

COMPANY	Sensormatic Electronics Corp. 6600 Congress Ave Boca Raton, Florida 33487
PRODUCT TESTED	AMB-4020 FCC ID: BVCAMB4020 IC: 3506A-AMB4020
FCC RULES	15.207, 15.209
IC SPECIFICATIONS	RSS 210
TEST DATE[s]	Dec. 11, 2004 – January 25, 2005
SUBMITTED BY	William M. Elliott

I. Summary of Results

47 CFR 15.203	ANTENNA REQUIREMENTS	COMPLIES
47 CFR 15.207	CONDUCTED EMISSIONS	COMPLIES
47 CFR 15.209	RADIATED EMISSIONS	COMPLIES
RSS 210: 5.9.1	OCCUPIED BANDWIDTH	PROVIDED

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 30MHz were performed at a 3 meter distance and the results were extrapolated to the distance specified per 15.31 and 15.209 invoking the 2-point extrapolation method.

The device is manufactured with an integral antenna. To accommodate the conducted RF measurements, a unit was modified to replace the antenna with an external SMA connector. Another unmodified unit was used for radiated spurious emissions.

1.2. Test Facility

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

The shielded room conducted emissions measurement facility and the radiated emissions Open Area Test Site are located at Sensormatic Electronics Corporation Headquarters at 6600 Congress Avenue, Boca Raton, Florida 33487. These sites have been found acceptable by and are on file with the FCC per FCC Registration Number 90925, and Industry Canada per file number IC 3506.

1.3. Test System Description.

The Sensormatic® AMB-4020 Hand-Held Scanner/Deactivator is a handheld device that can detect & deactivate ULTRAMAX EAS labels, and can scan and read barcode data. It is marketed with a base charging/locking station that is typically mounted to a fixed location.

Normal retail environment applications include detecting and deactivating EAS labels as well as scanning product barcodes. This unit consists of power regulation circuitry that uses the battery voltage to generate 1.25, 3.3, 5.0, 19 & 21 VDC. These voltages are used by the different components of the unit.

The product tested was a pre-production unit built to production drawings.

To detect EAS labels, the handheld drives a coil antenna at 58 kHz. This generates a magnetic field that excites a label when in range. The handheld can then detect the presence of the label.

The handheld is powered from a rechargeable 2 series cell Li-ion battery pack.

15.203. . The antenna is an internal loop antenna and not accessible to the user. Therefore the device complies with the provisions of this clause.

III. Conducted Emissions

15.207. Conducted emissions data are presented in Section VIII “Data”, Part A, “Conducted Emissions”.

The handheld is powered from a rechargeable 2 series cell Li-ion battery pack. However, the device is marketed with a base charging station that plugs into the AC mains. Therefore, conducted emissions testing was done with the handheld in the base. The operational mode of the handheld is limited while in the base charging station and the normal operating mode was exercised.

The product demonstrated compliance with the requirements of 15.207.

IV. Radiated Emissions

15.209. Radiated emissions data for this product are presented in Section VIII “Data”, Part B, Radiated Emissions. The product demonstrated compliance with the requirements. Radiated emissions measurements were performed at 3 meters. An inverse-linear distance extrapolation factor of 20 dB/decade was used. The results were compared to the limits by extrapolating the results to 300 meters as per 15.31(f)(2), .

Maximum radiation was determined by first assessing symmetry. The product exhibited semi-circular symmetry. Measurements were taken at radials of 22.5° throughout two quadrants; 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 radiating loop of the antenna structure.

See Section VIII, Part B for results.

V. Occupied Bandwidth

RSS 210:5.9.1. The 20 dB bandwidth measurements for this product are presented in Section VII “Data”, Part C, Occupied Bandwidth. A bandwidth requirement was not specified for 58kHz products, so the default 20dB bandwidth was measured.

VI. LIST OF MEASURING EQUIPMENT

The equipment used for determining compliance of the AMS-9040 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	Biconical Antenna	Electro Metrics	1017
	3146	Log Periodic Antenna	EMCO	3909
	3825/2	Line Imp Stable Network	EMCO	1562
X	3816/2NM	Line Imp Stable Network	EMCO	9703 1018
	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 magnetic field radiated emissions data; Part C contains occupied bandwidth data.

