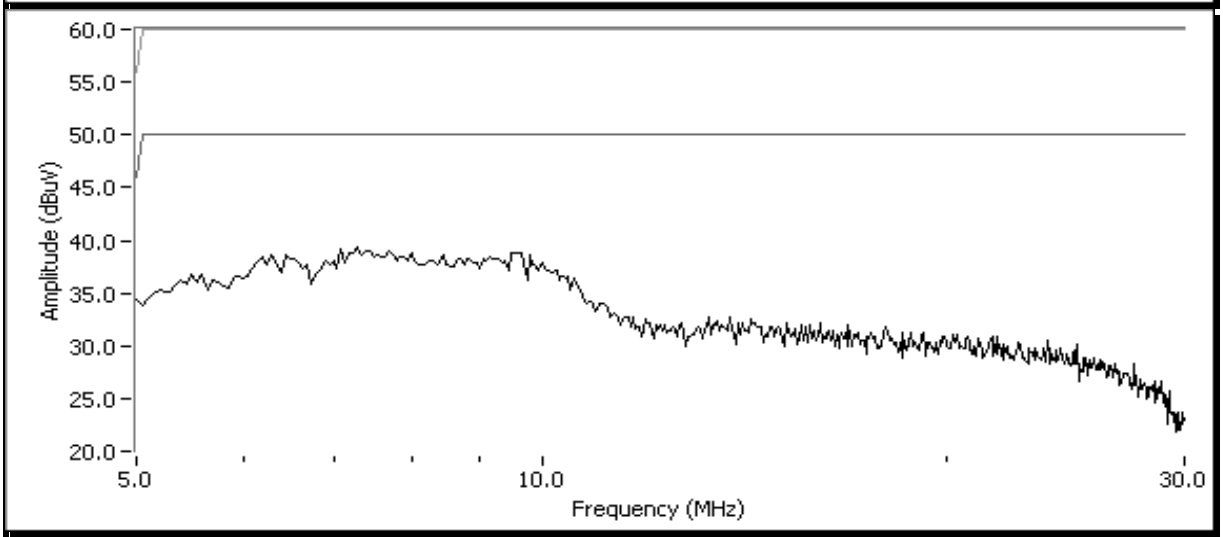
EMC Test Data

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

NEUTRAL





Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

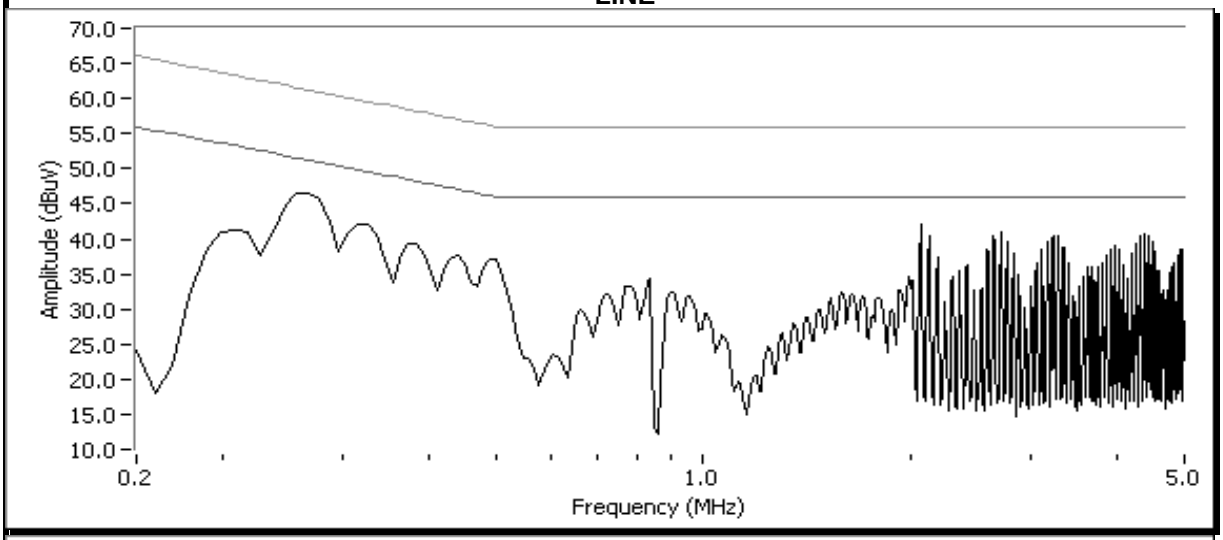
Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
2.073	36.9	Line 1	46.0	-9.1	AVG	
2.360	36.4	Neutral	46.0	-9.6	AVG	
5.008	30.4	Line 1	46.0	-15.6	AVG	
6.218	33.4	Neutral	50.0	-16.6	AVG	
2.073	39.1	Line 1	56.0	-16.9	QP	
2.360	38.7	Neutral	56.0	-17.3	QP	
6.218	37.6	Neutral	60.0	-22.5	QP	
0.182	39.6	Line 1	64.4	-24.8	QP	
5.008	35.1	Line 1	60.0	-24.9	QP	
0.182	28.1	Line 1	53.7	-25.6	AVG	
0.199	29.7	Neutral	63.7	-34.0	QP	
0.199	9.5	Neutral	53.3	-43.8	AVG	

