Electromagnetic Compatibility Test Report

Tests Performed on a Delsys, Inc.

Trigno Wireless Sensor, Model SP-W05

Radiometrics Document RP-7251

ACCREDITED
TESTING CERT #1495.01

Product Detail:
FCC ID: W4P-SP-W05
IC: 8138A-SPW05
Equipment type: 2.4 GHz Transmitter

Test Standards:
US CFR Title 47, Chapter I, FCC Part 15 Subpart C
FCC Part 15 CFR Title 47: 2012
Industry Canada RSS-210, Issue 7: 2007 as required for Category I Equipment
This report concerns: Original Grant for Certification
FCC Part 15.249

Tests Performed For:	*Test Facility:*
Delsys, Incorporated *Street Address:* 650 Beacon St., Floor 6 Boston, MA 02215 *Mailing Address:* PO Box 15734 Boston, Massachusetts 02215 United States	**Radiometrics Midwest Corporation** 12 East Devonwood Romeoville, IL 60446

Test Date(s): (Month-Day-Year)
April 13 thru 20, 2012

Document RP-7251 Revisions

Rev.	Issue Date	Affected Pages	Revised By
0	September 6, 2012		
1	September 26, 2012	All	Joseph Strzelecki

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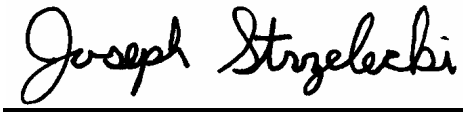
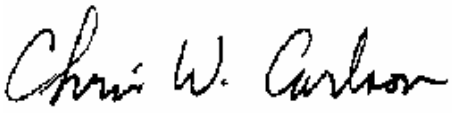
1 ADMINISTRATIVE DATA

Equipment Under Test: A Delsys, Inc., Trigno Wireless Sensor Model: SP-W05, Serial Number: none This will be referred to as the EUT in this Report	
Date EUT Received at Radiometrics: (Month-Day-Year) April 13, 2012	*Test Date(s): (Month-Day-Year)* April 13 thru 20, 2012
Test Report Written By: Joseph Strzelecki Senior EMC Engineer	*The Test Witnessed by:* The Test was not Witnessed by Personnel from Delsys, Inc.
Radiometrics' Personnel Responsible for Test:  Joseph Strzelecki Senior EMC Engineer NARTE EMC-000877-NE	*Test Report Approved By*  Chris W. Carlson Director of Engineering NARTE EMC-000921-NE

2 TEST SUMMARY AND RESULTS

The EUT (Equipment Under Test) is a Trigno Wireless Sensor, Model Trigno Wireless EMG System, manufactured by Delsys, Inc. The detailed test results are presented in a separate section. The following is a summary of the test results.

Emissions Tests Results

Environmental Phenomena	Frequency Range	FCC Section	RSS-210 Section	Test Result
20 dB Bandwidth Test	2400 to 2483 MHz	15.249	A2.9	Pass
Radiated Emissions	30 MHz to 25 GHz	15.249	A2.9	Pass

No Conducted emissions were performed since the EUT is battery operated only.

Note: The RSS-210 specification is not currently covered in Radiometrics' Scope of Accreditation. This is technically very similar to FCC, CFR 47 Part 15 which is on Radiometrics scope.

2.1 RF Exposure Compliance Requirements

Because the average power output is 0.21 mW, the EUT meets 15.203 of the FCC requirement for RF exposure. Since the EUT is less than 200 mW, it is exempt from RSS-102. There are no power level adjustments and the antenna is permanently attached. The detailed calculations for RF Exposure are presented in a separate document.

3 EQUIPMENT UNDER TEST (EUT) DETAILS

3.1 EUT Description

The EUT is a wireless sensor for the Trigno Wireless EMG System, Model SP-W05, manufactured by Delsys, Inc. The EUT was in good working condition during the tests, with no known defects.

