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Electromagnetic Emissions Test Report In Accordance With FCC Part 15 Section 15.209 on the Savi Technology, Inc. Transmitter Model: SP-65Y-ZAB

FCC ID: KL7-65XSP-V1

GRANTEE: Savi Technology, Inc. 615 Tasman Drive Sunnyvale, CA 94089-1707

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

REPORT DATE: July 7, 2004

FINAL TEST DATE: J

June 25, 2004

AUTHORIZED SIGNATORY:

Mark Briggs Vice President of Engineering



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SCOPE

An electromagnetic emissions test has been performed on the Savi Technology, Inc. model SP-65Y-ZAB pursuant to Subpart C of Part 15 of FCC Rules for intentional radiators. Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in ANSI C63.4-1992 as outlined in Elliott Laboratories test procedures.

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.

The test results recorded herein are based on single type tests of various models from the Savi Technology, Inc. SP-65Y-ZAB series and therefore apply only to the tested samples. The samples were selected and prepared by Eugene Schlindwein of Savi Technology, Inc.

The sample tested is representative of the following models:

SP-650-011, SP-650-211, SP-650-311, SP-650-111, SP-651-011, SP-651-211, SP-651-311, SP-651-111, SP-650-001, SP-650-201, SP-650-301, SP-650-101, SP-651-001, SP-651-201, SP-651-301, SP-651-101

For a detailed description of each model please refer to the EUT Details section of this report.

OBJECTIVE

The primary objective of the manufacturer is compliance with Subpart C of Part 15 of FCC Rules for the radiated and conducted emissions of intentional radiators. Certification of these devices is required as a prerequisite to marketing as defined in Part 2 the FCC Rules.

Certification is a procedure where the manufacturer or a contracted laboratory makes measurements and submits the test data and technical information to the FCC. The FCC issues a grant of equipment authorization 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, which are subsequently manufactured.

Maintenance of compliance 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.).

STATEMENT OF COMPLIANCE

The tested sample of Savi Technology, Inc. model SP-65Y-ZAB complied with the requirements of Subpart C of Part 15 of the FCC Rules for low power intentional radiators.

Maintenance of FCC compliance 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.).

TEST RESULTS SUMMARY 15.209 / RSS 210 Table 3

FCC Part 15 Section	Description	Comments	Result
15.207 / 15.107	AC Conducted Emissions, 0.15 – 30 MHz (Worst-Case with 132kHz Tx)	37.8dBµV @ 0.533MHz (-8.2dB)	Complies
	AC Conducted emissions 0.45 – 30 MHz (Worst-Case with 132kHz Tx)	47.5dBµV @ 0.394MHz (-0.5dB)	
15.209	Transmitter Fundamental Signal Emissions, 0.123 MHz Large Loop Antenna	22.2dBµV/m (12.8µV/m) @ 122.950kHz (-3.7dB)	Complies (note 1)
15.209	Transmitter Fundamental Signal Emissions, 0.123 MHz Small Loop Antenna	Not measured – large loop is worst case for loop antennas (refer to 132kHz data)	Complies (note 1)
15.209	Transmitter Fundamental Signal Emissions, 0.123 MHz Ferrite Antenna	1.6dBµV/m (1.2µV/m) @ 122.950kHz (- 24.2dB)	Complies (note 1)
15.209	Transmitter Fundamental Signal Emissions, 0.123 MHz 4-Element Handrail Antenna	2.4dBµV/m (1.3µV/m) @ 122.950KHz (- 23.4dB)	Complies (note 1)
15.209	Transmitter Fundamental Signal Emissions, 0.123 MHz 2-Element Handrail Antenna	4.3dBµV/m (1.6µV/m) @ 122.950kHz (- 21.5dB)	Complies (note 1)
15.209	Transmitter Fundamental Signal Emissions, 0.132 MHz Large Loop Antenna	22.8dBµV/m (13.8µV/m) @ 131.579kHz (-2.4dB)	Complies (note 1)
15.209	Transmitter Fundamental Signal Emissions, 0.132 MHz Small Loop Antenna	21.4dBµV/m (11.7µV/m) @ 132kHz (- 4.4dB)	Complies (note 1)
15.209	Transmitter Fundamental Signal Emissions, 0.132 MHz Ferrite Antenna	1.1dBµV/m (1.1µV/m) @ 131.579kHz (- 24.2dB)	Complies (note 1)
15.209	Transmitter Radiated Spurious Emissions, Tx @ 123kHz Worst-case – 4-element handrail	9.5dBµV/m (3.0µV/m) @ 245.900KHz (- 10.3dB)	Complies (note 1)
15.209	Transmitter Radiated Spurious Emissions, Tx @ 132kHz	All spurious more than 20dB below the limit	Complies (note 1)
15.109	Receiver Spurious Emissions	No receiver	N/A

Note 1 – The ferrite and loop antennas were tested in all three orthogonal axes. The Handrail antennas were tested in two different axes.

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	± 2.4
Radiated Emissions	30 to 1000	± 3.6

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Savi Technology, Inc. SP-65Y-ZAB series of rf signposts are designed to transmit at a low frequency (either 123 kHz or 132 kHz, dependant on model) to initiate a response from one of the Savi series of RFID tags. These tags are designed to transmit their ID at a frequency of 433.92 MHz. Some models in the SP-65Y-ZAB series include a 433.92 MHz transceiver to allow retrieval of a tag's ID and provide control signals to switch the tags on and off. Note that this report covers the models without the 433.92 MHz transceiver option.

The signposts can be configured with a variety of antennas for the low frequency transmitter, dependent on model number. The basic model uses an internally mounted ferrite core antenna. External antennas are available, and these connect to the device using a proprietary connector. The external antennas are in two different styles, a rectangular cross-section loop antenna or a "handrail" antenna.

There are two different-sized external loop antennas (large and small). The main unit is mounted to these antennas, which are intended to be installed at exit and entry points to trigger RFID tags to transmit as they pass by.

The handrail antenna is designed to be inserted into a U-section handrail and comes in two different versions, one with two antenna elements and one with four antenna elements. The version with two antennas is designed for the elements to be installed in handrails on either side of a corridor. The four-antenna version is designed for locations where one corridor intersects with another and allows elements to be placed in handrails on both sides of the corridor and both sides of the intersection, thereby ensuring that a tag moving in either direction from the intersection is triggered.

The actual model numbers within the SP-65Y-ZAB series are coded as follows:

Y: 0 = base model; 1 = Ethernet adapter; 2 = Ethernet adapter and UHF transceiver with short whip or magnetic mount antenna

Z (LF Antenna): 0 = No antenna (may be used with Handrail, Internal Ferrite or External Loop antenna); 1 = Internal Ferrite antenna; 2 = External loop antenna (12' range); 3 = External loop antenna (8' range)

A (LF frequency): 0 = 132 kHz; 1 = 123 kHz

B (Indoor/Outdoor): 0 = Indoor enclosure; 1 = Outdoor enclosure (note, the enclosures are all plastic, the outdoor version has improved weatherproofing)

Normally the EUT would be installed at access monitoring and control points (entry & leave portals), mounted on a wall, ceiling or pole during operation. The EUT was, therefore, treated as tabletop equipment during testing to simulate the end-user environment. The EUT can be either AC or DC powered. The electrical rating of the EUT is 100-240 VAC, 50-60 Hz, 0.3 A and 12.8-30 VDC, 1.2 A.

The sample was received on June 24, 2004 and tested on June 25, 2004. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number
Sovi	SP 652 011	123kHz Handrail ant	0400104070002
Savi	51-052-011		0400104070002
Savi	SP-652-211	123kHz Lg loop ant	0400104060007
Savi	SP-652-201	132kHz Lg loop ant	0400104060013
Savi	SP-652-311	123kHz Sm Loop ant	0400104060017
Savi	SP-652-111	123kHz Internal ant	0400104060002
Savi	SP-652-101	132kHz Internal ant	0400104060010
Savi	SPA-652-002	2-HandrailAntenna kit	None
Savi	SPA-652-003	4-HandrailAntenna kit	None

All radiated emissions were performed on all antennas, with the exception of the small loop antenna at 132kHz. Testing the large and small loops at 123 kHz demonstrated that the emissions were higher with the larger loop antenna.

AC conducted emissions were performed on both a 123kHz (SP-652-211) and 132 kHz (SP-652-201) transmitter.

ENCLOSURE

The EUT enclosure is primarily constructed of molded plastic. It measures approximately 69 cm wide by 13 cm deep by 120 cm high.

MODIFICATIONS

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

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Manufacturer	Model	Description	Serial Number	FCC ID
IBM	Thinkpad	Laptop	ANO9611TBOON	78-VA248 97/11
IBM	85G6709	AC Adapter	-	-

EUT INTERFACE PORTS

	0 0			
		Cable(s)		
Port	Connected To	Description	Shielded or Unshielded	Length(m)
Ethernet	Laptop	CAT 5	Unshielded	30
Sync Out	Unterminated	Multiwire	Shielded	30
Sync IN	Unterminated	Multiwire	Shielded	30
Antenna	Loop antenna	Multiwire	Shielded	0.25
AC in	AC Mains	3 wire	Unshielded	1.5
RS 232	Not cabled			

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

Note: The Configuration ports were not connected as the manufacturer stated that these are for diagnostic purpose and therefore would not normally be connected.

EUT OPERATION

The EUT was transmitting continuously for transmit mode measurements.

Conducted emissions measurements were made with the EUT transmitting continuously.

ANTENNA SYSTEM

The LF antenna is either integral to the device (loop and ferrite antennas) or connect via a proprietary connector.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on June 25, 2004at the Elliott Laboratories Open Area Test Site #2 located at 684 West Maude Avenue, Sunnyvale, California. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission.

ANSI C63.4 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception of predictable local TV, radio, and mobile communications traffic. The test site contains separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4-1992.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4-1992. Measurements are made with the EUT connected to the public power network through a 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.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment. The test site is maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4 guidelines.

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 1000MHz 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 run automated data collection programs which 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 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.

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 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 nonconductive 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 exhibit of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The FCC requires 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

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.

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, which 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, which have values close to the specification limit may also be measured with a tuned dipole antenna to determine compliance.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

CONDUCTED EMISSIONS SPECIFICATION LIMITS, SECTION 15.207 & 15.107(a)

The table below shows the limits for the emissions on the AC power line from an intentional radiator and a receiver.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on	Linear decrease on
	logarithmic frequency axis between 56.0 and 46.0	logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

CONDUCTED EMISSIONS SPECIFICATION LIMITS, RSS 210

Frequency	Class B	Class B
Range	Limit	Limit
(MHz)	(uV)	(dBuV)
0.450 to 30.000	250	48

RADIATED EMISSIONS SPECIFICATION LIMITS, SECTION 15.209 / RSS 210 Table 3

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands and the limits for all emissions for a low power device operating under the general rules of RSS 210 and FCC Part 15 Subpart C.

Frequency		
Range	Limit	Limit
(MHz)	(uV/m @ 3m)	(dBuV/m @ 3m)
0.009-0.490	2400/F _{KHz} @ 300m	67.6-20*log ₁₀ (F _{KHz}) @ 300m
0.490-1.705	24000/F _{KHz} @ 30m	87.6-20*log ₁₀ (F _{KHz}) @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) 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 above 30MHz, 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

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

 $F_d = 40*LOG_{10} (D_m/D_s)$

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
Fd	=	Distance Factor in dB
R _c	=	Corrected Reading in dBuV/m
Ls	=	Specification Limit in dBuV/m
Μ	=	Margin in dB Relative to Spec

EXHIBIT 1: Test Equipment Calibration Data

Conducted Emissions - AC	Power Ports, 25-Jun-04
Engineer: Juan Martinez	
Manufacturer	Description
Fischer Custom Comm.	LISN, 100A
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz
Rohde& Schwarz	Pulse Limiter

Model #	Asset #	Cal Due
FCC-LISN-50/250-100-2	1205	05-Apr-05
ESN	1332	12-May-05
ESH3 Z2	1398	12-Jan-05

Radiated Emissions, .1 Engineer: Chris Byleck	I - 2MHz, 24-Jun-04 (Low Frequency Transmitters) kie			
Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Magnetic Loop Antenna, 10k-30MHz	6502	1299	16-Dec-04
Hewlett Packard	EMC Spectrum Analyzer, 9KHz - 22GHz	8593EM	1319	20-Nov-04

Radiated Emissions, 30 - 4,000 MHz, 25-Jun-04 to 29-Jun-04 (UHF Transceiver, Digital Device)

Engineer: Juan Wartinez				
<u>Manufacturer</u>	Description	<u>Model #</u>	Asset #	<u>Cal Due</u>
EMCO	Horn Antenna, D. Ridge 1-18GHz	3115	786	29-Oct-04
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	12-May-05
EMCO	Log Periodic Antenna, 0.2-2 GHz	3148	1404	17-Nov-04
EMCO	Biconical Antenna, 30-300 MHz	3110B	1498	15-Jan-05
Hewlett Packard	EMC Spectrum Analyzer 9kHz - 6.5GHz	8595EM	780	26-Feb-05
EMCO	Horn Antenna, D. Ridge 1-18GHz	3115	786	29-Oct-04
Hewlett Packard	EMC Spectrum Analyzer 9kHz - 6.5GHz	8595EM	787	10-Dec-04
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	12-Jan-05

Conducted Emissions - AC Power Ports, 26-Jun-04

Engineer: Juan Martinez				
<u>Manufacturer</u>	Description	<u>Model #</u>	Asset #	<u>Cal Due</u>
Fischer Custom Comm.	LISN, 100A	FCC-LISN-50/250-100-2	1205	05-Apr-05
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	12-May-05
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	1398	12-Jan-05
Radiated Emissions, 30 - 1,00 Engineer: Juan Martinez	00 MHz, 11-Jan-05			
<u>Manufacturer</u>	Description	<u>Model #</u>	Asset #	<u>Cal Due</u>
EMCO	Log Periodic Antenna, 0.2-1 GHz	3146	1294	08-Apr-05
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	12-May-05
EMCO	Biconical Antenna, 30-300 MHz	3110B	1498	15-Jan-05

EXHIBIT 2: Test Measurement Data

T56150 32 Pages

Elliott

EMC Test Data

Client:	Savi Technology, Inc	Job Number:	J56067
Model:	SP-65Y-ZAB Signpost	T-Log Number:	T56150
		Account Manager:	Christine Vu
Contact:	Gene		
Emissions Spec:	FCC 15.209, 15.231, EN55022	Class:	A / Radio
Immunity Spec:		Environment:	

EMC Test Data

For The

Savi Technology, Inc

Model

SP-65Y-ZAB Signpost

Date of Last Test: 10/1/2004



EMC Test Data

Client:	Savi Technology, Inc	Job Number:	J56067
Model:	SP-65Y-ZAB Signpost	T-Log Number:	T56150
		Account Manager:	Christine Vu
Contact:	Gene		
Emissions Spec:	FCC 15.209, 15.231, EN55022	Class:	A / Radio
Immunity Spec:	Enter immunity spec on cover	Environment:	

EUT INFORMATION

General Description

The EUT is a Signpost with either 123 kHz or 132 kHz Transmitter and 433.92 MHz Transceiver which is designed to be used as part of an RFID inventory tracking system. Normally the EUT would be installed at access monitoring and control points (entry & leave portals), mounted on a wall, ceiling or pole during operation. The EUT was, therefore, treated as tabletop equipment during testing to simulate the end-user environment. The EUT can be either AC or DC powered. The electrical rating of the EUT is 100-240 VAC, 50-60 Hz, 0.3 A, 12.8-30 VDC, 1.2 A.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Savi	SP-652-011	123kHz Spider ant	0400104070002	TBD
Savi	SP-652-211	123kHz Lg loop ant	0400104060007	TBD
Savi	SP-652-201	132kHz Lg loop ant	0400104060013	TBD
Savi	SP-652-311	123kHz Sm Loop ant	0400104060017	TBD
Savi	SP-652-111	123kHz Internal ant	0400104060002	TBD
Savi	SP-652-101	132kHz Internal ant	0400104060010	TBD

Other EUT Details

Several tests were performed with different separations between the antenna elements for the handrail antenna. Little difference was observed with separations of between 10" and 1m.