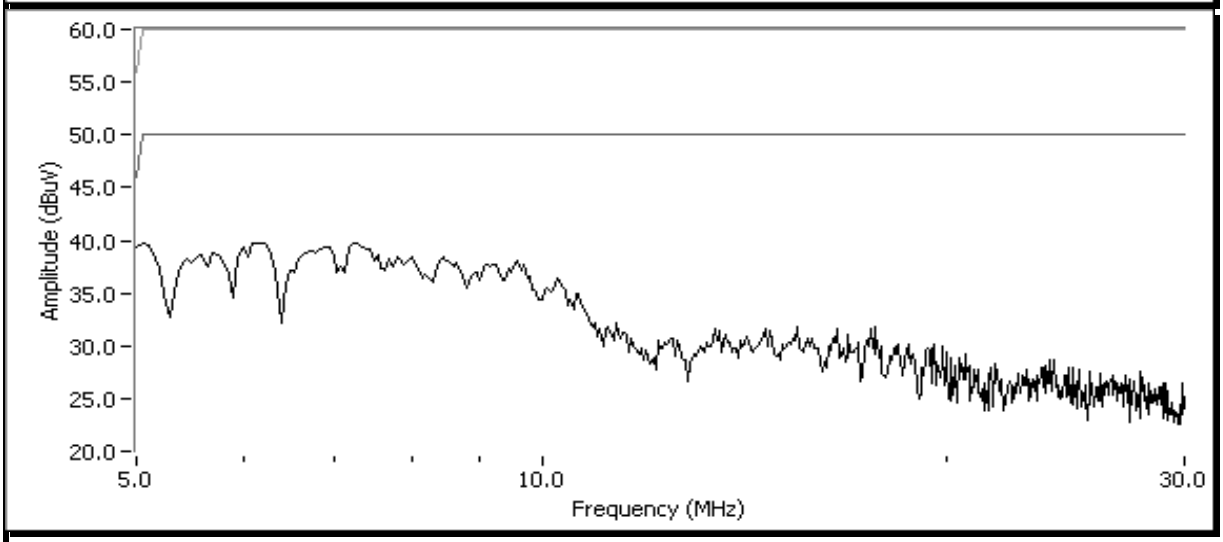
EMC Test Data

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

LINE



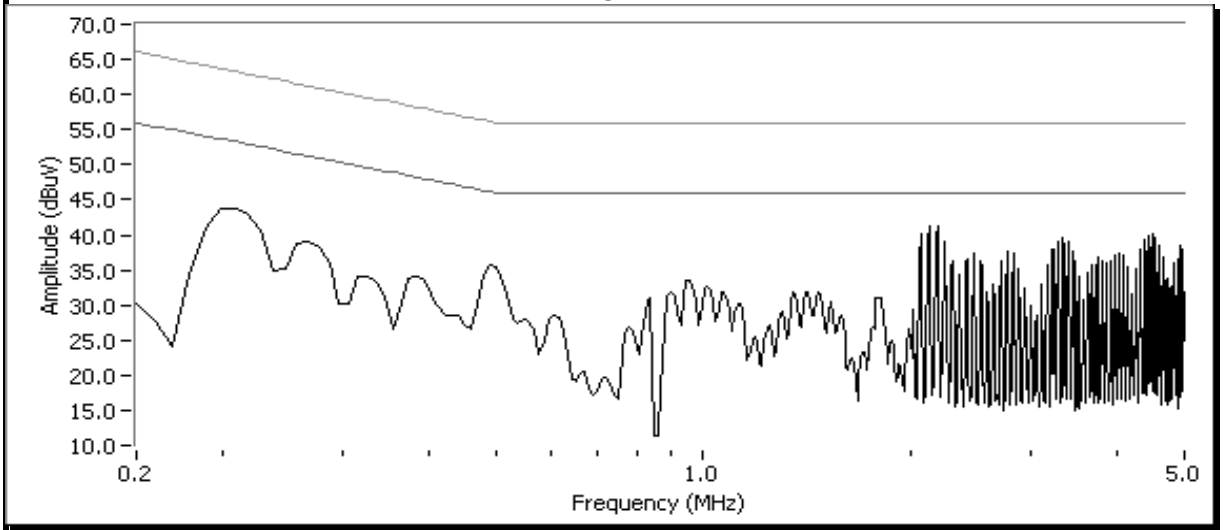


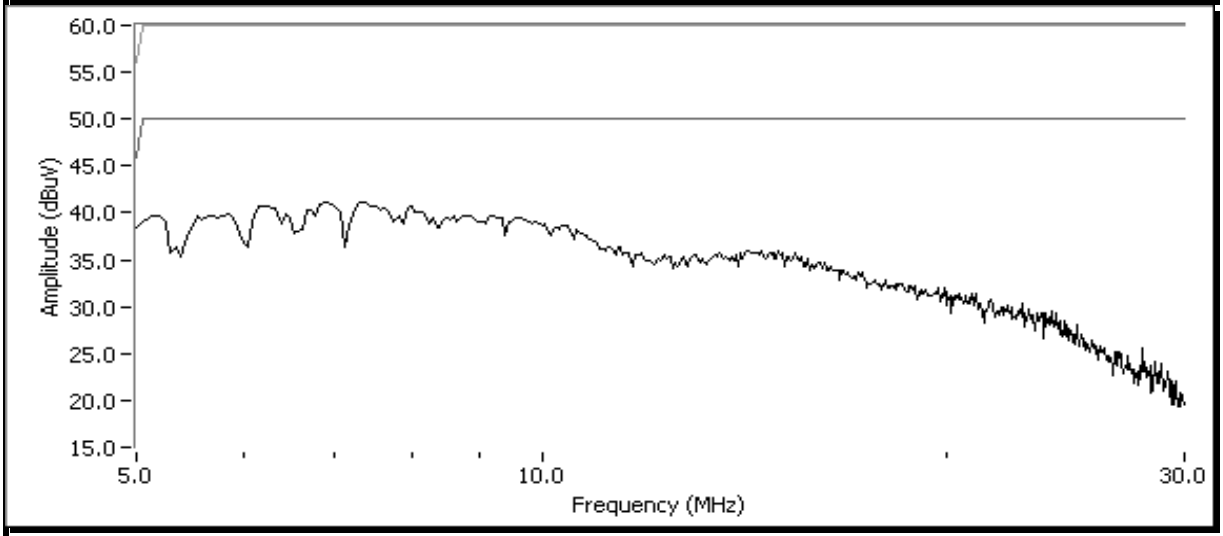
EMC Test Data

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

NEUTRAL





EMC Test Data

Client:	Handspring	Job Number:	J49634
Model:	Batman	T-Log Number:	T51679
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
2.072	40.0	Line 1	46.0	-6.0	AVG	
2.129	39.4	Neutral	46.0	-6.6	AVG	
0.286	41.8	Line 1	51.2	-9.5	AVG	
7.250	39.0	Line 1	50.0	-11.0	QP	
7.250	37.0	Line 1	50.0	-13.0	AVG	
7.363	36.2	Neutral	50.0	-13.9	AVG	
2.072	41.1	Line 1	56.0	-14.9	QP	
0.286	45.2	Line 1	60.6	-15.4	QP	
2.129	40.3	Neutral	56.0	-15.7	QP	
0.180	37.3	Neutral	53.7	-16.4	QP	
7.363	39.4	Neutral	60.0	-20.6	QP	
0.180	26.3	Neutral	53.7	-27.4	AVG	

