TEST REPORT

Testing Certification # 1367-01

Laboratory ID
PRODUCT SAFETY ENGINEERING, INC.
12955 Bellamy Brothers Boulevard
Dade City, Florida 33525 USA
PH (352) 588-2209 FX (352) 588-2544

Submitter ID
Seaward Group USA
6304 Benjamin Road
Suite 506
Tampa, FL 33634

Report Issue Date: 07/13/2012
Sample S/N: A2-915
Sample Receipt Date: 06/01/2012

Test Report Number: 12F190B
Model Designation: SS200R
Product Description: Solar Environmental Measurement

Sample Test Date: see data sheets

Description of non-standard test method or test practice: ***None***

Estimated Measurement Uncertainty: ***Not Applicable***

Special limitations of use: ***None***

Traceability: ***reference standards of measurement have been calibrated by a competent body using standards traceable to the NIST.***

According to testing performed at Product Safety Engineering, Inc., the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in regulations indicated on page (3) of the test report. The test results contained herein relate only to the model(s) identified above. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Project Engineer, I hereby declare that the equipment tested as specified above conforms to the requirements indicated on page (3) of the test report.

Signature  Name David Foerstner

Title Test Engineer Date 07/13/2012

Reviewed by: 

Approved Signatory 07/13/2012

D I R E C T O R Y - EMISSIONS

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

□ - EN 61000-6-3:2001

□ - EN 61000-6-4:2001

□ - EN 55011 : 2006 /A2:2007 □ - Group 1 □ - Group 2

□ - Class A □ - Class B

□ - EN 55013 : 1990 / A12:1994 / A13:1996 / A14:1999

□ - EN 55014 -1: 2001/A1:2001 A2:2002 □ - Household appliances and similar

□ - Portable tools

□ - Semiconductor devices

□ - EN 55022:2006 □ - Class A □ - Class B

□ -AS/NZS CISPR 22:2006 □ - Class A □ - Class B

■ - RSS-210 (A2.9) ■ - Technical Acceptance Certificate

□ - CNS 13438 □ - Class A □ - Class B

□ - VCCI V-3/2007.4 □ - Class A □ - Class B

■ - FCC Part 15.249 (per ANSI C63.4:2003) □ - Class A □ - Class B

■ - Certification
□ - Verification
□ - Declaration of Conformity

□ - FCC Part 18 (per FCC MP-5)

Product Safety Engineering, Inc 12955 Bellamy Brothers Blvd. Dade City, FL 33525
Tel (352) 588-2209 Fax (352) 588-2544

Environmental conditions during testing:

	LAB	OATS
Temperature: *	_____	: _____
Relative Humidity: **	_____	: _____

* The ambient temperature during the testing was within the range of (50° - 104° F) unless indicted above.
** The humidity levels during the testing was within the range of (10% - 90%) relative humidity unless indicated above.

Power supply system : ____*____ Volts _____ Hz __SINGLE__ phase

Internal battery

Sign Explanations:

□ - not applicable
■ - applicable

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Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

■ - Test not applicable

□ - Darby Test Site (Open Area Test Site)
□ - Darby Laboratory

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
□ -	8028-50	Solar	50 Ω LISN	829012, 829022
□ -	3825/2	Solar	50 Ω LISN	924840
□ -	EMC-30	Electro-Metrics	EMI Receiver	191
□ -	8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
□ -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ -	85662A	Hewlett Packard	Analyzer Display	2403A07352
□ -	8028-50	Solar	50 Ω LISN	903725, 903726
□ -	FCC-TLISN-T4-02	Fisher Custom Com.	Telecom ISN	20454
□ -	FCC-TLISN-T8-02	Fisher Custom Com.	Telecom ISN	20452

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

□ - Darby Test Site (Open Area Test Site)
□ -
□ -

at a test distance of :

