



1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

FCC Rules and Regulations / Intentional Radiators

Operational in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz, Bands

Part 15, Subpart C, Section 15.247

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name: Motion Control Unit  
Kind of Equipment: Nurse Call and Security Device  
Frequency Range: 2405 MHz - 2480 MHz  
Test Configuration: Wireless Connection (Tested at 120 vac, 60 Hz)  
Model Number(s): 0800-0318  
Model(s) Tested: 0800-0318  
Serial Number(s): N/A  
Date of Tests: January 7, 8, 9 & 16, 2008  
Test Conducted For: RF Technologies, Inc.  
3125 North 126th Street  
Brookfield, Wisconsin 53066

**NOTICE:** "This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government". Please see the "Additional Description of Equipment Under Test" page listed inside of this report.

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Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

SIGNATURE PAGE

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Test Engineer  
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Reviewed By:

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OATS Manager

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Brian Mattson  
General Manager



Company: RF Technologies, Inc.  
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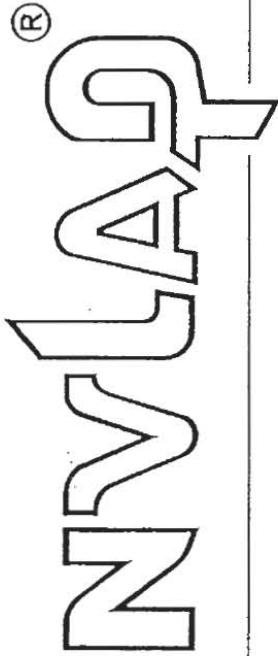


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Company:  
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Report Number:

RF Technologies, Inc.  
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United States Department of Commerce  
National Institute of Standards and Technology



# Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

**D.L.S. Electronic Systems, Inc.**  
Wheeling, IL

is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:

## ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005).



2007-10-01 through 2008-09-30

Effective dates

*Dolly S. Buser*  
For the National Institute of Standards and Technology

NVI AP-01C (REV. 2006-09-13)



Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

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## 1.0 SUMMARY OF TEST REPORT

It was found that the Motion Control Unit, Model Number(s) 0800-0318, **meets** the radio interference conducted and radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Section 15.247 for operational in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz, Bands.

## 2.0 INTRODUCTION

On January 7, 8, 9 & 16, 2008, a series of radio frequency interference measurements was performed on Motion Control Unit, Model Number(s) 0800-0318, Serial Number: N/A. The tests were performed according to the procedures of the FCC as stated in the "Methods of Measurement of Radio-Noise Emissions for Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" found in the American National Standards Institute, ANSI C63.4-2003. Tests were performed by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, Industry Canada, and VCCI.

### **Main Test Facility:**

D.L.S. Electronic Systems, Inc.  
1250 Peterson Drive  
Wheeling, Illinois 60090

### **O.A.T.S. Test Facility:**

D.L.S. Electronic Systems, Inc.  
166 S. Carter Street  
Genoa City, Wisconsin 53128

## 3.0 OBJECT

The purpose of this series of tests was to determine if the test sample could meet the radio frequency interference emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Sections 15.205, 15.209 & 15.247 for Intentional Radiators operating in the Bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.



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#### 4.0 TEST SET-UP

All emission tests were performed at D.L.S. Electronic Systems, Inc. and set up according to the ANSI C63.4-2003, Annex H.

All radiated emissions tests were performed with the test item placed on a 80 cm high rotating non-conductive table, located in the test room. Equipment normally operated on the floor was placed on a metal covered turntable which is flush with the surrounding conducting ground plane. The ground plane has an electrical isolation layer over its surface approximately 7 mm thick. The EUT is separated from the turntable ground plane by a non-conductive layer. The equipment under test was set up according to ANSI C63.4-2003, Sections 6 and 8.

#### 5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All preliminary data below 1000 MHz was automatically plotted using the ESI 26/40 Fixed Tuned Receiver. The data was taken using Peak, Quasi-Peak or the Average Detector Functions as required. This information was then used to determine the frequencies of maximum emissions. Above 1000 MHz, final data was taken using the Average Detector.

Below 1000 MHz, final data was taken using the ESI 26/40 Fixed Tuned Receiver. These plots were made using the Peak or Quasi-Peak Detector functions, with manual measurements performed on the questionable frequencies using the Quasi-Peak or the Average Detector Function of the ESI 26/40 Fixed Tuned Receiver as required. Above 1000 MHz, final data was taken using the Average Detector on the Spectrum Analyzer.

The bandwidths shown below are specified by ANSI C63.4-2003, Section 4.2.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

A list of the equipment used can be found in Table 1. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.



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## 6.0 AMBIENT MEASUREMENTS

For emissions measurements, broadband antennas and an EMI Test Receiver with a panoramic spectrum display are used. First the frequency range is scanned and displayed on the test receiver display. Next the scanned frequency range is divided into smaller ranges, and then it is manually tuned through to determine the emissions from the EUT. A headset or loudspeaker is connected to the test receiver's AM/FM demodulated output as an aid in detecting ambient signals and finding frequencies of significant emission from the EUT. If there is any doubt as to the source of the emission, it is further investigated by rotating the EUT, or by disconnecting the power from the EUT.

The EUT is set up in its typical configuration and operated in its various modes. For tabletop systems, cables are manipulated within the range of likely configurations. For floor-standing equipment, the cables are located in the same manner as the user would install them and no further manipulation is made. If the manner of cable installation is not known, or if it changes with each installation, cables or wires for floor-standing equipment shall be manipulated to the extent possible to produce the maximum level of emissions. For each mode of operation, the frequency spectrum is monitored. Variations in antenna height, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) are explored to produce the emissions that have the highest amplitude relative to the limit. These methods are performed to the specifications in ANSI C63.4-2003.





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7.0 DESCRIPTION OF TEST SAMPLE: (See also Paragraph 8.0)

7.1 Description:

This test sample is a wireless transceiver device that receives signals from battery powered devices and transmits these signals to other test samples on route to a final destination. The test sample communicates patient lying position and presence with other wireless communication devices (e.g. wireless paging devices) to create a mesh of wireless connectivity.

7.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 99mm x Width: 63.5mm x Height: 17.5mm

7.3 LINE FILTER USED:

N/A

7.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

N/A

Clock Frequencies:

32 MHz

7.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

1. ZigBee Motion Control Unit PCB Assembly, Chipcon

PN: 0830-0053 Rev. A



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8.0 ADDITIONAL DESCRIPTION OF TEST SAMPLE:  
(See also Paragraph 7.0)

1: Added 2 dB pad before transmitter amplifier.

NOTE:

Continuous Transmit with higher duty cycle than worst case during normal operation. Tested Low, Mid and High channels. Smaller nurse call port not filled. Used larger port with interface module for nurse call. Either can be used, but not both at the same time.

9.0 PHOTO INFORMATION AND TEST SET-UP

Item 0 Motion Control Unit

Model Number: 0800-0318; Serial Number: N/A

Item 1 Peripheral interface module and non-shielded cable with plastic shells to EUT. 20 cm

Item 2 GlobTek AC/DC Power Adaptor

Model: GTM348-9-1000D; Serial Number: N/A

Item 3 Nurse Call Button

Item 4 Motion Sensing Pad

Model: 1000-1160 Serial Number: 04070A00002

Item 5 RF Technologies Incontinence Pad

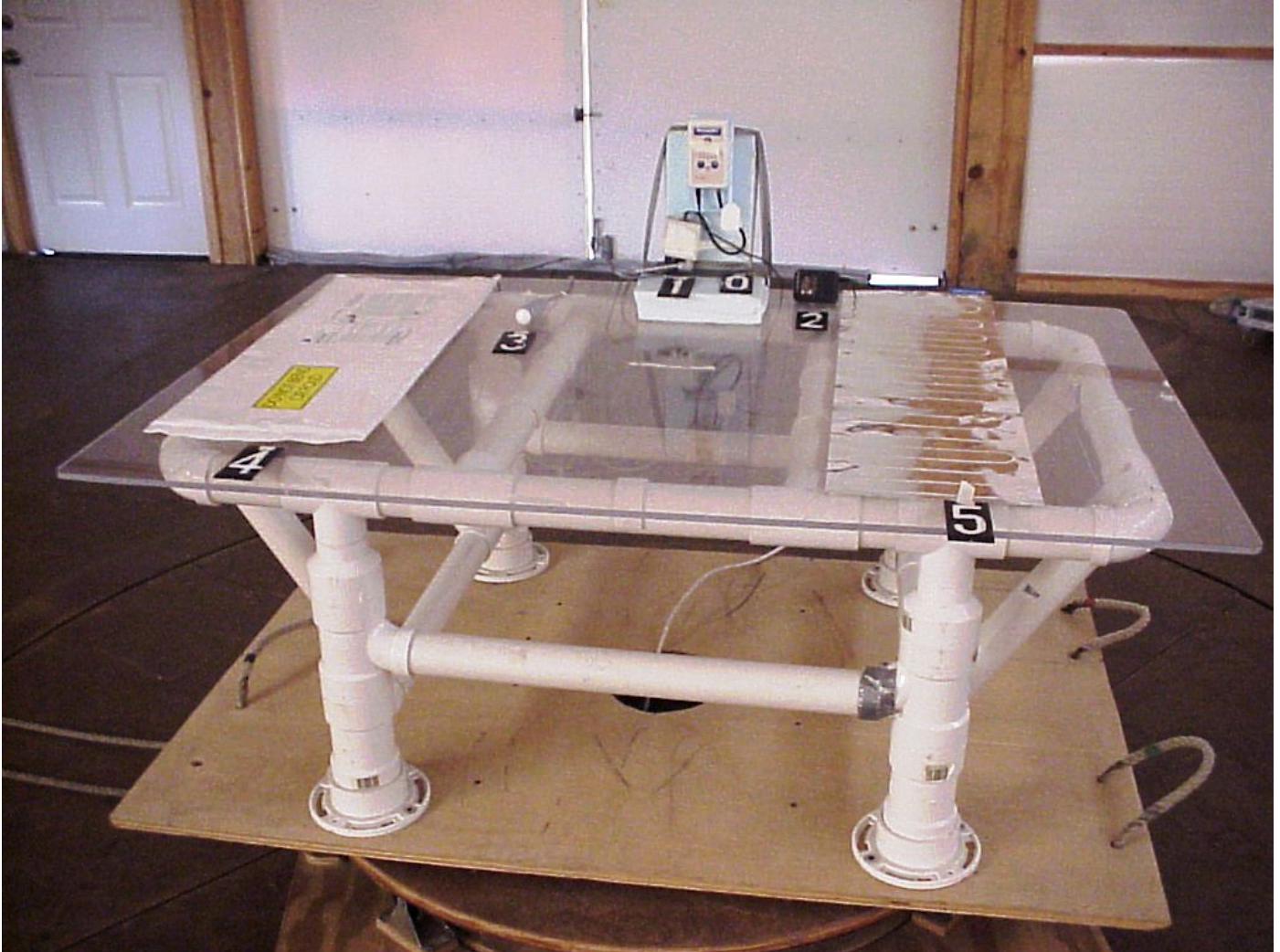
Model: 0460-0091; Serial Number: N/A



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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING





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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)







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## 10.0 CONDUCTED PHOTOS TAKEN DURING TESTING



LINE CONDUCTED 1



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## 10.0 CONDUCTED PHOTOS TAKEN DURING TESTING (CON'T)



LINE CONDUCTED 2





Company: RF Technologies, Inc.  
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## 11.0 RESULTS OF TESTS

The radio interference emission charts can be seen on the pages at the end of this report. Data sheets indicating the test measurements taken during testing can also be found at the end of this report.

## 12.0 CONCLUSION

It was found that the Motion Control Unit, Model Number(s) 0800-0318 **meets** the radio interference conducted and radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Section 15.247 for operational in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz, Bands.



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TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	11/08
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	12/08
Preamp	R&S	TS-PR10	032001/005	1GHz-10GHz	1/08
Preamp	Miteq	MF-6D-010100-50 A	213976	10GHz-18GHz	5/08
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18GHz-26GHz	9/08
Attenuator-20dB Fixed	Aeroflex Weinschel	75A-20-12	1071	DC – 40GHz	7/08
RF Limiter	Electrometrics	EM-7600	706		1/09
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	2/08
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	3/08
Horn Antenna	EMCO	3115	5731	1-18GHz	6/08
Horn Antenna	EMCO	3115	6204	1-18GHz	6/08
Horn Antenna	EMCO	3116	2549	18 – 40GHz	5/08
LISN	SOLAR	9252-50-R-24-BNC	961019		7/08





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# APPENDIX A

## TEST PROCEDURE

Part 15, Subpart C, Section 15.247 (a-h)

OPERATION WITHIN THE BAND 902-928 MHz,

2400-2483.5 MHz AND 5725-5857 MHz



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## APPENDIX A

### 1.0 AC POWER LINE CONDUCTED EMISSION MEASUREMENTS

If applicable, the conducted emissions were measured over the frequency range from 150 kHz to 30 MHz in accordance with the power line measurements as specified in the American National Standards Institute, ANSI C63.4-2003, Section 12. Since the device is operated from the public utility lines, the 115 Vac 60 Hz power leads, high and low sides, were to be measured by connecting the measuring equipment to the appropriate meter terminal of the LISN. All signals were then recorded. The allowed levels for Intentional Radiators cannot exceed the following:

Frequency of Emissions (MHz)	Conducted Limits (dBuV)	
	Quasi Peak	Average
.15 to .5	66 to 56	56 to 46
.5 to 5	56	46
5 to 30	60	50

All conducted emissions measurements were made at a test room temperature of **68°F** at **36%** relative humidity.



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APPENDIX A

AC POWER LINE CONDUCTED  
DATA AND GRAPH(S) TAKEN  
DURING TESTING

PART 15.207

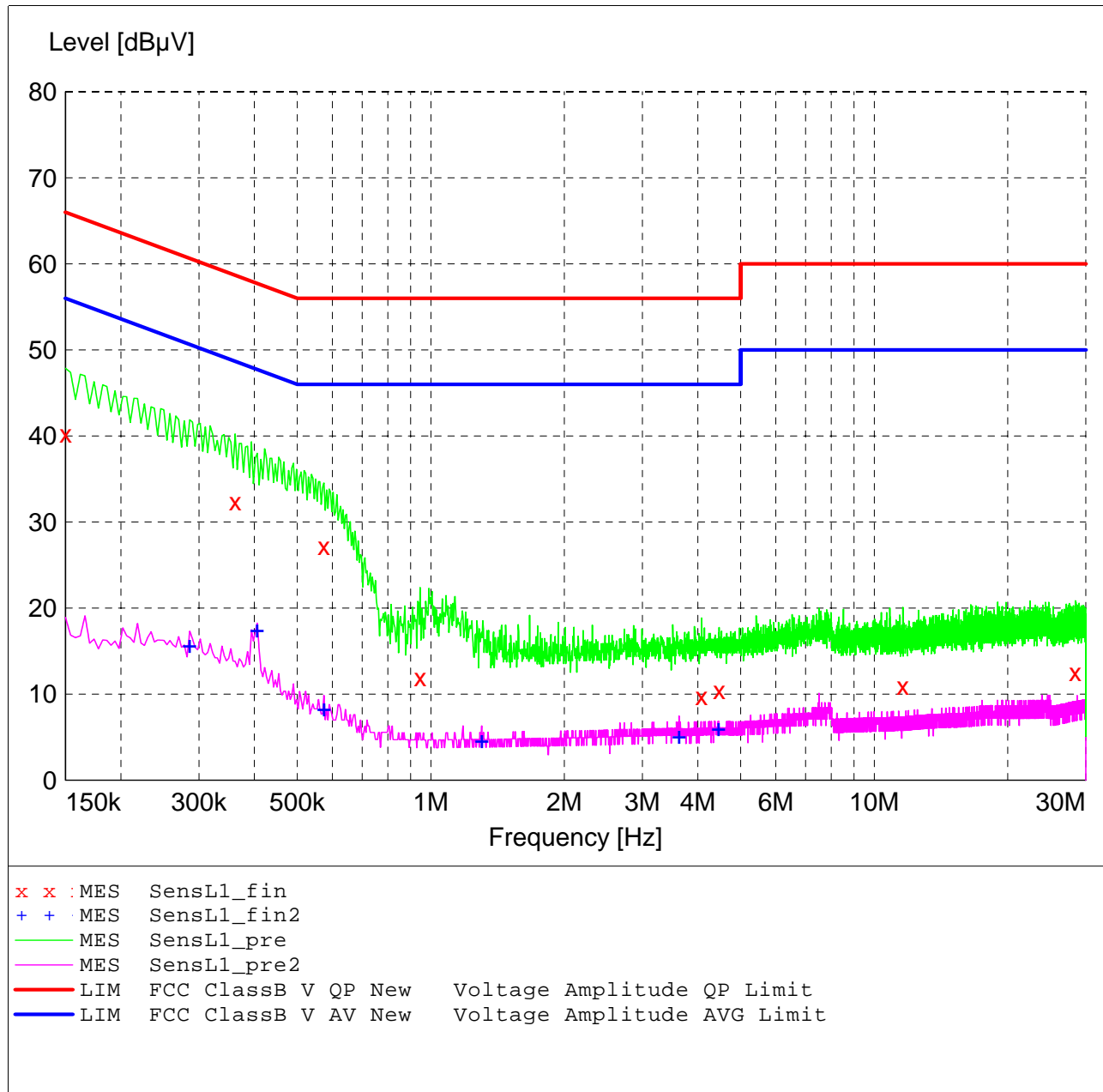
**FCC Part 15 Class B**

**Voltage Mains Test**

EUT: ST-520 Sensatec  
 Manufacturer: RF Technologies  
 Operating Condition: 68 deg. F, 36% R.H.  
 Test Site: DLS O.F. Site 1 (Screenroom)  
 Operator: Craig B  
 Test Specification: 120 V 60 Hz  
 Comment: Line 1  
 Date: 01-09-2007

**SCAN TABLE: "Line Cond Scrn RmFin"**

Short Description:			Line Conducted Emissions				Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.		
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	5.0 s	9 kHz	LISN DLS#128	
							CISPR AV



**MEASUREMENT RESULT: "SensL1\_fin"**

1/9/2008 8:55AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	40.20	11.6	66	25.8	QP	---	---
0.362000	32.40	10.5	59	26.3	QP	---	---
0.574000	27.20	10.3	56	28.8	QP	---	---
0.946000	11.90	10.2	56	44.1	QP	---	---
4.082000	9.80	10.8	56	46.2	QP	---	---
4.470000	10.40	10.8	56	45.6	QP	---	---
11.602000	10.90	11.3	60	49.1	QP	---	---
28.410000	12.50	12.4	60	47.5	QP	---	---

