MicroStrain, Inc.

ADDENDUM TEST REPORT TO 90661-6

2.4 GHz OEM Wireless Module, SG-Link OEM

Tested to the following standards:

FCC Part 15 Subpart C Sections 15.247
&
RSS-210 Issue 8

Report No.: 90661-6A

Date of issue: December 23, 2010

ACCREDITED

TESTING
CERT #803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

MicroStrain, Inc.
459 Hurricane Lane
Williston, VT 05495

REPRESENTATIVE: Jake Galbreath
Customer Reference Number: 8190

REPORT PREPARED BY:

Joyce Walker
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 90661

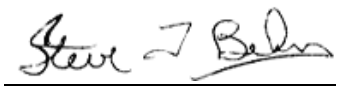
DATE OF EQUIPMENT RECEIPT: December 16, 2010
DATE(S) OF TESTING: December 16 - 21, 2010

Revision History

Original: Testing of the 2.4 GHz OEM Wireless Module, SG-Link OEM to FCC Part 15 Subpart C Section 15.247.
Addendum A: Permissive Change II testing of the 2.4 GHz OEM Wireless Module, SG-Link OEM to FCC Part 15 Subpart C Section 15.247 and RSS -210 Issue 8 due to a change to the board layout and the antenna changing from a 1.0 dBi Fractus chip antenna to a wire antenna that is less than 14" wavelength in the 2.4 GHz band.

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E., Suite A
Bothell, WA 98021-4413

Site Registration & Accreditation Information

Location	JAPAN	CANADA	FCC
Bothell	R-2296, C-2506 & T-1489	3082C-1	318736

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C 15.247 & RSS-210 Issue 8

Description	Test Procedure/Method	Results
Max Peak Output Power	FCC Part 15 Subpart C Section 15.247(b)(3) / KDB 558074	Pass
Spurious Emissions	FCC Part 15 Subpart C Section 15.247(d) / KDB 558074	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
This is a Permissive Change II change. The board layout has changed. The antenna has been changed from a 1.0 dBi Fractus chip antenna to a wire antenna that is less than ¼ wavelength in the 2.4 GHz band. As a result, the gain of this inefficient antenna is unknown. The measured field strength varies from the original certification testing as follows: 2405 MHz (+2.3 dB); 2440 MHz (-1.7 dB); 2480 MHz (-3.1 dB). The manufacturer has confirmed that the power settings have not changed since the original certification. The orientation that results in the highest field strength has changed, as well as the frequency; the original testing showed the highest field strength to be at 2480 MHz; the new tests show the highest field strength to be at 2405 MHz. The highest field strength from the new testing is 1.5 dB lower than the original certification, so a new MPE report should not be needed. Radiated TX spurious emissions from 30 kHz – 25 GHz are practically non-existent. The manufacturer declares that there is no change in conducted output power since original certification. The gain of the antenna was unknown prior to testing. The data was measured using field strength measurements and the antenna gain values were calculated under the assumption of unchanged conducted power.

EQUIPMENT UNDER TEST (EUT)

2.4 GHz OEM Wireless Module

Manuf: MicroStrain, Inc.
Model: SG-Link OEM
Serial: NODE:100

PERIPHERAL DEVICES

The EUT was not tested with peripheral device.

15.247(b)(3) Max Peak Output Power

Engineer Name: Jeff Gilbert

Test Equipment				
Name	**Model**	**Cal Date**	**Cal Due**	**Asset**
Cable	32026-2-29080-84	10/23/2009	10/23/2011	AN03121
Cable	Heliax	10/23/2009	10/23/2011	ANP05542
Preamp	83017A	9/17/2009	9/17/2011	AN01271
Cable	32026-2-29801-12	10/23/2009	10/23/2011	AN03123
Horn Antenna	3115	10/12/2009	10/12/2011	AN01412
Spectrum Analyzer	E4440A	8/25/2009	8/25/2011	AN02872

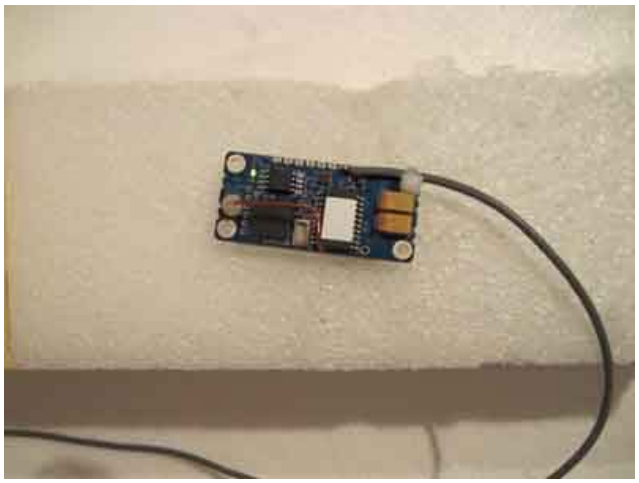
Test Conditions

Frequencies Tested – 2405 MHz, 2440 MHz, 2480 MHz.
Testing per KDB558074.
There is no RF connector so radiated field strength measurements must be performed.
Three Axis were investigated; X, Y, Z.
The EUT is transmitting a continuously modulated signal.
Temp: 21°C
Humidity: 29%
Pressure: 100.1 kPa

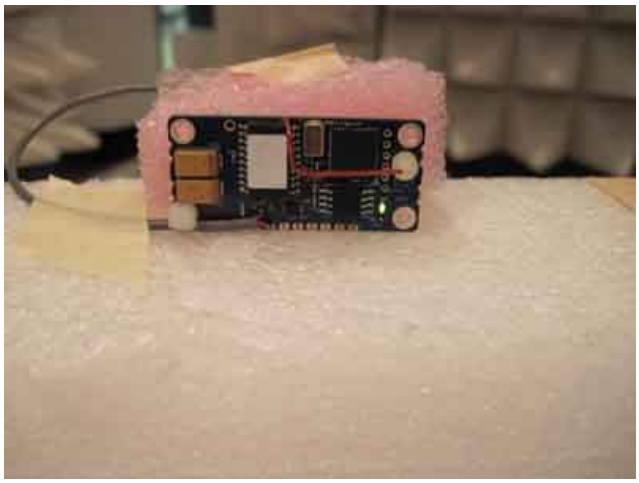
Test Data Sheets

US - F/S to Conducted Power Calculation								
Frequency (opt)	**F/S in dBuV/m**	**Numeric Gain G**	**F/S in V/m**	**Test Distance in meters**	**Conducted Power in Watts**	**Conducted Power in dBm**	**15.247 Limit in dBm**	**Pass/Fail**
2405	96.20	2.1400	0.0646	3	5.8440E-04	-2.33	30.0	Pass
2440	94.90	0.8520	0.0556	3	1.0881E-03	0.37	30.0	Pass
2480	94.60	0.6170	0.0537	3	1.4023E-03	1.47	30.0	Pass

