

FCC ID: BVCCCW

COMPANY	Sensormatic Electronics Corp. 951 Yamato Road Boca Raton, Florida
PRODUCT TESTED	Ccure Watch RFID System
FCC RULES	15.207, 15.209
TEST DATE	May 9-31, 2001
SUBMITTED BY	Donald J. Umbdenstock

I. Summary of Results

47 CFR 15.207	CONDUCTED EMISSIONS	COMPLIES
47 CFR 15.209	RADIATED EMISSIONS	COMPLIES

II. General Information

1.1 Test Methodology

Both conducted and radiated emissions testing were performed according to the procedures in ANSI C63.4-1992, and the requirements of 15.31, 15.33, 15.35, 15.207, and 15.209. Radiated emissions measurements below 30 MHz were performed at a distance of 10 meters and the results extrapolated to the distance specified per 15.31 and 15.209.

1.2 Test Facility

Measurements per 15.207 and 15.209 were performed at Sensormatic Electronics Corporation.

The shielded room conducted emissions measurement facility is located at Sensormatic Electronics Corporation Headquarters at 951 Yamato Road, Boca Raton, Florida, 33431. The radiated emissions Open Area Test Site is located at Sensormatic Electronics Corporation manufacturing location, 6600 Congress Avenue, Boca Raton, Florida 33487. These sites have been found acceptable by and are on file with the FCC per FCC letter 31040/SIT 1300F2.

1.3 Test System Description.

The CcureWatch system consists of a card reader, an access control card, a transceiver located in the loop antenna assembly, and interface circuitry to access control electronics in remote panels. The system can be configured with 1 to 4 antennas. A ground wire is provided for rfi mitigation.

The product tested was a pre-production unit.

15.203. The antenna is contained internally to the transceiver and is permanently attached, thus it is compliant with the requirements of this clause.

III. Conducted Emissions

Conducted emissions data are presented in Section VII “Data”, Part A “Conducted Emissions”. The product demonstrated compliance with the requirements of 15.207. The product was tested at 120 V, 60 Hz.

IV. Magnetic Field Radiated Emissions

Radiated emissions data for this product are presented in Section VII “Data”, Part B “Radiated Emissions”. The product demonstrated compliance with the requirements of 15.209. Radiated emissions measurements were performed at 10 meters. Propagation loss was determined measuring the emissions at 10 meters and extrapolating the results to 300 meters and 30 meters as required for the frequency of interest.

Maximum radiation was determined by first assessing symmetry while applying incremental rotation of the turntable in the preliminary measurements. The product exhibited quadrant symmetry. Measurements were taken at radials of 22.5° throughout one quadrant; the measurement antenna was rotated for maximum pickup about the vertical axis of the measurement antenna at each radial. The maximum emission was determined to be with the measurement loop antenna in the vertical polarization, parallel to the plane of the transmit antenna. The emissions were also greater for the single antenna configuration than for multiple antenna configurations due to phase cancellation of the multi-antenna configuration. Therefore the final data were recorded for the single antenna configuration.

The product was tested at input voltages ranging from 102 – 138 V, 60 Hz with no measurable change in transmitter output.

V. (This section intentionally left blank)

VI. LIST OF MEASURING EQUIPMENT

The equipment used for determining compliance of the Ultra Post system with the requirements of 15.207 and 15.209 is marked with an “X” in the first column of the table below.

