



	Test Report Serial No.:	052110YPA T1021-E15Z	Report Issue Date:	August 12, 2010	
	Measurement Date(s):	July 06-07, 2010	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

EMC MEASUREMENT REPORT (FCC/IC)


FCC PART 15 SUBPART C & IC RSS-210 ISSUE 7


MANUFACTURER / APPLICANT	SCANIMETRICS, INC.		
DEVICE UNDER TEST (DUT)	MOTESCAN WIRELESS STRAIN GAUGE SENSOR SYSTEM		
DEVICE MODEL(S)	WSP-900		
DEVICE IDENTIFIER(S)	FCC ID: YPAMOTE9A		
	IC: 9085A-MOTE9A		
DUT TX FREQUENCY BAND	902 - 928 MHz (ISM Band)		
DUT TRANSMIT FREQ. RANGE	906 - 924 MHz		
MAX. OUTPUT POWER TESTED	8.66 dBm		
TRANSMITTER MODULATION	OQPSK		
DUT ANTENNA TYPE(S)	External ¼-wave Dipole Antenna	Internal ¼-wave Chip Antenna	
DUT POWER SOURCE(S)	USB (DUT with dipole antenna)	AA Battery (DUT with chip antenna)	
APPLICATION TYPE(S)	FCC TCB Certification	IC CB Certification	
STANDARD(S) & PROCEDURE(S)	FCC 47 CFR	Part 2	
		Part 15.247	
	Industry Canada	RSS-210 Issue 7	
		RSS-Gen Issue 2	
	ANSI	C63.4-2003	
FCC DEVICE CLASSIFICATION	Digital Transmission System (DTS)		
IC DEVICE CLASSIFICATION	Low-power Licence-exempt Radiocommunication Device (Categ. 1)		
DATE OF SAMPLE RECEIPT	May 21, 2010		
DATE(S) OF EVALUATION(S)	July 06-07, 2010		
TEST REPORT SERIAL NO.	052110YPA-T1021-E15Z		
TEST REPORT REVISION NO.	Revision 1.0	Initial Release	August 12, 2010
TEST REPORT SIGNATORIES	Jon Hughes	Test Report Writer	Celltech Labs Inc.
	Sean Johnston	Laboratory Manager	Celltech Labs Inc.
TEST LAB AND LOCATION	Celltech Compliance Testing and Engineering Laboratory		
	21-364 Lougheed Road, Kelowna, B.C. V1X 7R8 Canada		
TEST LAB CONTACT INFO.	Tel.: 250-765-7650		Fax: 250-765-7645
	info@celltechlabs.com		www.celltechlabs.com
TEST LAB ACCREDITATION(S)	ISO/IEC 17025:2005 (A2LA Test Lab Certificate No. 2470.01)		

Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

DECLARATION OF COMPLIANCE - ELECTROMAGNETIC COMPATIBILITY (FCC/IC)

Test Lab Information	Name	CELLTECH LABS INCORPORATED			
	Address	21-364 Lougheed Road, Kelowna, British Columbia V1X 7R8 Canada			
Test Lab Registration No.(s)	FCC	714830			
	IC	3874A-1			
Applicant Information	Name	SCANIMETRICS INC.			
	Address	10230 Jasper Avenue, Edmonton, Alberta T5J 4P6 Canada			
Standard(s) & Procedure(s)	FCC	47 CFR Part 2; 15.247			
	IC	RSS-210 Issue 7; RSS-Gen Issue 2			
	ANSI	C63.4-2003			
Device Classification(s)	FCC	Digital Transmission System (DTS)			
	IC	Low-power Licence-exempt Radiocommunication Device (Category 1)			
Application Type(s)	FCC	TCB Certification			
	IC	CB Certification			
Device Identifier(s)	FCC ID:	YPAMOTE9A			
	IC:	9085A-MOTE9A			
Device Under Test (DUT)	MoteScan Wireless Strain Gauge Sensor System				
Device Model(s) Tested	WSP-900				
Test Sample Serial No.	020000021659 (Transceiver)				
Transmit Frequency Band	902 - 928 MHz (ISM Band)				
Transmit Frequency Range	906 - 924 MHz				
Max. RF Output Power Tested	8.66 dBm				
Modulation Type(s)	OQPSK (Offset Quadrature Phase-Shift Keying)				
Transmitter Duty Cycle(s)	Normal Operation = ~.6 to 3% on air time		Configuration Mode = > 100 ms on-time		
Antenna Type(s) Tested	¼-wave External Dipole Antenna		Manufacturer: Pulse Antennas	Gain: +3.0 dBi	
	¼-wave Internal Chip antenna		Manufacturer: Antenna Factor, Inc.	Gain: +0.5 dBi	
Power Source(s)	USB (DUT with dipole antenna)		AA Battery x2 (DUT with chip antenna)		
Power Source(s) Tested	USB connection to Laptop PC				
<p>This wireless device has demonstrated compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC 47 CFR Rule Part 2 and Rule Part 15.247; Industry Canada RSS-210 Issue 7 and RSS-Gen Issue 2; and ANSI C63.4-2003.</p> <p>I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.</p> <p>The results and statements contained in this report pertain only to the device(s) evaluated.</p> <p>This report shall not be reproduced partially or in full without the prior written approval of Celltech Labs Inc.</p>					
Test Report Approved By			Sean Johnston	Laboratory Manager	Celltech Labs Inc.

Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

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					Test Lab Certificate No. 2470.01



TEST SUMMARY


Referenced Standard(s):		FCC CFR Title 47 Part 15 Subpart C				
Appendix	Description of Test	Procedure Reference	Limit Reference	Test Start	Test End	Result
A	6dB Bandwidth	ANSI C63.4-2003	15.247(a)(2)	Jul06-10	Jul06-10	Pass
B	Peak Output Power	ANSI C63.4-2003	15.247(b)(3)	Jul06-10	Jul06-10	Pass
C	Conducted Spurious Emissions	ANSI C63.4-2003	15.247(d)	Jul06-10	Jul06-10	Pass
D	Power Spectral Density	ANSI C63.4-2003	15.247(e)	Jul06-10	Jul06-10	Pass
E	Radiated Spurious Emissions	ANSI C63.4-2003	15.209	Jul07-10	Jul07-10	Pass
F	Conducted Powerline Emissions	ANSI C63.4-2003	15.107(a)	Jul06-10	Jul06-10	Pass
H	Antenna Requirements	n/a	15.203	n/a	n/a	Complies
Referenced Standard(s):		Industry Canada RSS-210 Issue 7				
Appendix	Description of Test	Procedure Reference	Limit Reference	Test Start	Test End	Result
A	6dB Bandwidth	ANSI C63.4-2003	RSS-210 A8.2(a)	Jul06-10	Jul06-10	Pass
B	Peak Output Power	ANSI C63.4-2003	RSS-210 A8.4(1)	Jul06-10	Jul06-10	Pass
C	Conducted Spurious Emissions	ANSI C63.4-2003	RSS-210 A8.5	Jul06-10	Jul06-10	Pass
D	Power Spectral Density	ANSI C63.4-2003	RSS-210 A8.2	Jul06-10	Jul06-10	Pass
G	Radiated RX Spurious Emissions	RSS-Gen 4.10	RSS-Gen 6.(a)	Jul07-10	Jul07-10	Pass



REVISION LOG

Revision	Description	Implemented By	Issue Date
1.0	Initial Release	Jonathan Hughes	August 12, 2010

SIGNATORIES

Prepared By		Reviewed By		Date
				
	Jonathan Hughes / Report Writer		Sean Johnston / Lab Manager	August 12, 2010

Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

1.0 SCOPE

This report outlines the measurements made and results collected during electromagnetic emissions testing of the Scanimetrix, Inc. Model: WSP-900 MoteScan Wireless Strain Gauge Sensor System. The measurement results were applied against the applicable EMC requirements and limits outlined in the technical rules and regulations set forth in the Federal Communication's Commission Code of Federal Regulations Title 47 Part 15 Subpart C and Industry Canada Radio Standards Specification RSS-210 Issue 7 and RSS-Gen Issue 2.