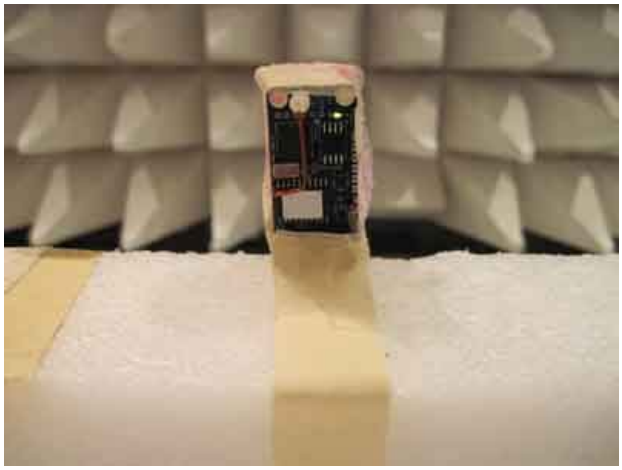
Test Setup Photos



X Orientation



Y Orientation



Z Orientation

15.247(d) Spurious Emissions

Engineer Name: Jeff Gilbert

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 22116 23rd Ave SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **MicroStrain, Inc.**
Specification: **15.247(d)**
Work Order #: **90661** Date: 12/20/2010
Test Type: **Maximized Emissions** Time: 10:20:30 AM
Equipment: **2.4 GHz OEM Wireless Module** Sequence#: 15
Manufacturer: MicroStrain, Inc. Tested By: Jeff Gilbert
Model: SG-Link OEM
S/N: NODE:100

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T3	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T4	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T5	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2.4 GHz OEM Wireless Module*	MicroStrain, Inc.	SG-Link OEM	NODE:100

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

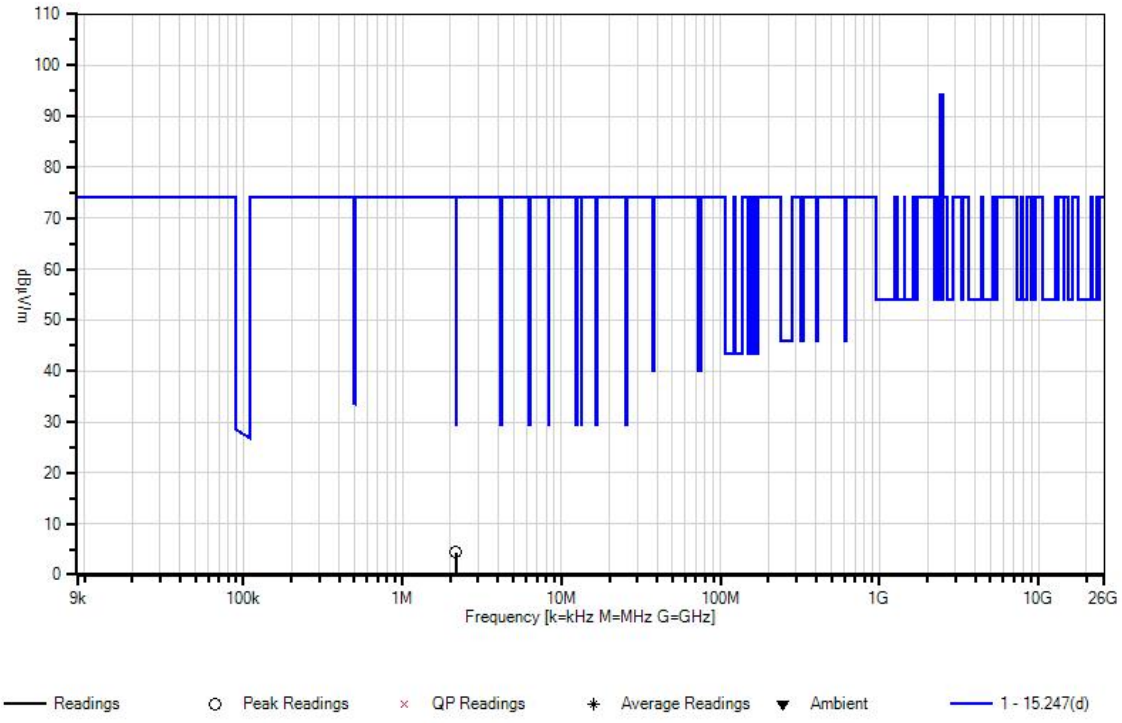
Frequency Range Investigated: 30 kHz - 30 MHz
20ºC, 29% relative humidity, 100.2 kPa
EUT is transmitting continuously; Z-orientation.
Testing per KDB558074.
Three TX channels investigated: 2405, 2440, 2480 MHz.

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2.176M	34.6	+9.7 +0.0	+0.1	+0.0	+0.0	-40.0	4.4	29.5	-25.1	Verti 100
2	92.520k	68.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-1.7	28.3	-30.0	Verti 100
3	91.080k	68.1	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-2.0	28.4	-30.4	Verti 100
4	109.680k	66.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-3.7	26.8	-30.5	Verti 100
5	103.560k	66.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-3.3	27.3	-30.6	Verti 100
6	98.520k	67.2	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-2.9	27.7	-30.6	Verti 100
7	104.160k	66.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-3.8	27.3	-31.1	Verti 100
8	109.440k	65.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-4.3	26.8	-31.1	Verti 100
9	90.120k	67.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-2.7	28.5	-31.2	Verti 100
10	90.600k	67.1	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-3.0	28.4	-31.4	Verti 100
11	108.720k	65.6	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-4.5	26.9	-31.4	Verti 100
12	98.160k	66.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-3.7	27.8	-31.5	Verti 100
13	97.440k	66.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-3.8	27.8	-31.6	Verti 100
14	100.320k	66.1	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-4.0	27.6	-31.6	Verti 100
15	95.520k	66.5	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-3.6	28.0	-31.6	Verti 100
16	102.120k	65.7	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-4.4	27.4	-31.8	Verti 100
17	92.520k	66.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-3.7	28.3	-32.0	Verti 100
18	105.120k	65.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-4.8	27.2	-32.0	Verti 100
19	8.365M	26.5	+9.5 +0.1	+0.2	+0.1	+0.0	-40.0	-3.6	29.5	-33.1	Verti 100
20	8.293M	25.7	+9.5 +0.1	+0.2	+0.1	+0.0	-40.0	-4.4	29.5	-33.9	Verti 100

