Elliott

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Electromagnetic Emissions Test Report and Request for Class II Permissive Change pursuant to FCC Part 15, Subpart C Specifiactions for a Intentional Radiator on the SAVI Model: SaviTag 410

PRESENT FCC ID: KL7-410T-V1

GRANT DATE: December 18,1997

GRANTEE: Savi Technology, Inc.
450 National Avenue
Mountain View, CA 94043

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

REPORT DATE: May 4, 1998

FINAL TEST DATE: April 21, 1998

TEST ENGINEER: Rudy Suy

AUTHORIZED SIGNATORY: Mark Briggs
Mark Briggs
Manager, EMC Consulting Services

NVLAP

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SCOPE

An electromagnetic emissions test has been performed on the Savi Technology transmitter model SaviTag 410 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 FCC Rules This test has been performed to confirm continued compliance of a new version of the SaviTag 410 in accordance with Part 2, Section 2.1043 of the FCC Rules for permissive changes to Certified devices.

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

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

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

The test results recorded herein are based on a single type test of the Savi Technology model SaviTag 410 and therefore apply only to the tested sample. The sample was selected and prepared by Vikram Verma of Savi Technology, Inc..

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. In this case, minor modifications to the design of the subject device require that additional testing be performed to demonstrate that the device continues to comply with the Rules. The original Grant of Equipment Authorization issued by the FCC for the Certification of the subject device will be valid for the new version once acceptance is received from the FCC.

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 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 SITE

GENERAL INFORMATION

Final test measurements were taken on April 21, 1998 at the Elliott Laboratories Open Area Test Site located at 684 West Maude Avenue, Sunnyvale, California. Pursuant to section 2.948 of the Rules, construction, calibration, and equipment data has been filed with the Commission.

The FCC 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 FCC requirements.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4. 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 CISPER 16 is used for emissions measurements. The ESH3 receiver 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 particular detector used during measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. 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

A Rohde and Schwarz EZM Spectrum Monitor/Controller is utilized to convert the receiver measurements to the field strength at the antenna, 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.

The EZM provides a visual display of the signal being measured. In addition, the EZM Spectrum Monitor runs the automated data collection programs which control both 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 50 uH LISNs used were manufactured by Fischer Custom Communications, model LISN-3 in combination with a 250 uH Fischer Custom Communications LISN-3 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.

POWER METER

A power meter and thermister mount are used for all output power measurements from transmitters as they provides a broadband indication of the power output. The power meter used was the Hewlett Packard model 432A, S/N 992-05509 and the thermister mount was the Hewlett Packard model 478A, S/N 46397.

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 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 which are programmed into the test receivers

ANTENNA MAST AND EQUIPMENT TURNTABLE

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

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

INSTRUMENT CALIBRATION

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

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The 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 to 1000 MHz. 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

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

RADIATED EMISSIONS SPECIFICATION LIMITS

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (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:

$$R_r - B = C$$

and

$$C - S = M$$

where:

R_r = Receiver Reading in dBuV

B = Broadband Correction Factor*

C = Corrected Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

* Broadband Level - Per ANSI C63.4, 13 dB may be subtracted from the quasi-peak level if it is determined that the emission is broadband in nature. If the signal level in the average mode is six dB or more below the signal level in the peak mode, the emission is classified as broadband.

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

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

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

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Savi Technology model SaviTag 410 is an active RFID tag which is designed to track a container to which is attached. (Information is sent from the TAG by means of RF to a reader which sends it to the host computer for processing).

The transmitter and receiver circuitry in the device tested is common to the SaviTag 410 product family. The differences between the various members of this product family are in the size of the memory module (2, 8, or 128 KB), the beeper (enabled or disabled) and the directional wakeup option (enabled or disabled), as detailed in the attached product list. The unit tested was the ST-410-108 which is considered representative of the worst case configuration of the product family. The sample was received and tested on April 21, 1998. The EUT consisted of the following component(s):

Manufacturer/Model/Description	Serial Number	FCC ID Number
Savi Tech. ST- 410- 108	0010178	KL7-410T-V1

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 7 cm wide by 2 cm deep by 22 cm high.

INPUT POWER

The EUT is powered from internal batteries. For testing, freshly charged batteries were used.

EMI SUPPRESSION DEVICES

The EUT contained the following EMI suppression devices during emissions testing:

Description	Manufacturer	Part Number
None		

PRINTED WIRING BOARDS

The Savi Technology model SaviTag 410 contained the following printed wiring boards during emissions testing:

Manufacturer/Description	Assembly #	Rev.	Serial #	Crystals (MHz)
Savi Tech. Main Board	810-01450-001	A	0010178	8

SUBASSEMBLIES

The Savi Technology model SaviTag 410 contained no subassembly modules during emissions testing.