**MEASUREMENT RESULT: "SensL1\_fin2"**

1/9/2008 8:55AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.286000	15.70	10.6	51	34.9	CAV	---	---
0.406000	17.50	10.4	48	30.2	CAV	---	---
0.574000	8.30	10.3	46	37.7	CAV	---	---
1.302000	4.70	10.3	46	41.3	CAV	---	---
3.630000	5.20	10.7	46	40.8	CAV	---	---
4.458000	6.10	10.8	46	39.9	CAV	---	---

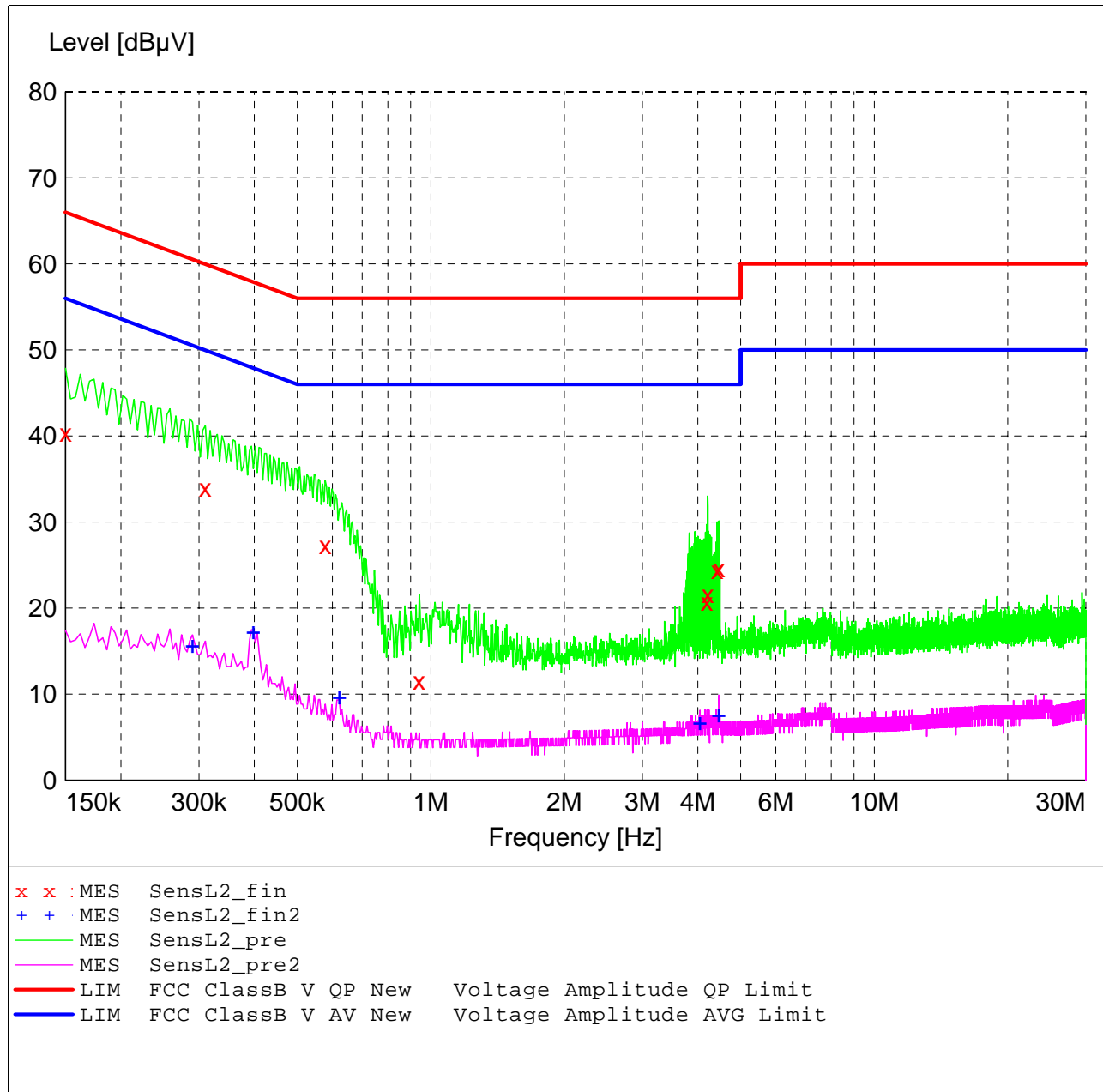
**FCC Part 15 Class B**

**Voltage Mains Test**

EUT: ST-520 Sensatec  
 Manufacturer: RF Technologies  
 Operating Condition: 68 deg. F, 36% R.H.  
 Test Site: DLS O.F. Site 1 (Screenroom)  
 Operator: Craig B  
 Test Specification: 120 V 60 Hz  
 Comment: Line 2  
 Date: 01-09-2007

**SCAN TABLE: "Line Cond Scrn RmFin"**

Short Description:			Line Conducted Emissions			Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	5.0 s	9 kHz	LISN DLS#128
CISPR AV						



**MEASUREMENT RESULT: "SensL2\_fin"**

1/9/2008 9:00AM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.150000	40.30	11.6	66	25.7	QP	---	---
0.310000	34.00	10.6	60	26.0	QP	---	---
0.578000	27.30	10.3	56	28.7	QP	---	---
0.942000	11.50	10.2	56	44.5	QP	---	---
4.194000	20.70	10.8	56	35.3	QP	---	---
4.214000	21.60	10.8	56	34.4	QP	---	---
4.426000	24.40	10.8	56	31.6	QP	---	---
4.466000	24.60	10.8	56	31.4	QP	---	---

**MEASUREMENT RESULT: "SensL2\_fin2"**

1/9/2008 9:00AM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.290000	15.70	10.6	51	34.8	CAV	---	---
0.398000	17.30	10.4	48	30.6	CAV	---	---
0.622000	9.80	10.3	46	36.2	CAV	---	---
4.046000	6.80	10.8	46	39.2	CAV	---	---
4.466000	7.60	10.8	46	38.4	CAV	---	---



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## APPENDIX A

### 2.0 SPURIOUS EMISSIONS AT ANTENNA TERMINALS – PART 15.247(c)

Spurious conducted emissions were measured at the antenna terminals. Plots were made showing the amplitude of each harmonic emission with the equipment operated. As shown by the radiated charts there was no reason to believe that there were any spurious emissions other than the harmonics that were than individually investigated when doing the conducted test at the antenna terminals. Measurements were made up to the 10<sup>th</sup> harmonic of the fundamental.

The allowed emissions for transmitters operating in the 2400 MHz - 2483.5 MHz bands for Motion Control Unit equipment are found under Part 15, Section 15.247(c). This paragraph states that in any 100 kHz bandwidth outside the frequency band which the spread spectrum intentional radiator is operating, the radio frequency power 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.

**NOTE: See the following pages for the data and graphs of the actual measurements made:**





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APPENDIX A

CONDUCTED EMISSION DATA AND GRAPH(S)

TAKEN FOR

SPURIOUS EMISSION MEASUREMENTS MADE

AT THE ANTENNA TERMINALS

PART 15.247(c)





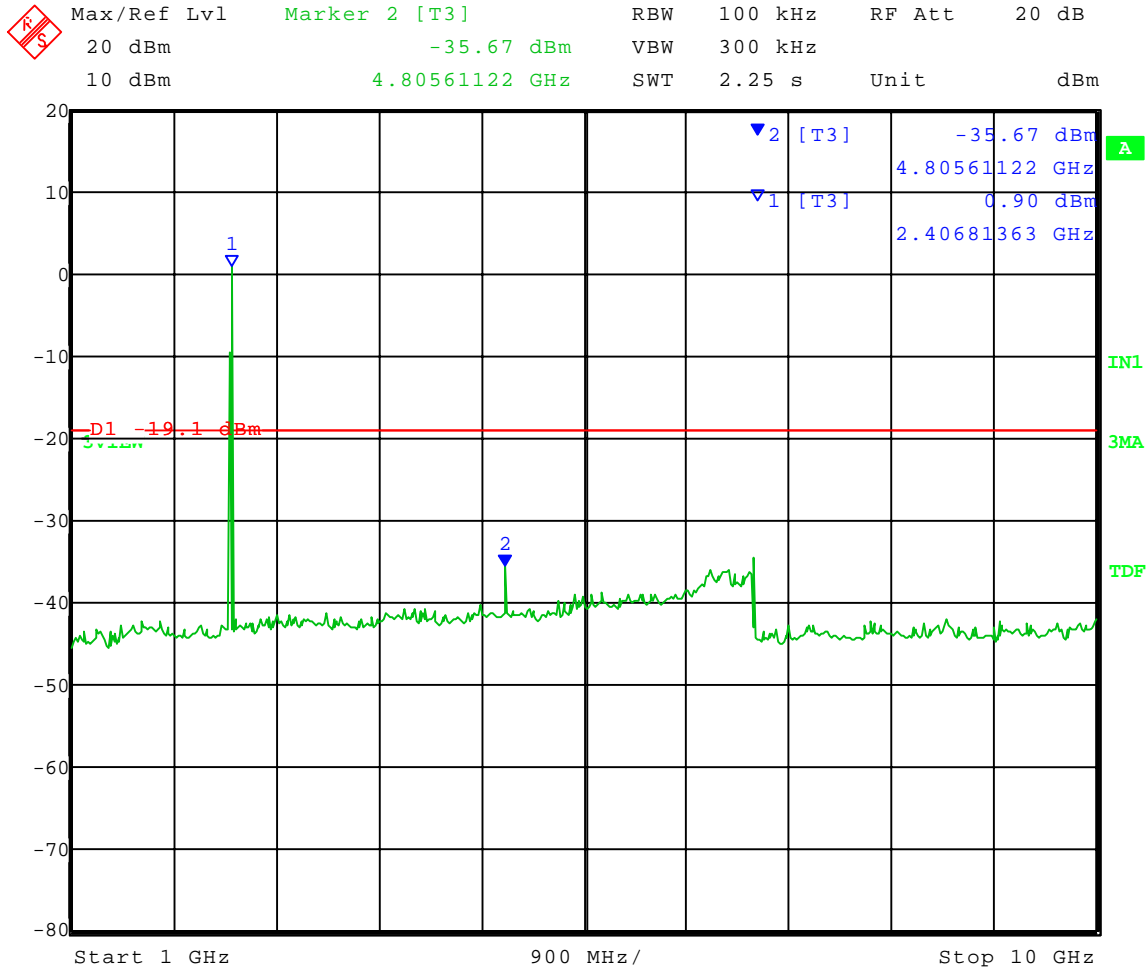
Company: RF Technologies, Inc.  
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APPENDIX A

Test Date: 01-07-2008  
 Company: RF Technologies  
 EUT: ST-520 Sensatec  
 Test: Spurious Emissions - Conducted  
 Operator: Craig B  
 Comment: Low Channel Transmit = 2.405 GHz  
 Frequency Range: 1 to 10 GHz  
 Limit = -19.10 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Date: 7.JAN.2008 13:07:17





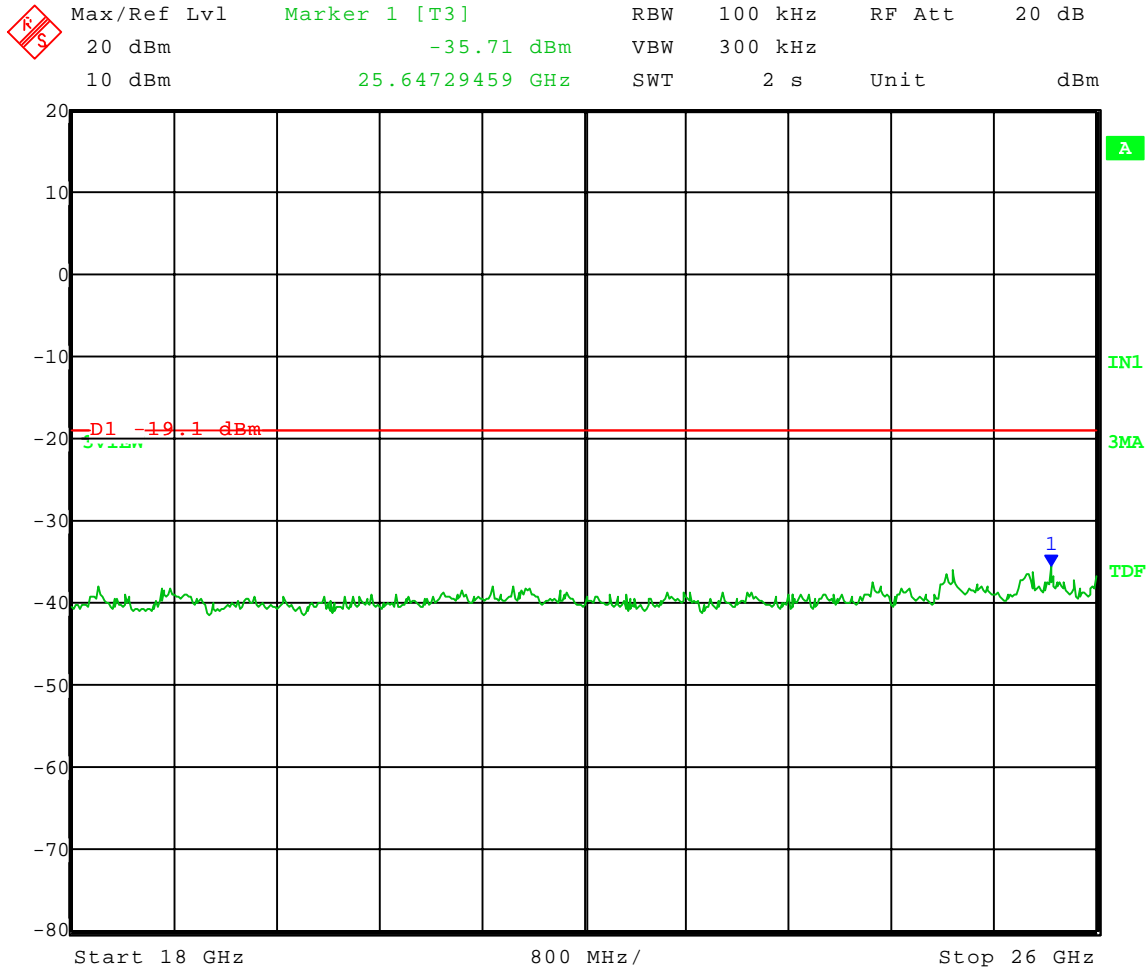
Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
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### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Spurious Emissions - Conducted  
Operator: Craig B  
Comment: Low Channel Transmit = 2.405 GHz  
Frequency Range: 18 to 26 GHz  
Limit = -19.10 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Date: 7.JAN.2008 13:10:32





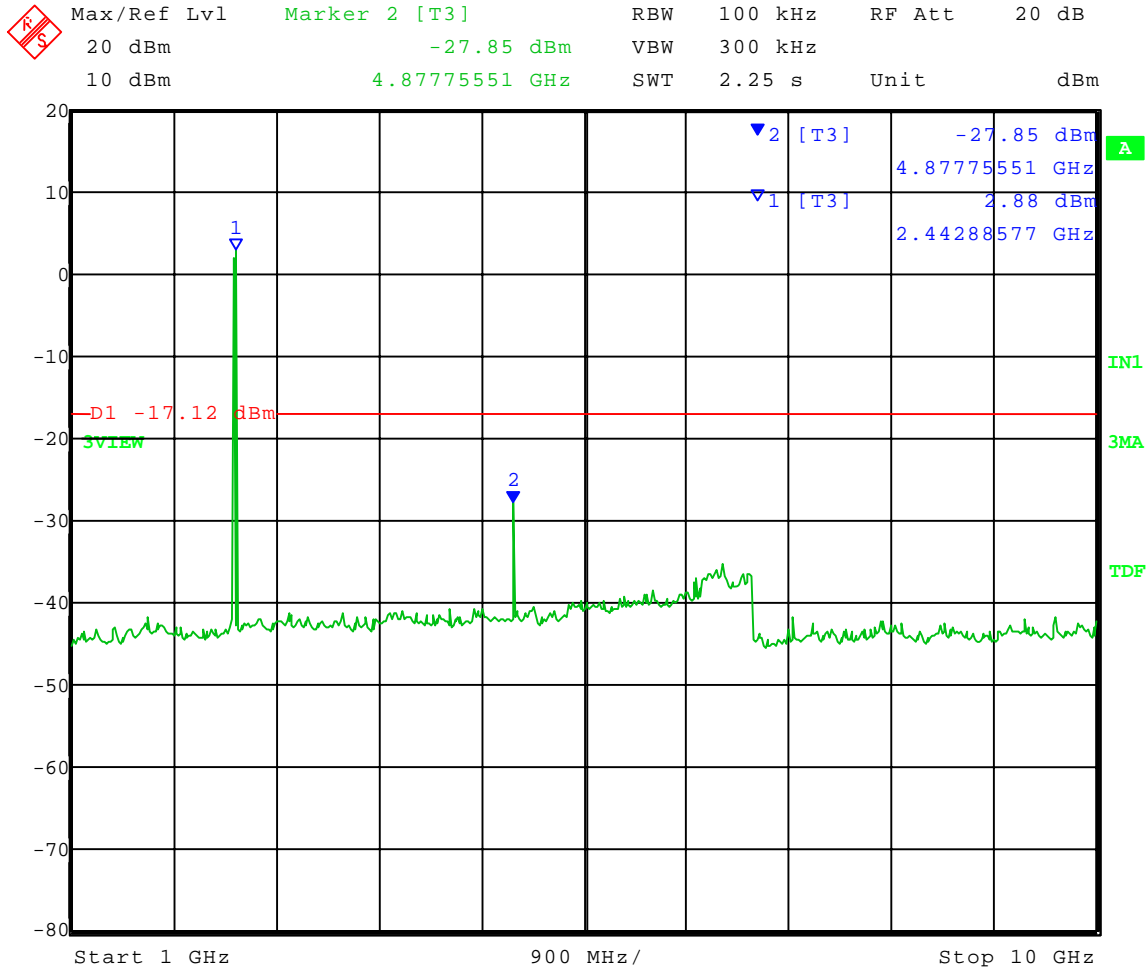
Company: RF Technologies, Inc.  
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APPENDIX A