EUT Enclosure

The EUT enclosure is primarily constructed of molded plastic. It measures approximately 69 cm wide by 13 cm deep by 120 cm high.

Modification History

Mod. #	Test	Date	Modification
1			None made during testing

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

Elliott

EMC Test Data

Client:	Savi Technology, Inc	Job Number:	J56067
Model:	SP-65Y-ZAB Signpost	T-Log Number:	T56150
		Account Manager:	Christine Vu
Contact:	Gene		
Emissions Spec:	FCC 15.209, 15.231, EN55022	Class:	A / Radio
Immunity Spec:	Enter immunity spec on cover	Environment:	

Test Configuration #1

	Lo	cal Support Equipm	ent	
Manufacturer	Model	Description	Serial Number	FCC ID
None				

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
IBM	Thinkpad	Laptop	ANO9611TBOON	78-VA248 97/11
IBM	85G6709	AC Adapter	-	-

Interface Cabling and Ports

Dort	Connected To		Cable(s)	
FUIL	Connected To	Description	Shielded or Unshielded	Length(m)
Ethernet	Laptop	CAT 5	Unshielded	30
Sync Out	Unterminated	Multiwire	Shielded	30
Sync IN	Unterminated	Multiwire	Shielded	30
Antenna	Loop antenna	Multiwire	Shielded	0.25
AC in	AC Mains	3 wire	Unshielded	1.5
RS 232	Not cabled			

Note: The Configuration ports were not connected as the manufacturer stated that these are for diagnostic purpose and therefore would not normally be connected.

EUT Operation During Emissions

Digital device radiated measurements and AC conducted emissions measurements: the EUT was transmitting continuously on both LF transmitter and UHF transceiver.

The EUT was transmitting continuously for transmit mode measurements. For receive mode measurements both transmitters were turned off and the receiver was active.

No measurements were made with the device transmitting a pulsed signal. Average field strength measurements for the pulsed signals were made by subtracting an average correction factor from the peak field strength based on the 10% duty cycle (measured in any 100mS period) for the pulsed data and control signals.

ЧĽ	111011				EMC Tes
Client: Sa	avi Technology, Inc				Job Number: J56067
Model: SI	2-65Y-7AB Signpost	ł		T-l	Log Number: T56150
				Αссоι	unt Manager: Christine Vu
Contact: G	ene 20 15 209 15 231 1	EN55022			Class: A / Radio
	С	onducted E	Emissions - Po	ower F	Ports
est Speci	fics				
Ob	jective: I he objectiv specificatior	i listed above.	n is to perform final qualif	ication test	ing of the EUT with respe
Date	of Test: 6/25/2004		Config. Used:	1 (model S	SP-652-201)
	gineer: Juan Martin	ez	Config Change:	None	
Test Er	action: CVOATC #1	`			
Test Er Test Lo General Te for tabletop e second LISI ne test area.	scation: SVOATS #2 st Configuratio quipment, the EUT v v was used for all lo	2 n was located on a wo cal support equipme	EUT Voltage: boden table, 40 cm from a ent. Remote support equi	vertical co	dividual run pupling plane and 80cm fro s located approximately 30
Test Er Test Lo General Te for tabletop e a second LISI ne test area.	est Configuration quipment, the EUT v v was used for all lo onditions:	2 n was located on a wo cal support equipme Temperature: Rel. Humidity:	EUT Voltage: boden table, 40 cm from a ent. Remote support equi 25 °C 42 %	vertical co	oupling plane and 80cm from the second se
Test Er Test Lo General Te for tabletop e second LISI ne test area. Ambient C	est Configuration quipment, the EUT v v was used for all lo onditions:	2 n was located on a wo cal support equipme Temperature: Rel. Humidity:	EUT Voltage: boden table, 40 cm from a ent. Remote support equi 25 °C 42 %	vertical co	oupling plane and 80cm from the second se
Test Er Test Lo General Te for tabletop e second LISI ne test area. Ambient C Summary o Run #	est Configuration est Configuration quipment, the EUT v v was used for all lo onditions: of Results	2 n was located on a wo cal support equipme Temperature: Rel. Humidity: t Performed	EUT Voltage: boden table, 40 cm from a ent. Remote support equi 25 °C 42 % Limit	Refer to in a vertical co ipment was	duvidual run pupling plane and 80cm fro clocated approximately 30 Margin
Test Er Test Lo General Te for tabletop e second LISI ne test area. Ambient C Summary o Run # 1	est Configuration quipment, the EUT v vas used for all lo onditions: of Results CE, AC P	2 n was located on a wc cal support equipme Temperature: Rel. Humidity: t Performed ower, 230V/50Hz	EUT Voltage: boden table, 40 cm from a ent. Remote support equi 25 °C 42 % Limit FCC & CISPR 22 B FN 301 489-1	Refer to in a vertical co ipment was Result Pass	Margin Margin 43.6dBµ V @ 0.318MHz (-6.2dB)
Test Er Test Lo General Te or tabletop e second LISI ne test area. Ambient C Gummary o Run # 1	est Configuration quipment, the EUT v vas used for all lo onditions: of Results CE, AC P	2 m was located on a wo cal support equipme Temperature: Rel. Humidity: t Performed ower, 230V/50Hz	EUT Voltage: ooden table, 40 cm from a ent. Remote support equi 25 °C 42 % Limit FCC & CISPR 22 B EN 301 489-1 FCC & CISPR 22 B	Refer to in evertical co ipment was Result Pass	Margin 43.6dBµV @ 0.318MHz (-6.2dB) 37.8dBµV @ 0.533MHz
Test Er Test Lo General Te for tabletop e second LISE ne test area. Ambient C Summary o Run # 1 2	est Configuration quipment, the EUT v vas used for all lo onditions: <u>Tes</u> CE, AC P	2 n was located on a wc cal support equipme Temperature: Rel. Humidity: <u>t Performed</u> ower, 230V/50Hz 'ower,120V/60Hz	EUT Voltage: boden table, 40 cm from a ent. Remote support equi 25 °C 42 % Limit FCC & CISPR 22 B EN 301 489-1 FCC & CISPR 22 B EN 301 489-1	Refer to in evertical co ipment was Result Pass Pass	Margin Margin 43.6dBµV @ 0.318MHz (-6.2dB) 37.8dBµV @ 0.533MHz (-8.2dB)
Test Er Test Lo General Te for tabletop e second LISI he test area. Ambient C Summary o Run # 1 2 3	est Configuration quipment, the EUT v vas used for all lo onditions: <u>of Results</u> <u>CE, AC P</u> <u>CE, AC P</u>	2 m was located on a wc cal support equipme Temperature: Rel. Humidity: t Performed ower, 230V/50Hz 'ower,120V/60Hz	EUT Voltage: boden table, 40 cm from a ent. Remote support equi 25 °C 42 % Limit FCC & CISPR 22 B EN 301 489-1 FCC & CISPR 22 B EN 301 489-1 RSS-210	Refer to in a vertical co ipment was Result Pass Pass Pass	Margin 43.6dBµ V @ 0.318MHz (-6.2dB) 37.8dBµ V @ 0.533MHz (-8.2dB) 47.5dBµ V @ 0.394MHz (-0.5dB)
Test Er Test Lo General Te or tabletop e a second LISI he test area. Ambient C Gummary o Run # 1 2 3 4	est Configuration quipment, the EUT v v was used for all lo onditions: of Results CE, AC P CE, AC P	2 n was located on a wc cal support equipme Temperature: Rel. Humidity: t Performed ower, 230V/50Hz 'ower,120V/60Hz 'ower,120V/60Hz : Power 24V/dc	Limit FCC & CISPR 22 B EN 301 489-1 RSS-210 EN 301 489-1	Refer to in evertical co ipment was Result Pass Pass Pass Pass	Margin 43.6dBµV @ 0.318MHz (-6.2dB) 37.8dBµV @ 0.533MHz (-8.2dB) 47.5dBµV @ 0.394MHz (-0.5dB) 47.5dBµV @ 0.394MHz

ΥI	Elli	ott					E/	
Client:	Savi Tecl	nnology, li	nc				Job Numbe	er: J56067
Madal			voct				T-Log Numbe	er: T56150
wouer.	3P-001-2	AD SIYIIL	1051				Account Manage	er: Christine Vu
Contact:	Gene							
Spec:	FCC 15.2	209, 15.23	1, EN5502	2			Clas	s: A / Radio
Run #1: A	C Power F	Port Conc	lucted Em	issions, 0.1	5 - 30MHz,	230V/50Hz (1	32kHz & 433MHz)	
requency	Level	AC	EN55	5022 B	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.318	43.6	Line	49.8	-6.2	Average			
0.212	41.8	Line	53.1	-11.3	Average			
0.212	51.0	Line	63.1	-12.1	QP			
0.318	37.0	Neutral	49.8	-12.8	Average			
0.318	46.3	Line	59.8	-13.5	QP			
0.212	39.6	Neutral	53.1	-13.5	Average			
	46.1	Line	60.0	-13.9	QP			
6.400		N	621	_1/ 9	$\cap D$			
6.400 0.212	48.2	Neutral	05.1	-14.7	21			
6.400 0.212 0.318	48.2 43.2	Neutral	59.8	-16.6	QP			
6.400 0.212 0.318 6.400	48.2 43.2 33.4	Neutral Neutral Line	59.8 50.0	-16.6 -16.6	QP Average			
6.400 0.212 0.318 6.400 20.650	48.2 43.2 33.4 40.0	Neutral Neutral Line Neutral	59.8 50.0 60.0	-16.6 -16.6 -20.0	QP Average QP			
6.400 0.212 0.318 6.400 20.650 20.650	48.2 43.2 33.4 40.0 26.3	Neutral Line Neutral Neutral	59.8 50.0 60.0 50.0	-16.6 -16.6 -20.0 -23.7	QP Average QP Average			
6.400 0.212 0.318 6.400 20.650 20.650 Run #2: A	48.2 43.2 33.4 40.0 26.3 C Power F Level	Neutral Line Neutral Neutral Neutral	59.8 50.0 60.0 50.0 Jucted Em	-16.6 -16.6 -20.0 -23.7 issions, 0.1	QP Average QP Average 5 - 30MHz, Detector	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 Run #2: At	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV	Neutral Line Neutral Neutral Port Conc AC Line	59.8 50.0 60.0 50.0 Jucted Em EN55 Limit	-16.6 -16.6 -20.0 -23.7 issions, 0.1	QP Average QP Average 5 - 30MHz, Detector QP/Ave	120V/60Hz (1	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 Run #2: A Frequency MHz 0.533	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8	Neutral Neutral Line Neutral Neutral Ort Conc AC Line Line	59.8 50.0 60.0 50.0 Iucted Em EN55 Limit 46.0	-16.6 -16.6 -20.0 -23.7 issions, 0.1 5022 B Margin -8.2	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 20.650 Run #2: Action Frequency MHz 0.533 0.212	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8 41.4	AC Line Neutral Neutral Neutral AC Line Line Line	59.8 50.0 60.0 50.0 Jucted Em EN55 Limit 46.0 53.1	-14.7 -16.6 -20.0 -23.7 issions, 0.1 5022 B Margin -8.2 -11.7	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 Run #2: A Frequency MHz 0.533 0.212 0.318	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8 41.4 37.3	AC Line Neutral Neutral Neutral	59.8 50.0 60.0 50.0 Iucted Em EN55 Limit 46.0 53.1 49.8	-16.6 -16.6 -20.0 -23.7 issions, 0.1 io22 B Margin -8.2 -11.7 -12.5	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average Average	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 20.650 Run #2: A0 Frequency MHz 0.533 0.212 0.318 0.212	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8 41.4 37.3 49.8	AC Line Neutral Neutral Neutral Neutral Neutral Cort Conc AC Line Line Line Line	59.8 50.0 60.0 50.0 Jucted Em EN55 Limit 46.0 53.1 49.8 63.1	-16.6 -16.6 -20.0 -23.7 issions, 0.1 5022 B Margin -8.2 -11.7 -12.5 -13.3	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average QP	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 20.650 Run #2: A Frequency MHz 0.533 0.212 0.318 0.212 0.318 0.212 6.400	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8 41.4 37.3 49.8 36.4	AC Line Neutral Neutral Neutral Neutral Cort Conc AC Line Line Line Line Line Line Line	59.8 50.0 60.0 50.0 Jucted Em EN55 Limit 46.0 53.1 49.8 63.1 50.0	-14.7 -16.6 -20.0 -23.7 issions, 0.1 issions, 0.1 issions, 0.1 -12.5 -13.3 -13.6	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average QP Average QP	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 20.650 Run #2: A Frequency MHz 0.533 0.212 0.318 0.212 0.318 0.212 6.400 0.212	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8 41.4 37.3 49.8 36.4 48.3	AC Line Neutral Neutral Neutral AC Line Line Line Line Line Neutral Neutral	63.1 59.8 50.0 60.0 50.0 Jucted Em Limit 46.0 53.1 49.8 63.1 50.0 63.1	-14.7 -16.6 -20.0 -23.7 issions, 0.1 issions, 0.1 issions, 0.1 -8.2 -11.7 -12.5 -13.3 -13.6 -14.8	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average QP Average QP	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.212 20.318 20.212 20.212 20.318	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8 41.4 37.3 49.8 36.4 48.3 34.7	AC Line Neutral Neutral Neutral Cort Conc AC Line Line Line Line Line Line Neutral Neutral Neutral	59.8 50.0 60.0 50.0 Jucted Em EN55 Limit 46.0 53.1 49.8 63.1 50.0 63.1 49.8	-16.6 -16.6 -20.0 -23.7 issions, 0.1 5022 B Margin -8.2 -11.7 -12.5 -13.3 -13.6 -14.8 -15.1	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average QP Average QP Average QP	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 20.650 20.650 20.650 20.650 20.650 20.212 0.318 0.212 0.318 0.212 0.318 0.212	48.2 43.2 33.4 40.0 26.3 C Power Γ Level dBμV 37.8 41.4 37.3 49.8 36.4 48.3 34.7 37.9	AC Line Neutral Neutral Neutral Cort Conc AC Line Line Line Line Line Neutral Neutral Neutral Neutral	59.8 50.0 60.0 50.0 60.0 50.0 Jucted Em Limit 46.0 53.1 49.8 63.1 50.0 63.1 50.0 63.1 50.0 63.1 50.0 63.1 50.0 63.1 50.0	-16.6 -16.6 -20.0 -23.7 issions, 0.1 5022 B Margin -8.2 -11.7 -12.5 -13.3 -13.6 -14.8 -15.1 -15.2	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average QP Average QP Average QP	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.212 0.212	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8 41.4 37.3 49.8 36.4 48.3 34.7 37.9 39.8	AC Line Neutral Neutral Neutral Cort Conc AC Line Line Line Line Line Neutral Neutral Neutral Neutral Neutral	59.8 50.0 60.0 50.0 bucted Em Limit 46.0 53.1 49.8 63.1 50.0 63.1 50.0	-16.6 -16.6 -20.0 -23.7 issions, 0.1 issions, 0.1 is	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average QP Average QP Average QP	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 20.650 Run #2: At requency MHz 0.533 0.212 0.318 0.212 6.400 0.212 0.318 0.212 0.318	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8 41.4 37.3 49.8 36.4 48.3 34.7 37.9 39.8 42.0	AC Line Neutral Neutral Neutral AC Line Line Line Line Line Neutral Neutral Neutral Neutral Neutral Neutral	59.8 50.0 60.0 50.0 Jucted Em EN55 Limit 46.0 53.1 49.8 63.1 50.0 63.1 49.8 53.1 50.0 63.1 49.8 53.1	-16.6 -16.6 -20.0 -23.7 issions, 0.1 issions, 0.1 is	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average Average QP Average QP Average QP Average QP	120V/60Hz (1 Comments	32kHz & 433MHz)	
6.400 0.212 0.318 6.400 20.650 20.650 20.650 20.650 20.650 20.650 20.650 20.212 0.318 0.212 0.318 0.212 0.318 0.212 0.318 0.212 0.318 0.212	48.2 43.2 33.4 40.0 26.3 C Power F Level dBμV 37.8 41.4 37.3 49.8 36.4 48.3 34.7 37.9 39.8 42.0 40.5	AC Line Neutral Neutral Neutral Neutral Line Line Line Line Neutral Neutral Neutral Neutral Neutral Line Line Line	59.8 59.0 60.0 50.0 60.0 50.0 lucted Em EN55 Limit 46.0 53.1 49.8 63.1 50.0 63.1 50.0 53.1 50.0 63.1 59.8 59.8 59.8	-16.6 -16.6 -20.0 -23.7 issions, 0.1 5022 B Margin -8.2 -11.7 -12.5 -13.3 -13.6 -14.8 -15.1 -15.2 -16.2 -17.8 -19.3	QP Average QP Average 5 - 30MHz, Detector QP/Ave Average Average QP Average QP Average QP Average QP	120V/60Hz (1 Comments	32kHz & 433MHz)	