CKC Laboratories, Inc. Date: 12/20/2010 Time: 10:20:30 AM Microstrain, Inc. WO#: 90661
15.247(d) Test Distance: 3 Meters Vertical Sequence#: 15 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Ave SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **MicroStrain, Inc.**
Specification: **15.247(d)**
Work Order #: **90661** Date: 12/20/2010
Test Type: **Maximized Emissions** Time: 9:19:21 AM
Equipment: **2.4 GHz OEM Wireless Module** Sequence#: 12
Manufacturer: MicroStrain, Inc. Tested By: Jeff Gilbert
Model: SG-Link OEM
S/N: NODE:100

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01993	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
T2	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T3	AN01517	Preamp	8447D	5/21/2010	5/21/2012
T4	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T5	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2.4 GHz OEM Wireless Module*	MicroStrain, Inc.	SG-Link OEM	NODE:100

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Frequency Range Investigated: 30 - 1000 MHz
20ºC, 29% relative humidity, 100.2 kPa
EUT is transmitting continuously; Z-orientation.
Testing per KDB558074.
Three TX channels investigated: 2405, 2440, 2480 MHz.

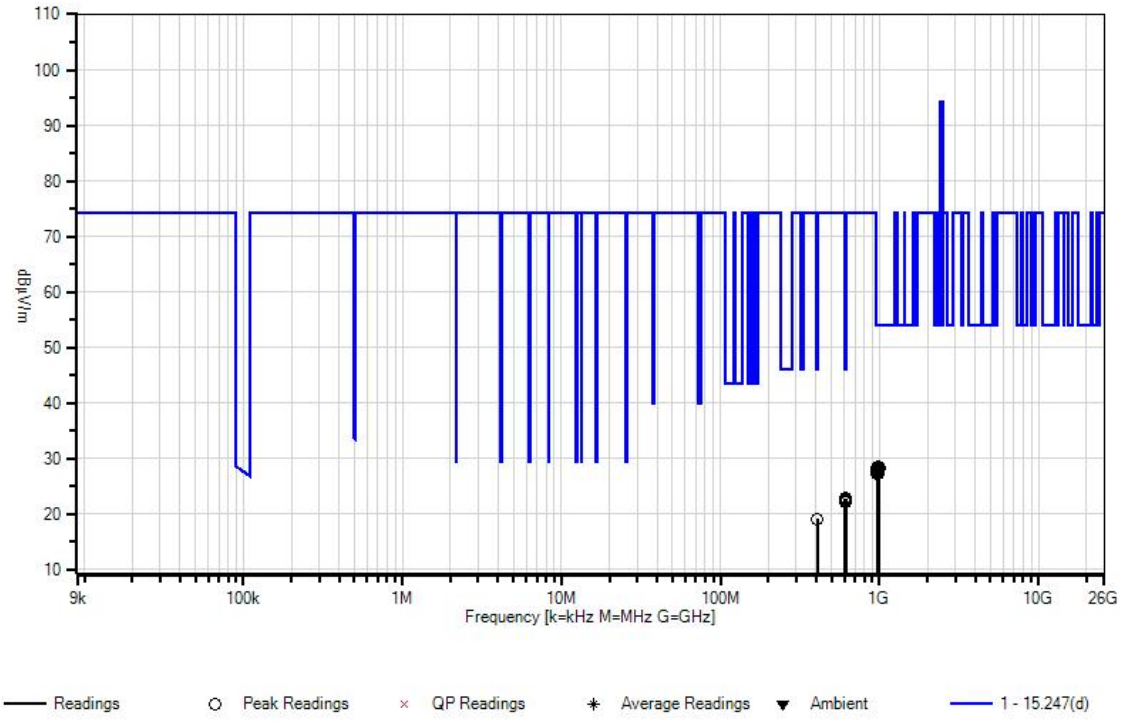
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	613.666M	28.4	+20.0 +0.6	+1.8	-29.5	+1.5	+0.0	22.8	46.0	-23.2	Horiz 130
2	608.500M	28.3	+20.0 +0.6	+1.8	-29.5	+1.5	+0.0 360	22.7	46.0	-23.3	Verti 130
3	608.020M	28.0	+20.0 +0.6	+1.8	-29.5	+1.5	+0.0	22.4	46.0	-23.6	Horiz 130
4	609.822M	27.6	+20.0 +0.6	+1.8	-29.5	+1.5	+0.0	22.0	46.0	-24.0	Horiz 130
5	990.859M	27.7	+24.3 +0.8	+2.4	-28.9	+2.1	+0.0	28.4	54.0	-25.6	Horiz 130
6	979.651M	28.1	+24.1 +0.8	+2.3	-29.0	+2.0	+0.0 360	28.3	54.0	-25.7	Verti 130
7	995.179M	27.5	+24.3 +0.8	+2.5	-28.9	+2.1	+0.0	28.3	54.0	-25.7	Horiz 130

8	970.886M	28.2	+24.0 +0.8	+2.2	-29.0	+2.0	+0.0 360	28.2	54.0	-25.8	Verti 130
9	990.295M	27.5	+24.3 +0.8	+2.4	-28.9	+2.1	+0.0 360	28.2	54.0	-25.8	Verti 130
10	971.575M	28.1	+24.0 +0.8	+2.2	-29.0	+2.0	+0.0 360	28.1	54.0	-25.9	Verti 130
11	966.440M	27.9	+24.0 +0.8	+2.2	-29.0	+2.0	+0.0	27.9	54.0	-26.1	Horiz 130
12	976.583M	27.5	+24.1 +0.8	+2.3	-29.0	+2.0	+0.0	27.7	54.0	-26.3	Horiz 130
13	976.396M	27.4	+24.1 +0.8	+2.3	-29.0	+2.0	+0.0	27.6	54.0	-26.4	Horiz 130
14	980.904M	27.1	+24.2 +0.8	+2.3	-29.0	+2.0	+0.0 360	27.4	54.0	-26.6	Verti 130
15	969.383M	27.4	+24.0 +0.8	+2.2	-29.0	+2.0	+0.0 360	27.4	54.0	-26.6	Verti 130
16	972.138M	27.2	+24.1 +0.8	+2.2	-29.0	+2.0	+0.0 360	27.3	54.0	-26.7	Verti 130
17	978.086M	27.1	+24.1 +0.8	+2.3	-29.0	+2.0	+0.0 360	27.3	54.0	-26.7	Verti 130
18	978.712M	27.0	+24.1 +0.8	+2.3	-29.0	+2.0	+0.0 360	27.2	54.0	-26.8	Verti 130
19	406.819M	28.3	+16.5 +0.5	+1.5	-28.9	+1.2	+0.0 360	19.1	46.0	-26.9	Verti 130
20	966.002M	27.1	+24.0 +0.8	+2.2	-29.0	+2.0	+0.0 360	27.1	54.0	-26.9	Verti 130