Test Date: 01-07-2008  
 Company: RF Technologies  
 EUT: ST-520 Sensatec  
 Test: Spurious Emissions - Conducted  
 Operator: Craig B  
 Comment: Middle Channel Transmit = 2.440 GHz  
 Frequency Range: 1 to 10 GHz  
 Limit = -17.12 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Date: 7.JAN.2008 13:14:21







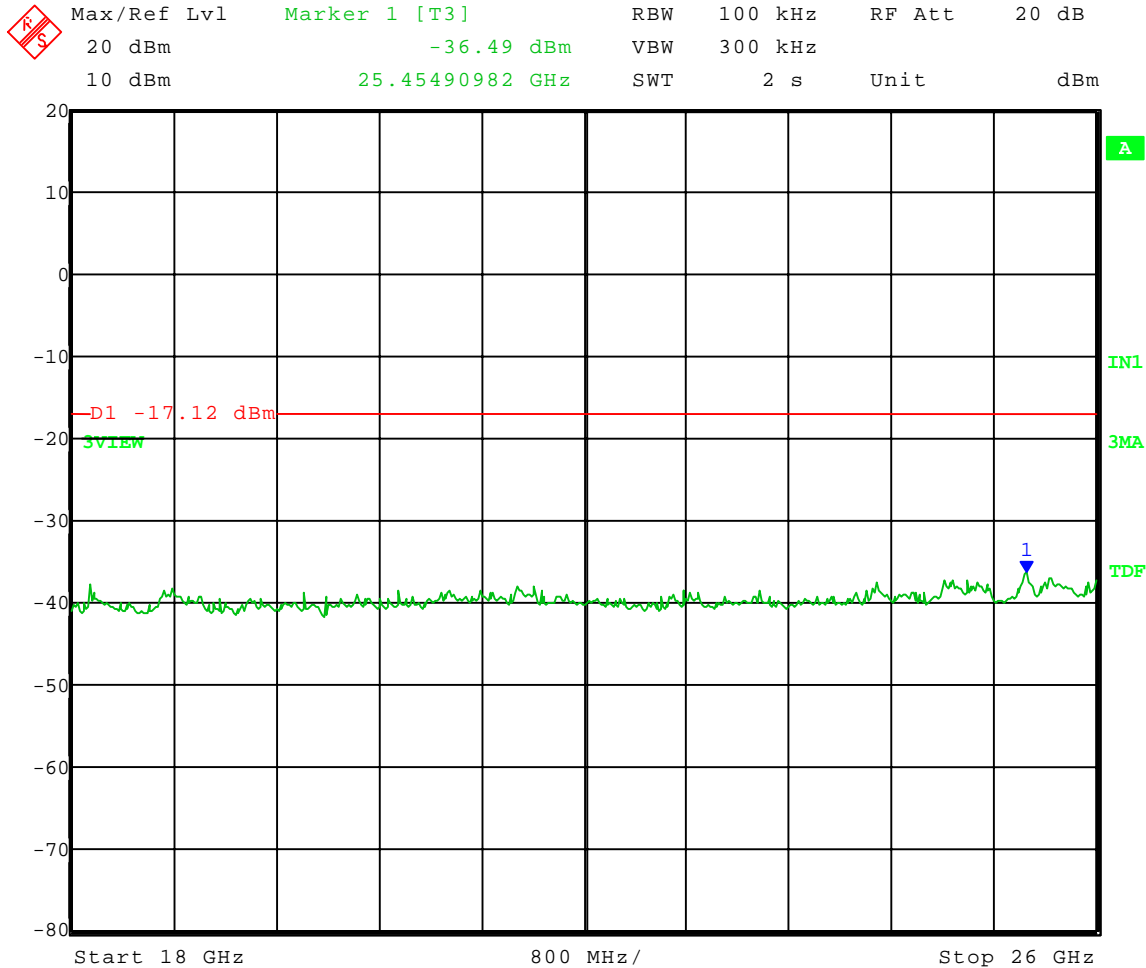
Company: RF Technologies, Inc.  
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### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Spurious Emissions - Conducted  
Operator: Craig B  
Comment: Middle Channel Transmit = 2.440 GHz  
Frequency Range: 18 to 26 GHz  
Limit = -17.12 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Date: 7.JAN.2008 13:17:35



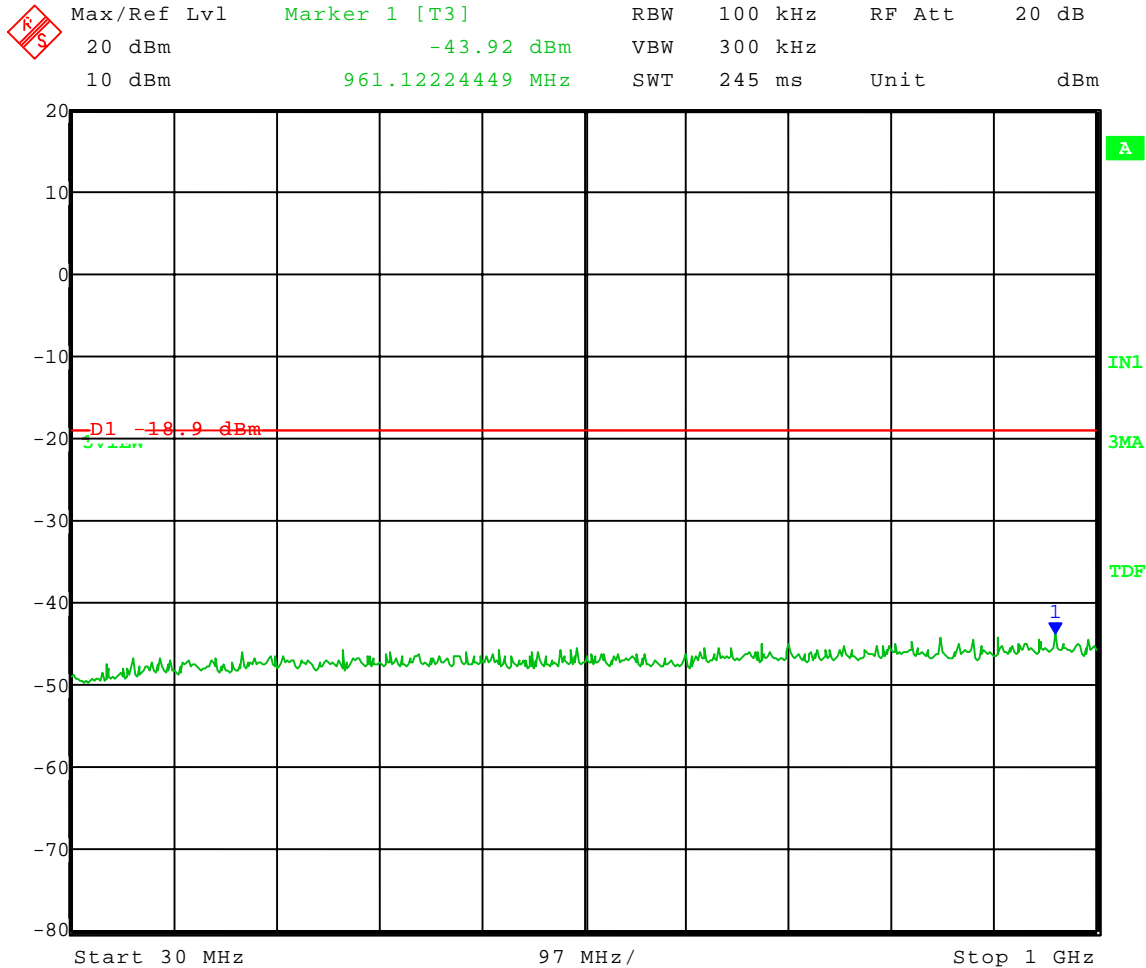
Company: RF Technologies, Inc.  
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### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Spurious Emissions - Conducted  
Operator: Craig B  
Comment: High Channel Transmit = 2.480 GHz  
Frequency Range: 30 to 1000 MHz  
Limit = -18.90 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Date: 7.JAN.2008 12:24:57



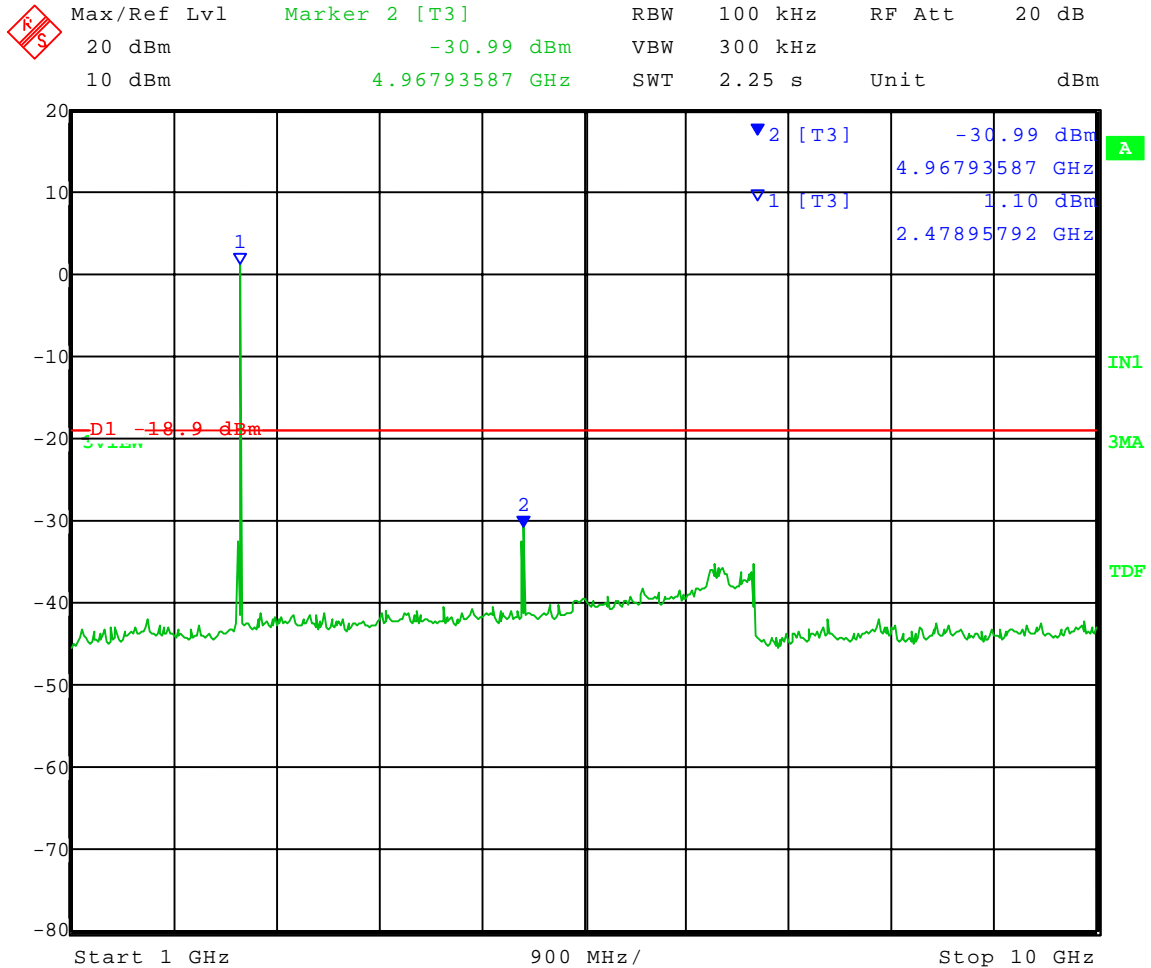
Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Spurious Emissions - Conducted  
Operator: Craig B  
Comment: High Channel Transmit = 2.480 GHz  
Frequency Range: 1 to 10 GHz  
Limit = -18.90 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Date: 7.JAN.2008 12:16:56



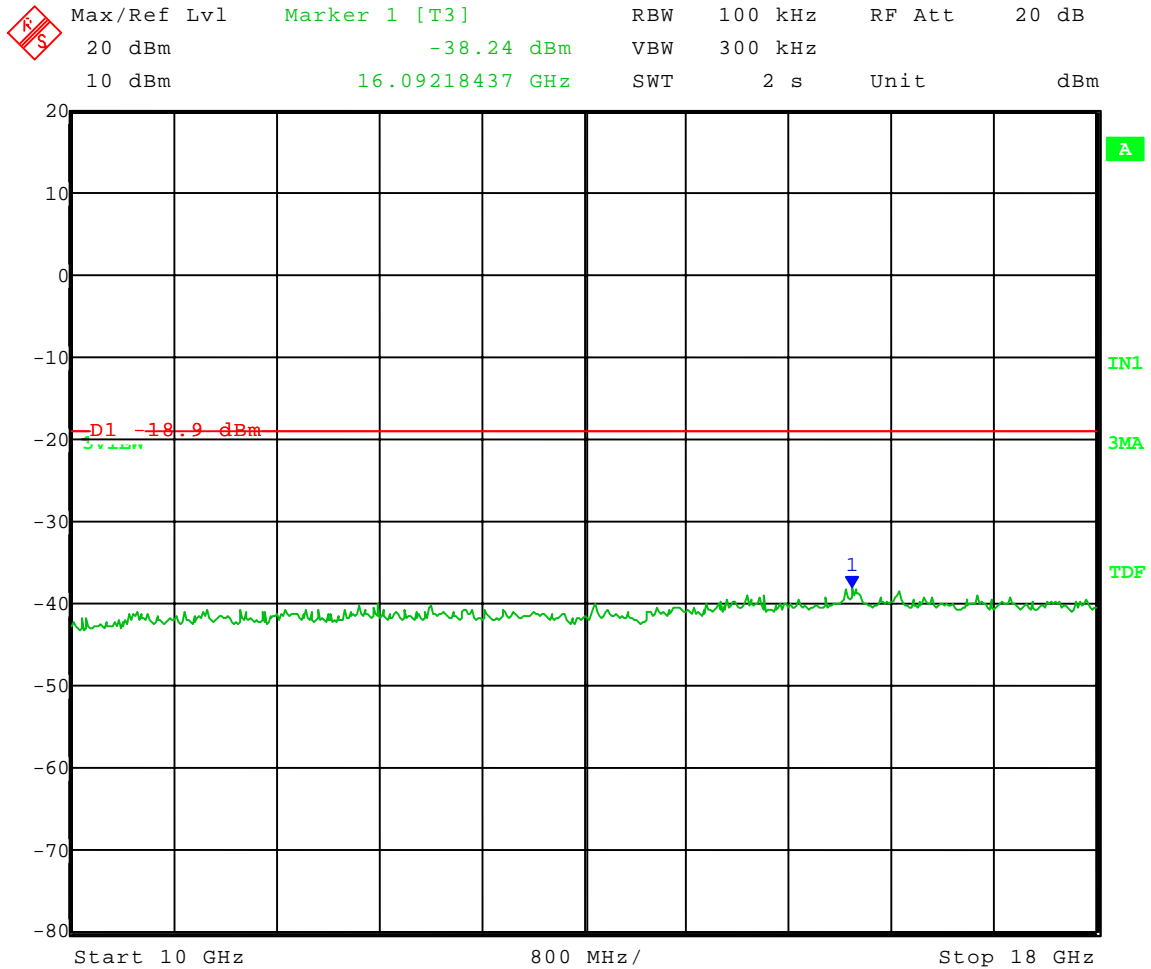
Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Spurious Emissions - Conducted  
Operator: Craig B  
Comment: High Channel Transmit = 2.480 GHz  
Frequency Range: 10 to 18 GHz  
Limit = -18.90 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Date: 7.JAN.2008 12:21:56



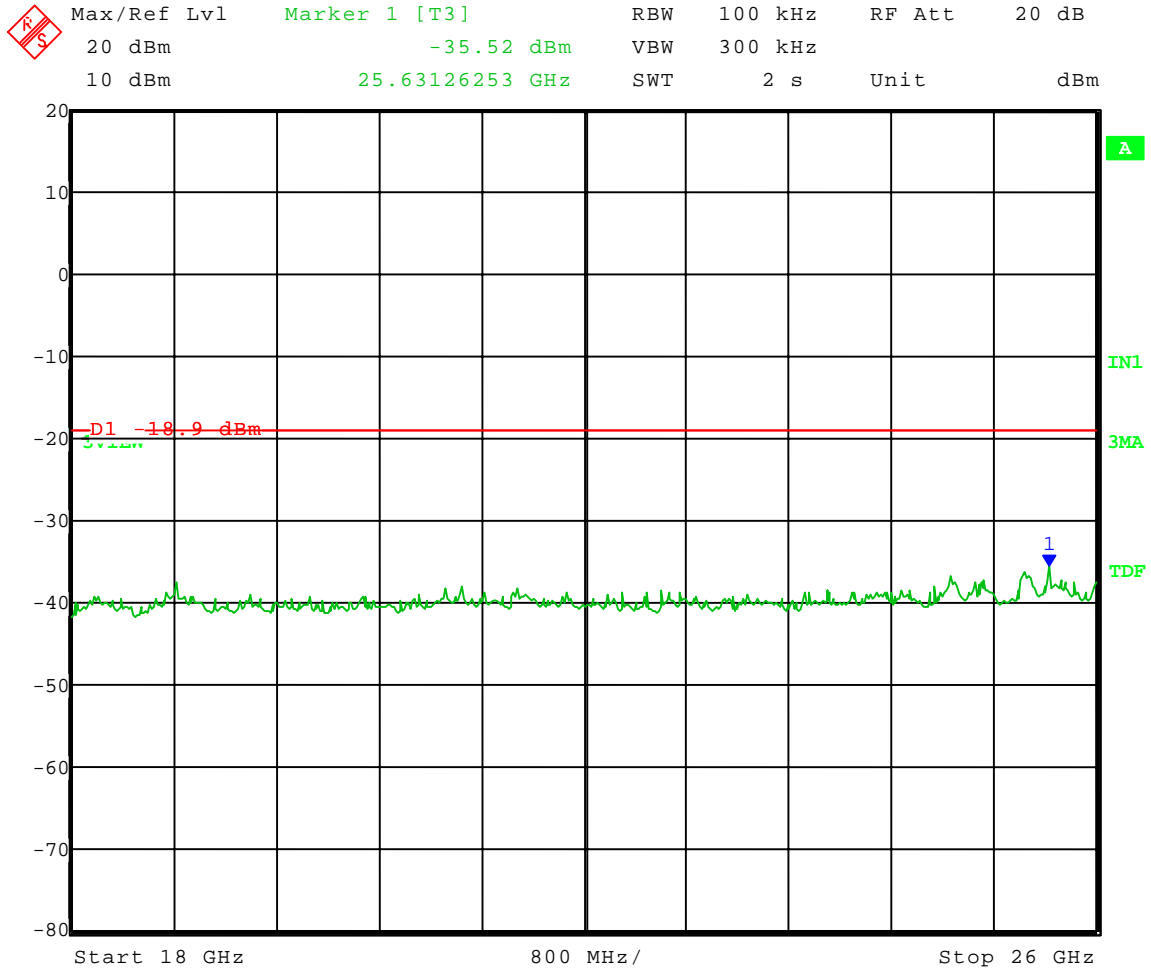
Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Spurious Emissions - Conducted  
Operator: Craig B  
Comment: High Channel Transmit = 2.480 GHz  
Frequency Range: 18 to 26 GHz  
Limit = -18.90 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Date: 7.JAN.2008 12:23:26