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6	Ellio	ott					EM	C Test Data
Client:	Savi Tech	nology, I	nc				Job Number:	J56067
Modal	SD 45V 7		nact				T-Log Number:	T56150
Model.	58-001-7	.AD SIYIII	0051				Account Manager:	Christine Vu
Contact:	Gene							
Spec:	FCC 15.2	.09, 15.23	31, EN55022	2			Class:	A / Radio
Run #3: A(C Power F	ort Con	ducted Emi	issions, 0.1	⊧5 - 30MHz,	120V/60Hz (1	32kHz & 433MHz)	
Frequency	Level	AC	RSS	5-210	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
5.550	41.1	Neutral	48.0	-6.9	QP			
6.400	40.0	Neutral	48.0	-8.0	QP			
0.533	39.8	Line	48.0	-8.2	QP	ļ		
6.400	39.8	Line	48.0	-8.2	QP	_		
0.533	37.4	Neutral	48.0	-10.6	QP	───		
5.650	31.3	Line	48.0	-10.7	QP			
Frequency	Level	AC	EN55	i022 B	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.394	47.5	Neutral	48.0	-0.5	Average	ļ		
0.394	47.5	Line	48.0	-0.5	Average	<u> </u>		
0.658	45.4	Neutral	46.0	-0.6	Average			
0.658	44./	Line	46.0	-1.3	Average	 		
0.922	41.0	Neutrai	46.0	-4.4	Average	<u> </u>		
0.922	41.Z	Neutral	40.0 58.0	-4.0				
0.394	53.0	Line	58.0	-5.0	OP	<u> </u>		
0.658	50.8	Neutral	56.0	-5.2	QP	1		
0.658	50.1	Line	56.0	-5.9	QP	1		
0.922	46.7	Neutral	56.0	-9.3	QP	<u> </u>		
0.922	46.4	Line	56.0	-9.6	QP			

Client: Savi Technology, Inc Job Number: J56067 Model: SP-65Y-ZAB Signpost T-Log Number: T56150 Account Manager: Christine Vu Contact: Gene Class: A / Radio Spec: FCC 15.209, 15.231, EN55022 Class: A / Radio Conducted Emissions - Power Ports 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 specification listed above. Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config Change: None Test Location: SVOATS #2 EUT Voltage: Refer to individual run Seeneral Test Configuration Tor tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from A second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m the test area. Ambient Conditions: Temperature: 25 °C Ref. Humidity: 42 %		ott			EM	IC Test L	Da
Model: SP-65Y-ZAB Signpost T-Log Number: T56150 Account Manager: Christine Vu Spec: FCC 15.209, 15.231, EN55022 Class: A / Radio Conducted Emissions - Power Ports est Specifics Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to specification listed above. Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config Change: None Test Location: SVOATS #2 EUT Voltage: Refer to individual run enereral Test Configuration or tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m e test area. mbient Conditions: Test Performed Limit Result Margin 1 CE, AC Power, 230V/50Hz FCC & CISPR 22 B Pass 37.9dBµV @ 0.305MHz (-10.1dB) 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B Pass 40.0dBµV @ 0.305MHz (-10.1dB) 3 CE AC Power 120V/60Hz FCC & CISPR 22 B Pass 40.0dBµV @ 0	Client: Savi Tec	nology, Inc		,	Job Number:	J56067	
Account Manager: Christine Vu Contact: Gene Spec: FCC 15.209, 15.231, EN55022 Class: A / Radio Conducted Emissions - Power Ports Conducted Emissions - Power Ports The objective of this test session is to perform final qualification testing of the EUT with respect to specification listed above. Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config Change: None Test Location: SVOATS #2 EUT Voltage: Refer to individual run Seneral Test Configuration or tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m te test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % Summary of Results Run # Test Performed Limit Result Margin (12.2dB) 2 CE, AC Power, 230V/50Hz FCC & CISPR 22 B Pass 37.9dBµV @ 0.305MHz (10.1dB) (10.1dB) 3 CE AC Power 120V/60Hz PSS-210 Pass 37.2dBµV @ 0.810MHz <td< td=""><td>Model: SP-65Y-</td><td>ZAB Sianpost</td><td></td><td>T-L</td><td>og Number:</td><td>T56150</td><td></td></td<>	Model: SP-65Y-	ZAB Sianpost		T-L	og Number:	T56150	
Contact: Gene Spec: FCC 15.209, 15.231, EN55022 Class: A / Radio Conducted Emissions - Power Ports est Specifics Objective: Specification listed above. Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config Change: None Test Location: SVOATS #2 EUT Voltage: Refer to individual run Seneral Test Configuration or tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m e test area. mbient Conditions: Test Performed Limit Result Margin (12.2dB) 1 CE, AC Power, 230V/50Hz FCC & CISPR 22 B EN 301 489-1 Pass 37.9dBµV @ 0.305MHz (10.1dB) 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B EN 301 489-1 Pass 37.2dBµV @ 0.305MHz (10.1dB) 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBµV @ 0.305MHz (10.1dB)	Combo at Como			Accou	int Manager:	Christine Vu	
Specifics Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to specification listed above. Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config. Used: 1 (model SP-652-211) Test Location: SVOATS #2 EUT Voltage: Refer to individual run Seeneral Test Configuration or tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m e test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % Imit Test Performed Limit Remote CiSPR 22 B 1 1 1 1 CE, AC Power, 230V/50Hz FC & CISPR 22 B 2 2 2 2 2 2	Spec: ECC 15 (209 15 231 EN55022			Class	A / Radio	
Conducted Emissions - Power Ports est Specifics Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to specification listed above. Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config Change: None Test Location: SVOATS #2 EUT Voltage: Refer to individual run emeral Test Configuration rtabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m e test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % Immary of Results 					010001		
Exit Specifics Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to specification listed above. Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config Change: None Test Location: SVOATS #2 EUT Voltage: Refer to individual run eneral Test Configuration rt tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % ummary of Results FCC & CISPR 22 B Result 37.9dBµV @ 0.305MHz 2 CE, AC Power, 230V/50Hz FCC & CISPR 22 B Pass 37.9dBµV @ 0.305MHz 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B Pass 37.2dBµV @ 0.810MHz 3 CE AC Power 120V/60Hz FCC & CISPR 22 B Pass 37.2dBµV @ 0.810MHz		Conducted E	Emissions - Po	ower P	orts		
Specifics The objective of this test session is to perform final qualification testing of the EUT with respect to specification listed above. Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config Change: None Test Location: SVOATS #2 EUT Voltage: Refer to individual run eneral Test Configuration rt tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m e test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % ummary of Results FCC & CISPR 22 B An argin 1 CE, AC Power, 230V/50Hz FCC & CISPR 22 B Pass 37.9dBµV @ 0.305MHz 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B Pass 40.0dBµV @ 0.305MHz 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBµV @ 0.810MHz	at Crasifias						
Objective: The objective of this test section is to perform find qualified of rest is performed above. Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config Change: None Test Location: SVOATS #2 EUT Voltage: Refer to individual run eneral Test Configuration r tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m e test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % ummary of Results FCC & CISPR 22 B Pass 1 CE, AC Power, 230V/50Hz FCC & CISPR 22 B Pass 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B Pass 40.0dBµ V @ 0.305MHz 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B Pass 40.0dBµ V @ 0.305MHz 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBµ V @ 0.810MHz	est specifics	The objective of this test sessio	n is to perform final qualif	ication testi	ing of the FI	IT with respect to	h thr
Date of Test: 6/25/2004 Config. Used: 1 (model SP-652-211) Test Engineer: Juan Martinez Config Change: None Test Location: SVOATS #2 EUT Voltage: Refer to individual run eneral Test Configuration or tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m a test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % ummary of Results EN 301 489-1 Pass 37.9dBµ V @ 0.305MHz (-12.2dB) 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B Pass 40.0dBµ V @ 0.305MHz (-10.1dB) 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBµ V @ 0.810MHz	Objective:	specification listed above.					<i>,</i>
Test Engineer: Juan Martinez Test Location: SVOATS #2 Config Change: None EUT Voltage: Refer to individual run eneral Test Configuration or tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m e test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % ummary of Results FCC & CISPR 22 B EN 301 489-1 Pass 37.9dBµV @ 0.305MHz (-12.2dB) 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B EN 301 489-1 Pass 40.0dBµV @ 0.305MHz (-10.1dB) 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBµV @ 0.810MHz	Date of Test	6/25/2004	Config. Used:	1 (model S	SP-652-211)		
Test Location: SVOATS #2 EUT Voltage: Refer to individual run eneral Test Configuration or tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m e test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % ummary of Results EUT Voltage: Refer to individual run 2 CE, AC Power, 230V/50Hz FCC & CISPR 22 B Pass 37.9dBµ V @ 0.305MHz (-12.2dB) 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B Pass 40.0dBµ V @ 0.305MHz (-10.1dB) 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBµ V @ 0.810MHz (-10.1dB)	Test Engineer:	Juan Martinez	Config Change:	None	,		
eneral Test Configuration r tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from second LISN was used for all local support equipment. Remote support equipment was located approximately 30 m e test area. mbient Conditions: Temperature: 25 °C Rel. Humidity: 42 % ummary of Results CE, AC Power, 230V/50Hz FCC & CISPR 22 B Pass GE, AC Power, 120V/60Hz FCC & CISPR 22 B Pass 40.0dBµV @ 0.305MHz (-12.2dB) CE, AC Power, 120V/60Hz FCC & CISPR 22 B Pass 40.0dBµV @ 0.305MHz (-10.1dB) CE AC Power 120V/60Hz Ress. 210 Pass 37.2dBµV @ 0.810MHz 	Test Location:	SVOATS #2	EUT Voltage:	Refer to in	dividual run		
Immary of Results Run # Test Performed Limit Result Margin 1 CE, AC Power, 230V/50Hz FCC & CISPR 22 B EN 301 489-1 Pass 37.9dBµ V @ 0.305MHz (-12.2dB) 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B FCC & CISPR 22 B EN 301 489-1 Pass 40.0dBµ V @ 0.305MHz (-10.1dB) 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBµ V @ 0.810MHz	nbient Conditi	ons: Temperature: Rel. Humidity:	25 °C 42 %				
Run # Test Performed Limit Result Margin 1 CE, AC Power, 230V/50Hz FCC & CISPR 22 B EN 301 489-1 Pass 37.9dBµ V @ 0.305MHz (-12.2dB) 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B EN 301 489-1 Pass 40.0dBµ V @ 0.305MHz (-10.1dB) 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBµ V @ 0.810MHz	ummary of Res	sults					
1 CE, AC Power, 230V/50Hz FCC & CISPR 22 B EN 301 489-1 Pass 37.9dBμ V @ 0.305MHz (-12.2dB) 2 CE, AC Power, 120V/60Hz FCC & CISPR 22 B EN 301 489-1 Pass 40.0dBμ V @ 0.305MHz (-10.1dB) 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBμ V @ 0.810MHz	Run #	Test Performed	Limit	Result	Ma	argin	
EN 301 489-1 CEN 301 489-1 Pass 40.0dBµ V @ 0.305MHz CEN 301 489-1 Pass 40.0dBµ V @ 0.305MHz CEN 301 489-1 CEN 301 480-1 CEN 301 480-1 CEN 301 480-1	4	CE, AC Power, 230V/50Hz	FCC & CISPR 22 B	Pass	37.9dBµV	@ 0.305MHz	
2 CE, AC Power,120V/60Hz EN 301 489-1 Pass (-10.1dB) 3 CE AC Power 120V/60Hz RSS-210 Pass 37.2dBµV @ 0.810MHz	1		EN 301 489-1 FCC & CISPR 22 B		(-12 40.0dBu.V	2.2dB) @ 0.305MHz	
3 CF_AC Power 120V/60Hz RSS-210 Pass 37.2dBµV @ 0.810MHz	1			Dace	roroubp r	0.00011112	
	2	CE, AC Power,120V/60Hz	EN 301 489-1	1 033	(-10).1dB)	
(-10.80B) 45.0dBµV@0.612MHz	1 2 3	CE, AC Power,120V/60Hz CE, AC Power,120V/60Hz	EN 301 489-1 RSS-210	Pass	(-10) 37.2dBµV	0.1dB) @ 0.810MHz	
4 CE, DC Power, 24Vac EN 301 489-1 Pass (-1.0dB)	1 2 3	CE, AC Power,120V/60Hz CE, AC Power,120V/60Hz	EN 301 489-1 RSS-210	Pass	(-10 37.2dBµV (-10 45.0dBµV).1dB) @ 0.810MHz).8dB) @ 0.612MHz	