2.0 REFERENCES



2.1 Normative References

ANSI/ISO 17025:2005	General Requirements for competence of testing and calibration laboratories
IEEE/ANSI C63.4-2003	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
CFR Title 47 Part 15C	Code of Federal Regulations Title 47: Telecommunication Part 15C: Intentional Radiators
IC Spectrum Management & Telecommunications Policy	Radio Standards Specification RSS-210 Issue 7 - Low-Power Licence-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment RSS-Gen Issue 2 - General Requirements and Information for the Certification of Radiocommunication Equipment

3.0 PASS/FAIL CRITERIA

Unless otherwise noted in the Appendices, the pass/fail criteria is the limit set forth in the reference standards. The DUT is considered to have passed the requirements if the data collected during the described measurement procedure is no greater than the specified limits as defined. The pass/fail statements made in this report only apply to the unit tested.

Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

4.0 FACILITIES AND ACCREDITATIONS

The facilities used in collecting the test results outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site conforms to the requirements set forth in ANSI C63.4 and is filed and listed with the FCC under Test Firm Registration Number 714830 and Industry Canada under Test Site File Number IC 3874A-1.

5.0 GENERAL INFORMATION

5.1 Applicant Information

Company Name	SCANIMETRICS, INC.
Address	#4500, 10230 Jasper Avenue
	Edmonton, Alberta T5J 4P6
	Canada

5.2 DUT Description


Device Type	MoteScan Wireless Strain Gauge Sensor System		
Device Model(s) Tested	WSP-900		
Test Sample Serial No.(s)	020000021659 (Transceiver)		
Device Identifier(s)	FCC ID:	YPAMOTE9A	
	IC:	9085A-MOTE9A	
Power Source(s) Tested	USB connection to Laptop PC		
Antenna Type(s) Tested	¼-wave External Dipole	Manufacturer: Pulse Antennas	Gain: +3.0 dBi
	¼-wave Internal Chip	Manufacturer: Antenna Factor, Inc.	Gain: +0.5 dBi



5.3 Mode(s) of Operation Tested

Transmit Frequency Range	906 - 924 MHz
Transmitter Test Frequency	906 MHz Ch 1(Low), 916 MHz Ch 6(Mid), 924 MHz Ch 10(High)
Transmitter Test Mode(s)	Tx set to continuously transmit the modulated signal. The signal transmitted is at Fc + 0.25 MHz using a OQPSK 1000 kbps mode.
Modulation Type(s)	OQPSK (Offset Quadrature Phase-Shift Keying)

5.4 Modification(s)

None

Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	 SCANIMETRICS
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
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Appendix A - Occupied Bandwidth

A.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §15.247(a); IC RSS-210 Issue 7
Procedure Reference	ANSI C63.4:2003

A.2 LIMITS

§15.247(a)(2) IC RSS-210 A1.1.5	(2) Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
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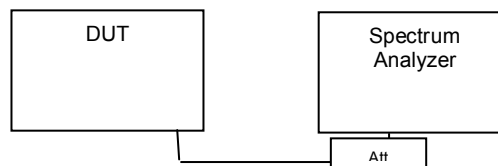
A.3 ENVIRONMENTAL CONDITIONS


Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa



ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00015	HP	E4408B	Spectrum Analyzer	03May12

A.4 SETUP DRAWING

Figure A.4 -1 - Setup Drawing – Occupied Bandwidth

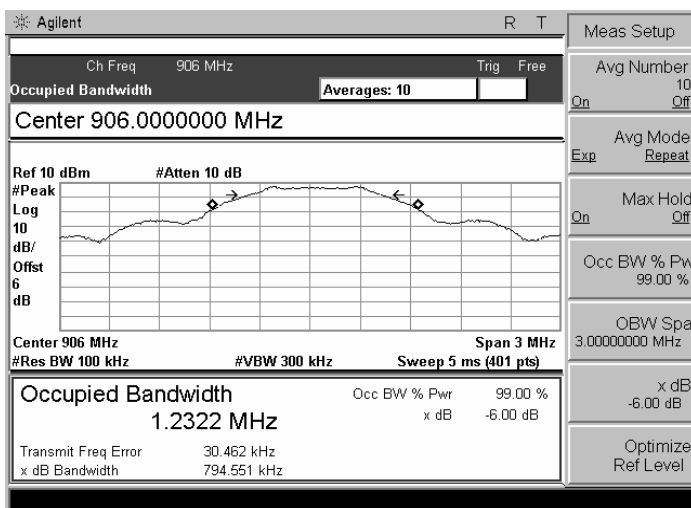


Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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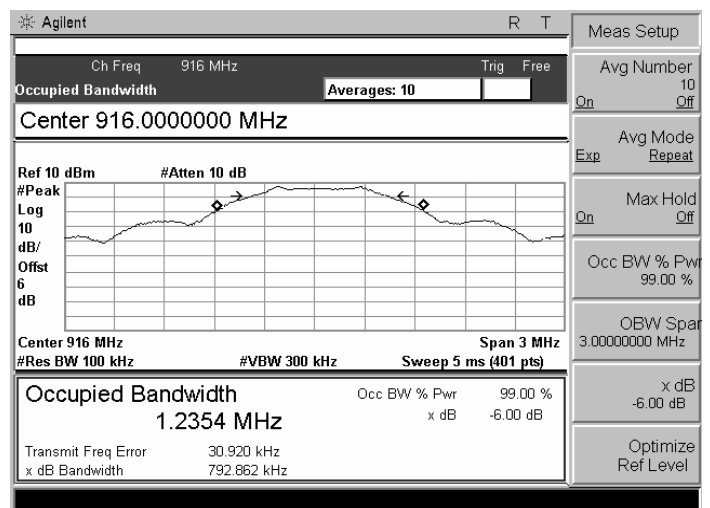
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	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Test Results:

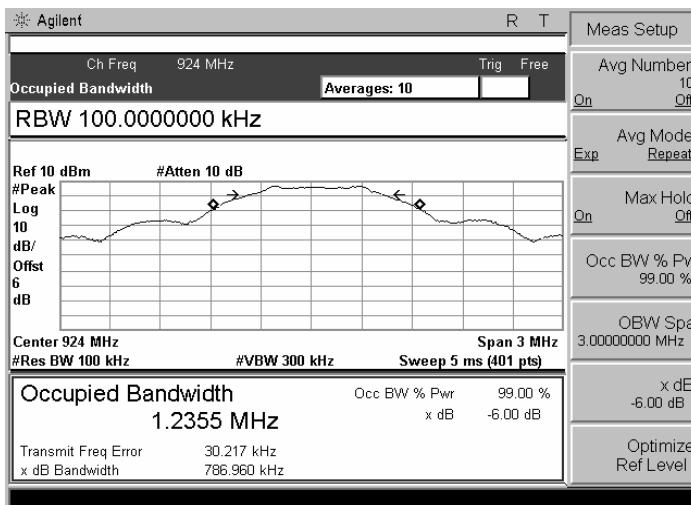
Carrier Frequency (MHz)	6 dB Bandwidth (kHz)	Limit	Remarks
906	794.551	> 500 kHz	Pass
916	792.862	> 500 kHz	Pass
924	786.96	> 500 kHz	Pass




Low Channel





Mid Channel



High Channel

Applicant:	Scanmetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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Appendix B

- Peak Output Power

B.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §15.247(b); IC RSS-210
Procedure Reference	ANSI C63.4

B.2 LIMITS

§15.247(b) IC RSS-210 A8.4	(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:
	3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the <i>maximum conducted output power</i> is the highest total transmit power occurring in any mode.