3.1.1 FCC Section 15.203 & RSS-GEN Antenna Requirements

The antenna is permanently attached to the PCB via a trace on the circuit board. The antenna is internal to the EUT and it is not readily available to be modified by the end user. Therefore it meets the 15.203 Requirements.

3.2 Related Submittals

The Sensor is operated under 15.249. It is subject to the FCC requirements pursuant to the certification equipment authorization under Part 15 Subpart C, and is being submitted as FCC ID: W4P-SP-W01.

4 TESTED SYSTEM DETAILS

4.1 Tested System Configuration

The system was configured for testing in a typical fashion. The EUT was placed on an 80-cm high, nonconductive test stand. The testing was performed in conditions as close as possible to installed conditions. Wiring was consistent with manufacturer's recommendations. Power was supplied to the EUT at 115 VAC, 60 Hz single-phase to its external power supply.

The identification for all equipment, plus descriptions of all cables used in the tested system, are:

Tested System Configuration List

Item	Description	Type*	Manufacturer	Model Number	Serial Number
1	Wireless Sensor with Transmitter	E	Delsys, Inc.	SP-W05	Proto 1

* Type: E = EUT, P = Peripheral,

4.2 Special Accessories

No special accessories were used during the tests in order to achieve compliance.

4.3 Equipment Modifications

No modifications were made to the EUT at Radiometrics' test facility in order to comply with the standards listed in this report.

5 TEST SPECIFICATIONS AND RELATED DOCUMENTS

Document	Date	Title
FCC CFR Title 47	2012	Code of Federal Regulations Title 47, Chapter 1, Federal Communications Commission, Part 15 - Radio Frequency Devices
ANSI C63.4-2009	2009	Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
IC RSS-210 Issue 8	2010	Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands) Category I Equipment
IC RSS-Gen Issue 3	2010	General Requirements and Information for the Certification of Radiocommunication Equipment (RSS-Gen)

The test procedures used are in accordance with the Industry Canada RSS-GEN and ANSI document C63.4, "Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The specific procedures are described herein. Radiated testing was performed at an antenna to EUT distance of 3 meters. The antenna was raised and lowered from 1 to 4 meters.

Note: The RSS-210 specification is not currently covered in Radiometrics' Scope of Accreditation. This is technically very similar to FCC, CFR 47 Part 15 which is on Radiometrics scope.

6 RADIOMETRICS' TEST FACILITIES

The results of these tests were obtained at Radiometrics Midwest Corp. in Romeoville, Illinois, USA. Radiometrics is accredited by A2LA (American Association for Laboratory Accreditation) to conform to ISO/IEC 17025: 2005 "General Requirements for the Competence of Calibration and Testing Laboratories". Radiometrics' Lab Code is 121191 and Certification Number is 1495.01. Radiometrics' scope of accreditation includes all of the test methods listed herein. A copy of the accreditation can be accessed on our web site (www.radiomet.com). Radiometrics accreditation status can be verified at A2LA's web site (www.a2la2.org).

The following is a list of shielded enclosures located in Romeoville, Illinois used during the tests:

Chamber E: Is a custom made anechoic chamber that measures 52' L X 30' W X 18' H. The walls and ceiling are fully lined with RF absorber. Pro-shield of Collinsville, Oklahoma manufactured the chamber.

Test Station F: Is an area that measures 10' D X 12' W X 10' H. The floor and back wall are metal shielded. This area is used for conducted emissions measurements.

A separate ten-foot long, brass plated, steel ground rod attached via a 6 inch copper braid grounds each of the above chambers. Each enclosure is also equipped with low-pass power line filters.

The FCC has accepted these sites as test site number US1065. The FCC test site Registration Number is 732175. Details of the site characteristics are on file with the Industry Canada as file number IC3124A-1.

A complete list of the test equipment is provided herein. The calibration due dates are indicated on the equipment list. The equipment is calibrated in accordance to ANSI/NCSL Z540-1 with traceability to the National Institute of Standards and Technology (NIST).