SUPPORT EQUIPMENT

None required to exercise the EUT.

EXTERNAL I/O CABLING

The EUT does not have any external ports intended for connection in the end-user environment.

TEST MODES

For all radiated emissions measurements of the fundamental and spurious emissions from the transmitter, the device was configured to transmit continuously at 433.88 MHz.

For all radiated emissions measurements from the receiver and digital circuitry, the device was configured to receive continuously at 433.885 MHz.

ANTENNA SYSTEM

The antenna system used consists of a loop antenna that is contained within the enclosure.

PROPOSED MODIFICATION DETAILS

GENERAL

This section details the modifications to the Savi Technology model SaviTag 410 being proposed. All construction deviations from the characteristics originally reported to the FCC are addressed. There were no changes made to the operation of the transmitter (i.e. the type and duration of transmissions).

ANTENNA DESIGN

The antenna was changed from a slot-type to a loop, giving a slightly increased antenna gain. There has been a corresponding reduction in the Transmitter output power.

MICROPROCESSOR DESIGN

The Microprocessor was changed to a version that contains on-board memory for firmware, thereby requiring less external interface and simplifying the design.

ADDITIONAL MICROPROCESSOR

Additional microprocessor added in order to process a more complex "Enable" signal.

POWER MANAGEMENT CIRCUITRY

Additional circuitry was added in order to more efficiently manage the power, including a different type of back-up battery.

TEST RESULTS

TEST DATA ANALYSIS - RADIATED FUNDAMENTAL

The following measurements were extracted from the data recorded during the radiated electric field emissions scan and represent the highest amplitude peaks relative to the specification limit. The actual test data and correction factors are contained in the appendices of this report.

Maximized Radiated Emissions @ Fundamental Transmit Frequency
Average & Peak Readings, Sorted by Margin

Frequency	Level	Pol	15.231	15.231	Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
433.885	90.3	v	92.9	-2.6	Peak	180	1.2	
433.885	70.3	v	72.9	-2.6	Ave	180	1.2	
433.885	82.0	h	92.9	-10.9	Peak	80	1.0	
433.885	62.0	h	72.9	-10.9	Ave	80	1.0	

TEST DATA ANALYSIS - RADIATED HARMONIC AND SPURIOUS OF TRANSMITTER

The following measurements were extracted from the data recorded during the radiated electric field emissions scan and represent the highest amplitude peaks relative to the specification limit. The actual test data and correction factors are contained in the appendices of this report.

Radiated spurious emissions from Transmitter, 30-4340MHz

Frequency	Level	Pol	15.231(e)	15.231(e)	Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2169.425	55.7	h	74.0	-18.3	Peak	200	1.1	
2169.425	51.8	v	74.0	-22.2	Peak	190	1.2	
3037.195	51.2	h	74.0	-22.8	Peak	220	1.0	
1735.540	48.6	v	74.0	-25.4	Peak	210	1.2	
1301.655	48.6	h	74.0	-25.4	Peak	250	1.4	
1301.655	47.4	v	74.0	-26.6	Peak	190	1.2	
1735.540	45.9	h	74.0	-28.1	Peak	230	1.1	
867.770	40.3	v	72.9	-32.6	Peak	300	1.0	
867.770	38.2	h	72.9	-34.7	Peak	320	1.5	

TEST DATA ANALYSIS - RADIATED EMISSIONS FROM RECEIVER/DIGITAL DEVICE

The following measurements were extracted from the data recorded during the radiated electric field emissions scan and represent the highest amplitude peaks relative to the specification limit. The actual test data and correction factors are contained in the appendices of this report.

Radiated spurious emissions, 30-1000 MHz
Quasi-Peak & Peak Readings, Sorted by Margin

Frequency	Level	Pol	FCC B	FCC B	Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
423.245	38.6	v	46.0	-7.4	QP	0	1.3	
40.000	23.2	v	40.0	-16.8	QP	0	1.0	
423.000	28.3	h	46.0	-17.7	QP	250	1.0	
846.490	26.2	v	46.0	-19.8	QP	0	1.4	
32.000	19.5	v	40.0	-20.5	QP	290	1.0	
846.490	25.4	h	46.0	-20.6	QP	40	1.0	
1735.540	45.9	h	54.0	-18.1	Peak	230	1.1	Pk rdg, Ave limit