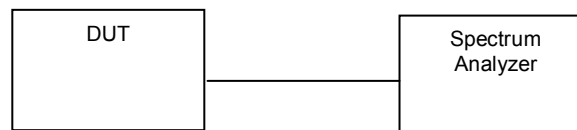
B.3 ENVIRONMENTAL CONDITIONS



Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00015	HP	E4408B	Spectrum Analyzer	03May12

B.4 SETUP DRAWING

Figure B.4-1 - Setup Drawing – Conducted Output Power



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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Appendix C

- Conducted Spurious Emissions

C.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §15.247(d); IC RSS-210
Procedure Reference	ANSI C63.4

C.2 LIMITS

§15.247(d) IC RSS-210 A8.5	(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
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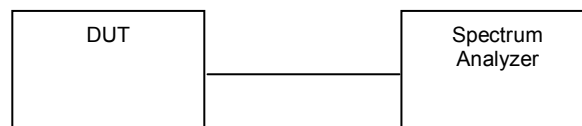
C.3 ENVIRONMENTAL CONDITIONS



Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00015	HP	E4408B	Spectrum Analyzer	03May12

C.4 SETUP DRAWING

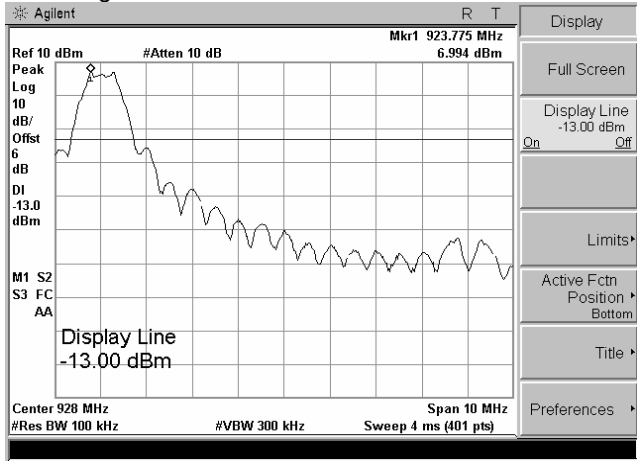
Figure C.4-1 - Setup Drawing – Conducted Spurious Emissions



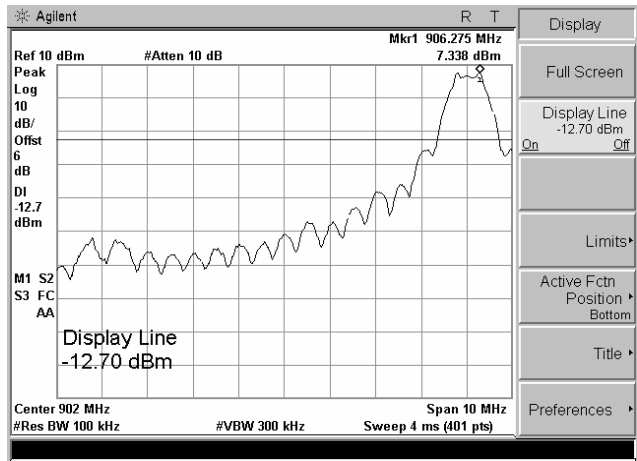
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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Test Results:


Band Edge





High Channel



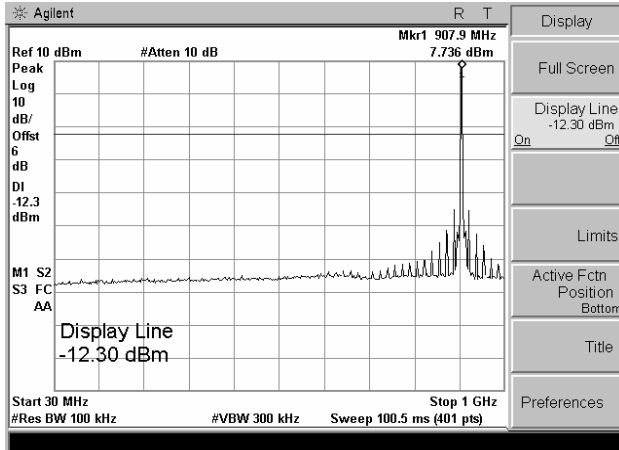
Low Channel

Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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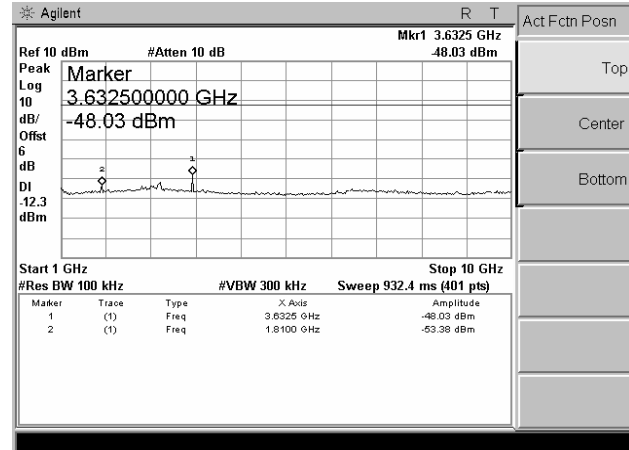
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Test Results (Cont.):