CKC Laboratories, Inc. Date: 12/20/2010 Time: 9:19:21 AM Microstrain, Inc. WO#: 90661
15.247(d) Test Distance: 3 Meters H & V Sequence#: 12 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Ave SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **MicroStrain, Inc.**
Specification: **15.247(d)**
Work Order #: **90661** Date: 12/20/2010
Test Type: **Maximized Emissions** Time: 11:30:35 AM
Equipment: **2.4 GHz OEM Wireless Module** Sequence#: 12
Manufacturer: MicroStrain, Inc. Tested By: Jeff Gilbert
Model: SG-Link OEM
S/N: NODE:100

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01412	Horn Antenna-ANSI C63.5 Calibration (dB)	3115	10/12/2009	10/12/2011
T2	AN03123	Cable	32026-2-29801-12	10/23/2009	10/23/2011
T3	AN01271	Preamp	83017A	9/17/2009	9/17/2011
T4	ANP05542	Cable	Heliax	10/23/2009	10/23/2011
T5	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2.4 GHz OEM Wireless Module*	MicroStrain, Inc.	SG-Link OEM	NODE:100

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Frequency Range Investigated: 1000 - 9000 MHz
20ºC, 29% relative humidity, 100.2 kPa
EUT is transmitting continuously; Z-orientation.
Testing per KDB558074.
Three TX channels investigated: 2405, 2440, 2480 MHz.

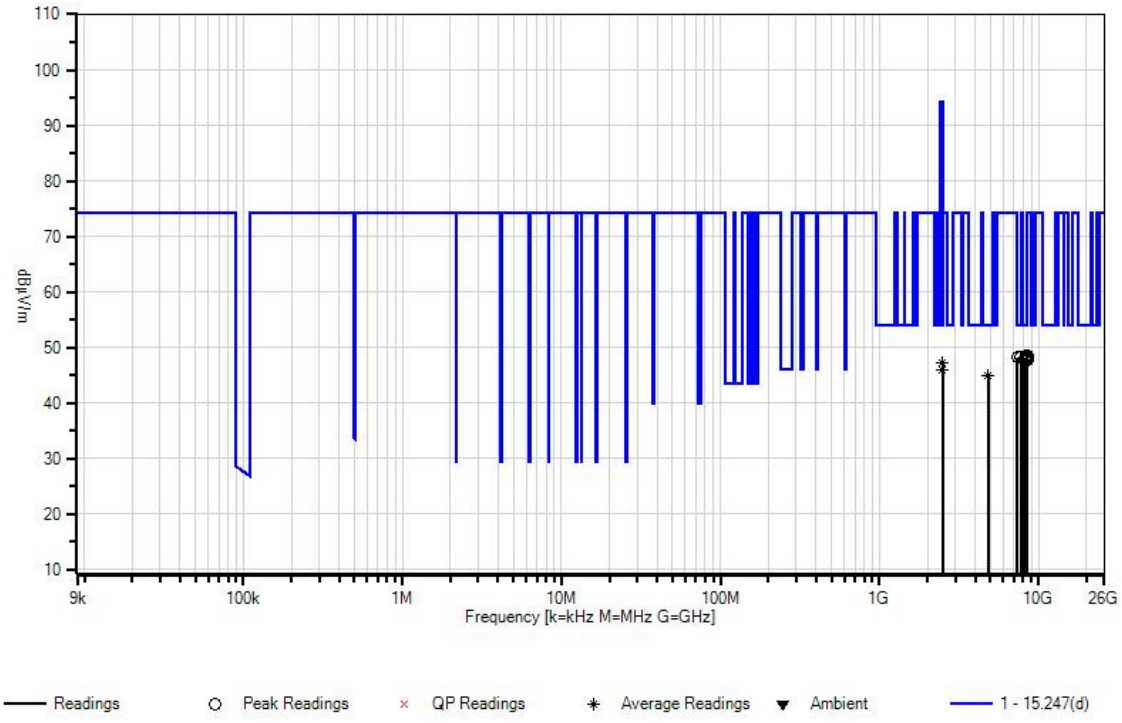
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	8495.556M	37.4	+37.3 +2.5	+0.4	-34.6	+5.6	+0.0	48.6	54.0	-5.4	Verti 120
2	8492.577M	37.4	+37.3 +2.5	+0.4	-34.6	+5.6	+0.0	48.6	54.0	-5.4	Verti 120
3	8466.961M	37.2	+37.3 +2.5	+0.4	-34.6	+5.6	+0.0	48.4	54.0	-5.6	Horiz 120
4	8462.787M	37.3	+37.2 +2.5	+0.4	-34.6	+5.6	+0.0 360	48.4	54.0	-5.6	Horiz 120
5	8450.871M	37.3	+37.2 +2.5	+0.4	-34.6	+5.6	+0.0	48.4	54.0	-5.6	Verti 120