□ - 3 meters
□ - 30 meters

■ - Test not applicable

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
□ -	3148	EMCO	Log Periodic Antenna	00044783
□ -	BIA-25	Electro-Metrics	Biconical Antenna	4283
□ -	8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
□ -	85662A	Hewlett-Packard	Analyzer Display	2403A07352
□ -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ -	ALR-30M	Electro-Metrics	Loop Antenna	824
□ -	8447D	Hewlett Packard	Preamplifier	2944A06832
□ -	EMC-30	Electro-Metrics	EMI Receiver	191
□ -	ALA-130/A	Antenna Research	Loop Antenna	106

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

□ - Test not applicable

■ - Darby Site (Open Area Test Site)
□ - Darby Lab
□ -

at a test distance of :

■ - 3 meters
□ - 10 meters
□ - 30 meters

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
□ -	HLP 3003C	EMC Automation	Hybrid Periodic Antenna	017501
■ -	8447D	Hewlett-Packard	Preamplifier (26dB)	2944A06832
■ -	8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
■ -	85662A	Hewlett-Packard	Analyzer Display	2403A07352
■ -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ -	BIA 25	Electro-Metrics	Biconical Antenna	4283
□ -	EMC-30	Electro-Metrics	EMI Receiver	191
□ -	8568B	Hewlett Packard	Spectrum Analyzer	2407A03213
□ -	85650A	Hewlett Packard	Quasi-Peak Adapter	2043A00358
□ -	85662A	Hewlett Packard	Analyzer Display	2340A05806
□ -	LPA30	Electro-Metrics	Log Periodic	2280
■ -	BIA-30	Electro-Metrics	Biconical Antenna	3852
■ -	3148	EMCO	Log Periodic Antenna	00075741

Emissions Test Conditions): CONDUCTED EMISSIONS - TELECOMMUNICATIONS PORT

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

■ - Test not applicable

□ - Darby Lab
□ -

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
□ -	EMC-30	Electro-Metrics	EMI Receiver	191
□ -	FCC-TLISN-T8-02	Fischer Custom Com	T-LISN	20452
□ -	FCC-TLISN-T4-02	Fischer Custom Com	T_LISN	20454
□ -				
□ -				
□ -				

The *EQUIVALENT RADIATED EMISSIONS* measurements in the frequency range 1 GHz - 10 GHz were performed in a horizontal and vertical polarization at the following test location :

■ - Darby Test Site (Open Area Test Site)
□ -
□ -
□ -

at a test distance of:

□ - 1 meters
■ - 3 meters
□ - 10 meters

□ - Test not applicable

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
■ -	8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
■ -	85662A	Hewlett-Packard	Analyzer Display	2403A07352
■ -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
■ -	8449B	Hewlett-Packard	Preamplifier	3008A00320
■ -	3115	Electro-Mechanics	Double Ridge Guide Horn	3810

The *ANTENNA TERMINAL DISTURBANCE VOLTAGE* in the frequency range 30 MHz - 1,000 MHz were performed.

□ - Darby Test Site (Open Area Test Site)
□ - Laboratory
□ -
□ -

■ - Test not applicable

	Model Number	Manufacturer	Description	Serial Number
□ -	2F9-3C4-3C5	Wavecom	UHF PAL TV Modulator	185879
□ -	2F1-3C4-3C5	Wavecom	VHF PAL TV Modulator	157728
□ -	A-8000	IFR	Spectrum Analyzer	1306
□ -	8648B	Hewlett-Packard	Signal Generator	3623A01433
□ -	8648B	Hewlett-Packard	Signal Generator	3623A01477
□ -	LMV-182A	Leader	RMS Milli-Voltmeter	8010091
□ -	3202	Krhon-Hite	Active filter	5899
□-	FMT115	Leaming	FM Modulator	NONE
□ -	371	UDT	Optical power meter	06657
□ -	TSG95	Tektronix	PAL video / Audio generator	B028883
□-				

Equipment Under Test (EUT) Test Operation Mode - Emission tests :

The device under test was operated under the following conditions during emissions testing:

□ - Standby

□ - Test program (H - Pattern)

□ - Test program (color bar)

□ - Test program (customer specific)

□ - Practice operation

■ - Normal Operating Mode

□ -

Configuration of the device under test:

The internal battery was checked and verified to be fully charged.