1	Savi Tool	anology le	20				Job Nu	mbor	156067
Client:	Savi Teci	nnology, Ir	10					imper:	J56067
Model:	SP-65Y-7	ZAB Signp	ost				I-Log Nu	imber:	156150 Christine Ma
<u> </u>	0						Account Mai	nager:	Christine Vu
Contact:	Gene	00 15 22		2				Class	A / Dadia
Spec:	FUU 15.2	209, 15.23	T, EN5502	2				Class:	A / Radio
Run #1: A	C Power I	Port Cond	ucted Em	issions, 0.1	5 - 30MHz,	230V/50Hz (1	23kHz & 433MH;	z)	
Frequency	Level	AC	EN55	022 B	Detector	Comments			
MHz	dBµV	Line	Limit	Margin	QP/Ave				
0.305	37.9	Line	50.1	-12.2	Average				
0.301	36.7	Neutral	50.2	-13.5	Average				
0.202	49.4	Line	63.5	-14.1	QP				
0.202	48.5	Neutral	63.5	-15.0	QP				
0.202	36.7	Neutral	53.5	-16.8	Average				
0.202	36.6	Line	53.5	-16.9	Average				
0 205	43.1	Line	60.1	-17.0	QP				
0.305			60.0	10.2	OP				
6.800	40.8	Line	00.0	-17.Z	21				
6.800 0.301	40.8 40.8	Line Neutral	60.2	-19.2	QP				
0.303 6.800 0.301 0.404	40.8 40.8 27.5	Line Neutral Neutral	60.0 60.2 47.8	-19.2 -19.4 -20.3	QP Average				
6.800 0.301 0.404 6.800	40.8 40.8 27.5 28.6	Line Neutral Neutral Line	60.2 47.8 50.0	-19.2 -19.4 -20.3 -21.4	QP Average Average				
6.800 0.301 0.404 6.800 0.404	40.8 40.8 27.5 28.6 34.0	Line Neutral Neutral Line Neutral	60.0 60.2 47.8 50.0 57.8	-19.2 -19.4 -20.3 -21.4 -23.8	QP Average Average QP				
6.800 0.301 0.404 6.800 0.404 Run #2: A	40.8 40.8 27.5 28.6 34.0 C Power I	Line Neutral Line Neutral Neutral	60.0 60.2 47.8 50.0 57.8 lucted Emi EN55	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1	QP Average Average QP 5 - 30MHz,	120V/60Hz (1	23kHz & 433MH;	z)	
6.800 0.301 0.404 6.800 0.404 Run #2: At Frequency MHz	40.8 40.8 27.5 28.6 34.0 C Power I	Line Neutral Line Neutral Port Cond	60.0 60.2 47.8 50.0 57.8 lucted Emi EN55 Limit	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1	QP Average Average QP 5 - 30MHz, Detector QP/Ave	120V/60Hz (1 Comments	23kHz & 433MH	z)	
6.800 0.301 0.404 6.800 0.404 Run #2: A Frequency MHz 0.305	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0	Line Neutral Line Neutral Neutral Port Cond AC Line Line	60.0 60.2 47.8 50.0 57.8 Limit 50.1	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 i022 B Margin -10.1	QP Average Average QP 5 - 30MHz, Detector QP/Ave Average	120V/60Hz (1 Comments	23kHz & 433MH;	z)	
0.303 6.800 0.301 0.404 6.800 0.404 Run #2: A Frequency MHz 0.305 0.202	40.8 40.8 27.5 28.6 34.0 C Power Γ Level dBμV 40.0 52.7	Line Neutral Line Neutral Port Cond AC Line Line Neutral	60.0 60.2 47.8 50.0 57.8 lucted Emi EN55 Limit 50.1 63.5	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 5022 B Margin -10.1 -10.8	QP Average Average QP 5 - 30MHz, Detector QP/Ave Average QP	120V/60Hz (1 Comments	23kHz & 433MH;	z)	
6.800 0.301 0.404 6.800 0.404 Run #2: Au Frequency MHz 0.305 0.202 4.964	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0 52.7 34.2	Line Neutral Line Neutral Ort Cond AC Line Neutral Line Line Line Line Line	60.0 60.2 47.8 50.0 57.8 Linit 50.1 63.5 46.0	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 022 B Margin -10.1 -10.8 -11.8	QP Average Average QP 5 - 30MHz, Detector QP/Ave Average QP Average	120V/60Hz (1 Comments	23kHz & 433MH	z)	
6.800 0.301 0.404 6.800 0.404 Run #2: A4 Frequency MHz 0.305 0.202 4.964 4.961	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0 52.7 34.2 34.0	Line Neutral Line Neutral Ort Cond AC Line Line Line Line Line Line Line Line Neutral Line Line Neutral Line Neutral	60.0 60.2 47.8 50.0 57.8 Lincted Em EN55 Limit 50.1 63.5 46.0 46.0	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 issions, 0.1 issions, 0.1 -10.1 -10.8 -11.8 -12.0	OP Average Average OP 5 - 30MHz, Detector OP/Ave Average OP Average Average	120V/60Hz (1 Comments	23kHz & 433MH;	z)	
6.303 6.800 0.301 0.404 6.800 0.404 Run #2: A Frequency MHz 0.305 0.202 4.964 4.961 0.202	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0 52.7 34.2 34.0 40.4	Line Neutral Line Neutral Oort Cond AC Line Line Line Line Neutral Neutral Neutral Neutral Neutral Neutral Neutral Neutral Neutral	60.0 60.2 47.8 50.0 57.8 Limit 50.1 63.5 46.0 46.0 53.5	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 issions, 0.1 i022 B Margin -10.1 -10.8 -11.8 -12.0 -13.1	OP Average QP 5 - 30MHz, Detector QP/Ave Average QP Average Average Average	120V/60Hz (1 Comments	23kHz & 433MH;	z)	
6.800 0.301 0.404 6.800 0.404 Run #2: Au Frequency MHz 0.305 0.202 4.964 4.961 0.202 0.206	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0 52.7 34.2 34.0 40.4 49.8	Line Neutral Line Neutral Ort Cond AC Line Line Neutral Line Neutral Neutral Neutral Line	60.0 60.2 47.8 50.0 57.8 Limit 50.1 63.5 46.0 46.0 53.5 63.4	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 0022 B Margin -10.1 -10.8 -11.8 -11.8 -12.0 -13.1 -13.6	QP Average QP 5 - 30MHz, Detector QP/Ave Average QP Average Average QP	120V/60Hz (1 Comments	23kHz & 433MH;	z)	
0.303 6.800 0.301 0.404 6.800 0.404 6.800 0.404 Frequency MHz 0.305 0.202 4.964 0.202 0.202 0.202 0.202 0.202 0.202 0.202 0.202 0.202 0.202 0.202 0.202 0.203	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0 52.7 34.2 34.0 40.4 49.8 46.0	Line Neutral Line Neutral Ort Cond AC Line Line Line Neutral Ine Neutral Line Line Line Line Line Line Neutral Line Neutral Line	60.0 60.2 47.8 50.0 57.8 Limit 50.1 63.5 46.0 46.0 53.5 63.4 60.1	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 issions, 0.1 i022 B Margin -10.1 -10.8 -11.8 -12.0 -13.1 -13.6 -14.1	QP Average QP 5 - 30MHz, Detector QP/Ave Average Average Average QP Average QP	120V/60Hz (1 Comments	23kHz & 433MH	z)	
0.303 6.800 0.301 0.404 6.800 0.404 Run #2: A Frequency MHz 0.305 0.202 4.964 0.202 0.202 0.206 0.305 0.206	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0 52.7 34.2 34.0 40.4 49.8 46.0 39.1	Line Neutral Neutral Neutral Oort Cond AC Line Line Neutral Line Neutral Neutral Line Line Line	60.0 60.2 47.8 50.0 57.8 Limit 50.1 63.5 46.0 46.0 53.5 63.4 60.1 53.4	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 issions, 0.1 i022 B Margin -10.1 -10.8 -11.8 -12.0 -13.1 -13.6 -14.1 -14.3	QPAverageAverageQP5 - 30MHz,DetectorQP/AveAverageQPAverageQPAverageQPAverageQPAverageQPAverageQPAverageQPAverageQPAverageQPQPAverageQPAverage	120V/60Hz (1 Comments	23kHz & 433MH;	z)	
6.303 6.800 0.301 0.404 6.800 0.404 Run #2: Au Frequency MHz 0.305 0.202 4.964 4.961 0.202 0.206 0.305 0.206 0.305	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0 52.7 34.2 34.0 40.4 49.8 46.0 39.1 34.6	Line Neutral Line Neutral Ort Cond Ort Cond Line Line Neutral Neutral Neutral Line Line Line Line Line	60.0 60.2 47.8 50.0 57.8 lucted Emi EN55 Limit 50.1 63.5 46.0 46.0 53.5 63.4 60.1 53.4 50.1	-19.4 -20.3 -21.4 -23.8 issions, 0.1 issions, 0.1 022 B Margin -10.1 -10.8 -11.8 -12.0 -13.1 -13.6 -14.1 -14.3 -15.5	QPAverageQPAverageQP5 - 30MHz,DetectorQP/AveAverageQPAverageQPAverageAverageQPAverage	120V/60Hz (1 Comments	23kHz & 433MH;	z)	
0.303 6.800 0.301 0.404 6.800 0.404 6.800 0.404 6.800 0.404 Frequency MHz 0.305 0.202 4.964 0.202 0.206 0.305 0.206 0.305 0.206 0.305 0.305 0.305 0.305	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0 52.7 34.2 34.0 40.4 49.8 46.0 39.1 34.6 43.8	Line Neutral Line Neutral Ort Cond AC Line Line Neutral Neutral Line Line Line Neutral Line Neutral Neutral	60.0 60.2 47.8 50.0 57.8 Limit 50.1 63.5 46.0 46.0 53.5 63.4 60.1 53.4 50.1 63.4 60.1 53.4 50.1 60.1	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 issions, 0.1 i022 B Margin -10.1 -10.8 -11.8 -12.0 -13.1 -13.6 -14.1 -14.3 -15.5 -16.3	QP Average QP 5 - 30MHz, Detector QP/Ave Average Average Average QP Average QP Average QP QP Average QP	120V/60Hz (1 Comments	23kHz & 433MH	z)	
0.303 6.800 0.301 0.404 6.800 0.404 6.800 0.404 Frequency MHz 0.305 0.202 4.964 0.202 0.202 0.202 0.202 0.202 0.206 0.305 0.206 0.305 0.305 0.305 0.305 0.305 0.305	40.8 40.8 27.5 28.6 34.0 C Power I Level dBμV 40.0 52.7 34.2 34.0 40.4 49.8 46.0 39.1 34.6 43.8 38.2	Line Neutral Neutral Neutral Neutral Ort Cond Cont Line Line Neutral Neutral Neutral Line Line Line Line Neutral Neutral Neutral Neutral Neutral Line	60.0 60.2 47.8 50.0 57.8 Limit 50.1 63.5 46.0 46.0 53.5 63.4 60.1 53.4 50.1 60.1 55.0 60.1 56.0	-19.2 -19.4 -20.3 -21.4 -23.8 issions, 0.1 issions,	QP Average QP Average QP 5 - 30MHz, Detector QP/Ave Average QP Average QP Average QP Average Average QP Average QP QP	120V/60Hz (1 Comments	23kHz & 433MH	z)	

6ł	Ellio	ott					EM	IC Test Data
Client:	Savi Tech	nnology, I	nc				Job Number:	J56067
	25 (5)(-						T-Log Number:	T56150
Model:	SP-65Y-2	ZAB Signp	JOST				Account Manager:	Christine Vu
Contact:	Gene							
Spec:	FCC 15.2	209, 15.23	31, EN5502	2			Class:	A / Radio
Run #3: A(C Power F	Port Conc	Jucted Emi	issions, 0.1	5 - 30MHz,	120V/60Hz (1	23kHz & 433MHz)	
Frequency	Level	AC	RSS	5-210	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.810	37.2	Line	48.0	-10.8	QP			
4.964	35.6	Line	48.0	-12.4	QP	Ļ		
0.810	35.4	Neutral	48.0	-12.6	QP			
0.506	34.1	Neutral	48.0	-13.9	QP			
0.506	31.5	Line	48.0	-16.5		 		
0.500	30.2	Neutrai	48.0	-17.8	U٢			
Frequency	Level	AC	EN55	5022 B	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.612	45.0	Line	46.0	-1.0	Average	ļ		
0.612	44.9	Neutral	46.0	-1.1	Average	ļ		
0.367	47.0	Neutral	48.6	-1.6	Average	ļ		
0.367	46.8	Line	48.6	-1.8	Average			
0.612	50.2	Line	56.0	-5.8				
0.012	50.1	Neutrai	56.0	-5.9		 		
0.307	52.5	Line	0.0C	-0.1		<u> </u>		
1 8/13	32.5 32.7		0.0C	-0.1		 		
1.043	32.7	Line	56.0	-18.5		<u> </u>		
0.150	21.4	Neutral	56.0	-34.6	Average	<u> </u>		
0.150	30.4	Neutral	66.0	-35.6	OP			
0	00	1104.4.4.	00.0	00.0	<u> </u>			

Client: Savi Technology, Inc Model: SP-65Y-ZAB Signpost Contact: Gene Spec: FCC 15.209, 15.231, EN55022 Radiated Emissions (Inf Test Specifics Objective: The objective of this test session is specification listed above. Date of Test: 6/24/2004	ternal Ferrit	T-L Accou	Job Number: J56 .og Number: T5 int Manager: Ch Class: A / 1na @ 13	6067 6150 ristine Vu Radio 2kHz)
Model: SP-65Y-ZAB Signpost Contact: Gene Spec: FCC 15.209, 15.231, EN55022 Radiated Emissions (Inf Test Specifics Objective: The objective of this test session i specification listed above. Date of Test: 6/24/2004	ternal Ferrit	T-L Accou	og Number: T5 Int Manager: Ch Class: A / Ina @ 13	6150 ristine Vu Radio 2kHz)
Contact: Gene Spec: FCC 15.209, 15.231, EN55022 Radiated Emissions (Inf Test Specifics Objective: The objective of this test session i specification listed above. Date of Test: 6/24/2004	ternal Ferrit	Accou	Class: A /	ristine Vu Radio 2kHz)
Contact: Gene Spec: FCC 15.209, 15.231, EN55022 Radiated Emissions (Inf Test Specifics Objective: The objective of this test session is specification listed above. Date of Test: 6/24/2004	ternal Ferrit	e Anter	Class: A / 1na @ 13	Radio
Spec: FCC 15.209, 15.231, EN55022 Radiated Emissions (In Test Specifics Objective: The objective of this test session is specification listed above. Date of Test: 6/24/2004	ternal Ferrit	e Anter	11na @ 13	2kHz)
Radiated Emissions (In Test Specifics Objective: The objective of this test session is specification listed above. Date of Test: 6/24/2004	ternal Ferrit	e Anter	ına @ 13	2kHz)
Test Specifics Objective: The objective of this test session is specification listed above. Date of Test: 6/24/2004	is to perform final qua			
Objective: The objective of this test session specification listed above. Date of Test: 6/24/2004	is to perform final qua			
Date of Test: 6/24/2004		llification testi	ing of the EUT w	vith respect to the
T . C	Config. Use	d: 1		
Lest Engineer: Chris Byleckie	Config Chang	e: None	_	
Test Location: SVOATS #2	EUT Voltag	e: 120V/60Hz	<u>′</u>	
General Test Configuration The EUT and all local support equipment were locate	d on the turntable for	radiated emis	ssions testina.	
For redicted emissions testing below 20 MUs the med) and 20 matara	from the FUT
otherwise noted. Radiated magnetic field measureme ground plane, with the loop of the antenna either para	asurement antenna w ents were made with allel or perpendicular	the loop anter to the EUT.	nna located one	meter above the
	21 °C			
Rel. Humidity:	59 %			
Summary of Results				
Run # Test Performed	Limit	Result	Margi	n
RE, Fundamental, Preliminary	FCC 1F 200	Daga	1.1dBµ V/m (1	1.1µV/m)
I, 2, 3 Scan	FCC 15.209	Pass	@ 131.57 (-24.2d	9KHZ (B)
			-16.4dBµ	V/m
RE, 132 KHZ - 1.32 WHZ,	FCC 15.209	Pass	(0.0.)	· -
4 Harmonic Emissions			(0.2µ V/m	n) @