6	8416.116M	37.4	+37.1 +2.4	+0.4	-34.7	+5.6	+0.0	48.2	54.0	-5.8	Verti 120
7	7749.743M	38.7	+35.7 +2.4	+0.5	-34.6	+5.4	+0.0	48.1	54.0	-5.9	Horiz 120
8	7325.319M	39.4	+35.2 +2.4	+0.5	-34.6	+5.2	+0.0 360	48.1	54.0	-5.9	Horiz 120
9	8202.621M	37.5	+36.6 +2.7	+0.4	-34.7	+5.5	+0.0	48.0	54.0	-6.0	Verti 120
10	8283.054M	37.4	+36.8 +2.6	+0.4	-34.7	+5.5	+0.0	48.0	54.0	-6.0	Verti 120
11	8347.842M	37.2	+36.9 +2.5	+0.4	-34.7	+5.6	+0.0	47.9	54.0	-6.1	Horiz 120
12	8198.649M	37.5	+36.5 +2.7	+0.4	-34.7	+5.5	+0.0	47.9	54.0	-6.1	Verti 120
13	8275.110M	37.3	+36.7 +2.6	+0.4	-34.7	+5.5	+0.0	47.8	54.0	-6.2	Horiz 120
14	8472.717M	36.6	+37.3 +2.5	+0.4	-34.6	+5.6	+0.0	47.8	54.0	-6.2	Horiz 120
15	8138.076M	37.5	+36.4 +2.6	+0.4	-34.7	+5.5	+0.0	47.7	54.0	-6.3	Horiz 120
16	8230.425M	37.2	+36.6 +2.7	+0.4	-34.7	+5.5	+0.0	47.7	54.0	-6.3	Verti 120
17	8149.992M	37.5	+36.4 +2.6	+0.4	-34.7	+5.5	+0.0 360	47.7	54.0	-6.3	Horiz 120
18	8217.516M	37.2	+36.6 +2.7	+0.4	-34.7	+5.5	+0.0 360	47.7	54.0	-6.3	Horiz 120
19	8436.969M	36.7	+37.2 +2.4	+0.4	-34.7	+5.6	+0.0 360	47.6	54.0	-6.4	Horiz 120
20	8373.417M	36.9	+37.0 +2.4	+0.4	-34.7	+5.6	+0.0 360	47.6	54.0	-6.4	Horiz 120
21	2483.892M Ave	48.6	+28.6 +1.3	+0.2	-34.4	+2.8	+0.0 360	47.1	54.0 Bandedge	-6.9	Verti 115
^	2483.892M	57.0	+28.6 +1.3	+0.2	-34.4	+2.8	+0.0 360	55.5	54.0	+1.5	Verti 115
^	2483.893M	53.7	+28.6 +1.3	+0.2	-34.4	+2.8	+0.0	52.2	54.0	-1.8	Verti 120
24	2483.884M Ave	47.4	+28.6 +1.3	+0.2	-34.4	+2.8	+0.0 60	45.9	54.0 Bandedge	-8.1	Horiz 130
^	2483.884M	55.7	+28.6 +1.3	+0.2	-34.4	+2.8	+0.0 60	54.2	54.0	+0.2	Horiz 130
^	2483.884M	51.7	+28.6 +1.3	+0.2	-34.4	+2.8	+0.0 360	50.2	54.0	-3.8	Horiz 120
27	4810.060M Ave	39.6	+32.6 +2.0	+0.4	-33.8	+4.2	+0.0 10	45.0	54.0	-9.0	Horiz 160
^	4810.048M	44.0	+32.6 +2.0	+0.4	-33.8	+4.2	+0.0 10	49.4	54.0	-4.6	Horiz 160
^	4810.048M	41.9	+32.6 +2.0	+0.4	-33.8	+4.2	+0.0	47.3	54.0	-6.7	Horiz 120

CKC Laboratories, Inc. Date: 12/20/2010 Time: 11:30:35 AM Microstrain, Inc. WO#: 90661
15.247(d) Test Distance: 3 Meters H & V Sequence#: 12 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Ave SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **MicroStrain, Inc.**
Specification: **15.247(d)**
Work Order #: **90661** Date: 12/20/2010
Test Type: **Maximized Emissions** Time: 12:12:34 PM
Equipment: **2.4 GHz OEM Wireless Module** Sequence#: 13
Manufacturer: MicroStrain, Inc. Tested By: Jeff Gilbert
Model: SG-Link OEM
S/N: NODE:100

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01412	Horn Antenna-ANSI C63.5 Calibration (dB)	3115	10/12/2009	10/12/2011
T2	AN03123	Cable	32026-2-29801-12	10/23/2009	10/23/2011
T3	AN01271	Preamp	83017A	9/17/2009	9/17/2011
T4	ANP05542	Cable	Heliax	10/23/2009	10/23/2011
T5	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2.4 GHz OEM Wireless Module*	MicroStrain, Inc.	SG-Link OEM	NODE:100

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Frequency Range Investigated: 9000 - 12500 MHz
20ºC, 29% relative humidity, 100.2 kPa
EUT is transmitting continuously; Z-orientation.
Testing per KDB558074.
Three TX channels investigated: 2405, 2440, 2480 MHz.

Ext Attn: 0 dB

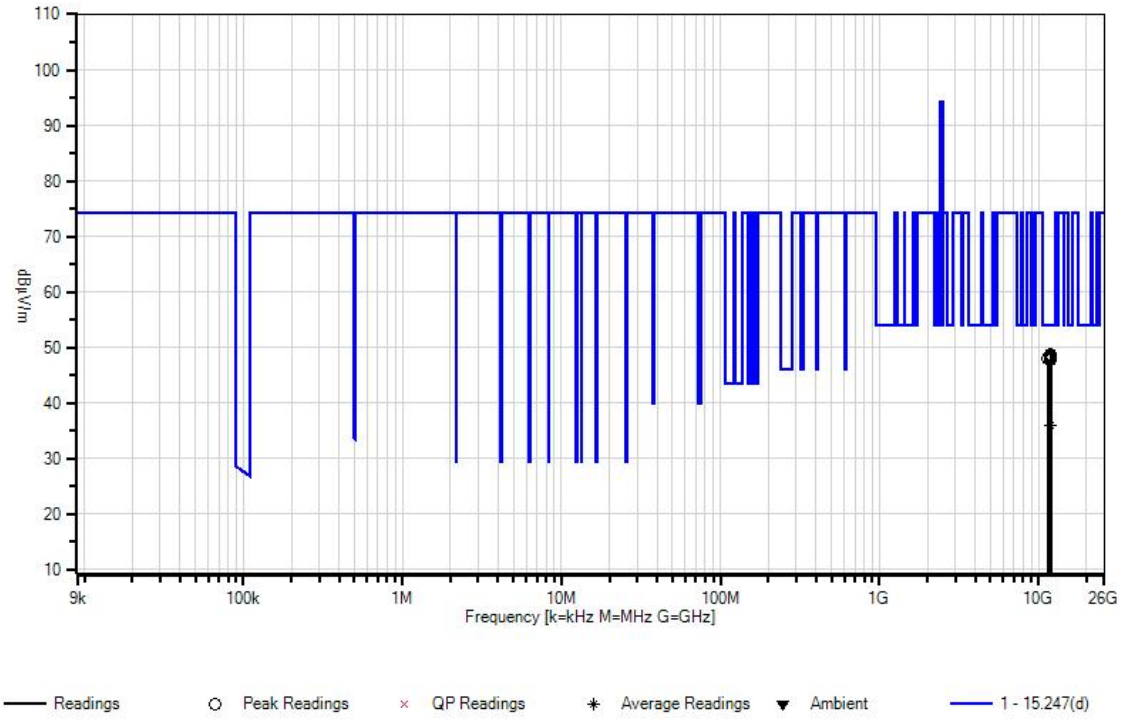
Measurement Data: Reading listed by margin. Test Distance: 2 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	11959.564 M	38.0	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.7	54.0	-5.3	Verti 115
2	11950.418 M	37.9	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.6	54.0	-5.4	Horiz 115
3	11949.359 M	37.6	+38.8 +3.2	+0.6	-35.0	+6.7	-3.5	48.4	54.0	-5.6	Verti 115