Rationale for EUT setup / configuration:

ANSI C63.4:2003

Emission Test Results:

Conducted emissions 150 kHz - 30 MHz

The requirements are ☐ **- MET** ☐ **- NOT MET**

Minimum limit margin dB at MHz
Remarks:

Radiated emissions (magnetic field) 10 kHz - 30 MHz

The requirements are ☐ **- MET** ☐ **- NOT MET**

Minimum limit margin dB at MHz
Remarks:

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are ■ **- MET** ☐ **- NOT MET**

Minimum limit margin **1.8** dB at **914.** MHz
Remarks:

Interference Power at the mains and interface cables 30 MHz - 300 MHz

The requirements are ☐ **- MET** ☐ **- NOT MET**

Minimum limit margin dB at MHz
Remarks:

Radiated emissions 1 GHz - 10 GHz

The requirements are ■ **- MET** ☐ **- NOT MET**

Minimum limit margin **0.5** dB at **1.832** GHz
Remarks:

Conducted Emissions - Telecommunications Port 150kHz - 30 MHz

The requirements are ☐ **- MET** ☐ **- NOT MET**

Minimum limit margin dB at MHz
Remarks:

GENERAL REMARKS:

The device was tested in (3) orthogonal positions.

SUMMARY:

The requirements according to the technical regulations are

■ - met

□ - **not** met.

The device under test does

■ - fulfill the general approval requirements mentioned on page 3.

□ - **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date **06/06/2012**

Testing End Date: **06/08/2012**

- PRODUCT SAFETY ENGINEERING INC -

Test-setup photo(s):
Conducted emission 150 kHz - 30 MHz

N/A

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Test-setup photo(s):
Radiated emission 30 MHz - 1000 MHz

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APPENDIX

A

Test Equipment Calibration Information

&

Test Data Sheets

Product Safety Engineering, Inc 12955 Bellamy Brothers Blvd. Dade City, FL 33525
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TEST EQUIPMENT CALIBRATION INFORMATION

Manufactirer	Model	Description	Serial Number	Cal Due *
Hewlett Packard	8566B	Spectrum Analyzer	2421A00526	10/13/2012
Hewlett Packard	85662A	Display	2403A07352	10/13/2012
Hewlett Packard	85650A	Quasi-peak Adapter	2043A00209	9/6/2012
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06832	3/8/2013
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06901	
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	1937A03247	
Hewlett Packard	8449B	Preamp 1 - 26.5 GHz	3008A00320	5/7/2013
Hewlett Packard	E7402A	Portable Spectrum Analyzer	US40240204	10/20/2012
Eaton	96005	Log Periodic Antenna	1099	
Electro-Metrics	BIA-30	Biconical Antenna	3852	4/20/2013
EMCO	3104C	Biconical Antenna	75927	
Electro-Metrics	ALR30M	Magnetic Loop Antenna	824	
Electro-Metrics	EMC-30	EMI Receiver	191	
Electro-Metrics	3115	Double Ridge Guide Antenna	3810	5/25/2013
Solar	8028	LISN	829012/809022	
Com-Power	LI-125	LISN	191180/191181	
EMCO	3148	Log Periodic Antenna	75741	1/17/2013
Schwartzbeck	MDS-21	Absorbing Clamp	2581	
Fisher Custom	FCC-TLISN-T4-02	T LISN	20454	
Fisher Custom	FCC-TLISN-T8-02	Fisher Custom	20452	

* Cal Due Date Format = MM/DD/YY

All equipment was calibrated one year prior to the cal due date listed unless otherwise indicated

Radiated Emissions (Fundamental & Harmonics)