	<u>Model</u>	<u>Description</u>	<u>Vendor</u>	<u>Serial #</u>
X	ALP -70	Loop Antenna	Electro Metrics	163
X	3110B	Biconnical Antenna	Electro Metrics	1017
X	3146	Log Periodic Antenna	EMCO	3909
	3825/2	Line Imp Stable Network	EMCO	1562
X	3816/2NM	Line Imp Stable Network	EMCO	9703 1064
	6060B	Frequency Generator	Giga-tronics	5850202
	FM2000	Isotropic Field Monitor	Amplifier Research	15171
	FP2000	Isotropic Field Probe	Amplifier Research	15214
	888	Leveler	Amplifier Research	14998
	75A220	Low Band Amplifier	Amplifier Research	15208
	10W1000A	High Band Amplifier	Amplifier Research	15138
	PEFT Junior	EFT Generator	Haefely Trench	083 180-16
	PEFT Junior	Capacitive Cable Clamp	Haefely Trench	083-078-31
	NSG435	ESD Simulator	Schaffner	1197
	NSG431	ESD Simulator	Schaffner	1267
X	HP8591EM	EMC Analyzer	Hewlett - Packard	3520A00190
		Power Source	Pacific Instruments	
	F-2031	EM Injection Clamp	Fischer Cust. Comm.	30
	FCC-801-M3-16	Coupling Decoupling Nwk	Fischer Cust. Comm.	58
	FCC-801-M3-16	Coupling Decoupling Nwk	Fischer Cust. Comm.	59
	F-33-1	RF Current Probe	Fischer Cust. Comm.	304
	EM 7600	Transient Limiter	Electro-Metrics	187
	Roberts Ant	Tunable Dipole Set	Compliance Design	003282
	Roberts Ant	Tunable Dipole Set	Compliance Design	003283
	HP8594E	Spectrum Analyzer	Hewlett Packard	3246A00300
X	HP8447F Opt 64	Dual Preamplifier	Hewlett Packard	2805A03473

VII. Data

Part A contains conducted emissions data; Part B contains radiated emissions data.

Part A

Conducted Emissions

Project Name	Conducted Emissions FCC Class B	Filename	RFID_CcureWatch_CondEMI_FCC_5-31-01.doc
EUT Name	CCureWatch Legacy Mode	Serial Number	
Engineer	Ron Devoe	Phone Number	
Date of Test	05/31/2001 8:39:54 AM	Test Name	Conducted Emission
Reg. Technician	Stephen Krizmanich		

Comments	Line In 120vac 60hz: Ferrite clamp (Ferrico F5NF130) on Line cord inside enclosure near barrier strip. External ground wire (6 foot 12 AWG) attached to chassis inside enclosure and line service box.
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Signal List

Signal	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	Avg Amp (dBuV)	Qualifies for -13dB reduction	Corrected QP Measurement (dBuV)	Limit (dBuV)
1	6.443875	62.96	58.65	48.37	Yes	45.65	48
2	6.980000	60.98	57.56	49.45	Yes	44.56	48
3	6.712000	60.88	57.46	50.16	Yes	44.46	48
4	4.966563	57.01	54.77	48.59	Yes	41.77	48
5	5.100325	60.15	54.73	44.39	Yes	41.73	48
6	20.537525	53.87	49.26	43.07	Yes	36.26	48