7 DEVIATIONS AND EXCLUSIONS FROM THE TEST SPECIFICATIONS

There were no deviations or exclusions from the test specifications.

8 CERTIFICATION

Radiometrics Midwest Corporation certifies that the data contained herein was taken under conditions that meet or exceed the requirements of the test specification. The results relate only to the EUT listed herein. Any modifications made to the EUT subsequent to the indicated test date will invalidate the data and void this certification.

9 TEST EQUIPMENT TABLE

RMC ID	Manufacturer	Description	Model No.	Serial No.	Frequency Range	Cal Period	Cal Date
AMP-05	RMC/Celeritek	Pre-amplifier	MW110G	1001	1.0-12GHz	12 Mo.	01/24/12
AMP-20	Avantek	Pre-amplifier	SF8-0652	15221	8-18GHz	12 Mo	01/24/12
AMP-22	Anritsu	Pre-amplifier	MH648A	M23969	0.1-1200MHz	12 Mo.	01/24/12
AMP-29	HP / Agilent	Amplifier	11975A	2304A00158	2-8 GHz	24 Mo.	04/05/11
ANT-13	EMCO	Horn Antenna	3115	2502	1.0-18GHz	24 Mo.	11/18/10
ANT-44	Impossible Machine	Super Log Antenna	SL-20M2G	1002	20-2000MHz	24 Mo.	12/14/11
ANT-48	RMC	Std Gain Horn	HW2020	1001	18-26 GHz	12 Mo.	04/05/12
ANT-53	EMCO	Loop Antenna	6507	1453	1 kHz-30 MHz	12 Mo	10/26/11
HPF-07	Mini-Circuits	High Pass Filter	VHF-1500+	31121	1.7-8 GHz	12 Mo	08/06/12
MXR-02	HP / Agilent	Harmonic Mixer	11970K	2332A00489	18-26.5GHz	24 Mo.	04/05/11
REC-03	Anritsu	Spectrum Analyzer	MS2601B	MT94589	0.01-2200MHz	12 Mo.	04/02/12
REC-08	Hewlett Packard	Spectrum Analyzer	8566B	2648A13481 2209A01436	30Hz-22GHz	12 Mo.	10/28/11
THM-03	Fluke	Temp/Humid Meter	971	95850465	N/A	12 Mo.	03/28/12

Note: All calibrated equipment is subject to periodic checks.

10 TEST SECTIONS

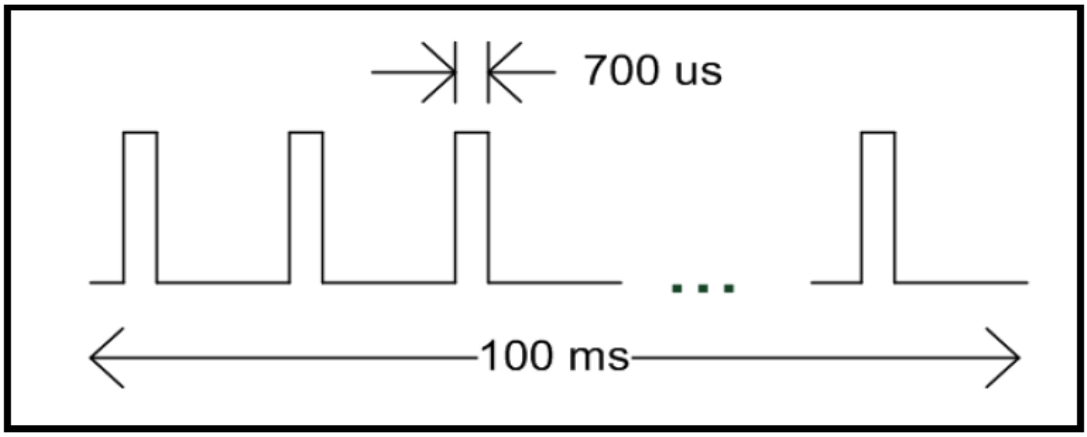
10.1 Time of Occupancy (Dwell Time)

As required by FCC section 15.35 and RSS-210 section 6.5, the Peak to Average correction factor is calculated by the highest duty cycle in percent over any 100mS transmission. The factor in dB is 20 * Log(Duty cycle/100).