4	11985.559 M	37.6	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.3	54.0	-5.7	Horiz 115
5	11956.194 M	37.6	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.3	54.0	-5.7	Horiz 115
6	11929.526 M	37.5	+38.8 +3.2	+0.6	-35.0	+6.7	-3.5	48.3	54.0	-5.7	Verti 115
7	11982.478 M	37.6	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.3	54.0	-5.7	Verti 115
8	11961.586 M	37.5	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.2	54.0	-5.8	Horiz 115
9	11974.776 M	37.5	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.2	54.0	-5.8	Verti 115
10	11996.053 M	37.4	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.1	54.0	-5.9	Verti 115
11	11968.132 M	37.4	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.1	54.0	-5.9	Verti 115
12	11910.463 M	37.3	+38.7 +3.2	+0.6	-35.0	+6.7	-3.5	48.0	54.0	-6.0	Verti 115
13	11983.152 M	37.3	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	48.0	54.0	-6.0	Horiz 115
14	11919.320 M	37.2	+38.7 +3.2	+0.6	-35.0	+6.7	-3.5	47.9	54.0	-6.1	Horiz 115
15	11419.240 M	37.6	+38.4 +3.4	+0.4	-35.0	+6.6	-3.5	47.9	54.0	-6.1	Horiz 115
16	11908.537 M	37.1	+38.7 +3.2	+0.6	-35.0	+6.7	-3.5	47.8	54.0	-6.2	Horiz 115
17	11929.814 M	37.0	+38.8 +3.2	+0.6	-35.0	+6.7	-3.5	47.8	54.0	-6.2	Horiz 115
18	11974.102 M	37.1	+38.8 +3.1	+0.6	-35.0	+6.7	-3.5	47.8	54.0	-6.2	Horiz 115

19	11918.165 M	37.0	+38.7 +3.2	+0.6	-35.0	+6.7	-3.5	47.7	54.0	-6.3	Horiz 115
20	11920.572 M	37.0	+38.7 +3.2	+0.6	-35.0	+6.7	-3.5	47.7	54.0	-6.3	Horiz 115
21	11941.933 M Ave	25.1	+38.8 +3.2	+0.6	-35.0	+6.7	-3.5	35.9	54.0	-18.1	Horiz 115
^	11941.933 M	38.7	+38.8 +3.2	+0.6	-35.0	+6.7	-3.5	49.5	54.0	-4.5	Horiz 115

CKC Laboratories, Inc. Date: 12/20/2010 Time: 12:12:34 PM Microstrain, Inc. WO#: 90661
15.247(d) Test Distance: 2 Meters H & V Sequence#: 13 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Ave SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **MicroStrain, Inc.**
Specification: **15.247(d)**
Work Order #: **90661** Date: 12/21/2010
Test Type: **Radiated Scan** Time: 8:12:09 AM
Equipment: **2.4 GHz OEM Wireless Module** Sequence#: 19
Manufacturer: MicroStrain, Inc. Tested By: Jeff Gilbert
Model: SG-Link OEM
S/N: NODE:100

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02741	Active Horn Antenna-ANSI C63.5 Antenna Factors (dB)	AMFW-5F-12001800-20-10P	10/29/2010	10/29/2012
T2	ANP05428	Cable	PE35591-60	12/17/2009	12/17/2011
T3	AN02762-68	Waveguide	Multiple	9/2/2010	9/2/2012
T4	ANP05422	Cable	PE35591-72	12/17/2009	12/17/2011
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2.4 GHz OEM Wireless Module*	MicroStrain, Inc.	SG-Link OEM	NODE:100

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Frequency Range Investigated: 12500 - 18000 MHz
20ºC, 29% relative humidity, 100.2 kPa
EUT is transmitting continuously; Z-orientation.
Testing per KDB558074.
Three TX channels investigated: 2405, 2440, 2480 MHz.

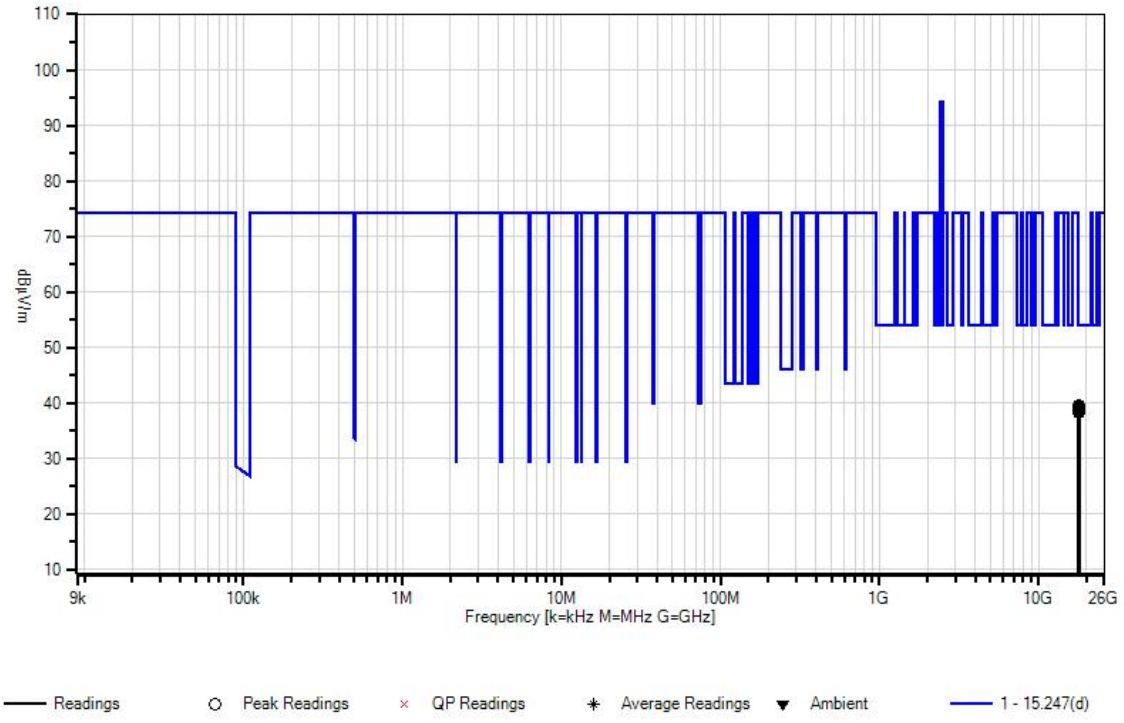
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 2 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	17980.200 M	38.8	-10.6	+6.5	+1.0	+7.3	-3.5 360	39.5	54.0	-14.5	Verti 100
2	17853.975 M	39.2	-11.3	+6.6	+0.9	+7.3	-3.5 360	39.2	54.0	-14.8	Horiz 100
3	17870.805 M	38.8	-11.2	+6.6	+0.9	+7.3	-3.5 360	38.9	54.0	-15.1	Verti 100
4	17994.060 M	38.1	-10.5	+6.5	+1.0	+7.3	-3.5 360	38.9	54.0	-15.1	Horiz 100