EXHIBIT A

Test Equipment Calibration

Test Equipment List - SVOATS#1

	Manufacturer/Description		Model	Asset #	Interval	Last Cal	Cal Due
☐	Elliott Laboratories	FCC / CISPR LISN	LISN-3, OATS	304	12	6/5/97	6/5/98
☐	EMCO	Double Ridge Horn Antenna, 1-18	3115	487	12	6/3/97	6/3/98
☐	EMCO	Biconical Antenna, 30-300 MHz	3110B	363	12	4/8/98	4/8/99
☐	EMCO	Log Periodic Antenna, 0.3-1 GHz	3146A	364	12	4/8/98	4/8/99
☐	EMCO	Double Ridge Horn Antenna, 1-18	3115	786	12	11/13/97	5/13/99
☐	Hewlett Packard	Power Meter	432A	259, (F304)	12	3/10/98	3/10/99
☐	Hewlett Packard	Spectrum Analyzer	8563E	284, (F194)	24	1/14/98	1/14/2000
☐	Hewlett Packard	Microwave Preamplifier, 1-26.5	8449B	263, (F303)	12	6/6/97	6/6/98
☐	Hewlett Packard	Thermistor Mount	478A	652	12	3/10/98	3/10/99
☐	Hewlett Packard	EMC Receiver /Analyzer	8595EM	780	24	10/24/97	10/24/99
☐	Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	12	11/10/97	11/10/98
☐	Hewlett Packard	EMC Receiver /Analyzer	8595EM	787	12	10/27/97	10/27/98
☐	Narda-West	EMI Filter 5.6 GHz, High Pass	60583 HXF370	247	12	4/22/97	4/22/98
☐	Narda-West	EMI Filter 2.4 GHz, High Pass	60583 HPF-161	248	12	4/22/97	4/22/98
☐	Rohde & Schwarz	10 dB Pad / Pulse Limiter, 50W	ESH3 Z2	371	12	7/24/96	7/24/97
☐	Rohde & Schwarz	10 dB Pad / Pulse Limiter	ESH3 Z2	372	12	6/17/97	6/17/98
☐	Rohde & Schwarz	Test Receiver	ESN	775	12	6/30/97	6/30/98
☐	Solar Electronics	High Pass Filter, fc = 8 kHz	7930-8.0	277	12	7/18/97	7/18/98

File Number: ____________________

Date: ________________
Engr: ________________

EXHIBIT B

Test Measurement Data

The following data includes conducted emission measurements of the Savi Technology model SaviTag 410 and maximized radiated emissions measurements of the complete system.

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EMC Test Log

Client:	Savi Tech	Date:	4/21/98	Test Engr:	Rudy Suy
Product:	Savi Tag ST- 410- 108	File:	T26279	Proj. Eng:	Mark Briggs
Objective:	Final Qual.	Site:	SVOATS #1	Contact:	Gene Schlindwein
Spec:	FCC part 15	Page:	1 of 4	Approved:	MB

Test Objective

The objective of this test session is to perform final qualification testing of the EUT defined below relative to the FCC requirements for an unlicensed, low-power transmitter, a receiver and a digital device.

Note: This unit has been tested and summitted to the FCC. It's being retested because of some modifications. The antenna was changed from Slot antenna to Loop antenna. The microprocessor was changed and in addition another processor was added. These changes will be updated in block diagram and schematic.

Test Summary

Run #1 - Measurement of fundamental emission field strength (Transmitter).

PASS	Results:	FCC §15.231(e)	-2.6 dB	Pk	@	433.885.MHz	Vertical
			-2.6 dB	Ave	@	433.885.MHz	Vertical

Note: Ave. Reading obtained by subtracting the average correction factor (20dB) from the Peak Reading.

Run #2 - Maximized Radiated Spurious Emissions Scan, 30-4340 MHz (Transmitter)

PASS	Results:	FCC §15.231(e)	-18.3 dB	Pk	@	2169.425.MHz	Vertical
			-18.3 dB	Ave	@	2169.425.MHz	Vertical

Note: Ave. Reading obtained by subtracting the average correction factor (20dB) from the Peak Reading.

Run #3 - Maximized Radiated Spurious Emissions Scan, 30-1000 MHz (Receiver/Digital Device)

PASS	Results:	FCC Class B	-7.4 dB	QP	@	423.245 MHz	Vertical

Equipment Under Test (EUT) General Description

The EUT is an active RFID tag which is designed to track a container to which is attached. (Information is sent from the TAG by means of RF to a reader which sends it to the host computer for processing).