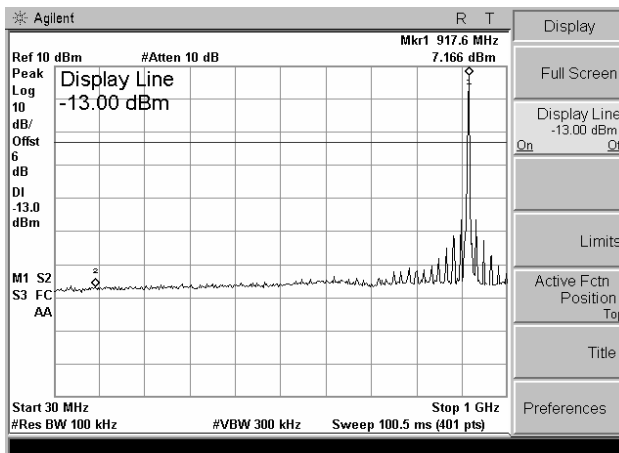
Conducted Emissions



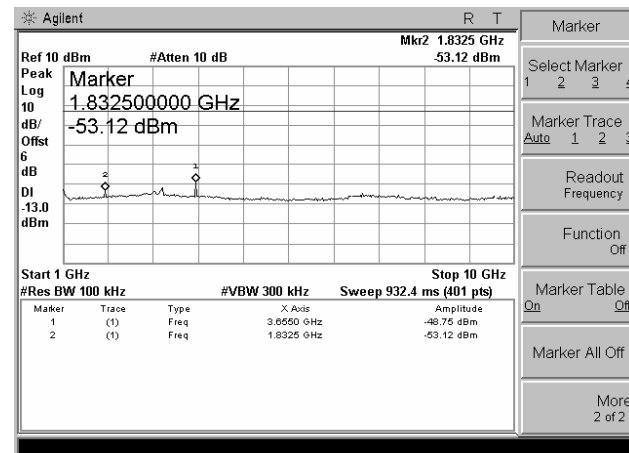
Low Channel: 30-1000 MHz



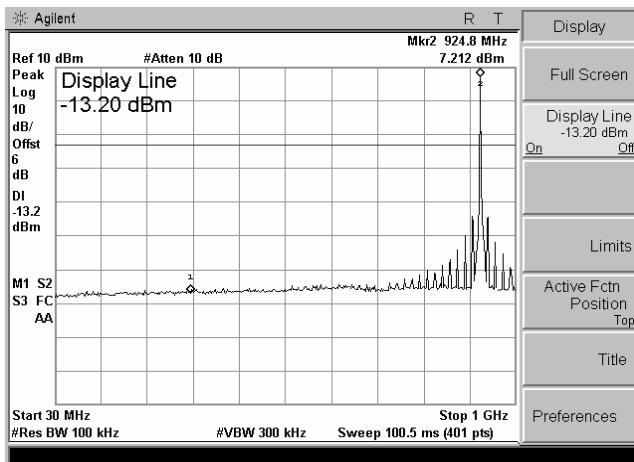
Low Channel: 1-10 GHz



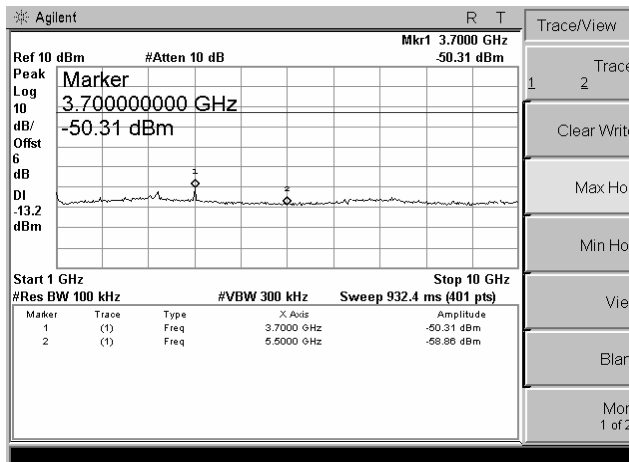
Mid Channel: 30-1000 MHz




Mid Channel: 1-10 GHz






High Channel: 30-1000 MHz



High Channel: 1-10 GHz

Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	Test Report Serial No.:	052110YPA T1021-E15Z	Report Issue Date:	August 12, 2010	 
	Measurement Date(s):	July 06-07, 2010	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2; §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Appendix D

- Power Spectral Density

D.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §15.247(e); IC RSS-210
Procedure Reference	ANSI C63.4

D.2 LIMITS

§15.247(e) IC RSS-210 A8.2(b)	(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
-------------------------------------	--

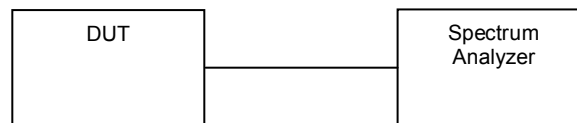
D.3 ENVIRONMENTAL CONDITIONS


Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa



ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00015	HP	E4408B	Spectrum Analyzer	03May12

D.4 SETUP DRAWING

Figure D.4-1 - Setup Drawing – Power Spectral Density

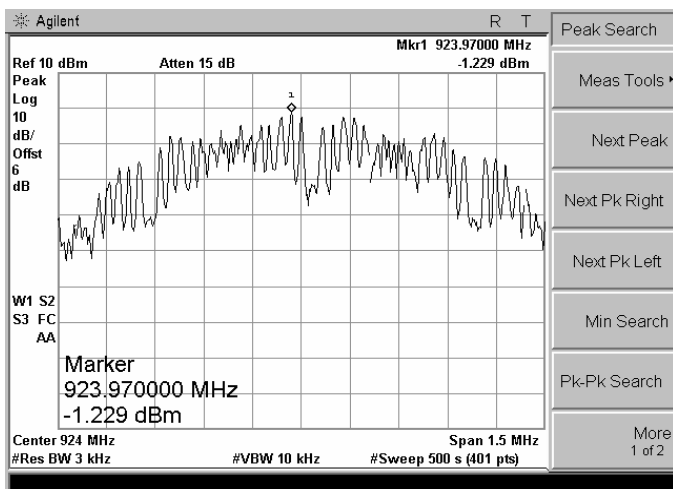
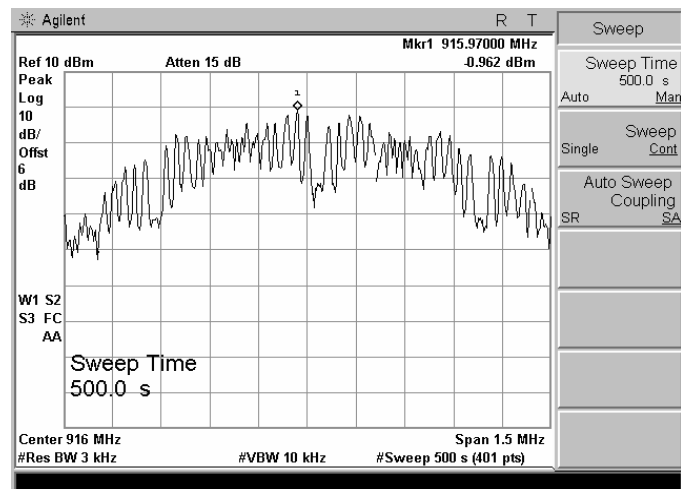
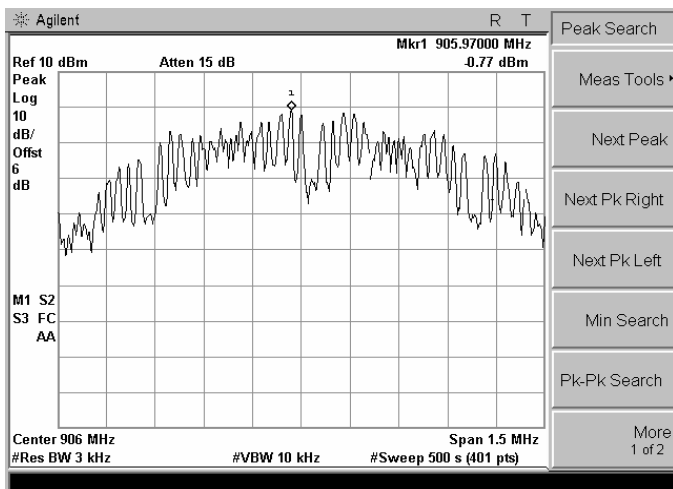



Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Test Results:

Carrier Frequency (MHz)	PSD (dBm)	Limit dBm	Remark
906	-0.77	8	Pass
916	-0.96	8	Pass
904	-1.23	8	Pass



Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	Measurement Date(s):	July 06-07, 2010	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2; §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Appendix E

- Radiated Spurious Emissions (TX)

E.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §15.205; §15.209
Procedure Reference	ANSI C63.4:2003

E.2 LIMITS

TX Emission Limits 15.209


Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100**	3
88–216	150**	3
216–960	200**	3
Above 960	500	3



**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

Restricted Bands

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	–2
13.36–13.41			

§15.209,
§15.205

Applicant:	Scanmetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	Test Report Serial No.:	052110YPA T1021-E15Z	Report Issue Date:	August 12, 2010	
	Measurement Date(s):	July 06-07, 2010	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