E	Ellic	ott						EM	IC Test Data
Client:	Savi Tech	nology, l	nc					lob Number:	J56067
Model	SP-65Y-7	AR Signi	nost				T-L	og Number:	T56150
wouci.	51-051-2	AD Sigiri	0031				Accou	nt Manager:	Christine Vu
Contact:	Gene								
Spec:	FCC 15.2	09, 15.23	31, EN55022	2				Class:	A / Radio
Run #1: P Measureme table below	reliminary ents of the	Radiate fundame	ed Emissior ental signal v	ns, Fundar were made	nental (Layir on the OATS	ng Flat) 5 at test dista	nces of 10r	n and 20m a	nd are recorded in the
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments	
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters		
131.579	82.5	10.4	92.9	0	Pk	72	1.0	Tested at 1	0m - Note 1
131.579	62.4	10.4	72.8	0	Pk	260	1.0	Tested at 2	20m - Note 2
Noto 2:	Dolorizatio	on of O ir	dicatos tha	loop was fr	ocina the EU	T. Lindicator	that the loc	n was norne	ndicular to the EUT
Note 3:	PUIdITZalli			ioop was ia	acing the EU	I, I IIIUICales		ip was perpe	
E Ex Run #2: P i Measureme table below	Extrapolation trapolation reliminary ents of the	Le Le n from 1 from 20 Radiate fundame	evel at 10m: evel at 20m: 0m to 20m: m to 300m: ed Emission ental signal v	92.9 72.8 66.8 <u>78.5</u> ns, Fundar were made	dBμV/m dBμV/m dB nental (On it on the OATS	s side) S at test dista	nces of 10r	n and 20m a	nd are recorded in the
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments	
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters		
131.579	66.0	10.4	76.4	0	Pk	156	1.0	Tested at 1	0m - Note 1
131.579	45.5	10.4	55.9	0	Pk	204	1.0	Tested at 2	20m - Note 2
Noto 1.	The mavir			with ontor	nac 10 incha	o conoratoo	hotwoon or	ab athor	
Note 1:	The maxir	num sigi		with antor	inas 10 inche	es seperates	between ea	ich other	
Note 3:	Polarizatio	on of O ir	idi ievei was	loop was fa	acing the FU	T Lindicates	that the loc	n was perpe	endicular to the FUT
<u>Extrapolat</u> E Ex	ion Factor Extrapolation	Calcula Le Le n from 1 from 20	ation: evel at 10m: evel at 20m: 0m to 20m: m to 300m:	76.4 55.9 68.2 <u>80.2</u>	dBμV/m dBμV/m dB				

E	Ellio	ott						EM	C Test Data
Client:	Savi Tech	nology, l	nc					ob Number:	J56067
Madal			aat				T-L	og Number:	T56150
woder:	3P-031-2	AB SIYII	0051				Accou	nt Manager:	Christine Vu
Contact:	Gene								
Spec:	FCC 15.2	09, 15.23	31, EN5502	2				Class:	A / Radio
Run #3: P Measureme table below	reliminary ents of the	Radiate	ed Emission ental signal	ns, Fundam were made o	ental (Stan on the OATS	d ing up) S at test dista	Inces of 10r	n and 20m a	nd are recorded in the
Frequency		AF dDm ⁻¹				AZIIIIUUI		Comments	
KHZ	αβμν		αβήλλω	(071)	PK/QP/AVg	degrees	meters	Tootod at 1	Om Noto 1
131.579	82.3 62.6	10.4	92.7	0	PK Dk	Z11 70	1.0	Tested at 1	Om Note 2
131.079	03.0	10.4	74.0	0	PK	19	1.0	Testeu al Z	
Note 1 [.]	The maxir	num siar	nal level wa	s with anten	nas 1 meter	senerates he	etween each	n other	
Note 2:	The maxir	num sigr	al level wa	s with anteni	nas 1 meter	seperates be	etween each	n other	
Note 3:	Polarizatio	on of O ir	idicates the	loop was fa	cina the EU	T. Lindicates	that the loo	p was perpe	endicular to the EUT.
E Ex Run #4: S	xtrapolatio trapolation ummary F	Le Le n from 1 from 20	vel at 10m: vel at 20m: 0m to 20m: m to 300m: amental ar	92.7 74.0 62.0 <u>72.9</u> nd Harmonia	dBµV/m dBµV/m dB	Emissions (Worst Case	e configurat	ion)
Frequency	Level	FCC	15.209	Detector	Azimuth	Height	Comments		
kHz	dBµV/m	Limit	Margin	Pk/QP/Avg	degrees	meters			
131.6	1.1	25.2	-24.2	Pk	79	1.0	Note 1		
Frequency	Level	FCC	15.209	Detector	Azimuth	Height	Comments		
kHz	dBµV/m	Limit	Margin	Pk/QP/Avg	degrees	meters			
394.7	-16.4	15.7	-32.0	Pk	0	1.0	Note 2, me	easured at 20	Om, extrapolated to 300m
394.7	-16.4	15.7	-32.0	Pk	0	1.0	Note 2, me	easured at 20	Om, extrapolated to 300m
263.1	-16.1	19.2	-35.3	Pk	0	1.0	Note 2, me	easured at 20	Om, extrapolated to 300m
526.3	-14.5	33.2	-47.7	Pk	0	1.0	Note 3, me	easured at 3r	m, extrapolated to 30m
Note 1: Note 2:	Level calc measuren Preliminar the fundar	ulated by nent reco Ty measu mental si s noted ii	y applying th orded at 20r rements sh gnal. An ey	he extrapola n from run # owed there t strapolation f	tion factor c 3. to be no sign factor of 401	alculated fror nificant signa og(measuren	n the measi Is at a dista nent distanc	urements at nce of 20m f e/specificatio	10m and 20m to the from the EUT other than on distance) was used for
Note 3:	All signals level of 3. 40log(mea	above 4 4dBuV/m asuremei	90kHz were at the speen nt distance/	e less than 4 cification dist	3.4dBuV/m tance of 30r distance).	(-8.2dBuA/m n if using the) at a distar suggested	ice of 3m, wi extrapolatior	hich is equivalent to a n factor of

C LIII	ou			EIVIC Test
Client: Savi Teo	chnology, Inc			Job Number: J56067
Model: SD 65V	7AB Signpost		T-I	Log Number: T56150
			Αссοι	unt Manager: Christine Vu
Contact: Gene				
Spec: FCC 15.	209, 15.231, EN55022			Class: A / Radio
Ra	diated Emissions (Small Loop	Antenn	na @ 132kHz)
				•
est Specifics	The objective of this test session	is to porform final aus	lification tast	ing of the EUT with respect
Objective	specification listed above.			ing of the EOT with respect
Date of Too	6/2//200/	Config Uso	d· 1	
Test Engineer	: Chris Byleckie	Config Chang	e: None	
Tost Location	: SVOATS #2	EUT Voltag	e: 120V/60H	Z
Test Location				
General Test Co	onfiguration			
eneral Test Co The EUT and all le	onfiguration ocal support equipment were locate	d on the turntable for	radiated emi	ssions testing.
General Test Co The EUT and all lo For radiated emis otherwise noted. ground plane, with	Difiguration bocal support equipment were locate sions testing below 30 MHz the mea Radiated magnetic field measurement the loop of the antenna either para	d on the turntable for asurement antenna w ents were made with allel or perpendicular	radiated emi ras located 10 the loop ante to the EUT.	ssions testing. 0 and 20 meters from the El nna located one meter abov
General Test Co The EUT and all le For radiated emis otherwise noted. ground plane, with	configuration bocal support equipment were locate sions testing below 30 MHz the mea Radiated magnetic field measurem in the loop of the antenna either para	d on the turntable for asurement antenna w ents were made with allel or perpendicular	radiated emi ras located 10 the loop ante to the EUT.	ssions testing. 0 and 20 meters from the El nna located one meter abo
For radiated emis otherwise noted. ground plane, with	configuration bocal support equipment were locate sions testing below 30 MHz the mea Radiated magnetic field measurement the loop of the antenna either para ions: Temperature: Rel. Humidity:	d on the turntable for asurement antenna w ents were made with allel or perpendicular 21 °C 59 %	radiated emi ras located 10 the loop ante to the EUT.	ssions testing. D and 20 meters from the El nna located one meter abov
For radiated emis otherwise noted. ground plane, with	Onfiguration bocal support equipment were locate sions testing below 30 MHz the mean Radiated magnetic field measurement a the loop of the antenna either para ions: Temperature: Rel. Humidity:	d on the turntable for asurement antenna w ents were made with allel or perpendicular 21 °C 59 %	radiated emi ras located 10 the loop ante to the EUT.	ssions testing. D and 20 meters from the El nna located one meter abov
General Test Co The EUT and all lo For radiated emis otherwise noted. ground plane, with Ambient Condit	onfiguration bocal support equipment were locate sions testing below 30 MHz the measurement Radiated magnetic field measurement In the loop of the antenna either para ions: Temperature: Rel. Humidity: sults	d on the turntable for asurement antenna w ents were made with allel or perpendicular 21 °C 59 %	radiated emi ras located 10 the loop ante to the EUT.	ssions testing. 0 and 20 meters from the El nna located one meter abo
General Test Co The EUT and all le For radiated emis otherwise noted. ground plane, with Ambient Condit Gummary of Re Run #	Onfiguration bocal support equipment were locate sions testing below 30 MHz the mean Radiated magnetic field measurement In the loop of the antenna either para ions: Temperature: Rel. Humidity: sults Test Performed	d on the turntable for asurement antenna w ents were made with allel or perpendicular 21 °C 59 % Limit	radiated emi ras located 10 the loop ante to the EUT.	ssions testing. D and 20 meters from the El Inna located one meter abov
General Test Co The EUT and all le For radiated emiss otherwise noted. ground plane, with Ambient Condit	onfiguration bccal support equipment were locate sions testing below 30 MHz the mean Radiated magnetic field measurement a the loop of the antenna either para ions: Temperature: Rel. Humidity: sults Test Performed RE, 132 kHz Fundamental	d on the turntable for asurement antenna w ents were made with allel or perpendicular 21 °C 59 % Limit	radiated emi ras located 10 the loop ante to the EUT. Result	ssions testing. D and 20 meters from the El nna located one meter abov Margin 21.4dBµ V/m
General Test Co The EUT and all lo For radiated emiss otherwise noted. ground plane, with mbient Condit ummary of Re Run # 1, 2, 3	Onfiguration bocal support equipment were locate sions testing below 30 MHz the mean Radiated magnetic field measurement In the loop of the antenna either para ions: Temperature: Rel. Humidity: sults Test Performed RE, 132 kHz Fundamental Emissions	d on the turntable for asurement antenna w ents were made with allel or perpendicular 21 °C 59 % Limit FCC 15.209	radiated emi ras located 10 the loop ante to the EUT. Result Pass	Ssions testing. D and 20 meters from the El nna located one meter abov Margin 21.4dBμ V/m (11.7μ V/m) @ 132kHz (
General Test Co The EUT and all la For radiated emis otherwise noted. ground plane, with Ambient Condit Gummary of Re Run # 1, 2, 3	Onfiguration bccal support equipment were locate sions testing below 30 MHz the mean Radiated magnetic field measurement a the loop of the antenna either para ions: Temperature: Rel. Humidity: sults Test Performed RE, 132 kHz Fundamental Emissions	d on the turntable for asurement antenna w ents were made with allel or perpendicular 21 °C 59 % Limit FCC 15.209	radiated emi ras located 10 the loop ante to the EUT. Result Pass	Ssions testing. D and 20 meters from the El nna located one meter abov 21.4dBμ V/m (11.7μ V/m) @ 132kHz (4.4dB)

E	Ellio	ott						EM	IC Test Data
Client:	Savi Tech	nology, l	nc					Job Number:	J56067
Madalı			aact				T-l	_og Number:	T56150
wouer.	3P-001-2	AD SIYII	0051				Accou	unt Manager:	Christine Vu
Contact:	Gene								
Spec:	FCC 15.2	09, 15.23	31, EN5502	2				Class	A / Radio
Run #1: Pr EUT set fo Measureme table below	reliminary r maximu ents of the	/ Radiate m Pout fundame	e d Emissio ental signal	ns, Fundam were made (nental (On it	s side) 5 at test dista	ances of 10r	m and 20m a	and are recorded in the
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments	
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters		
132.000	104.3	10.4	114.7	0	Pk	0	1.0	Tested at 1	10m - Note 1
132.000	85.3	10.4	95.7	0	Pk	360	1.0	Tested at 2	20m - Note 2
E Ex Run #2: W	xtrapolatic trapolatior forst Case	Le Le on from 1 n from 20 e Fundar	vel at 10m: vel at 20m: 0m to 20m: m to 300m: nental (Wo	114.7 95.7 63.2 <u>74.3</u> orst Case co	dBμV/m dBμV/m dB onfiguration)	Commont		
Frequency	Level	FCC	15.209	Detector	Azimuth	Height	Comments	S	
KΠZ 132.0	ивµv/ш 21 /	25.2	2 0	PK/QP/AVg	degrees	1 0	Noto 1		
132.0	Z1.4	Z0.Z	-3.0	FK	0	1.0	NULE I		
Note 1:	Level calo measuren	culated by nent reco	y applying t orded at 20r	he extrapola n from run #	tion factor ca 1.	alculated from	m the meas	urements at	10m and 20m to the
Note 2:	Preliminal the fundal 52dBuV/n distance o	ry measu mental si n (1.85dE of 300m i	rements sh gnal. Apar BuA/m) at a f using the s	lowed there t from the fui distance of a suggested ea	to be no sigr ndamental tr 20m, which i xtrapolation	hificant signa ansmission, s equivalent factor of 40lo	Is at a dista all signals t to a level o og(measure	nce of 20m below 490kH f -28dBuV/m ment distan	from the EUT other than z were less than at the specification ce/specification distance).
Note 3:	Preliminal fundamen is equival of 40log(n	ry measu Ital signa ent to a le neasuren	rements sh I. All signal evel of 3.4d nent distand	iowed there Is above 490 IBuV/m at the ce/specificat	to be no sigr 0kHz were le e specificatio ion distance)	nificant signa ss than 43.4 on distance c).	IS at a dista dBuV/m (-8 of 30m if usi	ince of 3m fr .2dBuA/m) a ng the sugge	om the EUT other than the t a distance of 3m, which ested extrapolation factor

CElli	ott			EM	IC Test D
Client: Savi Tec	hnology, Inc			Job Number:	J56067
Model: SP-65Y-	ZAB Signpost		T-l	_og Number:	T56150
Contact: Cono			ACCOL	int Manager:	
Snec: FCC 15.2	209. 15.231. EN55022			Class:	A / Radio
Test Specifics Objective Date of Test Test Engineer Test Location General Test Co The EUT and all lo	The objective of this test session i specification listed above. : 6/24/2004 : Chris Byleckie : SVOATS #2 onfiguration ocal support equipment were located	s to perform final qua Config. Use Config Chang EUT Voltag d on the turntable for	dification test d: 1 e: None e: 120V/60H radiated emi-	ing of the EL z ssions testin	JT with respect to th g.
otherwise noted. I ground plane, with Ambient Condit	Radiated magnetic field measurement the loop of the antenna either para	ents were made with illel or perpendicular 21 °C	the loop ante to the EUT.	nna located	one meter above th
Summary of Res	Rel. Humidity: sults	59 %			
Run #	Test Performed	Limit	Result	Ma	argin IBu V/m
1, 2, 3	RE, Fundamental, Preliminary Scan	FCC 15.209	Pass	(13.8µ 131.579k	i V/m) @ Hz (-2.4dB)
4	RE, 132 kHz - 1.32 MHz, Harmonic Emissions	FCC 15.209	Pass	-10.80 (0.3µ 394.740kł	dBµ V/m V/m) @ Hz (-26.5dB)
Modifications M No modifications v	ade During Testing: vere made to the EUT during testing)			
Deviations From No deviations were	The Standard e made from the requirements of the	e standard.			