The transmitter sends the data on a RF channel in a 700 us burst once every 13 ms as shown below. In any 100 ms interval there will be at most 8 bursts on a RF channel, for a maximum transmitter duty cycle of 5.6%.

Since the maximum total on time per 100 mSec time period is 5.6 mSec. The peak to average factor is 20*Log(5.6/100) = 25.0 dB.

Figure 1. Duty Cycle Plot



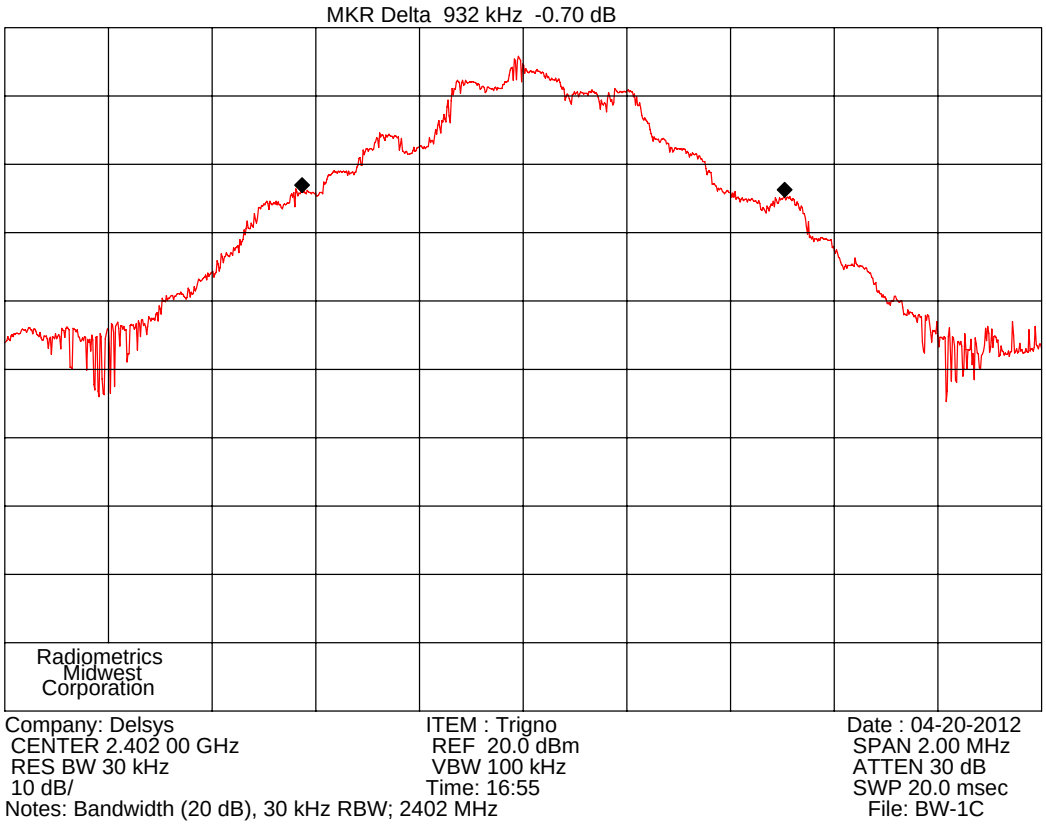
10.2 Occupied Bandwidth

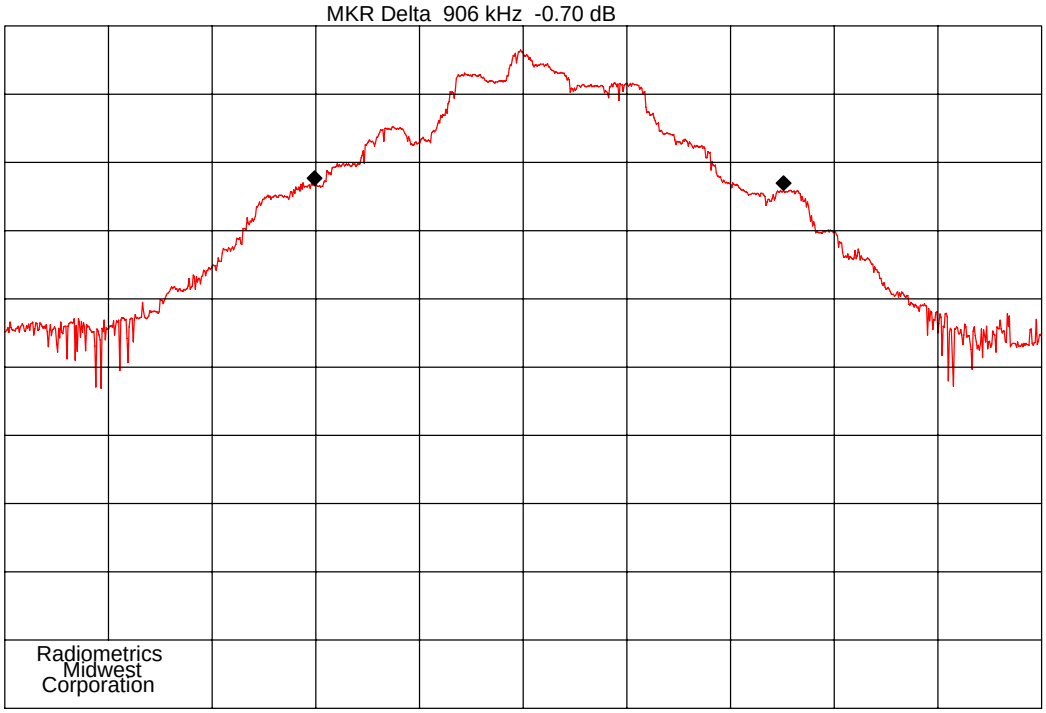
The spectrum analyzer was set to the MAX HOLD mode to record the worst case of the modulation. The EUT was transmitting at its maximum data rate. The trace was allowed to stabilize.

The marker-to-peak function was set to the peak of the emission. Then the marker-delta function was used to measure 20 dB down one side of the emission. The marker-delta function was reset and then moved to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