E.3 ENVIRONMENTAL CONDITIONS

Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

E.4 EQUIPMENT LIST

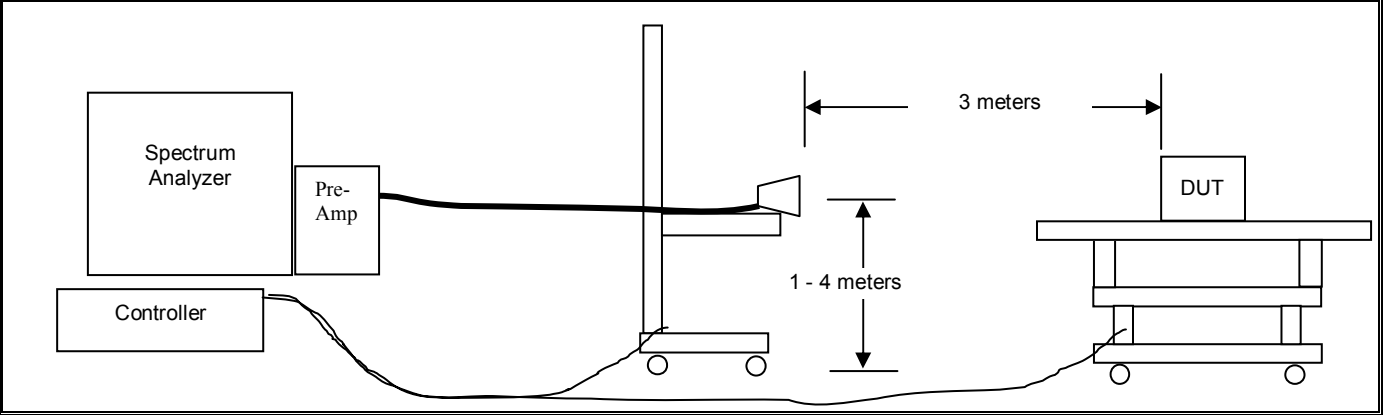
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00051	HP	8566B	Spectrum Analyzer RF Section	03May12
00049	HP	85650A	Quasi-peak Adapter	06May12
00047	HP	85685A	RF Preselector	05May12
00072	EMCO	2075	Mini-mast	n/a
00073	EMCO	2080	Turn Table	n/a
00071	EMCO	2090	Multi-Device Controller	n/a
00030	HP	83017A	Microwave system amplifier	n/a
00015	HP	E4408B	Spectrum Analyzer	03May12
00050	Chase	CBL-6111A	Bilog Antenna	03May13
00055	EMCO	3121C	Dipole Antenna	27Aug10
00034	ETS	3115	Double Ridged Guide Horn	29May12

E.5 MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	For the field strength measurements, the measurement equipment was connected as shown in E.4. Various antenna types may be required to cover the applicable frequency range tested. The ranges in which each antenna was used are shown below.			
	Frequency Range		RX Antenna	TX Antenna
	30 MHz - 1GHz		Bilog	N/a
	1 GHz - 18 GHz		ETS 3115 Horn	N/a
MEASUREMENT EQUIPMENT SETTINGS	For the spurious out-of-band emissions, the spectrum analyzer was set to the following settings:			
	Measurement	RBW	VBW	Detector
		kHz	kHz	
	< 1 GHz	100	300	Peak*
	> 1 GHz	1000	3000	Peak*
* As a worst-case measurement, the QP limit was applied to measurements made with a peak detector.				

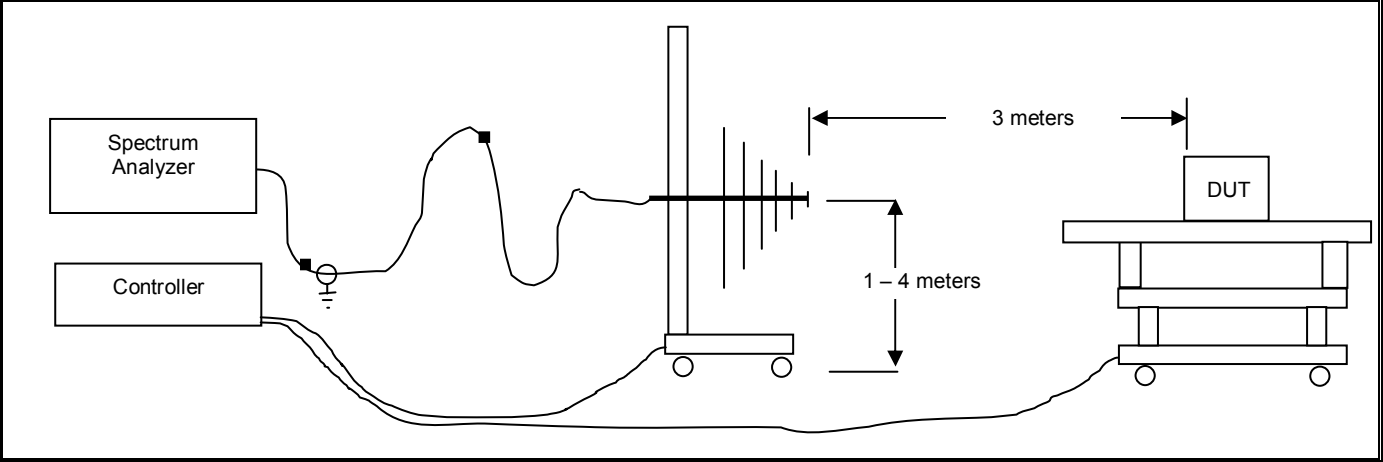
E.6 SETUP DRAWING




Figure E.6-1 - Setup Drawing – Radiated TX Spurious Emissions (> 1 GHz)



E.7 SETUP DRAWING

Figure E.7-1 - Setup Drawing – Radiated TX Spurious Emissions (< 1 GHz)



	Test Report Serial No.:	052110YPA T1021-E15Z	Report Issue Date:	August 12, 2010	 
	Measurement Date(s):	July 06-07, 2010	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01


Test Results:



Chip Antenna

Frequency	Level (dBuV)		Antenna Polarity (H/V)	Correction factors (dB)	Corrected Level (dBuV/m)		Limit (dBuV/m)		Qpk/Avg	Margin (dB)	
	pk	Qpk/Avg			pk	Qpk/Avg	pk	Qpk/Avg		pk	Qpk/Avg
Low											
1812	49.3	44.3	V	-1.5	47.8	42.8	74	54		26.2	11.2
2718*	nf		V	1.1			74	54			
3624*	45.5	40.2	V	5.7	51.2	45.9	74	54		22.8	8.1
1812	42.6	38.7	H	-1.4	41.2	37.3	74	54		32.8	16.7
2718*	nf		H	1.4			74	54			
3624*	nf		H	5.6			74	54			
Mid											
1832	48.4	43.2	V	-1.5	46.9	41.7	74	54		27.1	12.3
2748*	nf		V	1.1			74	54			
3664*	41.6	38.3	V	5.7	47.3	44	74	54		26.7	10
1832	nf		H	-1.4			74	54			
2748*	40.3	36	H	1.4	41.7	37.4	74	54		32.3	16.6
3664*			H	5.6			74	54			
High											
1848	47.9	42.3	V	-1.5	46.4	40.8	74	54		27.6	13.2
2772*	nf		V	1.1			74	54			
3696*	41.6	37.8	V	5.7	47.3	43.5	74	54		26.7	10.5
1848	nf		H	-1.4			74	54			
2772*	nf		H	1.4			74	54			
3696*	nf		H	5.6			74	54			

Remarks:

- 1) E-Field = Antenna Factor + Cable Loss + Meter Reading – Amp Gain
- 2) Peak Limit = Average Limit + 20dB
- 3) All DUT Orientations investigate, only highest reported for spurious emissions.
- 4) nf indicates emission not detectable above noise floor.
- 5) Remark “*” means restricted band
- 6) All emissions in the 30-1000 MHz band were investigated with only spurious emissions frequencies being detectable above the noise floor.
- 7) DUT orientations: x = Vertical, Y = Side, Z=Side rotated 90°