6	Ellio	ott						EM	C Test Data
Client:	Savi Tech	nology, I	nc				J	lob Number:	J56067
Model	SD 45V-2		net				T-L	og Number:	T56150
	3E-001-7		1051				Accou	nt Manager:	Christine Vu
Contact:	Gene						ļ		
Spec:	FCC 15.2	09, 15.23	31, EN55022	2				Class:	A / Radio
Run #1: Pi Measureme table below	re liminary ents of the	r Radiate fundame	d Emissior ental signal v	1s, Fundar were made	nental (Layir on the OATS	ng Flat) S at test distar	nces of 10n	n and 20m a	nd are recorded in the
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments	
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters		
132.000	85.7	10.4	96.1	0	Pk	0	1.0	Tested at 1	Om - Note 1
132.000	62.0	10.4	72.4	0	Pk	354	1.0	Tested at 2	0m - Note 2
Noto 1.	Dolarizatio	on of O ir	dicates the	loon was f	acing the FU	T Lindicates	that the loo	n was nerne	indicular to the FLIT
	Γυιατιζατις			1000 1000 1000				h mas heihe	
E Ex Run #2: Pi Measureme table below	xtrapolation trapolation reliminary ents of the	Le Le in from 10 i from 20 r Radiate fundame	vel at 10m: vel at 20m: 0m to 20m: m to 300m: ed Emission ental signal v	96.1 72.4 78.9 <u>92.8</u> ns, Fundar were made	dBµV/m dBµV/m dB mental (On it	s side) S at test dista	nces of 10r	n and 20m a	nd are recorded in the
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments	
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters		
132.000	103.1	10.4	113.5	0	Pk	0	1.0	Tested at 1	0m - Note 1
132.000	84.6	10.4	95.0	0	Pk	360	1.0	Tested at 2	0m - Note 2
Noto 1.	Dolarizatio	on of O ir	dicates the	loon was f	acing the FUT	T Lindicates	that the loo	n was nerne	ndicular to the FLIT
<u>Extrapolati</u> E Ex	ion Factor xtrapolatio trapolation	<u>· Calcula</u> Le In from 10 I from 201	t <mark>tion:</mark> vel at 10m: vel at 20m: 0m to 20m: m to 300m:	113.5 95.0 61.4 72.2	dBμV/m dBμV/m dB				

E	Ellic	ott						EM	C Test Data			
Client:	Savi Tech	nology, I	nc				J	ob Number:	J56067			
Madalı							T-L	og Number:	T56150			
Wouer.	5P-051-2	AR Siðirh)0SI				Accou	nt Manager:	Christine Vu			
Contact:	Gene											
Spec:	FCC 15.2	09, 15.23	31, EN5502	2				Class:	A / Radio			
Run #3: Pr Measureme table below	reliminary ents of the	Radiate	d Emission Intal signal	ns, Fundam were made d	ental (Stan on the OATS	ding up) S at test dista	inces of 10n	n and 20m a	nd are recorded in the			
Frequency	Level		Level	Pol	Detector	Azimuth	Height	Comments				
kHz	dBµV	dBm ⁻	dBµV/m	(0 / I)	Pk/QP/Avg	degrees	meters	-	0 N + 4			
132.000	103.5	10.4	113.9	0	PK	0	1.0	Tested at 1	0m - Note 1			
132.000	84.5	10.4	94.9	0	PK	300						
Note 1:	The maxir	num siar	al level wa	s with anten	nas 1 meter	seperates be	etween each	n other.				
Note 2:	The maxir	num sigr	al level was	s with anteni	nas 1 meter	seperates be	etween each	n other.				
Note 3:	Polarizatio	on of O ir	dicates the	loop was fa	cing the EU	T, I indicates	that the loo	p was perpe	endicular to the EUT.			
<u>Extrapolati</u> E Ex Run #4: W	ion Factor xtrapolatio trapolation forst Case	Calcula Le Le n from 10 from 20 Fundan	tion: vel at 10m: vel at 20m: 0m to 20m: m to 300m: nental and	113.9 94.9 63.0 <u>74.1</u> Harmonic F	dBµV/m dBµV/m dB Radiated En	nissions (W	orst Case o	configuratio	n)			
						•	T	5	, ,			
Frequency	Level	FCC	15.209	Detector	Azimuth	Height	Comments					
kHz	dBµV/m	Limit	Margin	Pk/QP/Avg	degrees	meters	Noto 1					
131.0	22.8	20.Z	-2.4	PK	304	1.0	Note 1					
Frequency	Level	FCC	15.209	Detector	Azimuth	Heiaht	Comments					
kHz	dBµV/m	Limit	Margin	Pk/QP/Avg	degrees	meters						
394.7	-10.8	15.7	-26.5	Pk	0	1.0	Note 2, me	asured at 20	Om, extrapolated to 300m			
263.1	-14.4	19.2	-33.6	Pk	0	1.0	Note 2, me	easured at 20	Om, extrapolated to 300m			
526.3	-12.5	33.2	-45.7	Pk	0	1.0	Note 3, me	easured at 3	m, extrapolated to 30m			
Note 1: Note 2:	Level calc measuren Preliminar the fundar	ulated by nent reco y measu mental si	/ applying th rded at 20r rements sh gnal. An ex	he extrapola n from run # owed there t trapolation f	tion factor ca 2. to be no sigr factor of 40lo	alculated from hificant signa og(measuren	n the measi Is at a dista nent distanc	urements at nce of 20m f e/specificati	10m and 20m to the from the EUT other than on distance) was used for			
Note 3:	All signals All signals level of 3. 40log(mea	above 4 4dBuV/m asuremer	90kHz were at the spec at distance/	e less than 4 cification dist specification	3.4dBuV/m tance of 30n distance).	(-8.2dBuA/m n if using the) at a distar suggested	ice of 3m, w extrapolation	hich is equivalent to a n factor of			

CEIII	ott			EM	IC Test Da
Client: Savi Tech	nology, Inc		J	ob Number:	J56067
Model: SP-65V-7	AR Signnost		T-L	og Number:	T56150
			Accou	nt Manager:	Christine Vu
Contact: Gene					
Spec: FCC 15.2	.09, 15.231, EN55022			Class:	A / Radio
Radi	ated Emissions (Ir	nternal Ferrit	e Anter	nna @ [·]	123kHz)
					,
Test Specifics					
Objective:	The objective of this test session specification listed above.	n is to perform final qua	alification testi	ng of the EL	JT with respect to the
Date of Test:	6/24/2004	Config. Use	d: 1		
Test Engineer:	Chris Byleckie	Config Chang	e: None		
Test Location:	SVOATS #2	EUT Voltag	e: 120V/60Hz	2	
General Test Co	nfiguration	ed on the turntable for	radiated emis	sions testin	n
					9. 9.
For radiated emiss otherwise noted. F ground plane, with	ions testing below 30 MHz the mo Radiated magnetic field measurer the loop of the antenna either pa	easurement antenna w nents were made with rallel or perpendicular	the loop anter to the EUT.	and 20 met	ers from the EUT, ur one meter above the
		21.00			
Amhient Conditi	ons. Temperature	21 °(
Ambient Conditi	ons: Temperature: Rel. Humidity:	21 °C 59 %			
Ambient Conditi Summary of Res	ons: Temperature: Rel. Humidity:	21°C 59 %			
Ambient Conditi Summary of Res	ons: Temperature: Rel. Humidity: sults Test Performed	21°C 59 % Limit	Result	Ma	argin
Ambient Conditi Summary of Res Run #	ons: Temperature: Rel. Humidity: sults Test Performed RE, Fundamental, Preliminary	21 °C 59 %	Result	 1.6dВµV/л 122	argin m (1.2µ V/m)
Ambient Conditi Summary of Res Run # 1, 2, 3	ons: Temperature: Rel. Humidity: sults Test Performed RE, Fundamental, Preliminary Scan	21 °C 59 % Limit FCC 15.209	Result Pass	Ma 1.6dBµ V/i @ 122 (24	argin m (1.2µ V/m) 2.950kHz
Ambient Conditi Summary of Res Run # 1, 2, 3	ons: Temperature: Rel. Humidity: sults Test Performed RE, Fundamental, Preliminary Scan	21 °C 59 % Limit FCC 15.209	Result Pass	Ма 1.6dВµ V/и @ 122 (-24 (-24 -5.3dВu V/	argin m (1.2µ V/m) 2.950kHz I.2dB) m (0.5µ V/m)
Ambient Conditi Summary of Res Run # 1, 2, 3 4	ons: Temperature: Rel. Humidity: sults Test Performed RE, Fundamental, Preliminary Scan RE, 132 kHz - 1.32 MHz,	Ercc 15.209	Result Pass Pass	Ma 1.6dBµ V/u @ 122 (-24 -5.3dBµ V/ @ 245	argin m (1.2µ V/m) 2.950kHz I.2dB) m (0.5µ V/m) 5.900kHz

Æ	Ellic	ott						EM	IC Test Data
Client:	Savi Tech	nology, I	nc				J	ob Number:	J56067
Model	SP-65Y-7		nnet				T-L	.og Number:	T56150
WOUCT.	JI -0J I -2	AD Sigirp	JU31				Accou	nt Manager:	Christine Vu
Contact:	Gene								
Spec:	FCC 15.20	09, 15.23	31, EN55022	2				Class:	A / Radio
Run #1: Pr Measureme table below	reliminary ents of the	r Radiate fundame	e d Emissior ental signal v	1s, Fundar vere made	nental (Layir on the OATS	ng Flat) S at test dista ^r	nces of 10r	n and 20m a	and are recorded in the
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments	
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters		
122.950	83.3	10.4	93.7	0	Pk	118	1.0	Tested at 1	0m - Note 1
122.950	64.5	10.4	74.9	0	Pk	264	1.0	Tested at 2	20m - Note 2
122.950	61.9	10.4	72.3	<u> </u>	Pk	0	1.0	Tested at 2	20m - Note 3
Noto 1.	Polarizatio	on of O ir	ndicates the	loon was f	acing the FU	T Lindicates	that the loc	in was nerne	andicular to the FUT
	FUIDIZAN			1000 1000 1000				h mas heihe	
<u>Extrapolati</u>	on Factor	<u>r Calcula</u>	<u>ition:</u>						
				00 7					
		Le	Verat rum:	93.1 71 Q	dBm//m				
F	vtranolatic	⊔c n from 1	Om to 20m	62.4	dbµv/m dR				
Ext	trapolation	1 from 20	m to 300m:	73.3	uD				
Run #2: Pr Measureme table below	eliminary ents of the	Radiate	e d Emission ental signal v	IS, Fundar vere made	nental (On its on the OATS	s side) at test dista	nces of 10n	n and 20m a	and are recorded in the
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments	
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters		
122.950	68.6	10.4	79.0	0	Pk	110	1.0	Tested at 1	0m - Note 1
122.950	47.6	10.4	58.0	0	Pk	249	1.0	Tested at 2	20m - Note 2
NI-1- 1.	Delerizati		- diastas the	laan waa f	- sing the FUE	T. L'indiantos	that the los	- was norma	
Note 1:	Polarizauc	n or o in	Idicates the	loop was ia	acing the EU	I, I Indicates	that the loo	p was perpe	
Extrapolati	ion Factor	r Calcula	ation:						
		Le	vel at 10m:	79.0	dBµV/m				
-		Le	vel at 20m:	58.0	dBµV/m				
E.	xtrapolatio	n from 1	Om to 20m:	69.7	dB				
EX	trapolation	from 201	m to 300m:	<u>82.0</u>					

E	Ellio	ott						EMC Test Data
Client:	Savi Tech	nology, I	nc				,	lob Number: J56067
							T-L	og Number: T56150
Model:	SP-65Y-Z	AB Signp	oost				Accou	nt Manager: Christine Vu
Contact [.]	Gene							5
Snec.	FCC 15.2	09.15.23	31. FN5502	2				Class: A / Radio
Opec.	10010.2	07710.20		-				
Run #3: P Measureme table below	reliminary ents of the ⁷ .	Radiate fundame	e d Emissio ental signal	ns, Fundam were made o	ental (Stan on the OATS	ding up) S at test dista	ances of 10r	n and 20m and are recorded in the
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters	
122.950	83.0	10.4	93.4	0	Pk	96	1.0	Tested at 10m - Note 1
122.950	63.9	10.4	74.3	0	Pk	279	1.0	Tested at 20m - Note 2
	-							
Note 1:	Polarizatio	on of O ir	ndicates the	loop was fa	cing the EU	T, I indicates	that the loc	p was perpendicular to the EUT.
Extrapolat E Ex Run #4: W	ion Factor Extrapolation trapolation	r Calcula Le Le on from 1 o from 20 e Fundan	tion: vel at 10m: vel at 20m: 0m to 20m: m to 300m: nental and	93.4 74.3 63.4 <u>74.6</u> Harmonic F	dBµV/m dBµV/m dB Radiated En	nissions (W	orst Case o	configuration)
Frequency	Level	FCC	15.209	Detector	Azimuth	Height	Comments	5
KHZ	dBµV/m	Limit	Margin	PK/QP/Avg	degrees	meters	Note 1	
123.0	1.6	25.8	-24.2	PK	264	1.0	Note I	
Fraguanau	Loval	ГСС	15 200	Dotostor	Azimuth	Lloight	Commonto	
	dBuV/m	FCC Limit	10.209 Margin		Azimum	motors	Comments	
<u>ΚΠΖ</u> 245.0	υσμν/π 5.2	LIIIII 10.0	1011 25 1	PK/QP/AVy	uegrees	1.0	Noto 2 ma	asurad at 20m overapolated to 200m
240.9	-0.0	19.0	-20.1 27.1	PK Dk	0	1.0	Note 2, me	easured at 20m, extrapolated to 200m
300.7 701.6	-20.9	10.3	-37.1		0	1.0	Note 2, me	asured at 2m. extrapolated to 300m
491.0	-10.5	33.0	-44.3	ГК	0	1.0	NOLE 5, THE	easureu ar sin, exirapolateu to sonn
Note 1:	Level calc measuren Preliminar	ulated by nent reco ry measu	y applying t orded at 20r rements sh	he extrapola n from run # owed there t	tion factor ca 1. to be no sigr	alculated from	m the meas Is at a dista	urements at 10m and 20m to the nce of 20m from the EUT other than
Note 2:	the fundar	mental si <u>s noted i</u> i	gnal. An ex n the table a	ktrapolation f above.	actor of 401	og(measurer	nent distanc	e/specification distance) was used for
Note 3:	All signals level of 3. 40log(mea	above 4 4dBuV/m asuremei	90kHz wer at the spen nt distance/	e less than 4 cification dis specification	3.4dBuV/m tance of 30n distance).	(-8.2dBuA/m n if using the	n) at a distar suggested	nce of 3m, which is equivalent to a extrapolation factor of