APPENDIX C: Radiated Emissions Test Configuration Photographs

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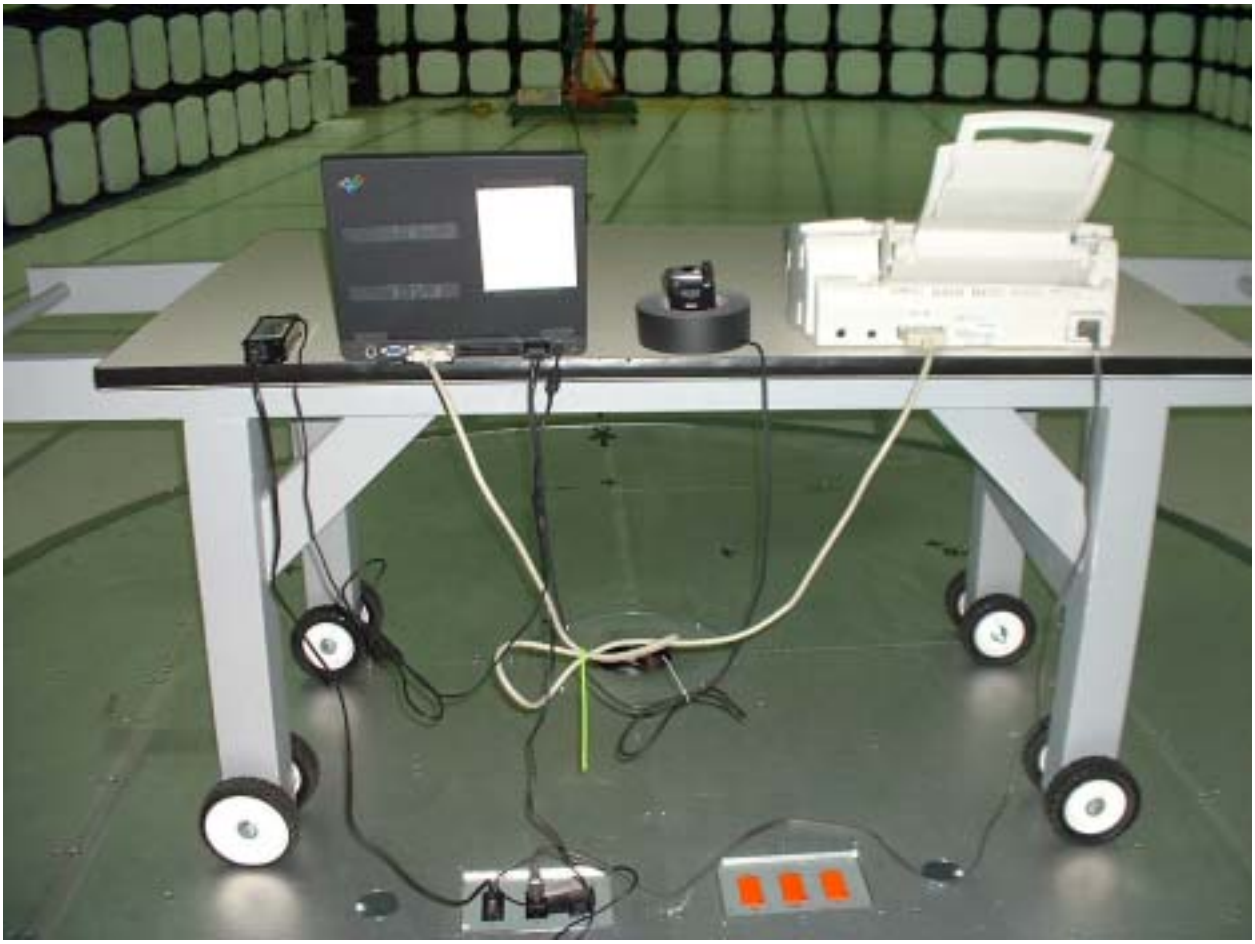