Applicant:	Scanmetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01


Test Results (Cont.):



Dipole Antenna

Frequency	Level (dBuV)		Antenna Polarity (H/V)	Correction factors (dB)	Corrected Level (dBuV/m)		Limit (dBuV/m)		Qpk/Avg	Margin (dB)	
	pk	Qpk/Avg			pk	Qpk/Avg	pk	Qpk/Avg		pk	Qpk/Avg
Low											
1812	47	42.2	V	-1.5	45.5	40.7	74	54		28.5	13.3
2718*	nf	nf	V	1.1			74	54			
3624*	44.1	39	V	5.7	49.8	44.7	74	54		24.2	9.3
1812	47.4	42.3	H	-1.4	46	40.9	74	54		28	13.1
2718*	nf		H	1.4			74	54			
3624*	43.2	38.5	H	5.6	48.8	44.1	74	54		25.2	9.9
Mid											
1832	46.9	40.1	V	-1.5	45.4	38.6	74	54		28.6	15.4
2748*	nf	nf	V	1.1			74	54			
3664*	40.5	36	V	5.7	46.2	41.7	74	54		27.8	12.3
1832	45.5	39	H	-1.4	44.1	37.6	74	54		29.9	16.4
2748*	nf		H	1.4			74	54			
3664*	nf		H	5.6		5.6	74	54			
High											
1848	46.5	40.1	V	-1.5	45	38.6	74	54		29	15.4
2772*	nf	nf	V	1.1			74	54			
3696*	41	37.3	V	5.7	46.7	43	74	54		27.3	11
1848	45	39.5	H	-1.4	43.6	38.1	74	54		30.4	15.9
2772*	nf		H	1.4			74	54			
3696*	nf		H	5.6		5.6	74	54			

Remarks:

- 8) E-Field = Antenna Factor + Cable Loss + Meter Reading – Amp Gain
- 9) Peak Limit = Average Limit + 20dB
- 10) All DUT Orientations investigate, only highest reported for spurious emissions.
- 11) nf indicates emission not detectable above noise floor.
- 12) Remark “*” means restricted band
- 13) All emissions in the 30-1000 MHz band were investigated with only spurious emissions frequencies being detectable above the noise floor.
- 14) DUT orientations: x = Vertical, Y = Side, Z=Side rotated 90°

Applicant:	Scanmetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Appendix F

- Conducted Powerline Emissions

F.1 REFERENCES

Normative Reference Standard(s)	CFR 47 FCC Part 15 §15.107 (a)
Procedure Reference(s)	ANSI C63.4

F.2 LIMITS

§15.107(a): Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 [μ]H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.50 – 5.0	56	46
5.0 – 30.0	60	50

F.3 ENVIRONMENTAL CONDITIONS

Temperature	25 ± 5 °C
Humidity	35 ± 5 %RH
Barometric Pressure	uncontrolled

F.4 EQUIPMENT LIST

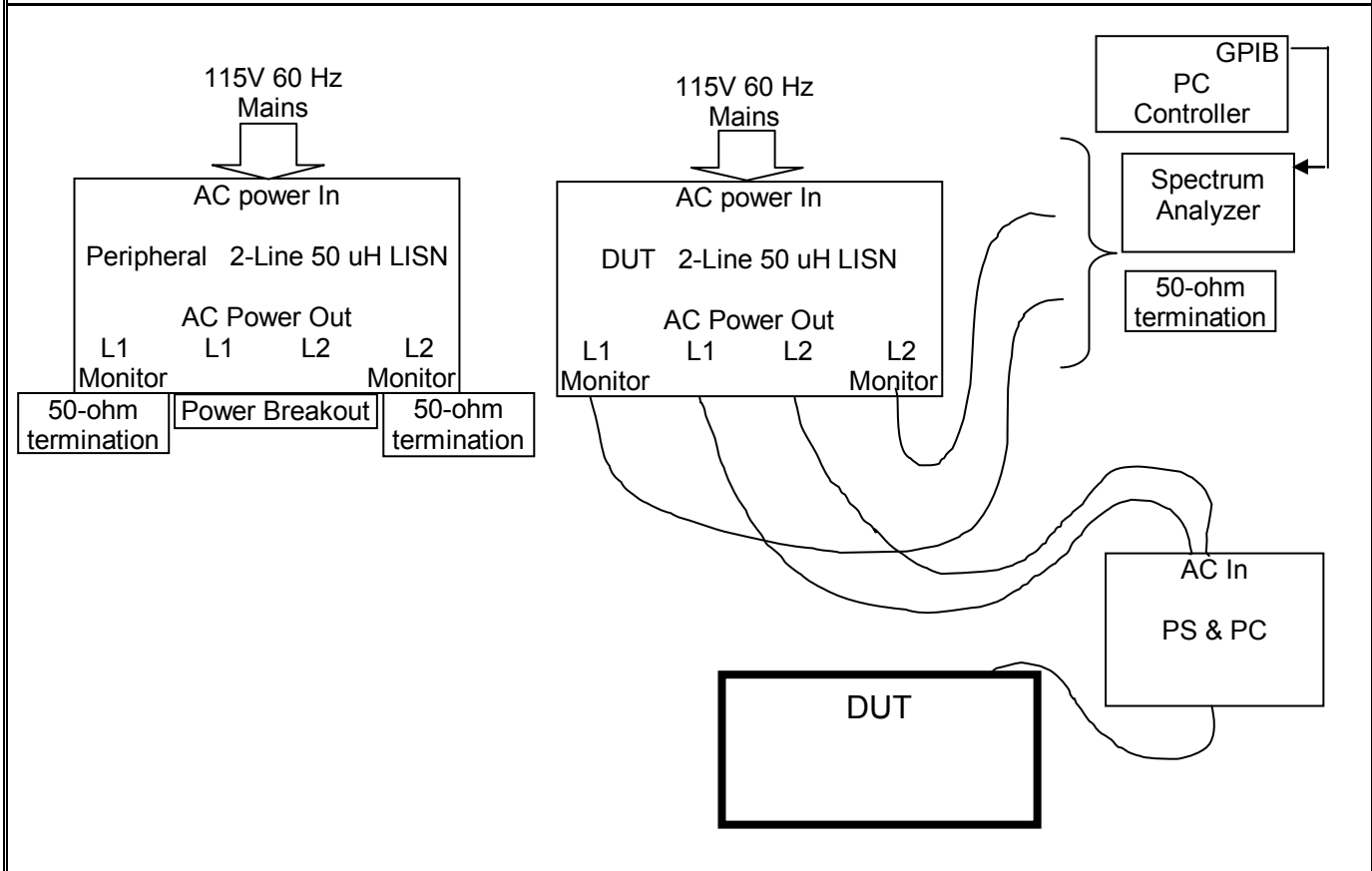
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00049	HP	85650A	Quasi-Peak Adapter	06May12
00047	HP	85685A	RF Preselector	05May12
00051	HP	8566B	Spectrum Analyzer RF Section	03May12
00083	EMCO	3825/2	Line Impedance Stabilization Network	03Mar11