Elli	ott		EMC Test Da				
Client: Savi Tecl	hnology, Inc			Job Number:	J56067		
Model: SP-65Y-2	ZAB Signpost		T-l Accou	.og Number: Int Manager:	T56150 Christine Vu		
Contact: Gene							
Spec: FCC 15.2	209, 15.231, EN55022			Class:	: A / Radio		
Ra	diated Emissions	(Large Loop	Antenn	na @ 12	(3kHz)		
T C							
Test Specifics							
Objective:	The objective of this test session specification listed above.	n is to perform final qual	ification test	ing of the EL	JT with respect to t		
Date of Test:	6/24/2004	Config. Used	l: 1				
Test Engineer:	Juan Martinez	Config Change	None	_			
lest Location:	SVUATS #2	EUT Voltage	: 120V/60H	Ζ			
General Test Co	nfiguration						
The EUT and all lo	cal support equipment were locat	ed on the turntable for r	radiated emi	ssions testin	g.		
For radiated emiss otherwise noted. F ground plane, with	ions testing below 30 MHz the me Radiated magnetic field measuren the loop of the antenna either pa	easurement antenna wa nents were made with tl rallel or perpendicular to	as located 10 he loop ante o the EUT.) and 20 met nna located	ters from the EUT, one meter above th		
Ambient Conditi	ons. Temperature:	21 °C					
	Rel. Humidity:	59 %					
Summary of Res	sults						
Run #	Test Performed	Limit	Result	Ma	argin		
	RE, Fundamental, Preliminary			22.20	dBµV/m		
1, 2, 3	Scan	FCC 15.209	Pass	(12.8)	JV/m)@		
				-5.8dBµ V/	/m (0.5µV/m)		
4	RE, 122.88 kHZ - 1.228 MHZ, Harmonic Emissions	FCC 15.209	Pass	@ 245.	900kHz (-		
				25	.6dB)		
Modifications M No modifications w	ade During Testing: rere made to the EUT during testi	ng	1	20	.000)		
		-					
Deviations From	The Standard						

No deviations were made from the requirements of the standard.

Client:Savi Technology, IncJob Number:J56067Model:SP-65Y-ZAB SignpostT-Log Number:T56150Account Manager:Christine VuContact:GeneIISpec:FCC 15.209, 15.231, EN55022Class:A / Radio

Run #1: Preliminary Radiated Emissions, Fundamental (Laying Flat)

Measurements of the fundamental signal were made on the OATS at test distances of 10m and 20m and are recorded in the table below.

Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters	
122.850	86.9	10.4	97.3	0	Pk	0	1.0	Tested at 10m - Note 1
122.850	63.4	10.4	73.8	0	Pk	0	1.0	Tested at 20m - Note 2

Extrapolation Factor Calculation:

Level at 10m:	97.3	dBµV/m
Level at 20m:	73.8	dBµV/m
Extrapolation from 10m to 20m:	78.1	dB
Extrapolation from 20m to 300m:	<u>91.8</u>	

Run #2: Preliminary Radiated Emissions, Fundamental (On its side)

Measurements of the fundamental signal were made on the OATS at test distances of 10m and 20m and are recorded in the table below.

Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters	
122.850	106.9	10.4	117.3	0	Pk	0	1.0	Tested at 10m - Note 1
122.850	89.0	10.4	99.4	0	Pk	360	1.0	Tested at 20m - Note 2
122.850	87.0	10.4	97.4	I	Pk	360	1.0	Tested at 20m - Note 2

Extrapolation Factor Calculation:

Level at 10m:	117.3	dBµV/m
Level at 20m:	99.4	dBµV/m
Extrapolation from 10m to 20m:	59.2	dB
Extrapolation from 20m to 300m:	<u>69.6</u>	

E	Ellio	ott						EM	C Test L	Data
Client:	Savi Tech	nology, I	nc				,	lob Number:	J56067	
							T-L	og Number:	T56150	
Model:	SP-65Y-Z	AB Sign	oost				Accou	nt Manager:	Christine Vu	
Contact:	Gene									
Spec:	FCC 15.2	09, 15.23	31, EN55022	2				Class:	A / Radio	
Run #2 co	ntinued									
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments		
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters			
122.850	104.3	10.4	114.7	0	Pk			Tested at 1	0m - Note 1	
122.850	85.1	10.4	95.5	0	Pk			Tested at 2	0m - Note 2	
<u>Extrapolat</u>	ion Factor	r Calcula	<u>ition:</u>							
		Le	vel at 10m:	114.7	dBµV/m					
_		Le	vel at 20m:	95.5	dBµV/m					
E E	xtrapolatio	n from 1	UM to 20M:	63./ 74.0	αB					
EX	liapoialioi		111 10 300111	<u>14.9</u>						
Final settir	าต									
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments		
kHz	dBuV	dBm ⁻¹	dBuV/m	(O / I)	Pk/QP/Ava	dearees	meters			
122.850	105.3	10.4	115.7	0	Pk			Tested at 1	0m - Note 1	
122.850	86.2	10.4	96.6	0	Pk			Tested at 2	0m - Note 2	
<u>Extrapolat</u>	ion Factor	r Calcula	ition:					-		
		Le	vel at 10m:	115.7	dBhn//w					
F	vtranolatio	Le Le from 1	Om to 20m:	90.0 62.2	dB dB					
E Fx	tranolation	from 20	m to 300 m·	74 5	uD					
LA	apolation	1110111 20	111 (0 300111.	<u>14.5</u>						

6	Ellio	ott						EM	C Test Data
Client:	Savi Tech	nology, I	nc				J	ob Number:	156067
•••••		1101- 3J ·					T-L	og Number:	T56150
Model:	SP-65Y-Z	AB Signp	oost				Accou	nt Manager:	Christine Vu
Contact:	Gene						,		
Spec:	FCC 15.2	09, 15.23	31, EN5502	2				Class:	A / Radio
Run #3: Pr Measureme table below Frequency	reliminary ents of the Level	r Radiate fundame AF	e d Emissio Intal signal I Level	ns, Fundam were made c Pol	ental (Stan on the OATS Detector	ding up) S at test dista Azimuth	Inces of 10n	n and 20m a	nd are recorded in the
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters		
122.850	105.4	10.4	115.8) Ó	Pk	0	1.0	Tested at 1	0m - Note 1
122.850	85.9	10.4	96.3	0	Pk	360	1.0	Tested at 2	0m - Note 2
Note 1:	The maxir	num sigr	al level was	s with antenr	nas 1 meter	seperates be	etween each	n other.	
Note 2:	Ine maxir	num sigr	al level was	S With anteni	1as I meter	seperates ue	etween eacr	n other.	andigular to the ELIT
Note 3:	Pulatizan	010101	Idicates the	100p Was ia				p was perpe	
E Ex Run #4: R	xtrapolation trapolation adiated El	Le Le In from 10 from 200	vel at 10m: vel at 20m: 0m to 20m: m to 300m: s (Worst Ca	115.8 96.3 64.5 <u>75.9</u> ase configu	dBμV/m dBμV/m dB ration)				
Frequency	Level	FCC	15.209	Detector	Azimuth	Height	Comments		
kHz	dBµV/m	Limit	Margin	Pk/QP/Avg	degrees	meters			
122.95	22.2	25.8	-3.7	Pk	0	0.0	Note 1 - ru	n 2, final set	ting data
Fragulanov	Lovol	ECC	15 200	Detector	Azimuth	Usight	Toommonto		
		FUU Limit	15.209 Margin		AZIMUU	Heigin	Comments		
K⊓∠ 245.0	ύσμν/m Γ Q	10 g	101aryin 25 5	PK/QP/Avy Dk	n	10	Noto 2 me	ocurad at 20	Om ovtranolated to 300m
243.7	-0.0 _10.7	17.0	-20.0	 Dk	0	1.0	Note 2, me	asured at 20	Om extranolated to 300m
491.6	-11.2	22.8	-45.0	Pk	0	1.0	Note 3 me	asured at 3r	m extranolated to 30m
							11010 07 11.0		
Note 1:	Level calc measuren	ulated by nent reco	/ applying th rded at 20r	ne extrapolat n f <u>rom run #</u> :	tion factor ca 2 <u>(final settir</u>	alculated fror ng <u>s).</u>	n the measu	urements at	10m and 20m to the
Note 2:	Preliminar the fundar the signal	y measu mental si s noted ir	rements sh gnal. An ex n the table a	owed there t <trapolation f<br="">above.</trapolation>	o be no sigr actor of 40k	nificant signa og(measuren	ls at a dista nent distanc	nce of 20m f e/specificatio	from the EUT other than on distance) was used for
Note 3:	All signals level of 3.4 40log(mea	above 4 4dBuV/m asuremer	90kHz were at the specint distance/	e less than 4 cification dist specification	3.4dBuV/m tance of 30n distance).	(-8.2dBuA/m n if using the	i) at a distan suggested	ice of 3m, wi extrapolatior	hich is equivalent to a n factor of

ology, Inc 3 Signpost						
3 Signpost		J	ob Number:	J56067		
Signpost		T-L	og Number:	T56150		
		Accou	nt Manager:	Christine Vu		
45.004 5155000						
, 15.231, EN55022			Class:	A / Radio		
diated Emissions	(2-element	handra	il antei	nna)		
				·		
ne objective of this test session	is to perform final qua	lification testi	na of the EU	T with respect to th		
ecification listed above.						
24/2004	Config User	d: 1				
ian Martinez	Config Change	e: None				
VOATS #2	EUT Voltage	e: 120V/60Hz				
· · · · · · · · · · · · · · · · · · ·						
guration	d on the turntable for	radiated omic	cione toetin	~		
support equipment were locate		radiated entits	SIONS LESUN	J.		
s testing below 30 MHz the mea liated magnetic field measureme e loop of the antenna either para	asurement antenna w ents were made with t allel or perpendicular t	as located 10 the loop anter to the EUT.	and 20 met ina located (ers from the EUT, u one meter above the		
remperature	21 °C					
Rel. Humidity:	59 %					
	0,7,0					
ts						
	Limit	Result	Ma			
Test Performed	Ennik			argin		
Test Performed E, Fundamental, Preliminary	E00 15 000		4.3dBµ V/r	argin n (1.6µ V/m)		
Test Performed E, Fundamental, Preliminary Scan	FCC 15.209	Pass	4.3dBµ V/r @ 122 (21	argin n (1.6µ V/m) .950kHz 5dP)		
Test Performed P.F. Fundamental, Preliminary Scan	FCC 15.209	Pass	4.3dBµ V/r @ 122 (-21 9.0dBµ V/r	argin n (1.6µ V/m) .950kHz .5dB) n (2.8µ V/m)		
Test Performed E, Fundamental, Preliminary Scan E, 122.88 kHz - 1.228 MHz,	FCC 15.209 FCC 15.209	Pass	4.3dBµV/r @ 122 (-21 9.0dBµV/r @ 245	argin n (1.6µ V/m) .950kHz .5dB) n (2.8µ V/m) .900kHz		
	diated Emissions he objective of this test session becification listed above. 24/2004 an Martinez VOATS #2 iguration support equipment were locate is testing below 30 MHz the mea liated magnetic field measurement e loop of the antenna either para as: Temperature: Rel. Humidity: ts	diated Emissions (2-element ne objective of this test session is to perform final quadredification listed above. 24/2004 Config. User an Martinez Config Change VOATS #2 EUT Voltage iguration support equipment were located on the turntable for is testing below 30 MHz the measurement antenna w liated magnetic field measurements were made with fee loop of the antenna either parallel or perpendicular to is: Temperature: 21 °C Rel. Humidity: 59 %	diated Emissions (2-element handra he objective of this test session is to perform final qualification testine becification listed above. 24/2004 Config. Used: 1 can Martinez Config Change: None VOATS #2 EUT Voltage: 120V/60Hz iguration support equipment were located on the turntable for radiated emists is testing below 30 MHz the measurement antenna was located 10 liated magnetic field measurements were made with the loop anter e loop of the antenna either parallel or perpendicular to the EUT. Temperature: 21 °C Rel. Humidity: 59 % 18	diated Emissions (2-element handrail anter he objective of this test session is to perform final qualification testing of the EU becification listed above. 24/2004 Config. Used: 1 can Martinez Config Change: None VOATS #2 EUT Voltage: 120V/60Hz support equipment were located on the turntable for radiated emissions testing s testing below 30 MHz the measurement antenna was located 10 and 20 met at and magnetic field measurements were made with the loop antenna located at a loop of the antenna either parallel or perpendicular to the EUT. ns: Temperature: 21 °C Rel. Humidity: 59 %		

E	Ellic	ott						EM	C Test Data	
Client:	Savi Tech	nology, l	nc				J	ob Number:	J56067	
Madalı			aact				T-Log Number:		T56150	
woder:	3P-031-2	AB SIYII	0051				Accou	nt Manager:	Christine Vu	
Contact:	Gene									
Spec:	FCC 15.20	09, 15.23	31, EN55022	2				Class:	A / Radio	
Run #1: P Measureme table below	reliminary ents of the	r Radiate fundame	e d Emissior ental signal v	ns, Funda r were made	nental (10 in on the OATS	ches sepera 5 at test dista	i tion, Layir nces of 10n	ng Flat) 2 An n and 20m a	ntennas nd are recorded in the	
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments		
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters			
122.850	84.9	10.4	95.3	0	Pk	0	1.0	Tested at 1	0m - Note 1	
122.850	65.9	10.4	76.3	0	Pk	354	1.0	Tested at 2	0m - Note 2	
Note 1	Delevizeti					T. I. Sadiantan	4 h a 4 d h a 1 a a		adiaulauta tha EUT	
Note 1:	Polarizatio	on of U Ir	ndicates the	loop was f	acing the EU	I, I Indicates	that the loo	p was perpe	ndicular to the EUT.	
Extrapolation Factor Calculation: Level at 10m: 95.3 dBμV/m Level at 20m: 76.3 dBμV/m Extrapolation from 10m to 20m: 63.2 dB										
Run #2: P Measureme table below	reliminary ents of the	Radiat e	ed Emission ental signal v	ns, Fundar were made	nental (10 in on the OATS	ches seper a S at test dista	ition, On its	s side) 2 An n and 20m a	tennas nd are recorded in the	
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments		
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters			
122.850	84.9	10.4	95.3	0	Pk	0	1.0	Tested at 1	Om - Note 1	
122.850	65.7	10.4	76.1	0	PK	360	1.0	Tested at 2	0m - Note 2	
Note 1:	Polarizatio	on of O ir	ndicates the	loop was f	acing the EU	T, I indicates	that the loo	p was perpe	ndicular to the EUT.	
Extrapolat E	ion Factor Extrapolation	Calcula Le Le n from 1 from 20	ation: evel at 10m: evel at 20m: 0m to 20m: m to 300m:	95.3 76.1 63.9 75.1	dBμV/m dBμV/m dB					