The transmitter and receiver circuitry in the device tested is common to the SaviTag 410 product family. The differences between the various members of this product family are in the size of the memory module (2, 8, or 128 KB), the beeper (enabled or disabled) and the directional wakeup option (enabled or disabled), as detailed in the attached product list. The unit tested was the ST-410-108 which is considered representative of the worst case configuration of the product family.

Normally, the EUT would be permanently attached to the side of a container. For the purposes of EMC testing the EUT was treated as table-top equipment and placed on its side on the tabletop to simulate the orientation of the device in its intended environment.

Equipment Under Test (EUT)

Manufacturer/Model/Description	Serial Number	FCC ID Number
Savi Tech. ST-410-108	0010178	KL7-410T-V1

Support Equipment

None required to exercise the EUT.

Power Supply and Line Filters

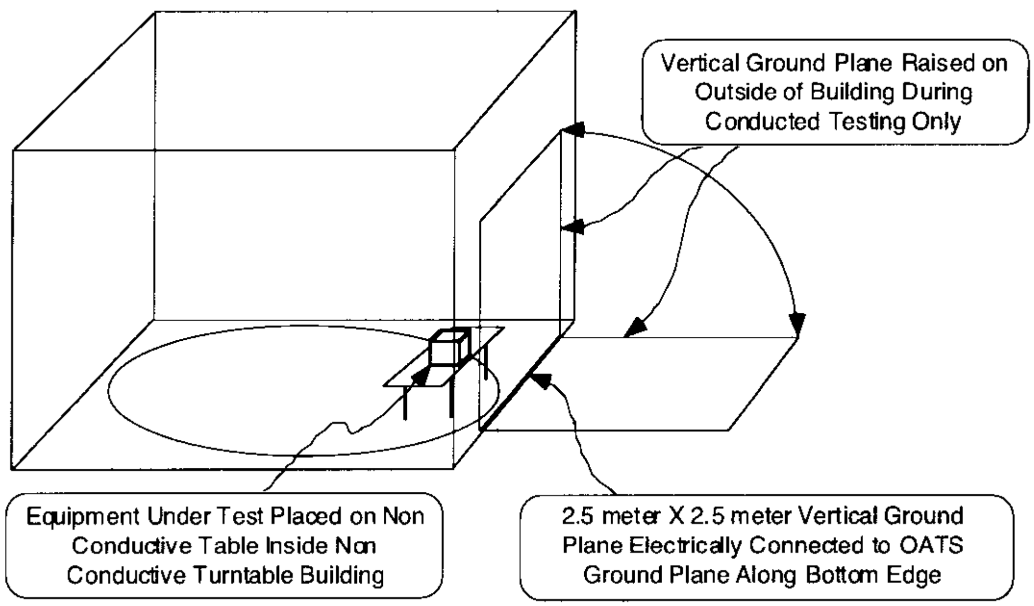
The EUT is powered from internal batteries. For testing freshly charged batteries were used.

Interface Cabling

The EUT does not have any external ports intended for connection in the end-user environment.

General Test Conditions

During radiated emissions testing, the EUT was running on freshly-charged batteries. The EUT was located on the center of a non-conducting bench which is 0.8 meter of the ground plane. The bench was centered on the turntable for radiated emissions testing.



Test Software

For all radiated emissions measurements of the fundamental and spurious emissions from the transmitter, the device was configured to transmit continuously at 433.88 MHz.

For all radiated emissions measurements from the receiver and digital circuitry, the device was configured to receive continuously at 433.885 MHz.

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EMC Test Log

Client:	Savi Tech	Date:	4/21/98	Test Engr:	Rudy Suy
Product:	Savi Tag ST- 410- 108	File:	T26279	Proj. Eng:	Mark Briggs
Objective:	Final Qual.	Site:	SVOATS #1	Contact:	Gene Schlindwein
Spec:	FCC part 15	Page:	4 of 4	Approved:	MB

Printed Wiring Boards in EUT

Manufacturer/Description	Assembly #	Rev.	Serial Number	Crystals (MHz)
Savi Tech. Main Board	810-01450-001	A	0010178	8

Subassemblies in EUT

Manufacturer/Description	Assembly Number	Rev.	Serial Number
none			

EUT Enclosure(s)

The EUT enclosure is primarily constructed of plastic. It measures approximately 7 cm wide by 2 cm deep by 22 cm high.

EMI Suppression Devices (filters, gaskets, etc.)

Description	Manufacturer	Part Number
none		

Test Data Tables

See the attached D-File

EXHIBIT C

Photographs of Test Configurations

EXHIBIT D

Detailed Photographs of Savi Technology Model SaviTag 410 Proposed Change of Construction