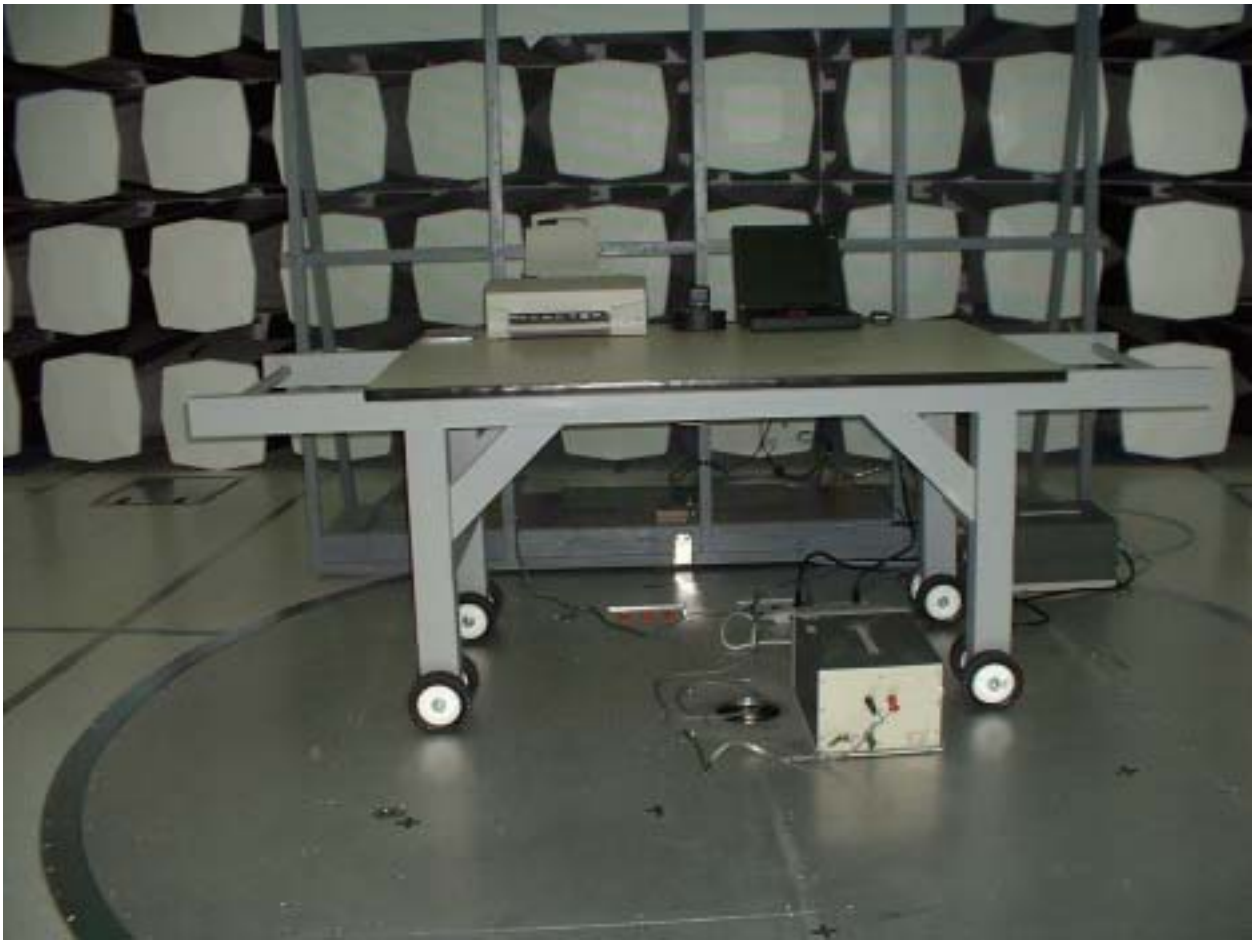
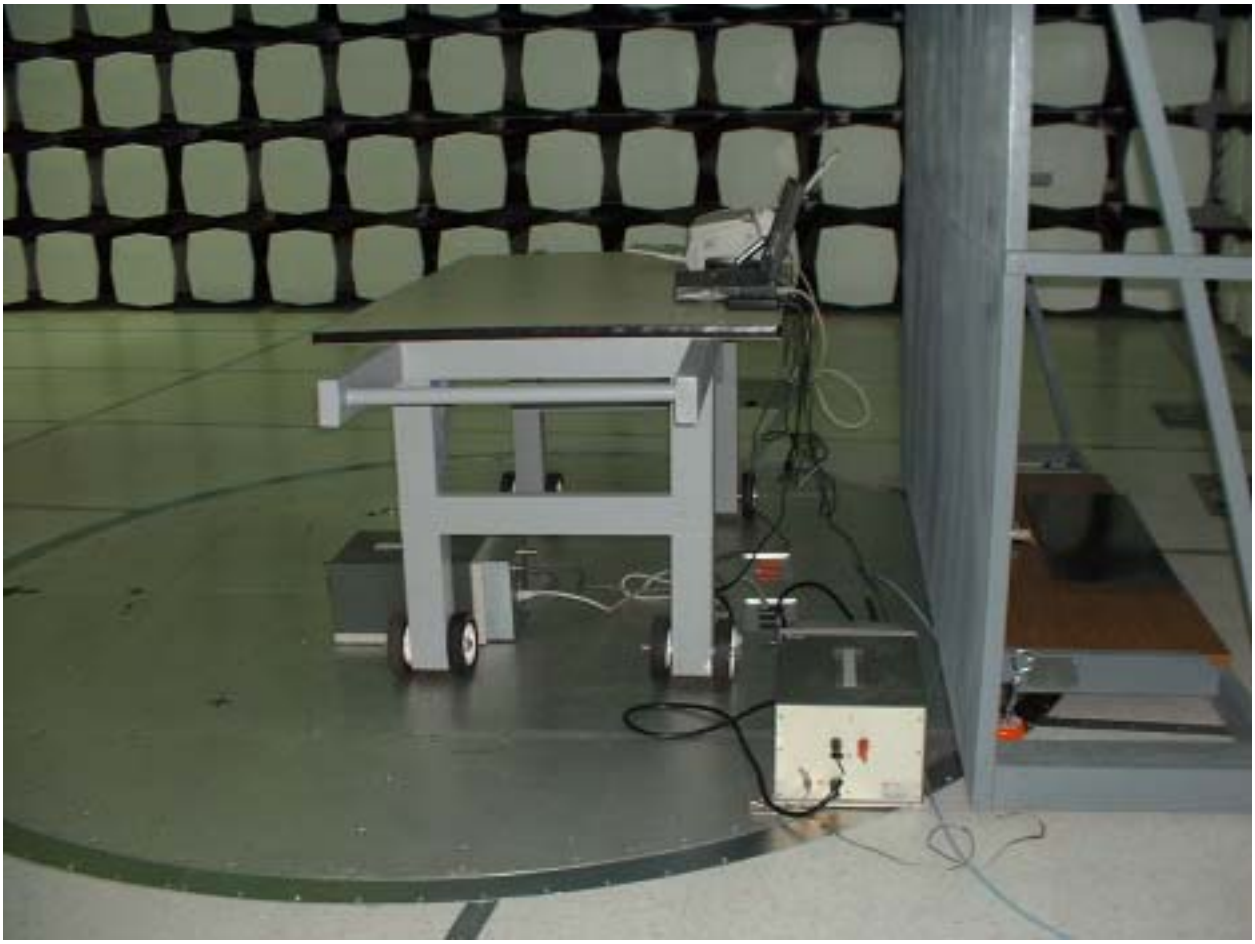