Figure 1. L1 Full Range

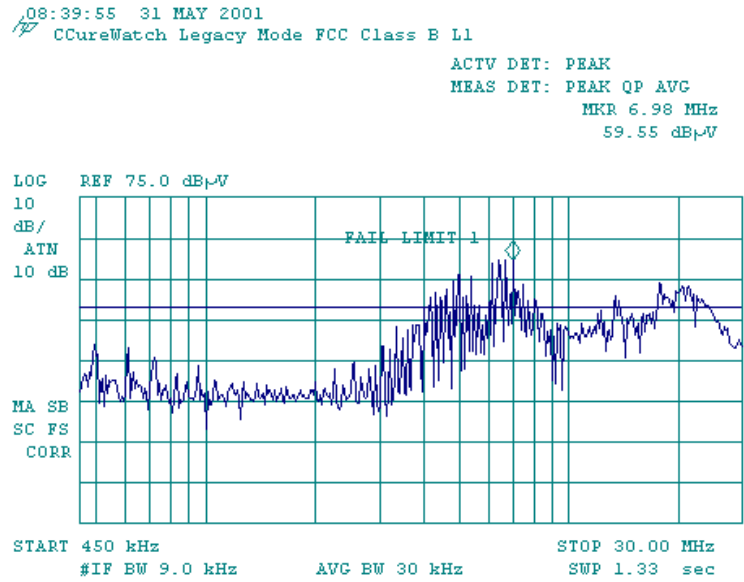
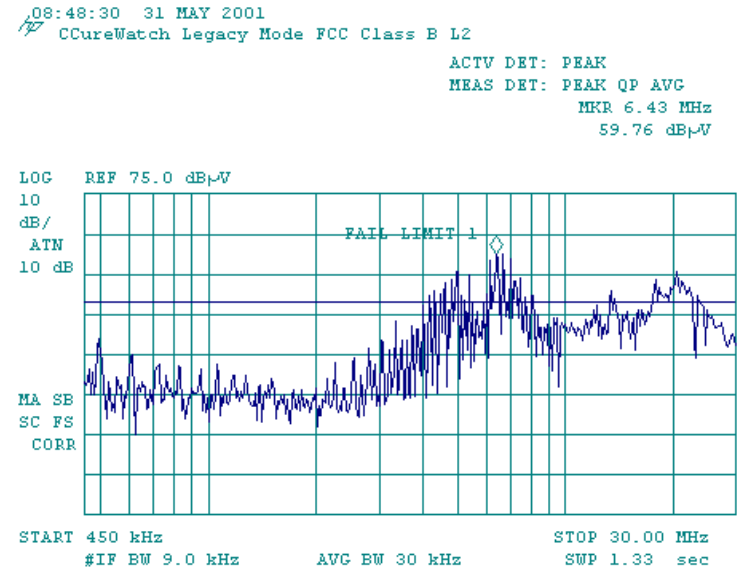


Figure 2. L2 Full Range



Part B

Radiated Emissions

Ccure Watch Legacy Single Antenna

Frequency	Distance	Detector	Reading	Reading	Ave CF	Dist CF	HPF CF	Ant CF	Measured	Limit	Spec Dist
(kHz)	(meters)		(dB)	(dB)	(dB)	(dB)	(dB)	(dBuV)	Value	(dBuV)	
			9k BW	1k Bw					(dBuV)		
134.2	10	Pk	55.5	55	-4.4	-88.6	0	55.5	17.5	25.0	at 300m
134.2	20	Pk	37.7	37.6							
134.2	30	Pk	27.7	27.6							
268.4	10	Pk	9.6	9.6	-4.4	-88.6	1.5	49.5	-32.4	19.0	at 300m
402.6	10	Pk	8.7	8.7	-4.4	-88.6	0.8	46.5	-37.0	15.5	at 300m
536.8	10	Pk	amb	-10	0	-28.6	0.3	44.2	5.9	33.0	at 30m
671.0	10	Pk	amb	amb	0	-28.6	0.3	42.9	amb	31.1	at 30m
805.2	10	Pk	amb	amb	0	-28.6	0.2	41.9	amb	29.5	at 30m
939.4	10	Pk	amb	amb	0	-28.6	0.1	41	amb	28.1	at 30m
1073.6	10	Pk	amb	nf	0	-28.6	0.2	40.5	nf	27.0	at 30m
1207.8	10	Pk	amb	3.2	0	-28.6	0.2	40.2	15.0	26.0	at 30m
1342.0	10	Pk	amb	amb	0	-28.6	0.1	39.5	amb	25.0	at 30m

Notes

- Dist CF = Distance Correction Factor = $20 \log (\text{Test Dist} / \text{Spec Dist})^P = 20 P \log (\text{Test Dist} / \text{Spec Dist})$
Where P is the roll-off exponent. P is found as follows:
- $P = (\text{Level}(\text{at Distance 1}) - \text{Level}(\text{at Distance 2})) / 20 \log (\text{Distance 2} / \text{Distance 1})$
- Ave CF = Average detector Correction Factor = $20 \log (\text{duty cycle})$
- Measured Value = Reading + Ave CF + Dist CF + HPF CF + Ant CF
- Limit = $20 * \log(2400/f)$ for $f < 490 \text{ kHz}$, or $20 * \log(24000/f)$ for $f > 490 \text{ kHz}$.