5	17972.280 M	38.2	-10.6	+6.5	+1.0	+7.3	-3.5	38.9	54.0	-15.1	Horiz
							360				100
6	17817.345 M	38.9	-11.4	+6.6	+0.9	+7.3	-3.5	38.8	54.0	-15.2	Verti
							360				100
7	17881.695 M	38.6	-11.1	+6.6	+0.9	+7.3	-3.5	38.8	54.0	-15.2	Verti
							360				100
8	17883.180 M	38.5	-11.1	+6.6	+0.9	+7.3	-3.5	38.7	54.0	-15.3	Horiz
							360				100
9	17835.660 M	38.7	-11.4	+6.6	+0.9	+7.3	-3.5	38.6	54.0	-15.4	Verti
							360				100
10	17929.710 M	38.2	-10.9	+6.5	+1.0	+7.3	-3.5	38.6	54.0	-15.4	Horiz
							360				100
11	17869.815 M	38.5	-11.2	+6.6	+0.9	+7.3	-3.5	38.6	54.0	-15.4	Verti
							360				100
12	17765.370 M	38.9	-11.7	+6.6	+0.9	+7.3	-3.5	38.5	54.0	-15.5	Verti
							360				100
13	17989.605 M	37.7	-10.6	+6.5	+1.0	+7.3	-3.5	38.4	54.0	-15.6	Horiz
							360				100
14	17889.615 M	38.2	-11.1	+6.6	+0.9	+7.3	-3.5	38.4	54.0	-15.6	Horiz
							360				100
15	17888.130 M	38.2	-11.1	+6.6	+0.9	+7.3	-3.5	38.4	54.0	-15.6	Verti
							360				100
16	17889.120 M	38.2	-11.1	+6.6	+0.9	+7.3	-3.5	38.4	54.0	-15.6	Verti
							360				100
17	17829.720 M	38.3	-11.4	+6.6	+0.9	+7.3	-3.5	38.2	54.0	-15.8	Verti
							360				100
18	17772.795 M	38.6	-11.7	+6.6	+0.9	+7.3	-3.5	38.2	54.0	-15.8	Verti
							360				100
19	17917.335 M	37.8	-10.9	+6.5	+1.0	+7.3	-3.5	38.2	54.0	-15.8	Horiz
							360				100
20	17997.525 M	37.4	-10.5	+6.5	+1.0	+7.3	-3.5	38.2	54.0	-15.8	Verti
							360				100

CKC Laboratories, Inc. Date: 12/21/2010 Time: 8:12:09 AM Microstrain, Inc. WO#: 90661
15.247(d) Test Distance: 2 Meters Horizontal Sequence#: 19 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Ave SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **MicroStrain, Inc.**
Specification: **15.247(d)**
Work Order #: **90661** Date: 12/21/2010
Test Type: **Radiated Scan** Time: 7:46:08 AM
Equipment: **2.4 GHz OEM Wireless Module** Sequence#: 17
Manufacturer: MicroStrain, Inc. Tested By: Jeff Gilbert
Model: SG-Link OEM
S/N: NODE:100

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02742	Active Horn Antenna-ANSI C63.5 Antenna Factors (dB)	AMFW-5F-18002650-20-10P	11/10/2010	11/10/2012
T2	ANP05428	Cable	PE35591-60	12/17/2009	12/17/2011
T3	AN02763-69	Waveguide	Multiple	9/2/2010	9/2/2012
T4	ANP05422	Cable	PE35591-72	12/17/2009	12/17/2011
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2.4 GHz OEM Wireless Module*	MicroStrain, Inc.	SG-Link OEM	NODE:100

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Frequency Range Investigated: 18000 - 25000 MHz
20ºC, 29% relative humidity, 100.2 kPa
EUT is transmitting continuously; Z-orientation.
Testing per KDB558074.
Three TX channels investigated: 2405, 2440, 2480 MHz.

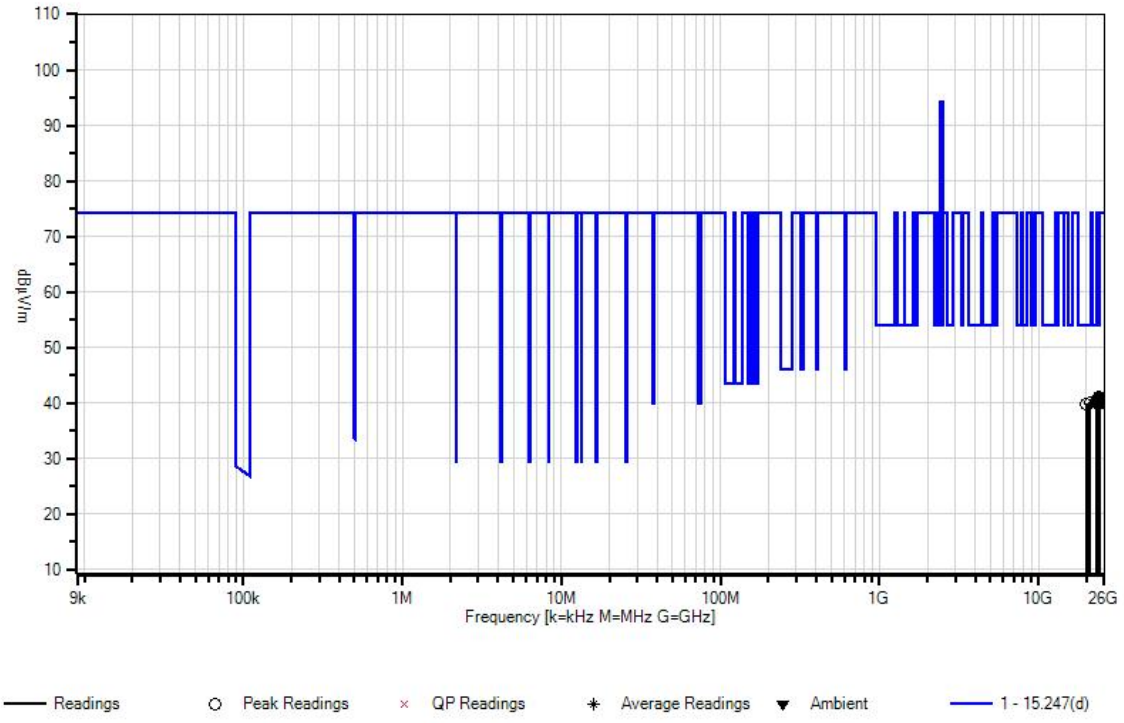
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 2 Meters