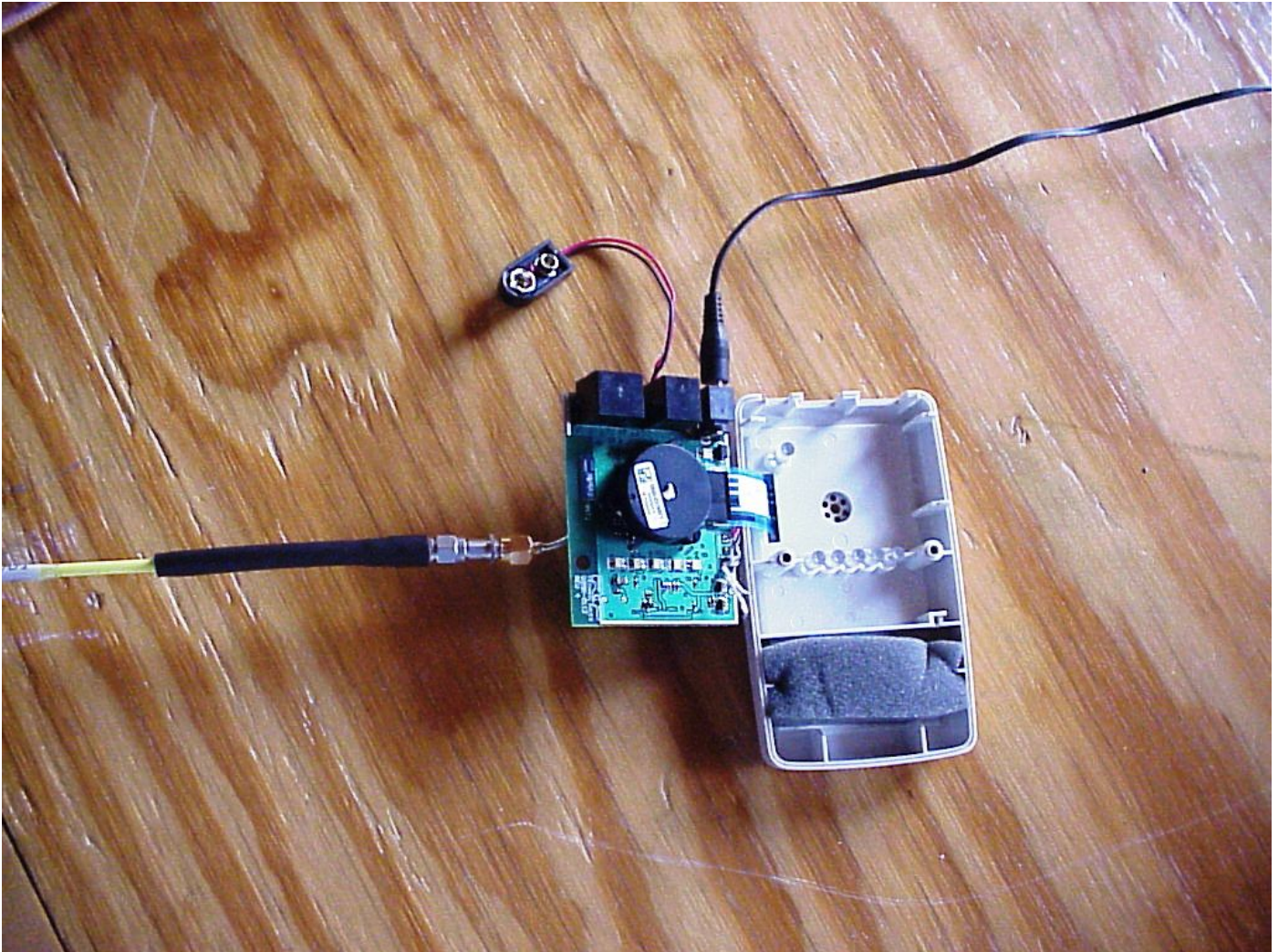


Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 3.0 CONDUCTED EMISSIONS (ANTENNA TERMINAL) PHOTOS TAKEN DURING TESTING





Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 4.0 RESTRICTED BANDS

As stated in Section 15.205a, the fundamental emission from the Motion Control Unit shall not fall within any of the bands listed below:

Frequency in MHz	Frequency in MHz	Frequency in MHz	Frequency in GHz
.0900 to .1100	162.0125 to 167.17	2310.0 to 2390	9.30 to 9.50
.4900 to .5100	167.7200 to 173.20	2483.5 to 2500	10.60 to 12.70
2.1735 to 2.1905	240.000 to 285.00	2655.0 to 2900	13.25 to 13.40
8.362 to 8.3660	322.200 to 335.40	3260.0 to 3267	14.47 to 14.50
13.36 to 13.410	399.900 to 410.00	3332.0 to 3339	15.35 to 16.20
25.50 to 25.670	608.000 to 614.00	3345.8 to 3358	17.70 to 21.40
37.50 to 38.250	960.000 to 1240.00	3600.0 to 4400	22.01 to 23.13
73.00 to 75.500	1300.000 to 1427.00	4500.0 to 5250	23.60 to 24.00
108.00 to 121.94	1435.000 to 1626.50	5350.0 to 5450	31.20 to 31.80
123.00 to 138.00	1660.000 to 1710.00	7250.0 to 7750	36.43 to 36.50
149.90 to 150.00	1718.800 to 1722.20	8025.0 to 8500	ABOVE 38.60
156.70 to 156.90	2200.000 to 2300.00	9000.0 to 9200	

#### NOTE:

The noise floor within the Restricted Bands for the EMC Receiver will typically lay 20 dB below the limit.

### 5.0 RESTRICTED BAND AND BAND EDGE COMPLIANCE

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the attenuation below the general limits specified in 15.209 is not required.

The field strength of any **radiated emissions** which fall within the restricted bands shall not exceed the general radiated emissions limits as stated Section 15.209.

**NOTE:** See the following page(s) for the graph(s) made showing compliance for Restricted Band and Band Edge Compliance:



1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

APPENDIX A

DATA AND GRAPH(S) TAKEN SHOWING

THE RESTRICTED BAND COMPLIANCE

PART 15.247(c)





Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Radiated Spurious Emissions in Restricted Bands - 30 MHz to 25 GHz  
 Tested at a 3 Meter Distance

**EUT:** ST-520 Sensatec  
**Manufacturer:** RF Technologies  
**Operating Condition:** 71 deg F; 31% R.H.  
**Test Site:** Site 3  
**Operator:** Craig B  
**Test Specification:** FCC Part 15.247(d) and FCC Part 15.205  
**Comment:** Unit cannot transmit continuously for testing.  
 Transmitting at maximum duty cycle allowed by test software (greater than maximum duty cycle during normal use).  
**Date:** 01/08/2008

- Notes:** (1) Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz  
 (2) Average measurements were taken with RBW = 1 MHz, VBW = 10 Hz  
 (3) All other restricted band emissions at least 20 dB under the limit.

**Channel 11:**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
4.81	Average	Vert	38.17	32.82	-32.2	38.79	---	38.79	54	15.21	Res. Band
4.81	Max Peak	Vert	57.18	32.82	-32.2	57.80	---	57.80	74	16.20	Res. Band
4.81	Average	Horz	38.03	32.82	-32.2	38.65	---	38.65	54	15.35	Res. Band
4.81	Max Peak	Horz	56.71	32.82	-32.2	57.33	---	57.33	74	16.67	Res. Band



Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Radiated Spurious Emissions in Restricted Bands - 30 MHz to 25 GHz  
 Tested at a 3 Meter Distance

**EUT:** ST-520 Sensatec  
**Manufacturer:** RF Technologies  
**Operating Condition:** 71 deg F; 31% R.H.  
**Test Site:** Site 3  
**Operator:** Craig B  
**Test Specification:** FCC Part 15.247(d) and FCC Part 15.205  
**Comment:** Unit cannot transmit continuously for testing.  
 Transmitting at maximum duty cycle allowed by test software (greater than maximum duty cycle during normal use).  
**Date:** 01/08/2008

- Notes:** (1) Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz  
 (2) Average measurements were taken with RBW = 1 MHz, VBW = 10 Hz  
 (3) All other restricted band emissions at least 20 dB under the limit.

**Channel 18:**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
4.88	Average	Vert	41.46	32.96	-32.1	42.32	---	42.32	54	11.68	Res. Band
4.88	Max Peak	Vert	70.01	32.96	-32.1	70.87	---	70.87	74	3.13	Res. Band
4.88	Average	Horz	39.68	32.96	-32.1	40.54	---	40.54	54	13.46	Res. Band
4.88	Max Peak	Horz	63.91	32.96	-32.1	64.77	---	64.77	74	9.23	Res. Band
7.32	Average	Vert	39.81	35.97	-30.6	45.18	---	45.18	54	8.82	Res. Band
7.32	Max Peak	Vert	61.24	35.97	-30.6	66.61	---	66.61	74	7.39	Res. Band
7.32	Average	Horz	39.96	35.97	-30.6	45.33	---	45.33	54	8.67	Res. Band
7.32	Max Peak	Horz	59.74	35.97	-30.6	65.11	---	65.11	74	8.89	Res. Band



Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

# Radiated Spurious Emissions in Restricted Bands - 30 MHz to 25 GHz Tested at a 3 Meter Distance

**EUT:** ST-520 Sensatec  
**Manufacturer:** RF Technologies  
**Operating Condition:** 71 deg F; 31% R.H.  
**Test Site:** Site 3  
**Operator:** Craig B  
**Test Specification:** FCC Part 15.247(d) and FCC Part 15.205  
**Comment:** Unit cannot transmit continuously for testing.  
 Transmitting at maximum duty cycle allowed by test software (greater than maximum duty cycle during normal use).  
**Date:** 01/08/2008

- Notes:** (1) Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz  
 (2) Average measurements were taken with RBW = 1 MHz, VBW = 10 Hz  
 (3) All other restricted band emissions at least 20 dB under the limit.

### Channel 26:

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
4.96	Average	Vert	40.91	33.12	-32.0	42.03	---	42.03	54	11.97	Res. Band
4.96	Max Peak	Vert	66.85	33.12	-32.0	67.97	---	67.97	74	6.03	Res. Band
4.96	Average	Horz	40.93	33.12	-32.0	42.05	---	42.05	54	11.95	Res. Band
4.96	Max Peak	Horz	66.78	33.12	-32.0	67.90	---	67.90	74	6.10	Res. Band
7.44	Average	Vert	37.91	36.26	-30.1	44.07	---	44.07	54	9.93	Res. Band
7.44	Max Peak	Vert	55.57	36.26	-30.1	61.73	---	61.73	74	12.27	Res. Band
7.44	Average	Horz	38.31	36.26	-30.1	44.47	---	44.47	54	9.53	Res. Band
7.44	Max Peak	Horz	57.05	36.26	-30.1	63.21	---	63.21	74	10.79	Res. Band



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Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

APPENDIX A

DATA AND GRAPH(S) TAKEN SHOWING  
THE BAND EDGE CONDUCTED COMPLIANCE  
  
PART 15.247(c)



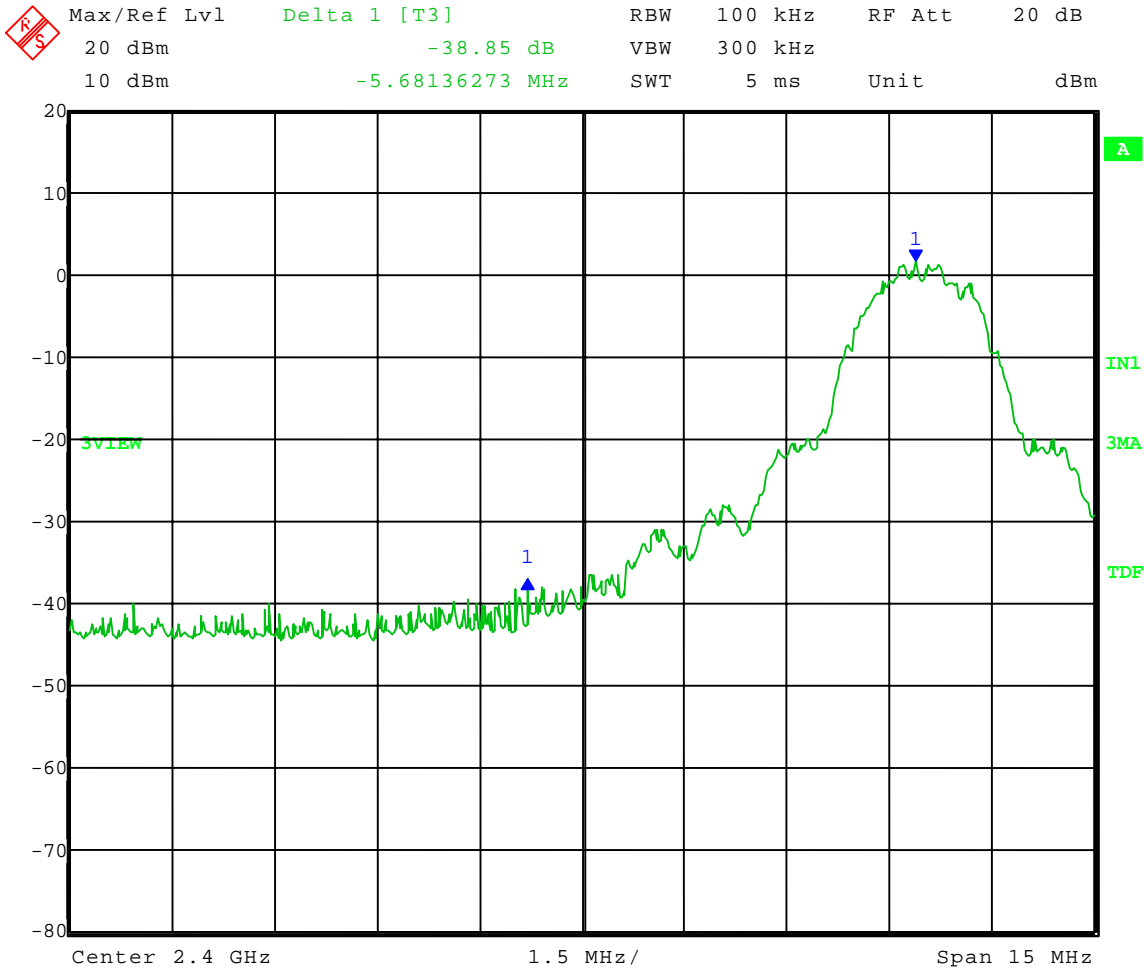
Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Low Band-Edge Compliance - Conducted  
Operator: Craig B  
Comment: **Low Channel: Frequency – 2.405 GHz**

Band-Edge Frequency = 2.4 GHz  
Band-Edge > 20 dB Below Peak In-Band Emission



Date: 7.JAN.2008 12:11:35



Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

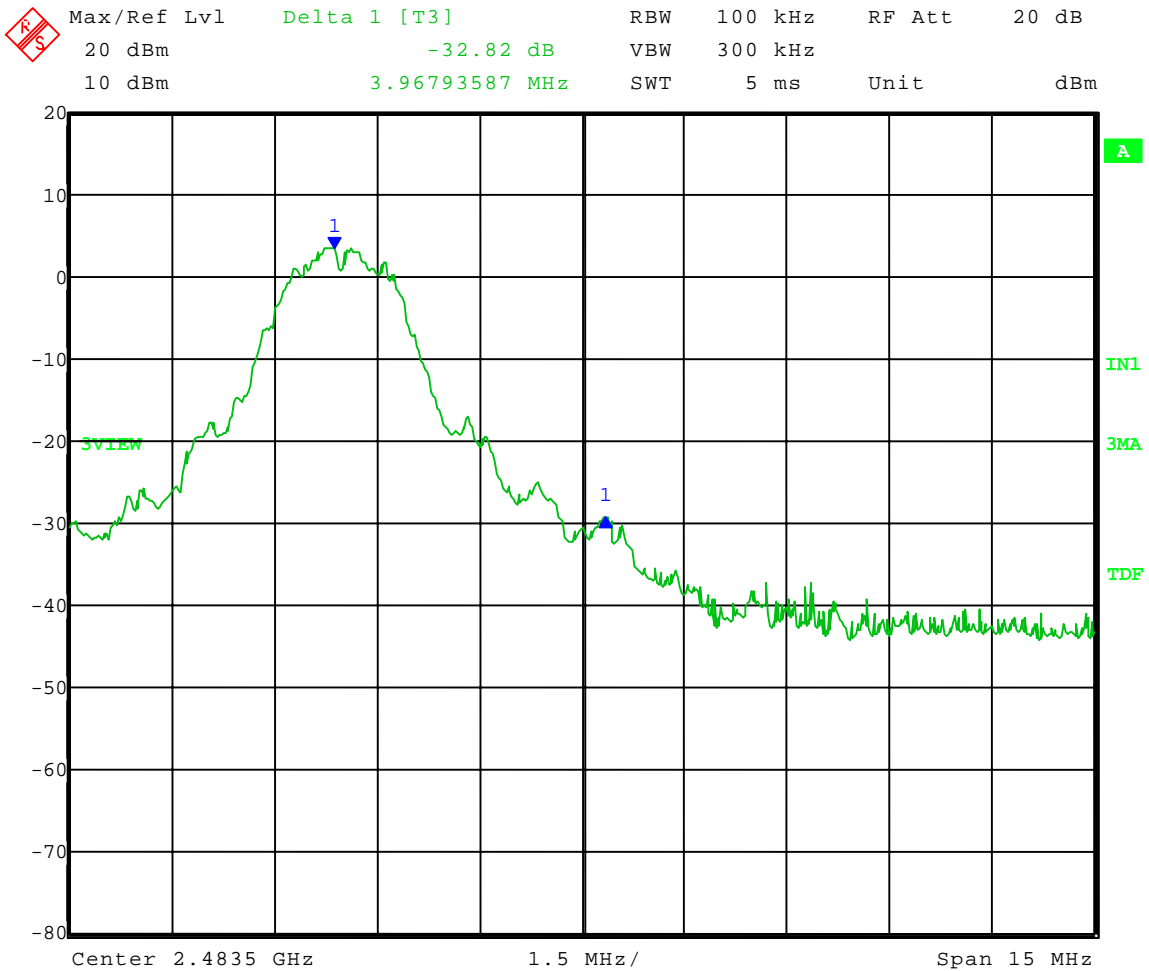
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 01-07-2008  
 Company: RF Technologies  
 EUT: ST-520 Sensatec  
 Test: Upper Band-Edge Compliance - Conducted  
 Operator: Craig B

Comment: **High Channel: Frequency - 2.480 GHz**

Band-Edge Frequency = 2.4835 GHz  
 Band-Edge > 20 dB Below Peak In-Band Emission



Date: 7.JAN.2008 12:14:00



1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

APPENDIX A

DATA AND GRAPH(S) TAKEN SHOWING

THE UPPER BAND EDGE

PART 15.247(c)

BAND EDGE FALLS ON THE RESTRICTED

FREQUENCY BAND



Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### Radiated Upper Band-Edge measurement

Test Procedure: "Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

The EUT was investigated at the low and high channels of operation to determine band-edge compliance. Because the upper band-edge coincides with a restricted band, bandedge compliance for the upper band-edge was determined using the radiated mark-delta method. The radiated field strength of the fundamental emission was first determined and then the mark-delta method was used to determine the field strength of the band-edge emissions. The lower band-edge compliance was determined using the marker-delta method in which the radio frequency power that is produced by the EUT is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power.