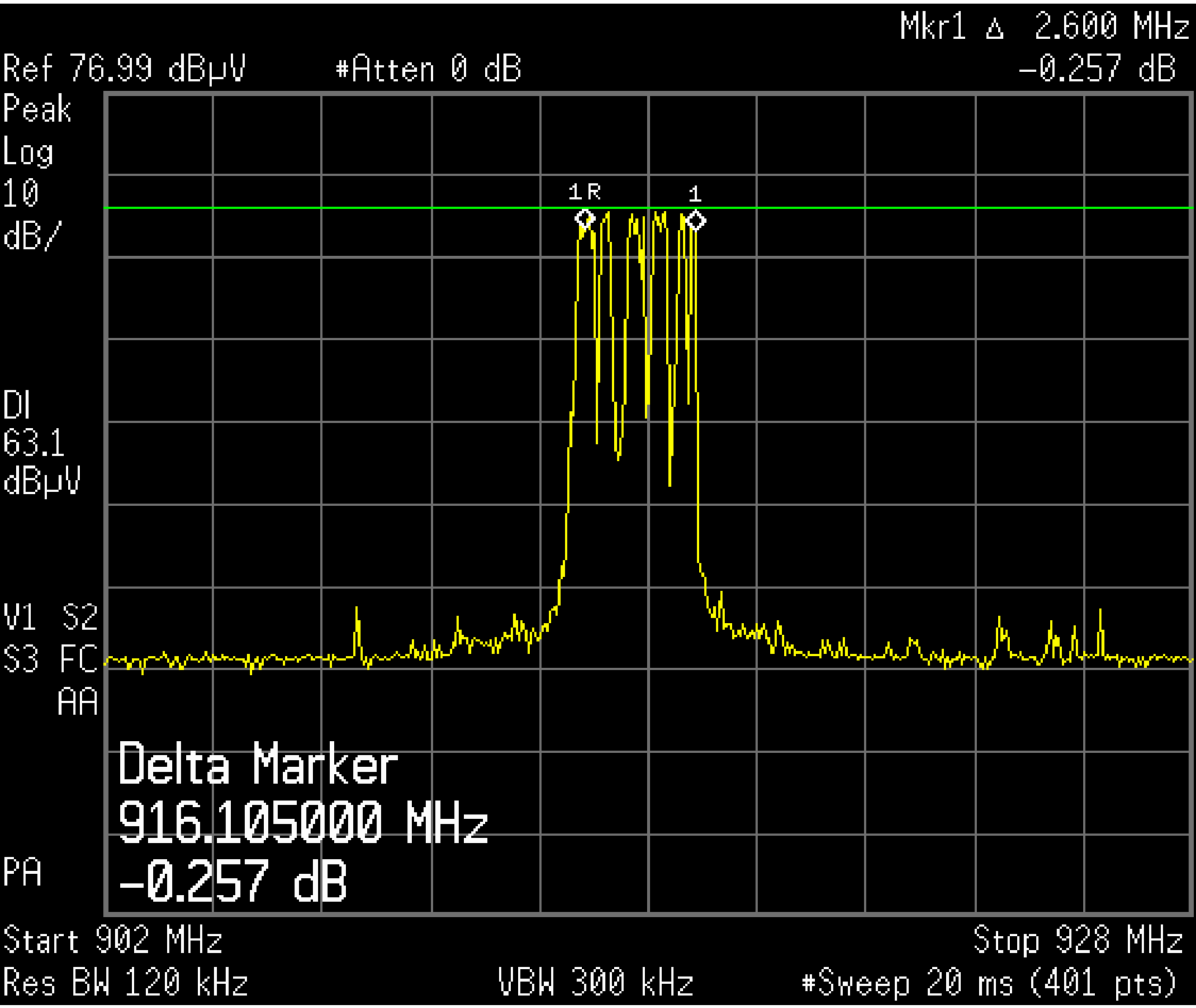
Frequency MHz		Measured dBuV/m	Limit dBuV/m	Delta Limit dB	Detector PK/QP/AVG
913.5		92.1	94	-1.9	QP
1827		53.3	54	-0.7	AVG
1827		58.1	74	-15.9	PK
2740.5		43.7	54	-10.3	AVG
3654		42.6	54	-11.4	AVG
4567.5		41.9	54	-12.1	AVG
9135		46.2	54	-7.8	AVG
9135		51.6	74	-22.4	PK
915.9		92.2	94	-1.8	QP
1831.8		53.5	54	-0.5	AVG
1831.8		58.5	74	-15.5	PK
2747.7		43.5	54	-10.5	AVG
3663.6		42.2	54	-11.8	AVG
4579.5		41.6	54	-12.4	AVG
9159		46.8	54	-7.2	AVG
9159		52.3	74	-21.7	PK
EMCO Log Periodic Antenna Model# 3148 used at 914 MHz					
EMCO Horn Antenna Model# 3115 used at all frequencies above 1 GHz					