APPENDIX D: Conducted Emissions Test Configuration Photographs



APPENDIX D: Conducted Emissions Test Configuration Photographs



APPENDIX E: Information and Labeling Requirements

The following information has been provided to clarify notification, equipment labeling requirements and information that must be included in the operator's manual. These requirements may be found in the standards/regulations listed in the scope of this report.

United States Class B Label

> This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: If the device is too small or for such use that it is not practicable to place the US label statement on it, the statement shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed

Japanese Class B Label

Label Location

The required label(s) must be in a *conspicuous location* on the product, which is defined as any location readily visible to the user of the device without the use of tools.

Label Attachment

The label(s) must be *permanently attached* to the product, which is defined as attached such that it can normally be expected to remain fastened to the equipment during the equipment's expected useful life. A paper gum label will generally not meet this condition.

APPENDIX E: Information and Labeling Requirements

United States Class B Manual Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and the receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

Note: Additional information about corrective measures may also be provided to the user at the manufacturer's option.

Where special accessories, such as shielded cables, are required in order to meet FCC emission limits, appropriate instructions regarding the need to use such accessories must be contained on the first page of text concerned with the installation of the device in the operator's manual.

The operator's manual must also caution the user that changes or modifications not expressly approved by you, the manufacturer, could void their right to operate the equipment.

The FCC has indicated that the radio interference statement be bound in the same manner as the operator's manual. Thus, a loose-leaf insert page in a bound or center-spine and stapled manual would not meet this condition.

Japanese Class B Manual Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

ENGLISH TRANSLATION OF USER'S MANUAL INFORMATION

This is Class B product based on the standard of the Voluntary Control Council For Interference by Information Technology Equipment (VCCI). If this used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

APPENDIX E: Information and Labeling Requirements

Industry Canada Information

For ICES-003 (digital apparatus), the product must be labeled with a notice indicating compliance, e.g.

"This Class[*] digital apparatus complies with Canadian ICES-003."

[*] should be A or B as appropriate.

If it is not feasible to fix a label to the product, the notice may be included in the user manual.

The label or notice may be in English, French or both, based on the intended market, company marketing policies, and any other applicable provincial or federal regulations.

Japanese Information

The VCCI requires a notification for each product sold with the VCCI label. A notification letter on your company letterhead with 2 copies of Form 1 must be sent to the VCCI in Japan at the following address:

Voluntary Control Council for
Interference by Information Technology Equipment
NOA Building, 7th Floor
3-5 Azabudai 2-chome, Minato-ku,
Tokyo 106-0041, Japan

You may also submit the form electronically on the VCCI web site http://www.vcci.or.jp/vcci_e/member/index.html. Go to "Documents and Forms, Report of Compliance" in Members only section. Enter your username and password and click "OK". Then click "Please click here if you submit report of compliance electronically" to open the submission form. Fill all required columns and click "CONFIRM" after making sure everything is filled properly.

Australia Information

In Australia, an application to use the C-Tick mark must be made by the importer of the product. The importer must hold a Declaration of Conformity and compliance folder, of which this report forms a part, for each product sold with a C-Tick mark