#### Upper Band-Edge Marker Delta Method

Frequency (MHz)	Antenna Polarity (H/V)	Fundamental Field Strength (dB $\mu$ V/m)	Duty Cycle Correction (dB)	Delta-Marker (dB)	Band-Edge Field Strength (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
2480 (Peak)	V	101.92	N/A	-32.05	69.87	74	4.13
2480 (Avg)	V	69.13	---	-32.05	37.08	54	16.92



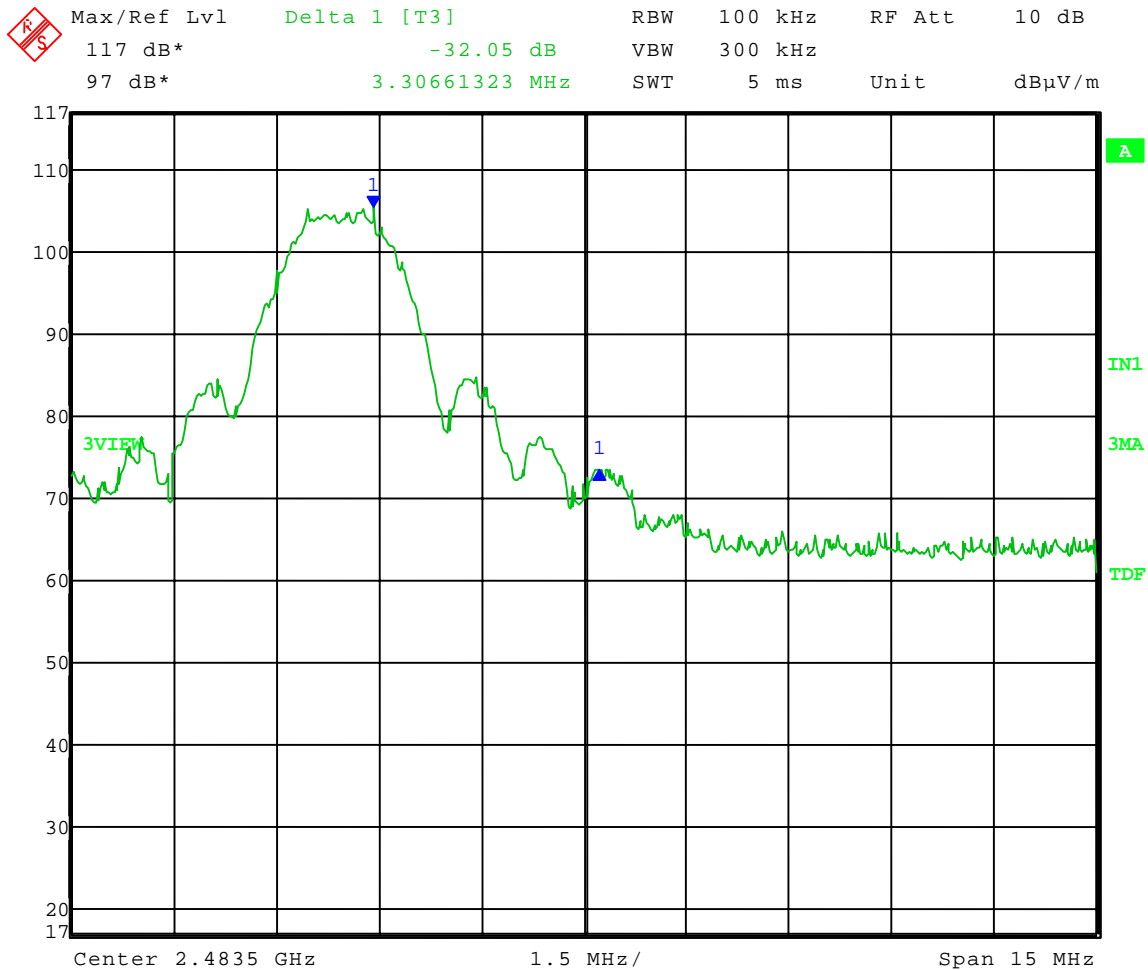


Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-16-2008  
Company: RF Technologies  
EUT: ST-520 Sensetec  
Test: Upper Band-Edge Radiated – Marker Delta Method  
Operator: Craig B  
Comment: High Channel: Frequency – 2.480 GHz



Date: 16.JAN.2008 13:16:24



Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 6.0 FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSION MEASUREMENTS

The radiated measurements made at D.L.S. Electronic Systems, Inc., for the Motion Control Unit, Model Number: 0800-0318, are shown in tabulated and graph form. Preliminary radiation measurements were performed at a 3 meter test distance with the limits adjusted linearly when required. The frequency range from 30 MHz to over 960 MHz, depending upon the fundamental frequency as stated in Part 15.33a, was automatically scanned and plotted at various angles.

Measurements for the Motion Control Unit were made up to 25000 MHz, in accordance with Section 15.33a for Intentional Radiators with a fundamental frequency of 2405 MHz - 2480 MHz. For intentional radiators, the frequency range to be investigated is determined by the lowest radio frequency generated by the device without going below 30 MHz, up to at least the tenth harmonic of the highest fundamental frequency or 10 GHz, whichever is lower. At those frequencies where significant signals were detected, measurements were made over the entire frequency range specified in FCC Part 15, Subpart C, Section 15.247 at the open field test site, located at Genoa City, Wisconsin, FCC file number **31040/SIT**. When required, limits were extrapolated using a linear extrapolation.

All signals in the frequency range of 30 MHz to 2000 MHz were measured with a Biconical Antenna or tuned dipoles and from 200 MHz to 1000 MHz, a Log Periodic or Tuned Dipoles were used. From 1000 MHz to 25 GHz Horn Antennas were used. During the test the equipment was rotated and the antenna was raised and lowered from 1 meter to 4 meters to find the maximum level of emissions. In order to find maximum emissions, the cables were moved through all the positions the equipment would be expected to experience in the field. The EUT, peripheral equipment and cables were configured to meet the conditions in ANSI C63.4-2003, Clauses 6 & 8. Tests were made with the receive antenna(s) in both the horizontal and vertical planes of polarization. In each case, the table was rotated to find the maximum emissions.



Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 6.0 FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSION MEASUREMENTS (CON'T)

As stated in Section 15.247(b) the allowed maximum peak output power of the transmitter shall not exceed 1 Watt. In any 100 kHz bandwidth outside these frequency bands (the power that is produced by the modulation products of the spreading sequence), the information sequence and the carrier frequency shall be either at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Attenuation below the general limits specified in 15.209 is not required.

Field strength limits are at a distance of 3 meters. The emission limits shown are based on measurement instrumentation employing an average detector.

Emissions radiated outside of the specified frequency bands, except for harmonics are attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Preliminary radiated emission measurements were performed at a 3 meter test distance. The frequency range from 30 MHz to 1000 MHz was automatically scanned and plotted at various angles.

#### **NOTE:**

All radiated emissions measurements were made at a test room temperature of **71°F** at **31%** relative humidity.



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Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

APPENDIX A

RADIATED DATA AND GRAPH(S) TAKEN FOR  
FIELD STRENGTH OF FUNDAMENTAL AND  
SPURIOUS EMISSION MEASUREMENTS

PART 15.247

30 MHz – 1000 MHz

**FCC Part 15 Class B**

**Electric Field Strength**

EUT: ST-520 Sensatec  
Manufacturer: RF Technologies, Inc.  
Operating Condition: 71 deg. F; 42% R.H.  
Test Site: DLS O.F. Site 3  
Operator: Craig B  
Test Specification:  
Comment: Tx and Rx; Low, Mid, High channels  
Date: 01-08-2008

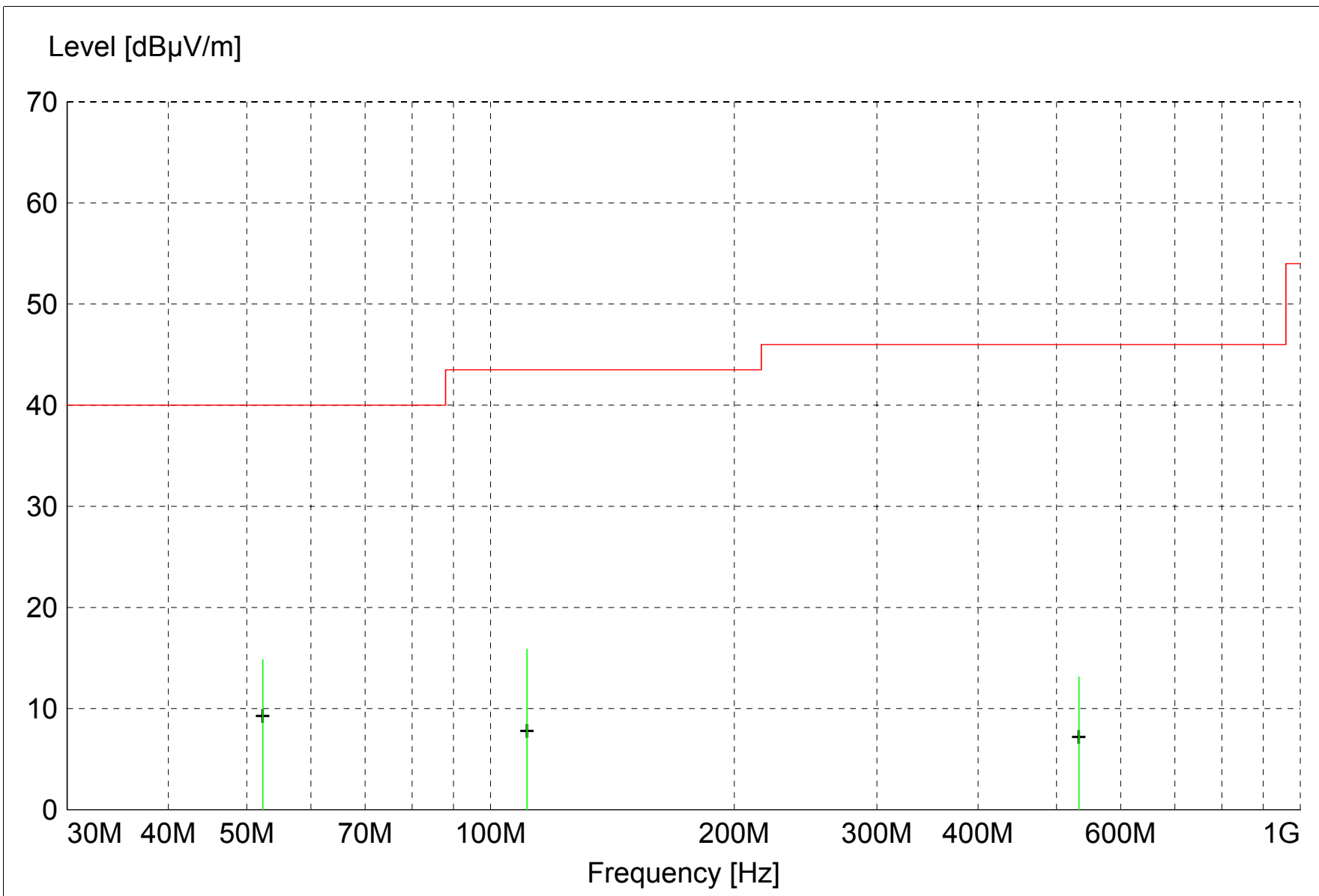
**TEXT: "Site 3 MidV 3M"**

Short Description: Test Set-up Vert30-1000MHz  
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/005

Antennas ---  
Biconical -- EMCO 3104C SN: 9701-4785  
Log Periodic -- EMCO 3146 SN: 9702-4895

Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/005

TEST SET-UP: EUT Measured at 3 Meters with VERTICAL Antenna Polarization



||||| MES A1704\_F1V\_Quasi-Peak  
 + + + MES A1704\_F1V\_Peak\_List  
 — LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

**MEASUREMENT RESULT: "A1704\_F1V\_Final"**

1/8/2008 9:23AM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dB $\mu$ V	Factor	Loss	Level	dB $\mu$ V/m	dB	Ant.	Angle	Detector	
		dB $\mu$ V/m	dB	dB $\mu$ V/m	dB $\mu$ V/m		m	deg		
52.330000	28.27	10.88	-24.3	14.8	40.0	25.2	1.00	270	QUASI-PEAK	Noise Floor
110.920000	27.38	11.96	-23.5	15.9	43.5	27.6	1.00	180	QUASI-PEAK	Noise Floor
532.840000	16.14	17.77	-20.8	13.1	46.0	32.9	1.00	0	QUASI-PEAK	Noise Floor

**FCC Part 15 Class B**

**Electric Field Strength**

EUT: ST-520 Sensatec  
Manufacturer: RF Technologies, Inc.  
Operating Condition: 71 deg. F; 42% R.H.  
Test Site: DLS O.F. Site 3  
Operator: Craig B  
Test Specification:  
Comment: Tx and Rx; Low, Mid, High channels  
Date: 01-08-2008

**TEXT: "Site 3 MidH 3M"**

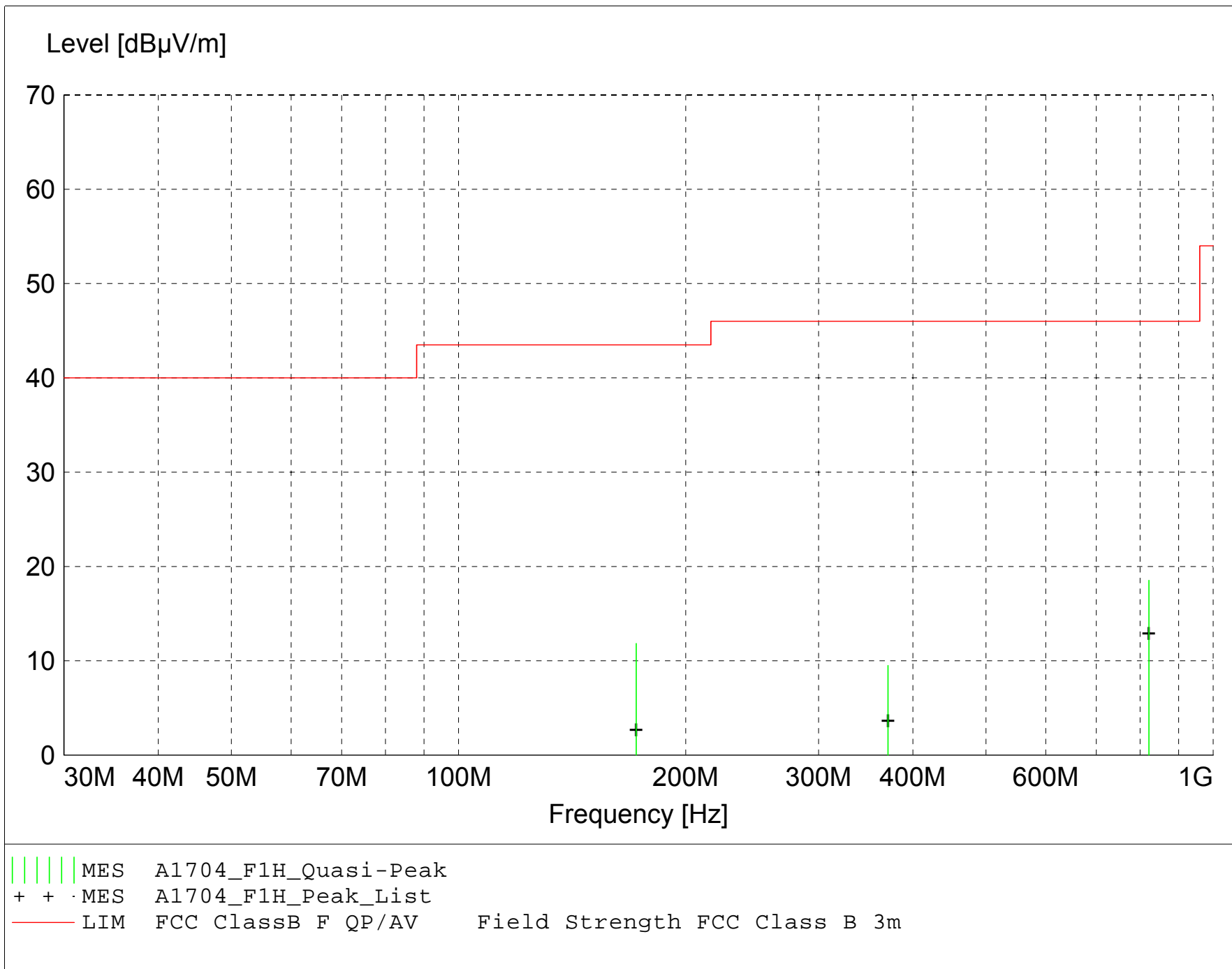
Short Description: Test Set-up Horz30-1000MHz  
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/005

Antennas ---  
Biconical -- EMCO 3104C SN: 9701-4785  
Log Periodic -- EMCO 3146 SN: 9702-4895

Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/005

TEST SET-UP: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization





**MEASUREMENT RESULT: "A1704\_F1H\_Final"**

1/8/2008 9:30AM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dB $\mu$ V	Factor	Loss	Level	dB $\mu$ V/m	dB	Ant.	Angle	Detector	
		dB $\mu$ V/m	dB	dB $\mu$ V/m			m	deg		
821.780000	16.17	21.43	-19.1	18.5	46.0	27.5	2.00	180	QUASI-PEAK	Noise Floor
171.985000	20.32	14.51	-23.0	11.8	43.5	31.7	2.50	225	QUASI-PEAK	Noise Floor
370.820000	16.30	14.54	-21.3	9.5	46.0	36.5	2.50	315	QUASI-PEAK	Noise Floor



1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

APPENDIX A

RADIATED DATA AND GRAPH(S) TAKEN FOR  
E.I.R.P. OF FUNDAMENTAL EMISSION  
MEASUREMENTS

PART 15.247

SUBSTITUTION METHOD



Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

DLS Electronic Systems, Inc.