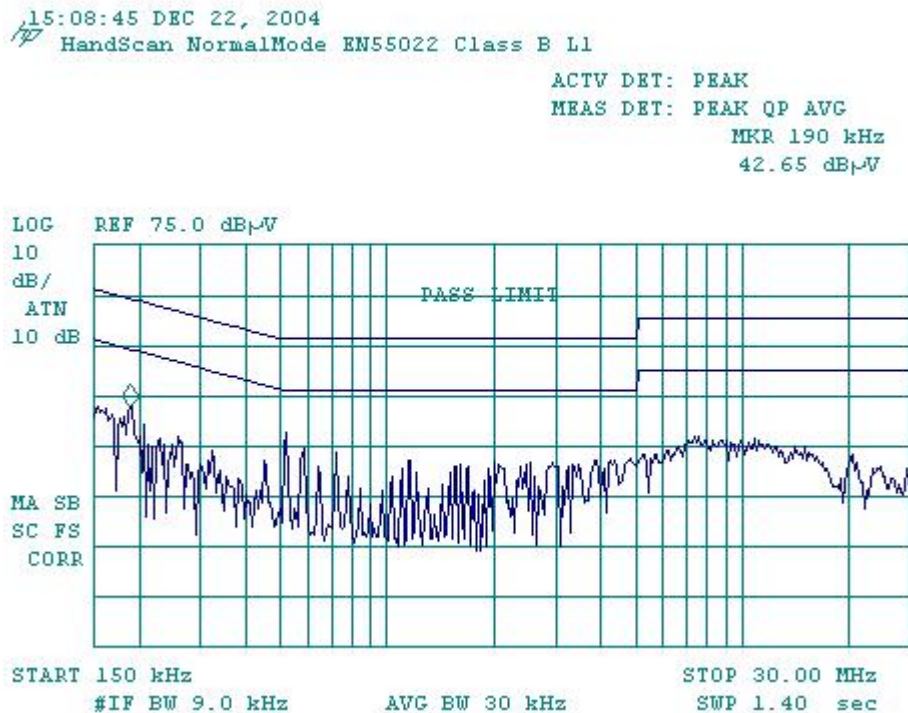
Part A Conducted Emissions

Project Name	Conducted Emissions EN55022 Class B Limit	Filename	AMB4020_CondEMI_12-22-04.doc
EUT Name	AMB4020 HandScan	Serial Number	
Engineer	Tim Relihan	Phone Number	
Date of Test	12/22/04 3:08:43 PM	Test Name	Conducted Emission
Reg. Technician	Stephen Krizmanich		

Signal List

Signal	Freq (MHz)	Peak Detector (dBuV)	QP Detector (dBuV)	Avg Detector (dBuV)	EN55022 Limits QP/Avg (dBuV)	Comments
1	.200	39.1	37.0	32.9	63.3 / 53.3	Complies
2	.533	38.3	36.5	35.5	56.0 / 46.0	Complies
3	20.29	36.2	34.6	31.8	60.0 / 50.0	Complies
4	8.22	37.4	36.0	31.3	60.0 / 50.0	Complies

Figure 1. Full Range



Part B

Radiated Emissions

Project Name	Radiated Emissions
EUT Name	AMB 4020
Engineer	Tim Relihan
Date of Test	December 7 th , 2004
Reg. Staff	Elliott

Comments	1. Inverse-linear distance extrapolation [20 db / decade] used. 2. Measurement distance 3 meters
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Freq kHz	S.A. dBuV	Det	BW	Ant Fact dB	Filter Fact dB	DCCF dB	DCF dB	Pk Cor dBuV/m	Actual dBuV/m	Limit dBuV/m
58(pwr-15%)										
58(pwr+15%)										
58	56.4	pk	9kHz	62.3		-20.00	-80.00	45.0	25.0	32.3/300
116	15.7	pk	9kHz	56.7	1.9	-20.00	-80.00	4.4	-15.6	26.3/300
174	13.3	pk	9kHz	53.2	0.8	-20.00	-80.00	6.9	-13.1	22.8/300
232	4.9	pk	9kHz	50.6	0.5	-20.00	-80.00	-11.0	-31.0	20.3/300
290	11.2	pk	9kHz	48.7	0.4	-20.00	-80.00	-3.8	-23.8	18.4/300
348*	11.8	pk	9kHz	47.3	0.4	-20.00	-80.00	-25.2	-45.2	16.8/300
406	2.9	pk	9kHz	46.1	0.4	-20.00	-80.00	-10.8	-30.8	15.4/300
464	-2.4	pk	9kHz	45.2	0.2	-20.00	-80.00	-19.3	-39.3	14.3/300
522@	-4.0	qp	9kHz	44.4	0.2	-20.00	-40.00	23.5	3.5	33.3/30
580#	11.3	qp	9kHz	43.6	0.2	-20.00	-40.00	17.0	-3.0	32.3/30

SA: Spectrum Analyzer Reading

Det: Detector

BW: Band Width

Ant Fact Antenna Factor

DCCF: Duty Cycle
Correction Factor

DCF: Distance
Correction
Factor

Actual Corrected Reading

Part C

Occupied Bandwidth

Project Name	Industry Canada BW Measurement	Filename	4020 IC BW Screen Capture.doc
EUT Name	AMS4020	Serial Number	
Engineer	Relihan	Phone Number	
Date of Test	December 7th, 2004	Test Name	Industry Canada 20 dB BandWidth
Reg. Technician	Mac Elliott		

Comments	Line Input:120vac 60hz
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Figure 1.