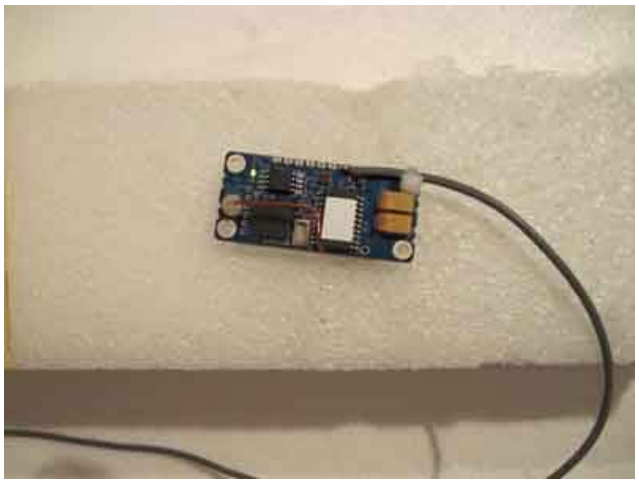
#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	23939.934 M	40.5	-13.6	+7.9	+0.4	+9.3	-3.5 360	41.0	54.0	-13.0	Horiz 100
2	23964.959 M	40.2	-13.6	+7.9	+0.4	+9.3	-3.5	40.7	54.0	-13.3	Verti 100
3	23713.708 M	40.2	-13.8	+7.9	+0.5	+9.4	-3.5	40.7	54.0	-13.3	Verti 100
4	23674.669 M	40.2	-13.9	+7.9	+0.5	+9.4	-3.5 360	40.6	54.0	-13.4	Horiz 100

5	23990.985 M	40.1	-13.6	+7.9	+0.4	+9.3	-3.5	40.6	54.0	-13.4	Horiz
							360				100
6	23857.852 M	40.0	-13.7	+7.9	+0.5	+9.3	-3.5	40.5	54.0	-13.5	Horiz
							360				100
7	23766.761 M	40.0	-13.8	+7.9	+0.5	+9.3	-3.5	40.4	54.0	-13.6	Horiz
							360				100
8	23038.033 M	40.6	-14.7	+7.8	+0.8	+9.2	-3.5	40.2	54.0	-13.8	Horiz
							360				100
9	21068.065 M	40.4	-12.7	+7.3	+0.4	+8.2	-3.5	40.1	54.0	-13.9	Verti
											100
10	23014.009 M	40.5	-14.8	+7.8	+0.8	+9.2	-3.5	40.0	54.0	-14.0	Verti
											100
11	23722.717 M	39.5	-13.8	+7.9	+0.5	+9.4	-3.5	40.0	54.0	-14.0	Horiz
							360				100
12	23035.030 M	40.3	-14.7	+7.8	+0.8	+9.2	-3.5	39.9	54.0	-14.1	Verti
											100
13	21062.059 M	40.2	-12.7	+7.3	+0.4	+8.2	-3.5	39.9	54.0	-14.1	Horiz
							360				100
14	23873.868 M	39.4	-13.7	+7.9	+0.5	+9.3	-3.5	39.9	54.0	-14.1	Horiz
							360				100
15	23008.003 M	40.4	-14.8	+7.8	+0.8	+9.2	-3.5	39.9	54.0	-14.1	Horiz
							360				100
16	23022.017 M	40.4	-14.8	+7.8	+0.8	+9.2	-3.5	39.9	54.0	-14.1	Horiz
							360				100
17	23910.905 M	39.4	-13.7	+7.9	+0.4	+9.3	-3.5	39.8	54.0	-14.2	Horiz
							360				100
18	23978.973 M	39.3	-13.6	+7.9	+0.4	+9.3	-3.5	39.8	54.0	-14.2	Horiz
							360				100
19	23985.980 M	39.3	-13.6	+7.9	+0.4	+9.3	-3.5	39.8	54.0	-14.2	Horiz
							360				100
20	19900.899 M	40.3	-12.1	+7.0	+0.3	+7.8	-3.5	39.8	54.0	-14.2	Verti
											100

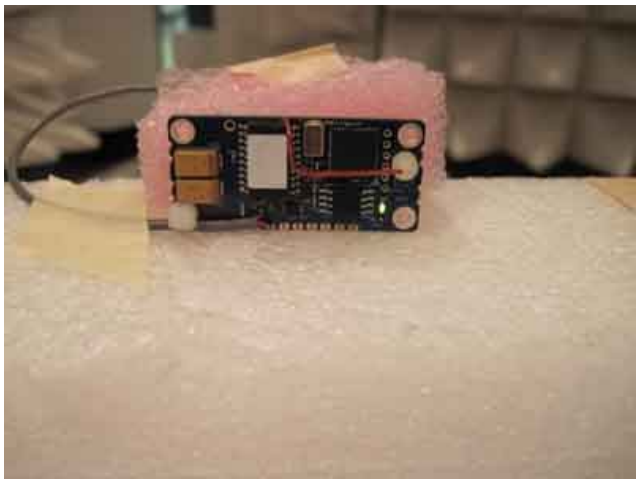
CKC Laboratories, Inc. Date: 12/21/2010 Time: 7:46:08 AM Microstrain, Inc. WO#: 90661
15.247(d) Test Distance: 2 Meters H & V Sequence#: 17 Ext ATTN: 0 dB



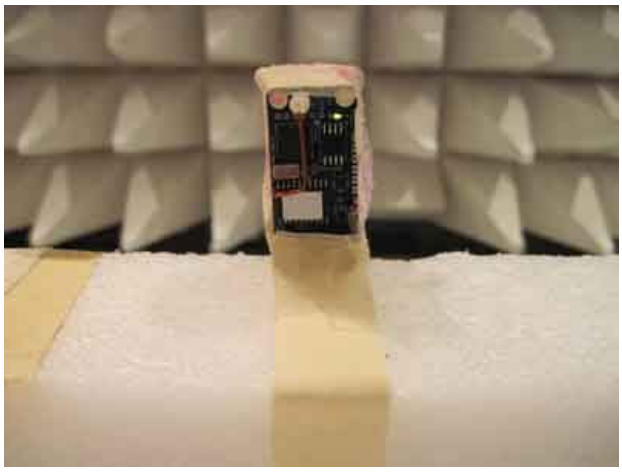
Test Setup Photos



X Orientation



Y Orientation



Z Orientation

30kHz - 30MHz

30 - 1000MHz

12.5 - 18GHz

18 - 25GHz

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer/receiver readings recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.