Company: RF Technologies  
 Operator: Craig B  
 Date of test: 01-07-2008  
 Temperature: 71 deg. F  
 Humidity: 31% R.H.

### EIRP - Substitution Method

Model: <b>ST-520 Sensatec</b>								
Channel: <b>11</b>								
Frequency and Polarization (MHz)	Max. Field Strength of EUT @ 3 meters (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)	Strength of emission [EIRP] (mW)
2405 vertical	104.30	-1.46	1.85	9.59	6.28	30.00	23.72	4.25
2405 horizontal	98.93	-8.40	1.85	9.59	-0.66	30.00	30.66	0.86

EIRP = Signal generator output - cable loss + antenna gain

ERP<sub>(ref. to ½λ dipole)</sub> = Signal generator output - cable loss + antenna gain - 2.15



Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

DLS Electronic Systems, Inc.

Company: RF Technologies  
 Operator: Craig B  
 Date of test: 01-07-2008  
 Temperature: 71 deg. F  
 Humidity: 31% R.H.

### EIRP - Substitution Method

Model: <b>ST-520 Sensatec</b>								
Channel: <b>18</b>								
Frequency and Polarization (MHz)	Max. Field Strength of EUT @ 3 meters (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)	Strength of emission [EIRP] (mW)
2440 vertical	104.60	-0.44	1.86	9.63	7.33	30.00	22.67	5.41
2440 horizontal	101.51	-5.60	1.86	9.63	2.17	30.00	27.83	1.65

EIRP = Signal generator output - cable loss + antenna gain

ERP<sub>(ref. to 1/2λ dipole)</sub> = Signal generator output - cable loss + antenna gain - 2.15



Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

DLS Electronic Systems, Inc.

Company: RF Technologies  
 Operator: Craig B  
 Date of test: 01-07-2008  
 Temperature: 71 deg. F  
 Humidity: 31% R.H.

### EIRP - Substitution Method

Model: <b>ST-520 Sensatec</b>								
Channel: <b>26</b>								
Frequency and Polarization (MHz)	Max. Field Strength of EUT @ 3 meters (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)	Strength of emission [EIRP] (mW)
2480 vertical	102.62	-2.86	1.86	9.68	4.96	30.00	25.04	3.13
2480 horizontal	100.20	-6.73	1.86	9.68	1.09	30.00	28.91	1.29

EIRP = Signal generator output - cable loss + antenna gain

ERP<sub>(ref. to ½λ dipole)</sub> = Signal generator output - cable loss + antenna gain - 2.15



1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

## APPENDIX A

# 6 dB BANDWIDTH GRAPHS

## PART 15.247



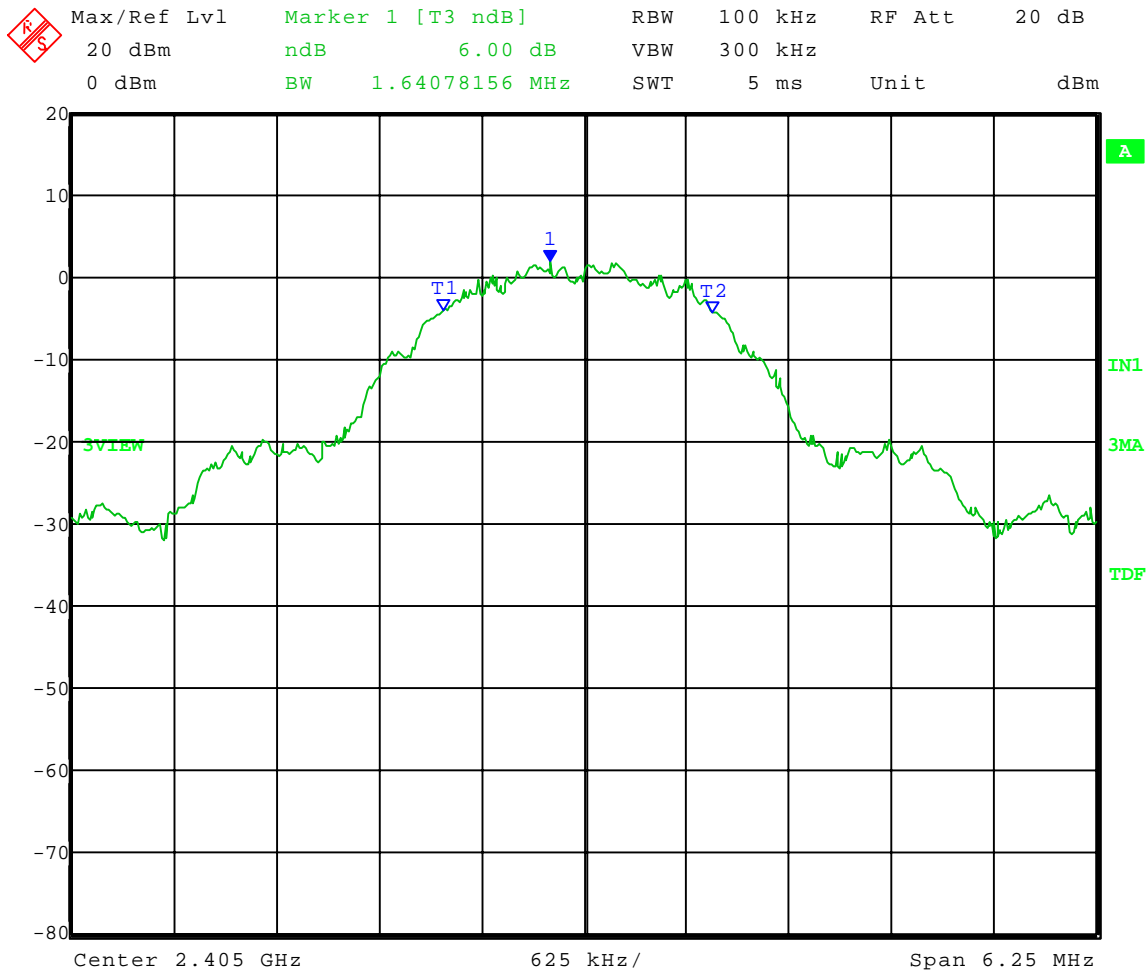
Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 01-16-2008  
 Company: RF Technologies  
 EUT: ST-520 Sensatec  
 Test: 6 dB Bandwidth - Conducted  
 Operator: Craig B  
 Comment: **Low Channel: Frequency – 2.405 GHz**

6 dB Bandwidth = 1.641 MHz



Date: 16.JAN.2008 12:59:08





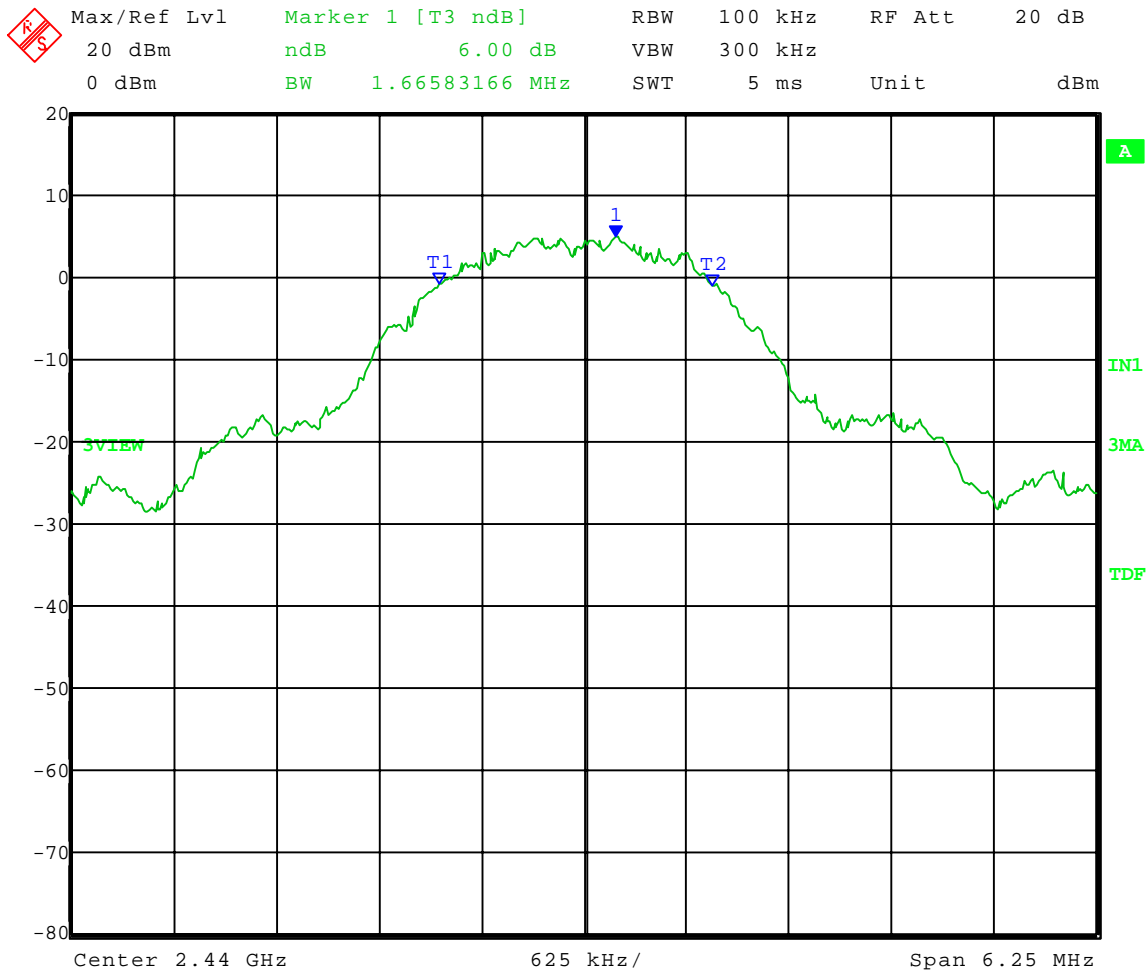
Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-16-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: 6 dB Bandwidth - Conducted  
Operator: Craig B  
Comment: Middle Channel: Frequency - 2.440 GHz

6 dB Bandwidth = 1.666 MHz



Date: 16.JAN.2008 13:01:46



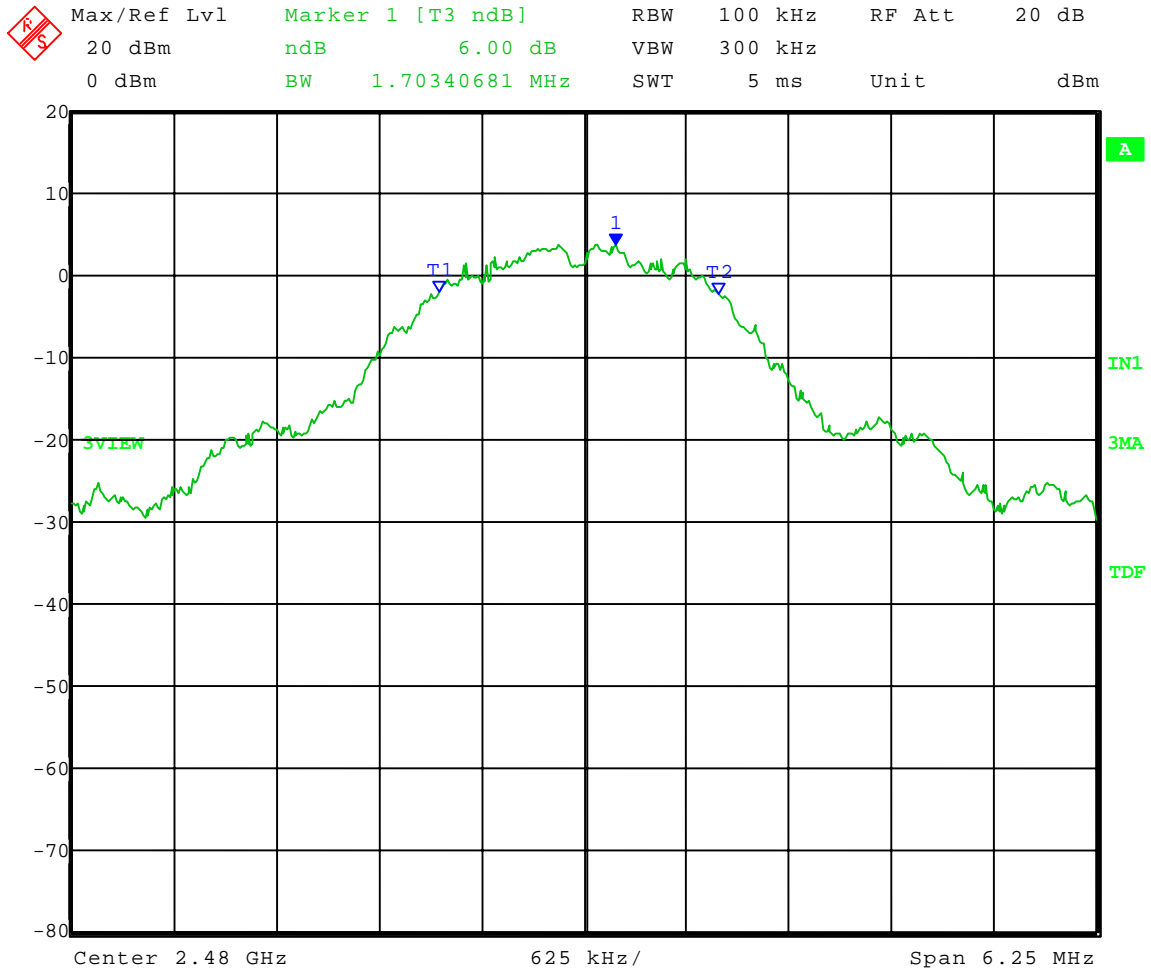
Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-16-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: 6 dB Bandwidth - Conducted  
Operator: Craig B  
Comment: **High Channel: Frequency - 2.480 GHz**

6 dB Bandwidth = 1.703 MHz



Date: 16.JAN.2008 13:03:51



1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

## APPENDIX A

# DUTY CYCLE OF NORMAL UNIT GRAPH(S)

## PART 15.247

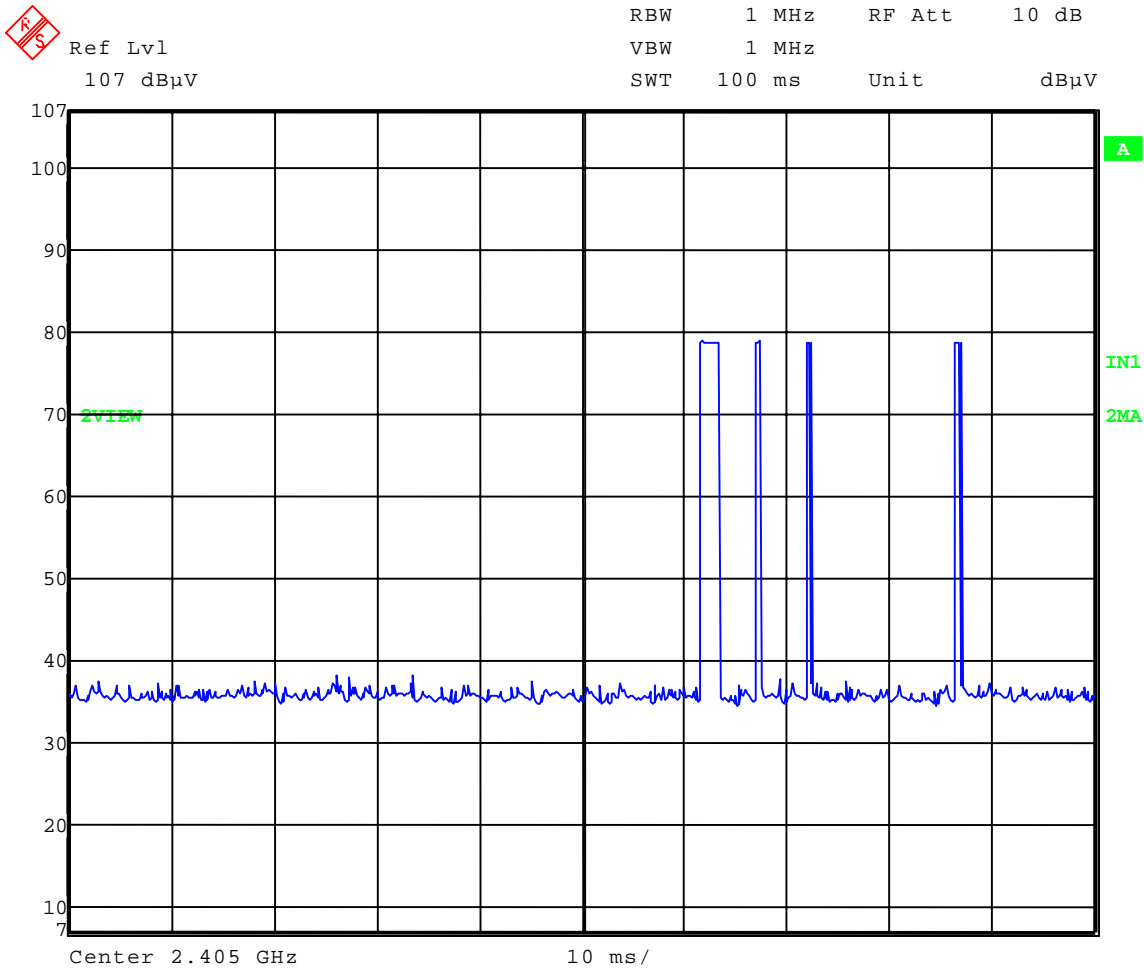


Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Duty Cycle – maximum duty cycle during normal operation  
Operator: Craig B  
Comment: Small Pulse – 1 x 440.882  $\mu$ s = 0.440882 ms  
Medium Pulse – 2 x 681.363  $\mu$ s = 1.362726 ms  
Large Pulse – 1 x 2.084168 ms = 2.084168 ms  
Total on Time = 3.89 ms during 100 ms Sweep  
20 log (3.89/100) = 28.2  
**Duty Cycle Correction Factor = 28.2 dB**