E	Ellic	ott						EM	C Test Data	
Client:	Savi Tech	nology, l	nc				Job Number: J56067			
Model	SD 45V 7		voct	T-L	og Number:	T56150				
IVIUUEI. 37-037-2AD SIGIPUSI								nt Manager:	Christine Vu	
Contact: Gene										
Spec:	FCC 15.20	09, 15.23	31, EN55022		Class:	A / Radio				
Run #3: P Measureme table below	reliminary ents of the ^{7.}	Radiate	d Emissior Intal signal v	is, Fundar vere made	nental (1 me on the OATS	ter seperations at test distant	on, laying on nces of 10n	down) 2 Ant n and 20m a	ennas nd are recorded in the	
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments		
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters			
122.850	84.3	10.4	94.7	0	Pk	0	1.0	Tested at 1	Om - Note 1	
122.850	65.9	10.4	/6.3	0	PK	360	1.0	Tested at 2	Om - Note 2	
Note 1.	Polarizatio	n of O ir	dicates the	loon was f	acing the FUT	T Lindicates	that the loo	n was nerne	endicular to the FLIT	
Extrapolat	Extrapolation Factor Calculation: Level at 10m: 94.7 dBμV/m Level at 20m: 76.3 dBμV/m Extrapolation from 10m to 20m: 61.2 dB									
Run #4: P Measureme table below	reliminary ents of the ^{7.}	Radiate	d Emissior Intal signal v	is, Fundar vere made	nental (1 Me on the OATS	ter seperatic 5 at test dista	on, On its s nces of 10n	tide) 2 Antern and 20m a	nnas nd are recorded in the	
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments		
kHz	dBµV	dBm ⁻¹	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters			
122.850	84.9	10.4	95.3	0	Pk	0	1.0	Tested at 1	0m - Note 1	
122.850	65.9	10.4	76.3	0	Pk	360	1.0	Tested at 2	Om - Note 2	
Noto 1.	Dolorizatio	on of O in	dicatos tho	loop was fr	ocina the EU	T. Lindicator	that the lea		undicular to the FLIT	
Note 1:	PUIdITZallC			ioup was i	acing the EU	I, I IIIUICALES		p was perpe		
<u>Extrapolat</u>	ion Factor	<u>Calcula</u>	tion:							
Level at 10m: 95.3 dBµV/m Level at 20m: 76.3 dBµV/m Evtrapolation from 10m to 20m: 63.3 dB										
Ex	xtrapolatio trapolation	n from 10	0m to 20m: m to 300m:	63.2 <u>74.3</u>	dΒ					

E	Ellio	ott					EMC Test Data
Client:	Savi Tech	nology, l	nc				Job Number: J56067
Madal			aat				T-Log Number: T56150
Contact:	SP-051-Z	AB SIGN	JOSI		Account Manager: Christine Vu		
Snec-	ECC 15 2	09 15 23	R1 EN5502	2	Class: A / Radio		
Run #5° H	armoinc F	Padiated	Emissions	2			
		luulutou	Linission	•			
Frequency	Level	FCC	15.209	Detector	Azimuth	Height	Comments
kHz	dBµV/m	Limit	Margin	Pk/QP/Avg	degrees	meters	
122.95	4.3	25.8	-21.5	Pk	354	1.0	Note 1
-			15.000				
Frequency	Level	FCC	15.209	Detector	Azimuth	Height	Comments
KHZ	αβμν/m	LIMIT	Margin	PK/QP/AVg	degrees	meters	Note 2 management at 20m outrapolated to 200m
245.9	9.0	19.8	-10.8	PK Dk	-	-	Note 2, measured at 20m, extrapolated to 300m
308.7 701.6	3.0	10.3	-13.3	PK Dk	-	-	Note 2, measured at 2m, extrapolated to 300m
491.0	ა.0	33.0	-30.0	PK	-	-	Note 5, measured at 5m, extrapolated to 50m
Note 1:	Level calc measuren	ulated by nent reco	y applying the provided at 20r	he extrapola n with the ar	tion factor c ntennas sep	alculated from arated by 1m	m the measurements at 10m and 20m to the n (run #3).
Note 2:	the fundai	y measu mental si <u>s noted i</u>	gnal. An ex n the table a	owed there t <pre>ktrapolation f above.</pre>	actor of 40	nificant signa og(measuren	ment distance/specification distance) was used for
Note 3:	All signals level of 3. 40log(mea	above 4 4dBuV/m asureme	90kHz were at the speen nt distance/	e less than 4 cification dist specification	3.4dBuV/m tance of 30r distance).	(-8.2dBuA/m n if using the	n) at a distance of 20m, which is equivalent to a e suggested extrapolation factor of
						Tx	

Æ	Ellio	ott			EM	IC Test Dat		
Client:	Savi Tech	nnology, Inc		Job Number: J56067				
Model	SD 45V 7	AR Signpost		T-L	og Number:	T56150		
	3F-031-2			Accou	nt Manager:	Christine Vu		
Contact:	Gene	00 45 004 ENECOD			01			
Spec:	FCC 15.2	09, 15.231, EN55022		Class:	A / Radio			
	R	adiated Emission	s (4-element ł	nandra	il antei	nna)		
Test Spe	cifics	T I I				. <u></u>		
(Objective:	The objective of this test session specification listed above.	n is to perform final qualif	ication testi	ing of the EU	I with respect to the		
Dat	te of Test:	6/24/2004	Config. Used:	1				
Test	Engineer:	Juan Martinez	Config Change:	None				
lest	Location:	SVUATS #2	EUT Voltage:	120V/60Hz	2			
General The EUT	Test Co and all loo	nfiguration cal support equipment were locat	ed on the turntable for ra	adiated emis	ssions testing	g.		
For radia otherwise ground pl	ted emissi e noted. R lane, with	ions testing below 30 MHz the me Radiated magnetic field measuren the loop of the antenna either pa	easurement antenna was nents were made with th rallel or perpendicular to	s located 10 e loop anter the EUT.) and 20 met nna located (ers from the EUT, unle one meter above the		
Ambient	Conditi	ons: Temperature:	21 °C					
		Rel. Humidity:	59 %					
Summary	y of Res	ults						
Rur	า #	Test Performed	Limit	Result	Ma	argin		
1 0	2 4	RE, Fundamental, Preliminary		Dava	2.4dBµ V/r	n (1.3µV/m)		
Ι, Ζ,	3, 4	Scan	FCC 15.209	Pass	@ 122	.950KHZ 2.4dB)		
					9.5dBµ V/r	n (3.0µ V/m)		
5		RE, 122.88 KHZ - 1.228 MHZ, Harmonic Emissions	FCC 15.209	Pass	@ 245	.900KHz		
		FIGHTIOTHIC ETHISSIONS			(-10).3dB)		
Modificat No modif	tions Ma ications w	ade During Testing: ere made to the EUT during testi	ng					
Deviation No devia	ns From tions were	The Standard made from the requirements of t	he standard.					

E	Ellic	ott						EM	IC Test Data
Client:	Savi Tech	nology, I	nc				J	ob Number:	J56067
Madal			+				T-L	og Number:	T56150
woder:	3P-03Y-2	AB SIGU	JOSI				Accou	nt Manager:	Christine Vu
Contact:	Gene								
Spec:	FCC 15.20	09, 15.23	31, EN55022	2			Class:	A / Radio	
Run #1: P Measureme table below	reliminary ents of the /.	Radiate	d Emission	1s, Fundan were made	nental (10 in on the OATS	S at test distan	ntion, Layin nces of 10n	ng Flat) 4 Ar	ntennas nd are recorded in the
		Al ARm ⁻¹				Azimum	motors	COMMENCE	
122 050	υ <u>ο</u> μν 82.5	10 J	05μv/m 92.9		PK/QP/Avy Dk	n	10	Tostod at 1	Om - Noto 1
122.755	64.0	10.4	74.4	0	Pk	360	1.0	Tested at 2	Om - Note 2
122.700	0.1.0	10			1 1	000	110	100104 41 -	
Note 1:	Polarizatio	on of O ir	idicates the	loop was fa	acing the EU	T, I indicates	that the loo	p was perpe	endicular to the EUT.
Extrapolation Factor Calculation:									
		Le	vel at 10m:	92.9	dBµV/m				
-	···tranalatia	Le	vel at 20m:	74.4	dBµV/m				
		from 20	JM 10 20111:	01.3 72 0	(IB) (This factor	used to calcu	ulata tha lay	ul in the tah	la balaw)
L^	llapuation		11 10 300111.	12.0	(THIS TACTOR	USEU IO CAICI			
Run #2: P Measureme table below	reliminary ents of the	Radiate	ed Emission ental signal v	ns, Fundan were made	nental (10 in on the OATS	iches sepera S at test dista	Ition, On its	s side) 4 An n and 20m a	itennas nd are recorded in the
Frequency			Level		Detector	AZIMUM	Height	Comments	
KHZ	αβηλ	0BM	αβήλλω	(071)	PK/QP/AVg	degrees	meters	Tostad at 1	Om Noto 1
122.900	ö2.γ 64.1	10.4 10.4	93.3 74.50	0	PK Dk	0 360	1.0	Tested at 2	UM - NULE I Dom - Note 2
122.700	ו דט	۲0.1	74.50	0	IN	300	1.0		
Note 1:	Polarizatio	on of O ir	idicates the	loop was f	acing the EU	T. I indicates	that the loo	p was perpe	endicular to the EUT.
Extrapolat	ion Factor	<u>Calcula</u>	ition:			<u>.</u>		· · ·	
Level at 10m: 93.3 dBµV/m									
Level at 20m: 74.5 dBµV/m									
E E	xtrapolatio	n from 1	Jm to 20m:	62.6	(This factor	used to color	ulata tha lay	al in the tab	
EX	arapolation	Trom 20	n to 300m:	<u>/3.0</u>	(This factor	used to carci		ei in the tad	ie delow)

Co T	7111	312									
61	<u>- 1110</u>	ott						EM	IC Test Data		
Client:	Savi Tech	nology, I	nc				J	Job Number: J56067			
Madalı							T-L	og Number:	T56150		
Wouer.	5P-051-2	AB Siyiip	JOSI				Accou	nt Manager:	Christine Vu		
Contact:	Gene										
Spec:	FCC 15.20	09, 15.23	51, EN55022		Class:	: A / Radio					
Run #3: Pi Measureme table below	r eliminary ents of the	Radiate fundame	d Emission Intal signal v	ı s, Fundan vere made	nental (25 in on the OATS	i ches sepera 3 at test distar	i tion, layin nces of 10n	g down) 4 A n and 20m a	Antennas and are recorded in the		
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments			
kHz	dBµV	dBm ⁻¹	dBµV/m	(0 / I)	Pk/QP/Avg	degrees	meters		· · · ·		
122.950	83.1	10.4	93.5	0	Pk	0	1.0	Tested at 1	0m - Note 1		
122.950	64.1	10.4	/4.52	0	PK	360	1.0	lested at 2	20m - Note 2		
Note 1	Polarizatio	n of O ir	dicates the	loon was fr	acing the FU	T Lindicates	that the loo	n was perpe	endicular to the FUT		
Extrapolation Factor Calculation:											
Level at 10m: 93.5 dBµV/m Level at 20m: 74.5 dBµV/m Extrapolation from 10m to 20m: 63.0 dB Extrapolation from 20m to 300m: <u>74.1</u> (This factor used to calc							ulate the lev	vel in the tab	ble below)		
Run #4: Pi Measureme table below	r eliminary ents of the	Radiate	d Emission Intal signal v	ıs, Fundan vere made	nental (25 in on the OATS	i ches sepera S at test dista	i tion, On it nces of 10n	s side) 4 An n and 20m a	Itennas and are recorded in the		
Frequency	Level	AF	Level	Pol	Detector	Azimuth	Height	Comments			
kHz	dBµV	dBm	dBµV/m	(O / I)	Pk/QP/Avg	degrees	meters				
122.950	83.1	10.4	93.5	0	Pk	0	1.0	Tested at 1	10m - Note 1		
122.950	64.0	10.4	74.4	0	PK	360	1.0	Tested at 2	20m - Note 2		
Note 1.	Polarizatio	of O ir	dicates the	loon was fr	acing the FU	T Lindicates	that the loo	was nerne	endicular to the FUT		
				1000 1000 10							
<u>Extrapolat</u>	ion Factor	<u>Calcula</u>	<u>tion:</u>								
		Le	vel at 10m:	93.5	dBµV/m						
	stranolatio	Lt ^{er}	vel at zum:	/4.4 40 /	dBhn/w dRh						
Ex	trapolation	from 20	m to 300m:	03.4 <u>74.6</u>	ав (This factor	used to calcı	ulate the lev	el in the tab	le below)		

E	Ellic	ott					El	MC Test Data	
Client:	Savi Tech	nology, l	nc	Job Number: J56067					
					T-Log Numbe	er: T56150			
Model:	SP-65Y-Z	AB Signj	oost		Account Manage	er: Christine Vu			
Contact:	Gene								
Spec:	FCC 15.20	09, 15.23	31, EN5502	2			Clas	s: A / Radio	
Run #5: H	armonic R	adiated	Emissions	s (Worst cas	se configura	ation 25 inc	hes seperation, layin	g down)	
Frequency	Level	FCC	15.209	Detector	Azimuth	Height	Comments		
KHz	dBµV/m	Limit	Margin	Pk/QP/Avg	degrees	meters			
122.95	2.4	25.8	-23.4	Pk	360	1.0	Note 1		
F	Laval	F 00	15 000	Datastan	۸ <u>_</u> :	l la la la la la	Commente		
	Level dBuV/m	FCC Limit	15.209 Margin	Detector	Azimuth	Height	Comments		
<u>Σ</u> 2/5.9	υ <u></u> 95	10 8	-10.3	PK/QP/AVy Pk	uegrees	-	Note 2 measured at	20m extranolated to 300m	
368.8	-5.72	16.3	-22.0	Pk	-	-	Note 2, measured at	20m, extrapolated to 300m	
	0.12		22.0						
Note 1:	Level calc measurem	ulated by nent reco	y applying t orded at 20r	he extrapola n with the ar	tion factor ca itennas sepa	alculated fro arated by 25	m the measurements a " (run #1).	at 10m and 20m to the	
	Preliminar	y measu	rements sh	owed there t	o be no sigr	nificant signa	als at a distance of 20n	n from the EUT other than	
Note 2:	the fundamental signal. An extrapolation factor of 40log(measurement distance/specification distance) was used for								
	the signals noted in the table above.								
Nata 2.	All signals above 490kHz were less than 43.4dBuV/m (-8.2dBuA/m) at a distance of 3m, which is equivalent to a								
Note 3:	level of 3.4ubuv/m at the specification distance of 30m it using the suggested extrapolation factor of A0log(measurement distance/specification distance)								
	40l0g(IIIea	Sulenie		specification	uisiance).				
						Tx			

EXHIBIT 3: Photographs of Test Configurations

EXHIBIT 4: EUT Details

EXHIBIT 5: Detailed Photographs of Savi Technology, Inc. Model SP-65Y-ZAB

EXHIBIT 6: Block Diagram of Savi Technology, Inc. Model SP-65Y-ZAB

EXHIBIT 7: Schematic Diagrams of Savi Technology, Inc. Model SP-65Y-ZAB

EXHIBIT 8: Theory of Operation for Savi Technology, Inc. Model SP-65Y-ZAB

EXHIBIT 9: Operator's Manual