F.5 MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	The conducted emissions were measured on each of the two AC powerline leads connected to the DUT's power supply brick. A two line LISN was used to make this measurement. A drawing of the equipment setup is shown in C.7
MEASUREMENT EQUIPMENT SETTINGS	<p>Each of the monitor ports from the 2-line LISN was connected in turn to the spectrum analyzer. The port not connected to the analyzer was terminated in a 50-ohm load. A prescan of the peak emission levels was made of the 150 kHz – 30 MHz range split into 4 equal frequency bands. The following were the spectrum analyzer settings:</p> <p>Start Frequency and Stop Frequency set by software for each of the four bands RBW: 100 kHz VBW: 300 kHz Sweep: 500 mS</p> <p>The resulting data from each band was corrected and collected by software and presented in the graphical representations shown in C.9 for the two leads. The frequency points with peak levels within 20 dB of the average limit were selected and optimized using software control each type of detector (peak, quasi-peak and average). This data was corrected by the software is presented in the tables shown in section C.9.</p>

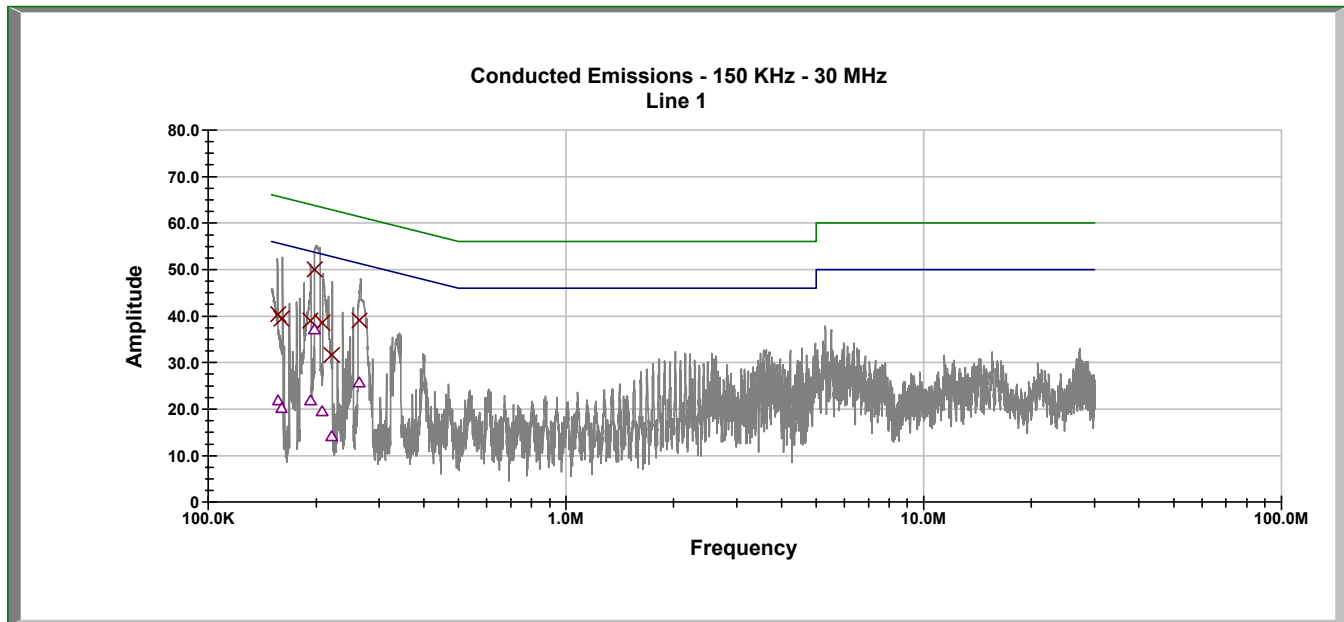
F.6 SETUP DRAWING

Figure F.6-1 - Setup Drawing – Line-Conducted Emissions



F.7 TEST RESULTS

F.7.1 Line 1 Conducted Emissions

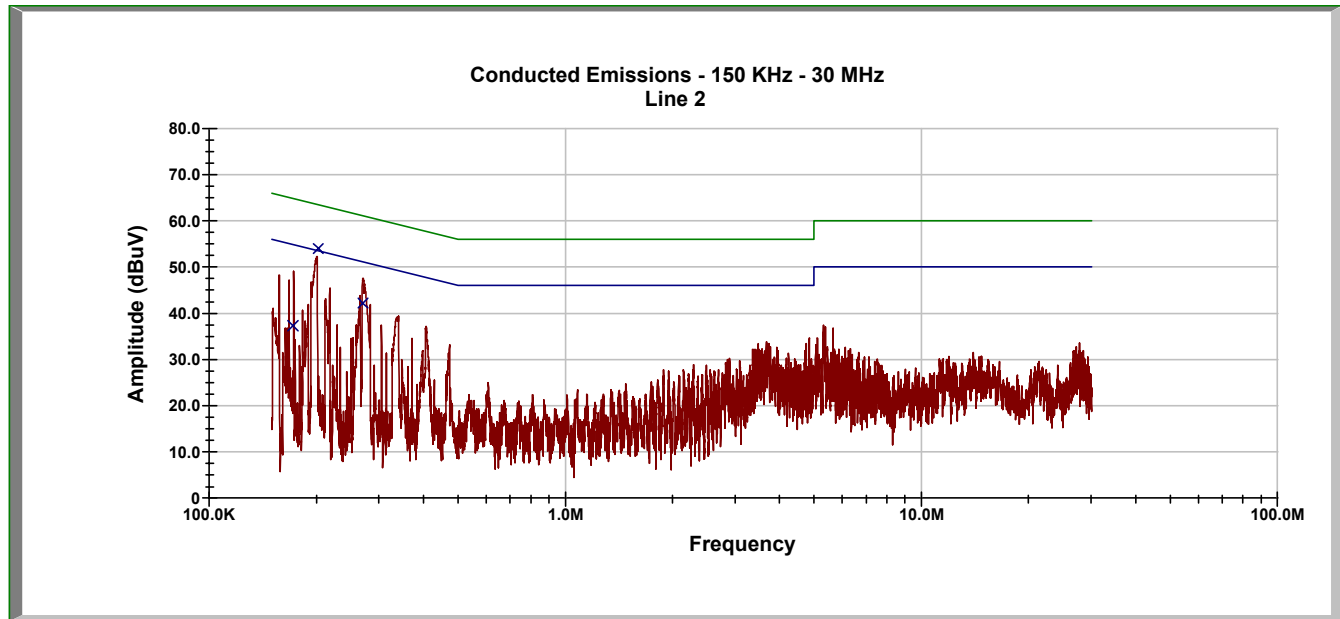


Frequency (MHz)	Emission Level (dBuV)			Limits (dBuV)		Margin (dB)		Result
	Corrected Average	Corrected Peak	Corrected QP	Average	QP	Average	QP	
0.1567	21.91	47.49	40.47	56.10	66.10	34.19	25.63	Pass
0.1601	20.23	47.08	39.50	55.91	65.91	35.69	26.41	Pass
0.1930	21.93	46.09	39.11	54.29	64.29	32.36	25.18	Pass
0.1981	37.17	51.78	50.08	54.06	64.06	16.89	13.98	Pass
0.2082	19.54	45.18	38.62	53.63	63.63	34.09	25.01	Pass
0.2211	14.13	38.47	31.68	53.11	63.11	38.98	31.43	Pass
0.2644	25.71	43.67	39.12	51.55	61.55	25.84	22.44	Pass

Calculations

Emission Level = Measured Level + correction factor
Margin = Limit - Emission Level



F.7.2 Line 2 Conducted Emissions



Frequency (MHz)	Emission Level (dBuV)			Limits (dBuV)		Margin (dB)		Result
	Corrected Average	Corrected Peak	Corrected QP	Average	QP	Average	QP	
0.172	19.857	44.61	37.42	55.29	65.29	35.43	27.87	Pass
0.203	38.135	52.66	54.04	53.87	63.87	15.73	9.83	Pass
0.270	31.221	44.478	42.278	51.36	61.36	20.14	19.08	Pass