Date: 7.JAN.2008 14:50:38

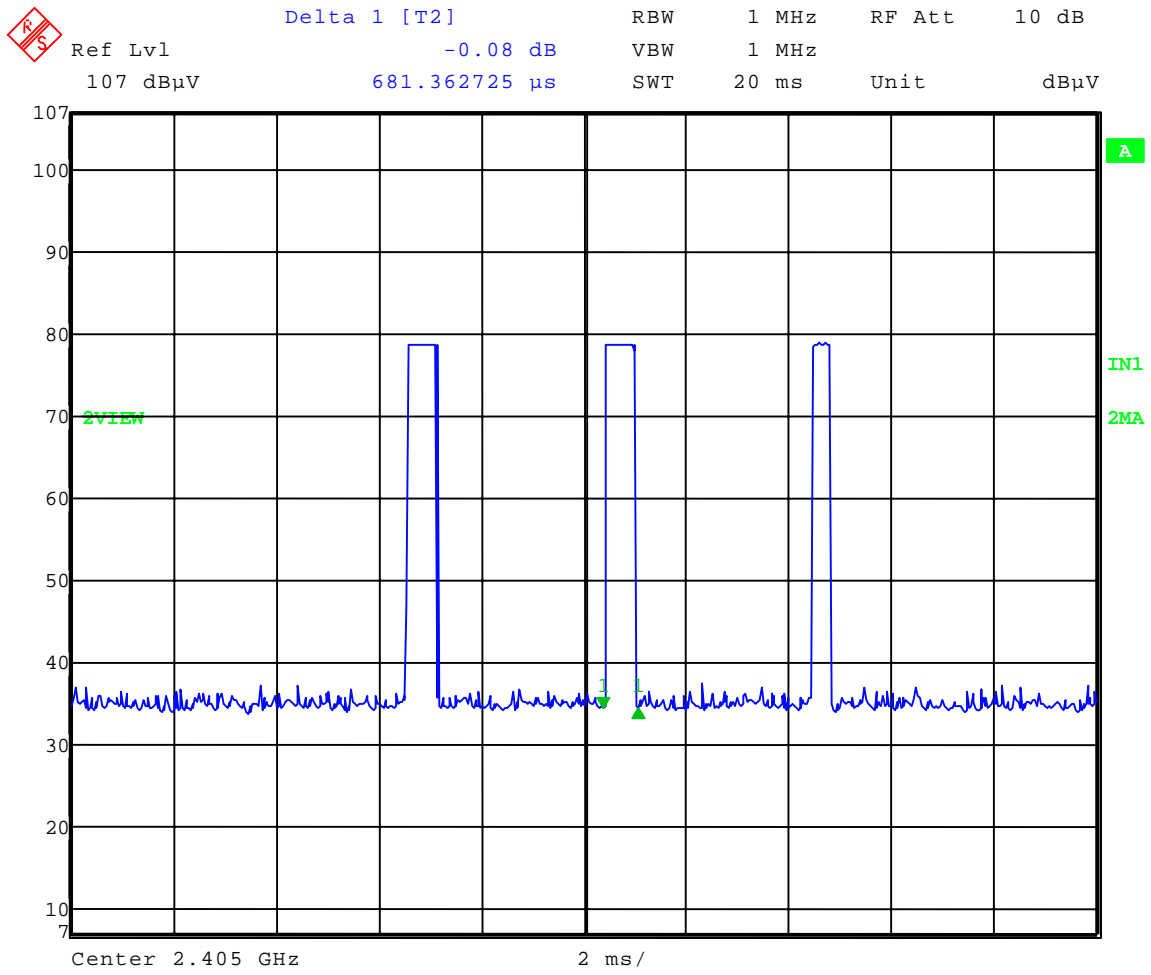


Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Duty Cycle – maximum duty cycle during normal operation  
Operator: Craig B  
Comment: Medium Pulse On Time



Date: 7.JAN.2008 14:52:47

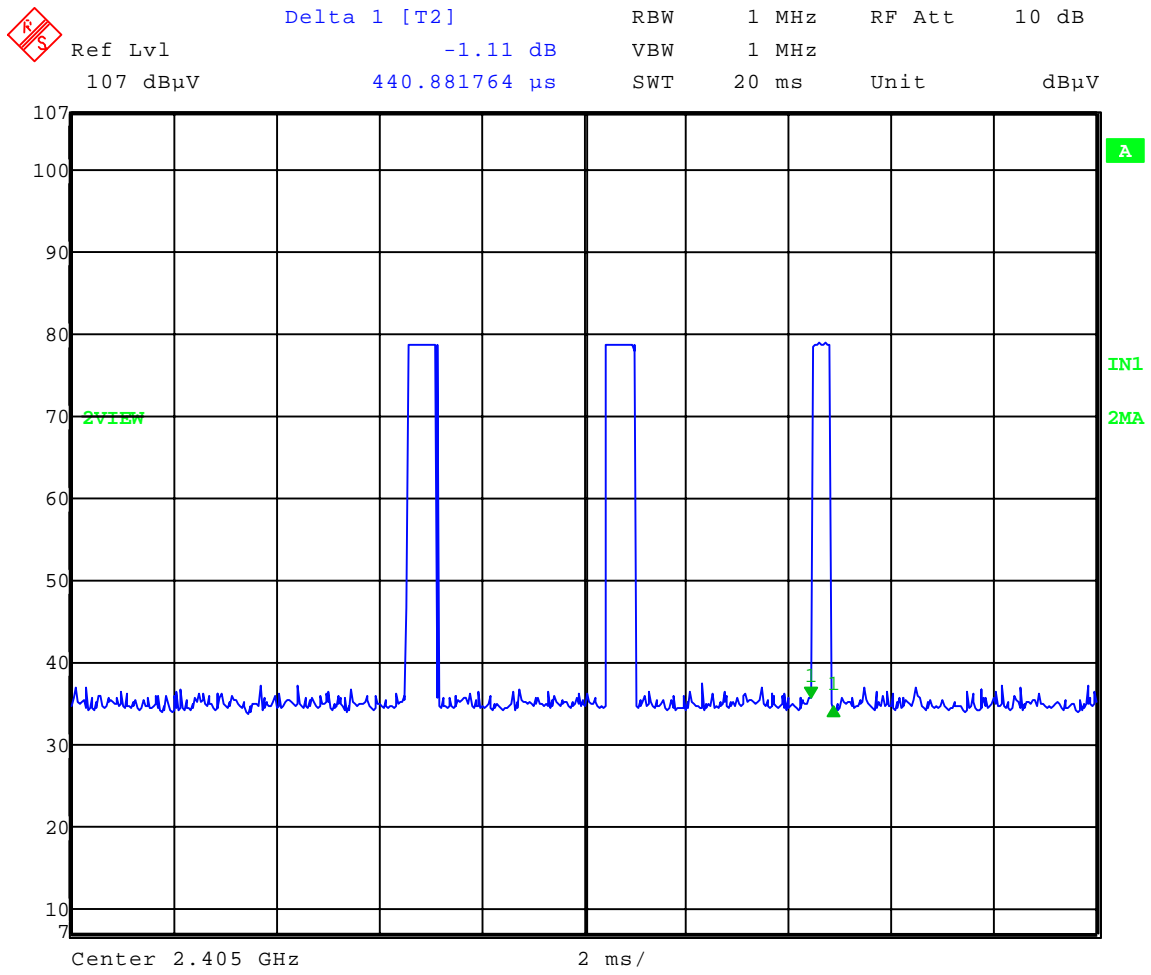


Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Duty Cycle – maximum duty cycle during normal operation  
Operator: Craig B  
Comment: Small Pulse On Time



Date: 7.JAN.2008 14:53:33

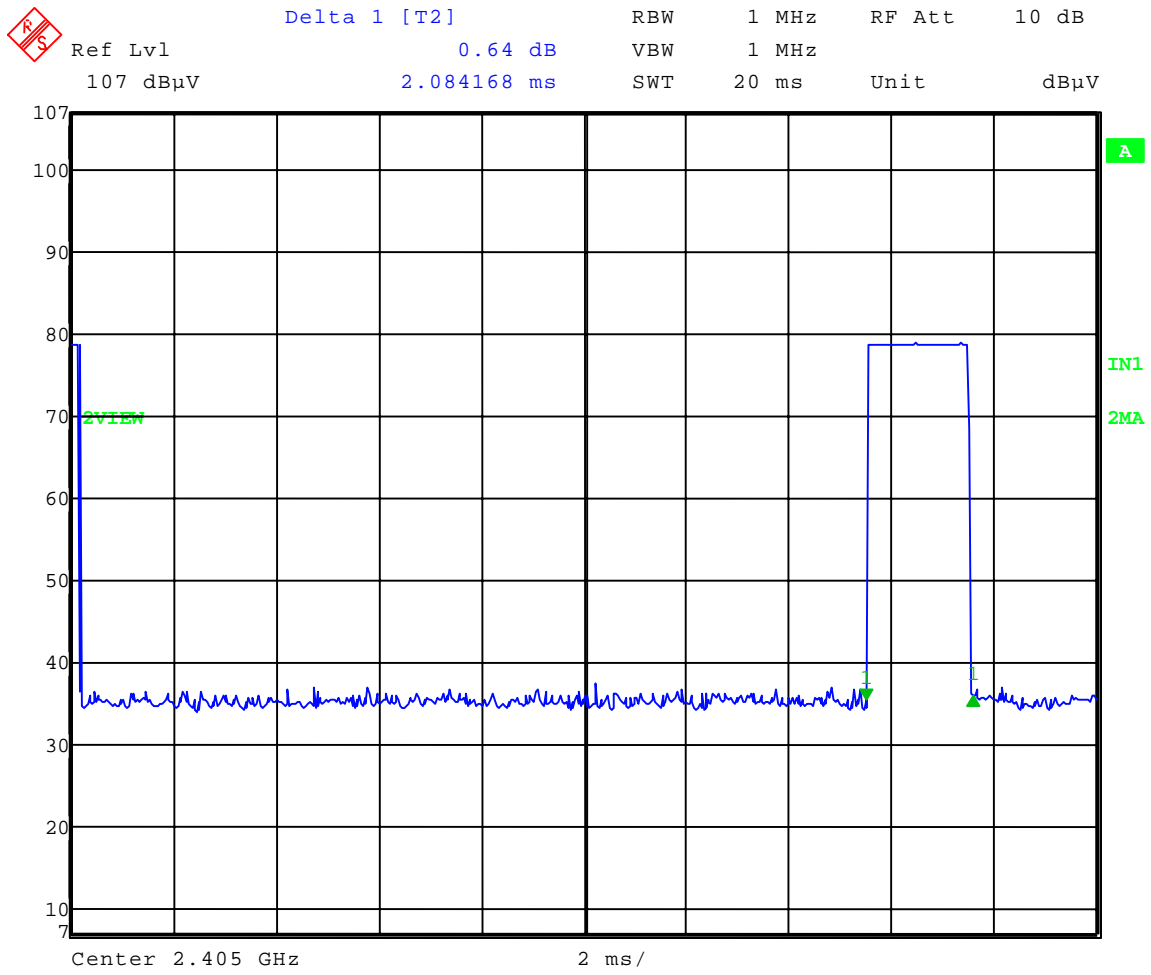


Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Duty Cycle – maximum duty cycle during normal operation  
Operator: Craig B  
Comment: Large Pulse On Time



Date: 7.JAN.2008 14:54:28



1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

## APPENDIX A

# NUMBER OF HOPPING FREQUENCIES GRAPH(S)

## PART 15.247





Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### **RFTECHNOLOGIES™**

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3125 N. 126<sup>th</sup> St. Brookfield, WI 53005  
1-800-669-9946 Ph: 262-790-1771  
Fx: 262-790-1784  
[info@rft.com](mailto:info@rft.com)  
[www.rft.com](http://www.rft.com)

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Product Name:	Motion Control Unit
Owner:	RF Technologies, Inc.
Owner Model Number:	0800-0318
FCC ID Number:	KXU-MCCCZ24
Canadian ID Number:	2719A- MCCCZ24

List of 16 frequencies (channels) used by the RF Technologies Motion Control Unit.

All Zigbee radios use IEEE 802.15.4, which specifies the 16 channels to use. They start at 2405 MHz and are separated by 5 MHz. Therefore the channels are as follows:

2405  
2410  
2415  
2420  
2425  
2430  
2435  
2440  
2445  
2450  
2455  
2460  
2465  
2470  
2475  
2480



1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

## APPENDIX A

# CONDUCTED PEAK OUTPUT POWER GRAPHS

## PART 15.247



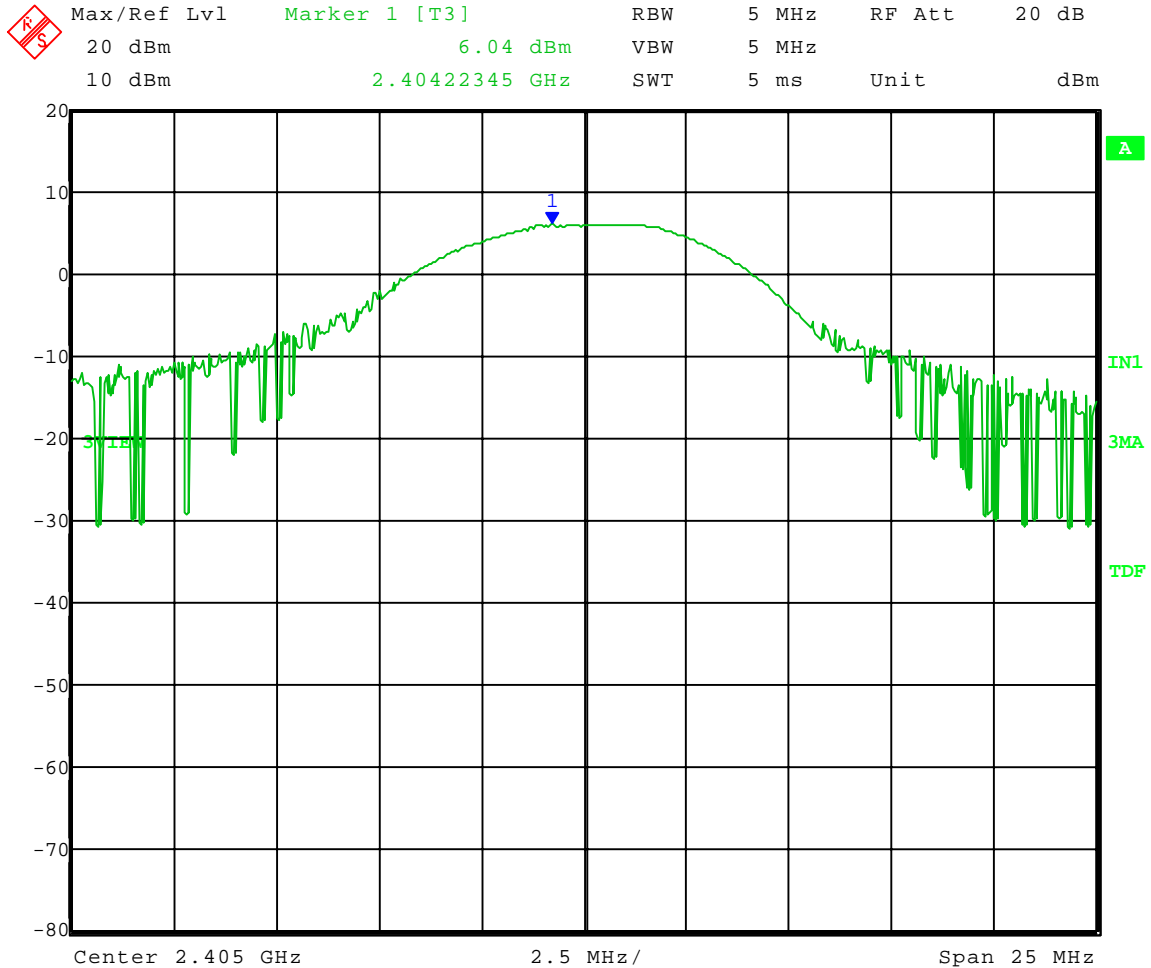
Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Peak Power Output - Conducted  
Operator: Craig B  
Comment: **Low Channel: Frequency – 2.405 GHz**