PRODUCT EMISSIONS

PSE OPEN AREA TEST SITE Data File: SEAWARD TX FCCB@3M 11JUNE 2012

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORR FACTOR dB	COMMENTS
1	33.690	40.0	34.9	-5.1	PK	V	100	180	-16.9	
2	60.020	40.0	31.6	-8.4	PK	V	100	180	-18.1	
3	66.744	40.0	32.8	-7.2	PK	V	100	315	-19.3	
4	72.019	40.0	31.3	-8.7	PK	V	100	315	-20.3	
5	95.995	43.5	35.6	-8.0	PK	V	100	180	-18.	
6	120.022	43.5	34.6	-8.9	PK	V	100	45	-14.4	
7	126.039	43.5	32.3	-11.2	PK	V	100	135	-15.	
8	153.392	43.5	34.6	-8.9	PK	V	150	135	-13.6	
9	192.021	43.5	35.0	-8.5	PK	V	100	180	-10.6	
10	200.270	43.5	33.5	-10.0	PK	H	150	135	-16.	
11	225.75	46.0	37.5	-8.5	PK	H	200	270	-14.9	
12	232.620	46.0	34.7	-11.3	PK	H	100	45	-14.7	
13	360.010	46.0	32.4	-13.6	PK	V	100	225	-11.4	
14	432.013	46.0	36.3	-9.7	PK	H	150	180	-10.4	
15	480.020	46.0	35.5	-10.5	PK	H	150	180	-9.	
16	913.383	46.0	88.6	42.6	PK	H	100	270	-1.5	TX MODE
17	914.598	46.0	92.2	46.2	QP	V	150	180	-1.5	TX MODE UPRIGHT
18	915.972	46.0	91.6	45.6	PK	H	250	270	-1.4	TX MODE ON SIDE

BANDWIDTH PLOT



APPENDIX

B

System Under Test Description

Product Safety Engineering, Inc 12955 Bellamy Brothers Blvd. Dade City, FL 33525
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SYSTEM

****

DEVICE TYPE: EUT - SS200R
Serial #: A2-915

DEVICE TYPE: Dell Notebook Computer
Model #: Inspiron 1150

AC Cord: None

I/O cables: EUT
Length: 2 meters
Shielded: Yes
Connector: USB A to USB B
Port: EUT - USB to Computer USB

I/O cables: EUT
Length: 2 meters
Shielded: No
Connector: 5 pin DIN to dedicated temperature probes
Port: EUT - Probe to panel sensor split to ambient sensor

****

Port labeled "LINK" on EUT is only used in production setup.

APPENDIX

C

Measurement Protocol

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ANSCI C63.4 2003 was the guiding document for test procedures as required by 47 CFR Part 15 Subpart A Section 15.31(a)(3).

The EUT was powered with an internal battery during the collection of data included within.

The data is compared to the FCC Part 15 Class B limits.

The "EMI" instrumentation is capable of calculating the final emission level based on the following formula:

Level at the receiver (dBµV) + Antenna Correction Factor (dB/M) + Cable Loss (dB) - Preamp Gain (dB) = Actual Level in dBµV/M.

The sample calculation below is based on the actual test data collected:

Observed Level		**44.2**	dBµV	
ACF	+	**15.6**	dB/M	
Cable Loss	+	**1.1**	dB	
Preamp Gain	–	**26.0**	dB	
Actual Level		**34.9**	dBµV/M	@ 33.69 MHz

Please have a company official review this report and sign.

_____