Calculations

Emission Level = Measured Level + correction factor
Margin = Limit - Emission Level

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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Appendix G

- Radiated Spurious Emissions (RX)

G.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §15.109; IC RSS-210
Procedure Reference(s)	The procedure used was ANSI C63.4-2003. The frequency was scanned from 30 MHz to 1.0 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The DUT was measured in three (3) orthogonal planes.
	RSS-Gen 4.10

G.2 LIMITS


§15.109 RSS-Gen 6.(a)		Frequency (MHz)	Limits
		30-88	40.0 dBuV/m measured @ 3 meters
		80-216	43.5 dBuV/m measured @ 3 meters
		216-960	46.0 dBuV/m measured @ 3 meters
		Above 960	54.0 dBuV/m measured @ 3 meters

G.3 ENVIRONMENTAL CONDITIONS

Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

G.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00072	EMCO	2075	Mini-mast	n/a
00073	EMCO	2080	Turn Table	n/a
00071	EMCO	2090	Multi-Device Controller	n/a
00015	HP	E4408B	Spectrum Analyzer	03May12
00050	Chase	CBL-6111A	Bilog Antenna	03May13
00051	HP	8566B	Spectrum Analyzer RF Section	03May12
00049	HP	85650A	Quasi-peak Adapter	06May12
00047	HP	85685A	RF Preselector	05May12
00006	R & S	SMR 20	Signal Generator (10MHz-40GHz)	30Apr12

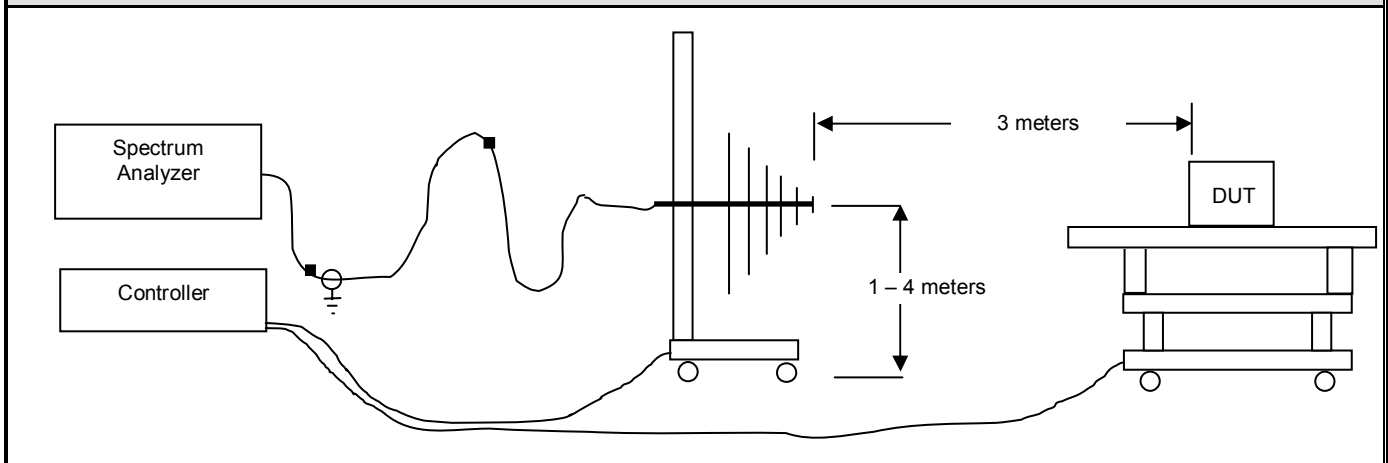
Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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G.5 MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	For the field strength measurements, the measurement equipment was connected as shown in G.6. Various antenna types may be required to cover the applicable frequency range tested. The ranges in which each antenna was used are shown below.		
	Frequency Range	RX Antenna	TX Antenna
	30 MHz - 1GHz	Bilog	N/a
	1 GHz - 18 GHz	ETS 3115 Horn	N/a
MEASUREMENT EQUIPMENT SETTINGS	For the spurious out-of-band emissions, the spectrum analyzer was set to the following settings:		
	Measurement	RBW	VBW
		kHz	kHz
	< 1 GHz	100	300
	> 1 GHz	1000	3000
* As a worst-case measurement, the QP limit was applied to measurements made with a peak detector.			

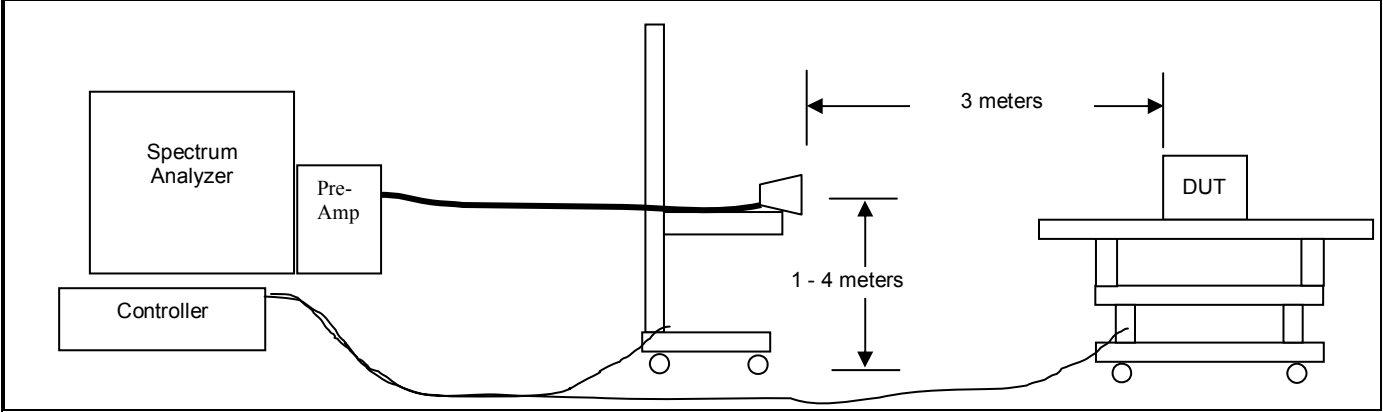
G.6 SETUP DRAWING

Figure G.66-1 - Setup Drawing – Radiated RX Spurious Emissions (< 1 GHz)





G.7 SETUP DRAWING

Figure G.7-1 - Setup Drawing – Radiated RX Spurious Emissions (> 1 GHz)



G.8 TEST RESULTS

There were no detectable emissions above the noise floor.

	Test Report Serial No.:	052110YPA T1021-E15Z	Report Issue Date:	August 12, 2010	
	Measurement Date(s):	July 06-07, 2010	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Appendix H

- Antenna Requirement §15.203


§ 15.203 Antenna Requirement



An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The DUT complies with the antenna requirements of 15.203 as follows:


External Dipole Antenna = Reverse gender SMA (non-standard connector)

Internal Chip Antenna - permanently attached antenna

Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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	Test Report Serial No.:	052110YPA T1021-E15Z	Report Issue Date:	August 12, 2010	
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	FCC Rule Part(s):	47 CFR §2, §15.247	FCC Test Firm Reg. No.:	714830	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

END OF DOCUMENT

Applicant:	Scanimetrics, Inc.	Model:	WSP-900	FCC ID:	YPAMOTE9A	IC:	9085A-MOTE9A	
DUT Type:	MoteScan Wireless Strain Gauge Sensor System			Transmit Frequency Range:		906 - 924 MHz		
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