Peak Output Power = 6.04 dBm = **4.02 mW**



Date: 7.JAN.2008 11:28:09



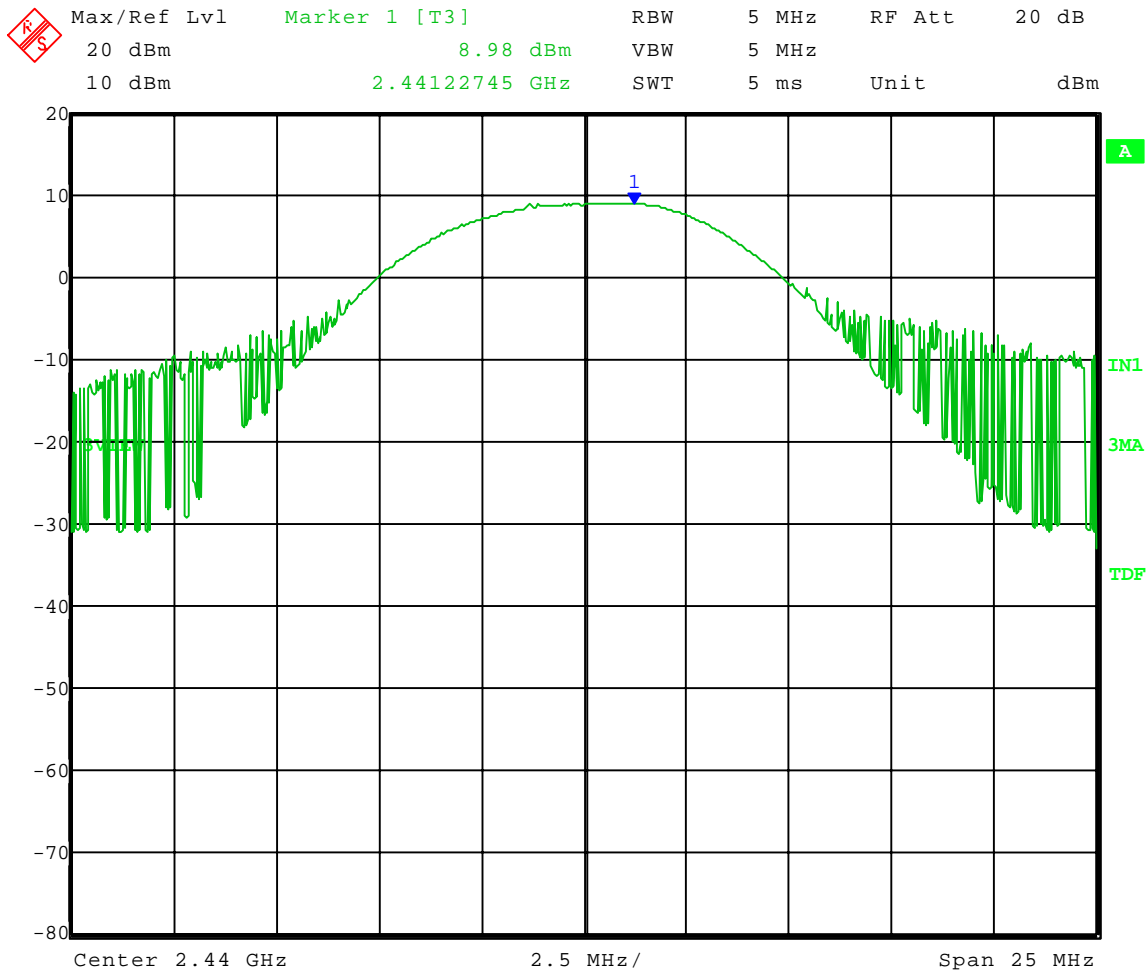
Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Peak Power Output - Conducted  
Operator: Craig B  
Comment: Middle Channel: Frequency - 2.440 GHz

Peak Output Power = 8.98 dBm = 7.91 mW



Date: 7.JAN.2008 11:30:22



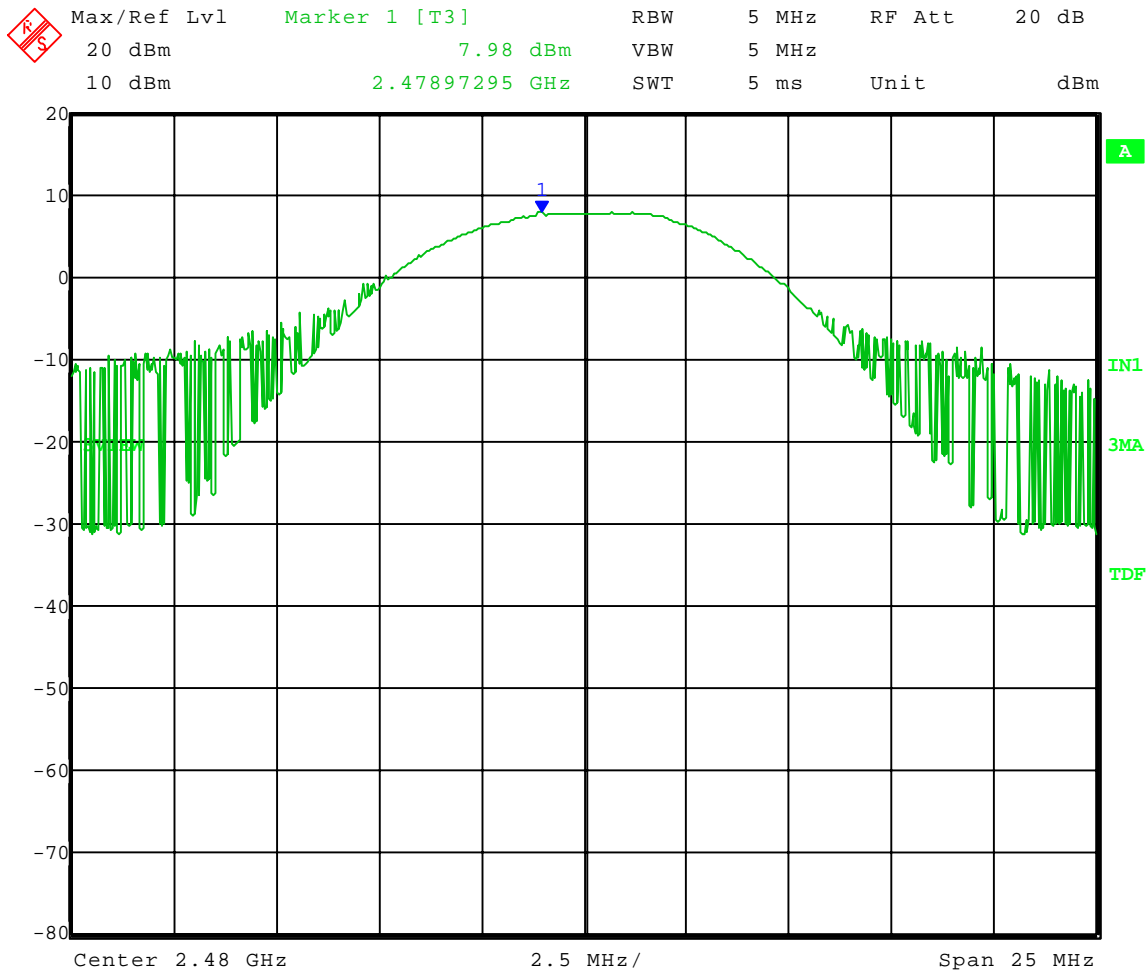
Company: RF Technologies, Inc.  
 Model Tested: 0800-0318  
 Report Number: 14050

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 01-07-2008  
 Company: RF Technologies  
 EUT: ST-520 Sensatec  
 Test: Peak Power Output - Conducted  
 Operator: Craig B  
 Comment: High Channel: Frequency – 2.480 GHz

Peak Output Power = 7.98 dBm = 6.28 mW



Date: 7.JAN.2008 11:32:33



1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

# PEAK POWER SPECTRAL DENSITY GRAPHS

## PART 15.247

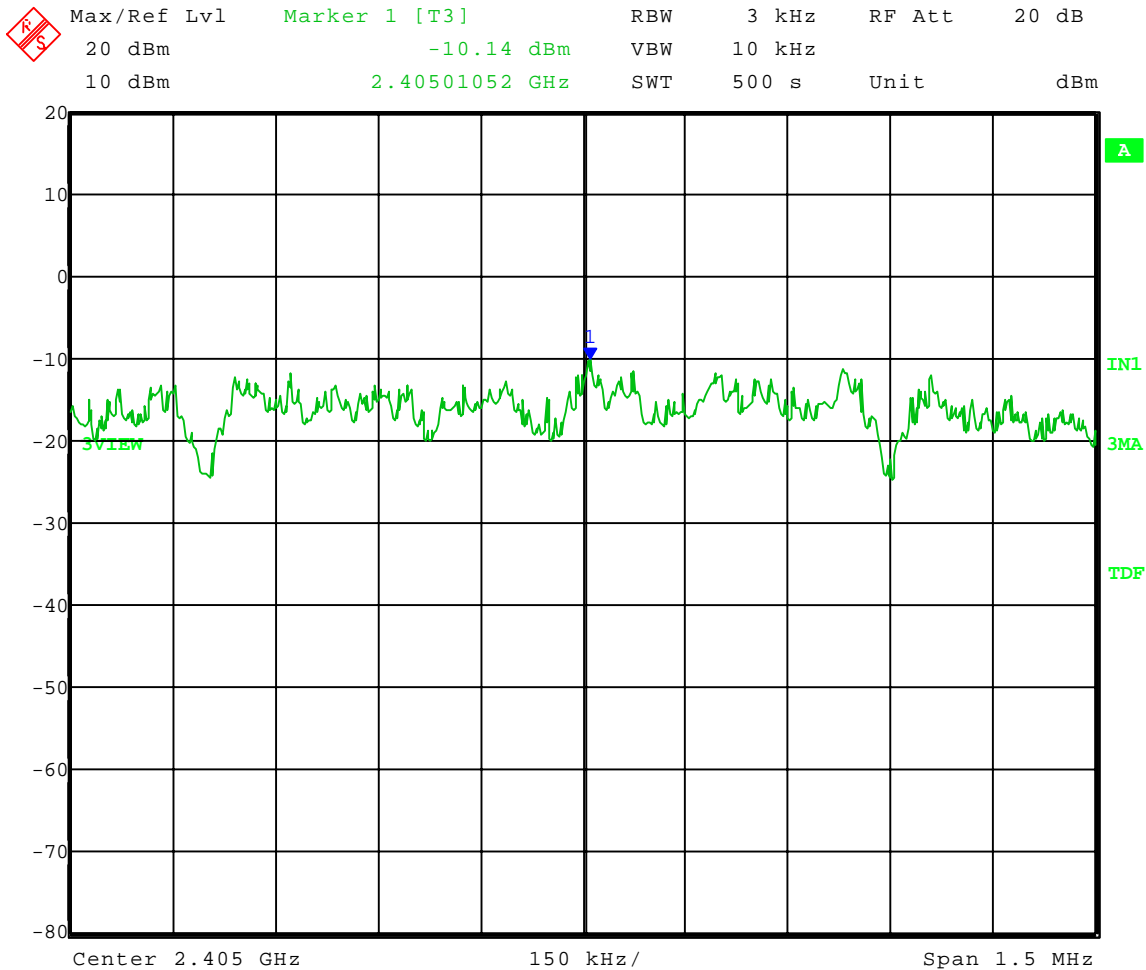


1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Peak Power Spectral Density - Conducted  
Operator: Craig B  
Comment: **Low Channel: Frequency – 2.405 GHz**  
Limit: 8 dBm

3 kHz Bandwidth = -10.14 dBm



Date: 7.JAN.2008 12:08:59

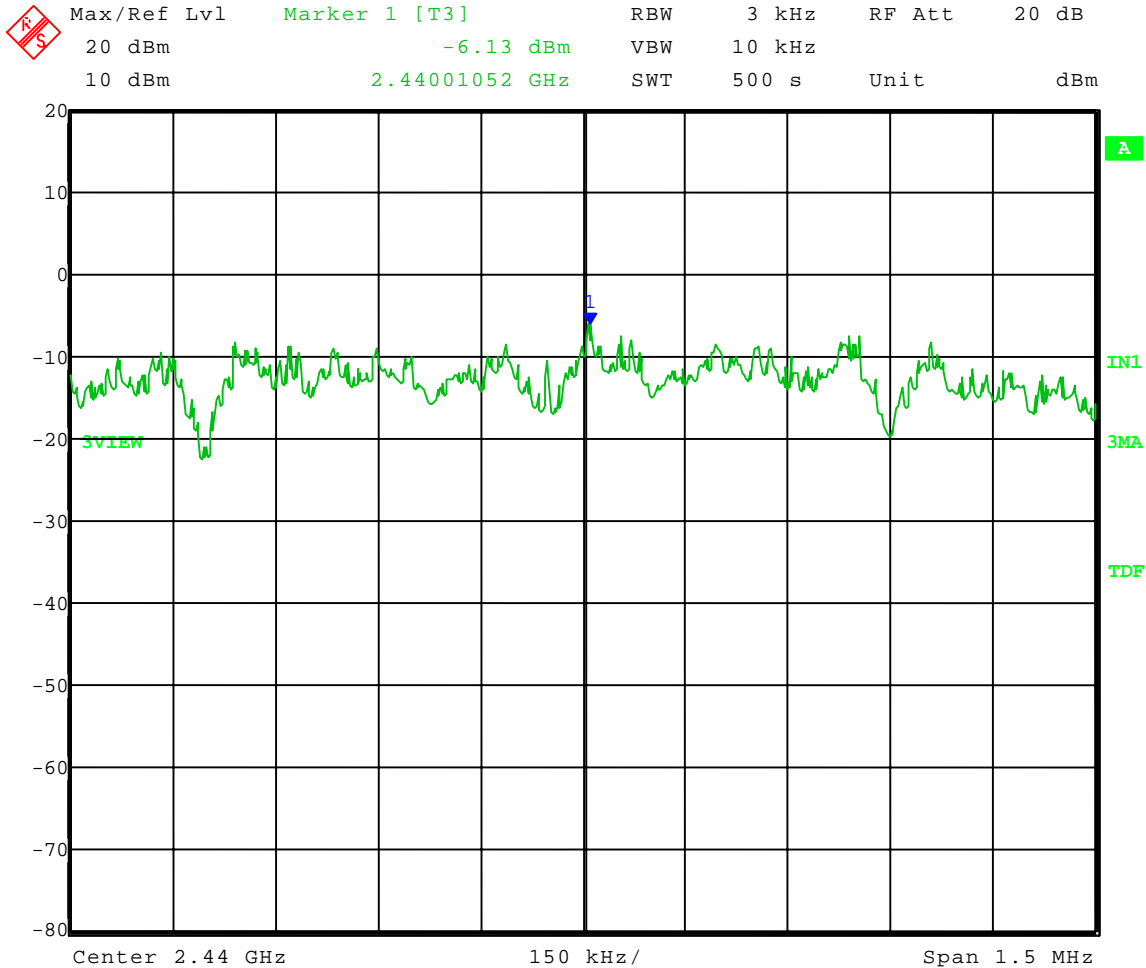


1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Peak Power Spectral Density - Conducted  
Operator: Craig B  
Comment: Middle Channel: Frequency - 2.440 GHz  
Limit: 8 dBm

3 kHz Bandwidth = -6.13 dBm



Date: 7.JAN.2008 11:48:49



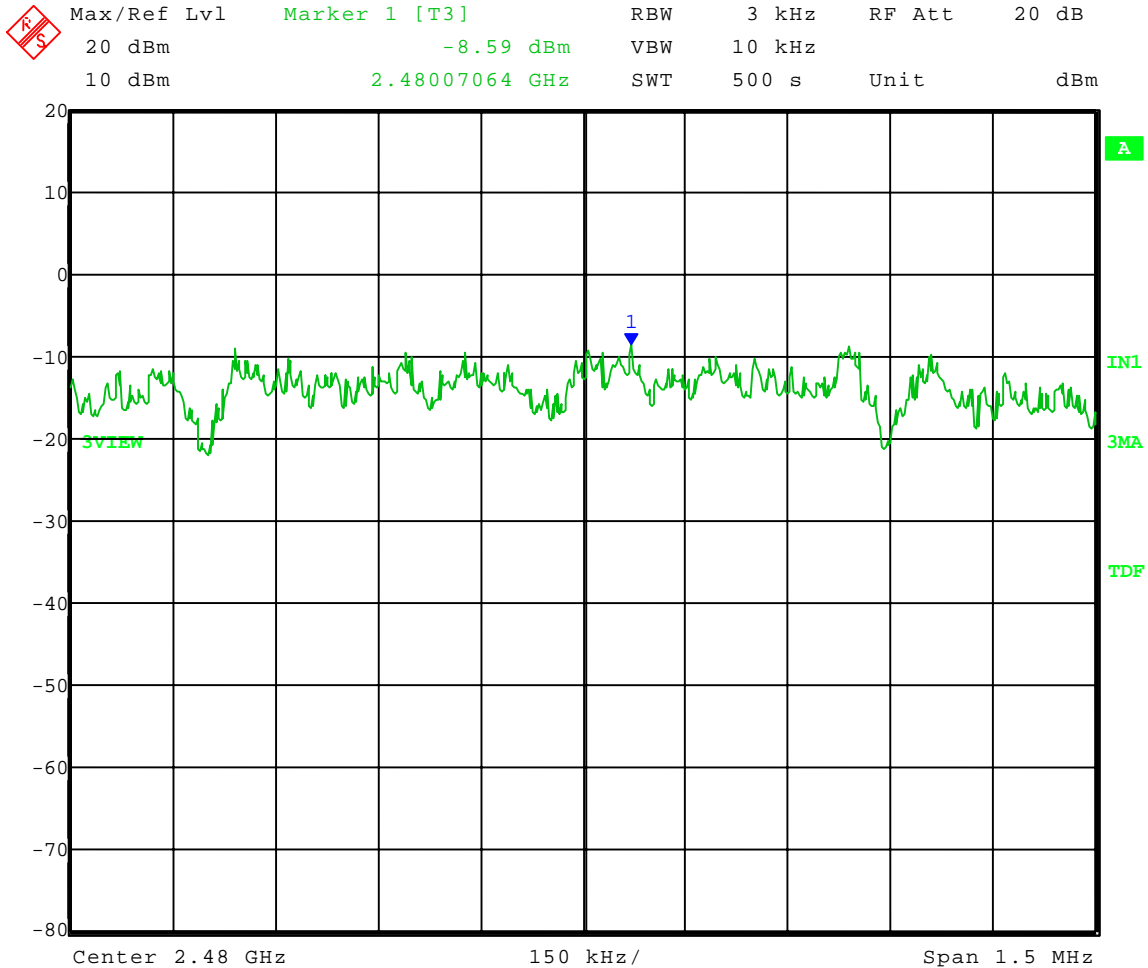


1250 Peterson Dr., Wheeling, IL 60090

Company: RF Technologies, Inc.  
Model Tested: 0800-0318  
Report Number: 14050

Test Date: 01-07-2008  
Company: RF Technologies  
EUT: ST-520 Sensatec  
Test: Peak Power Spectral Density - Conducted  
Operator: Craig B  
Comment: High Channel: Frequency - 2.480 GHz  
Limit: 8 dBm

3 kHz Bandwidth = -8.59 dBm



Date: 7.JAN.2008 11:58:22