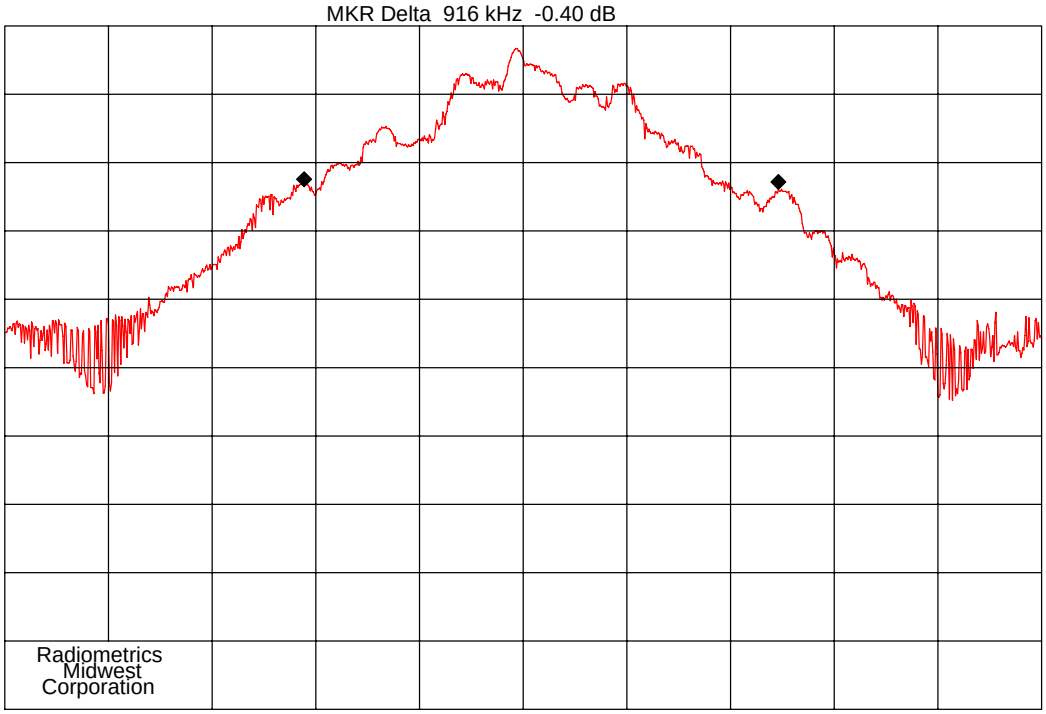
Channel	20 dB EBW in kHz using Canada 30kHz RBW	20 dB EBW in kHz using FCC 100kHz RBW
2402	932	1138
2440	906	1124
2474	916	1124

10.2.1 Bandwidth Plots

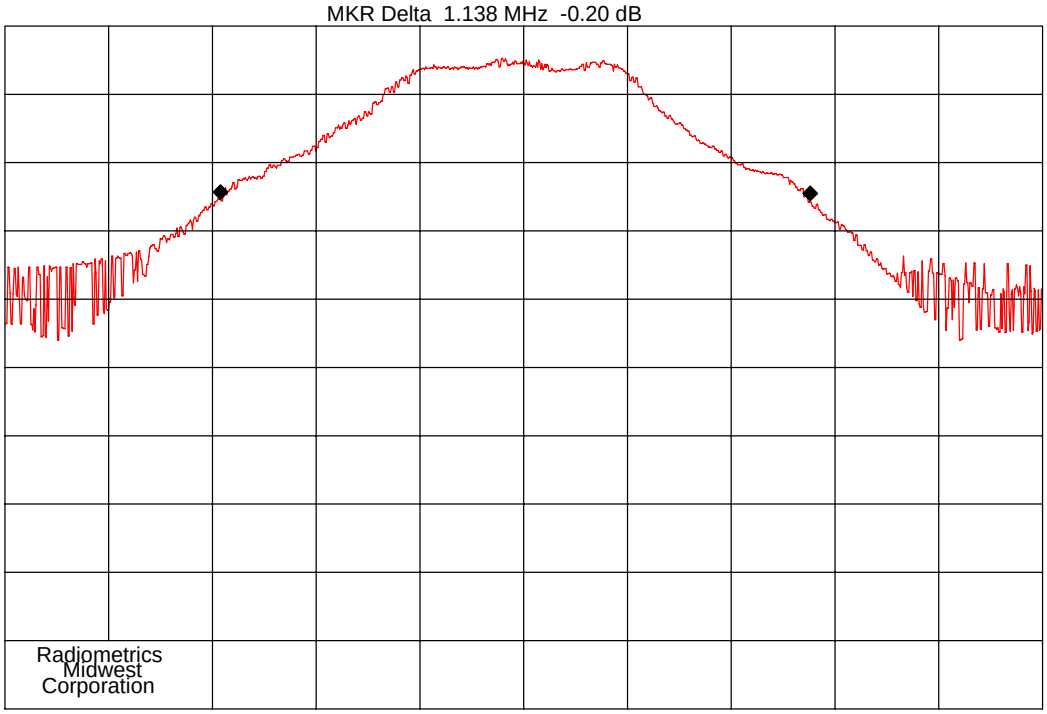




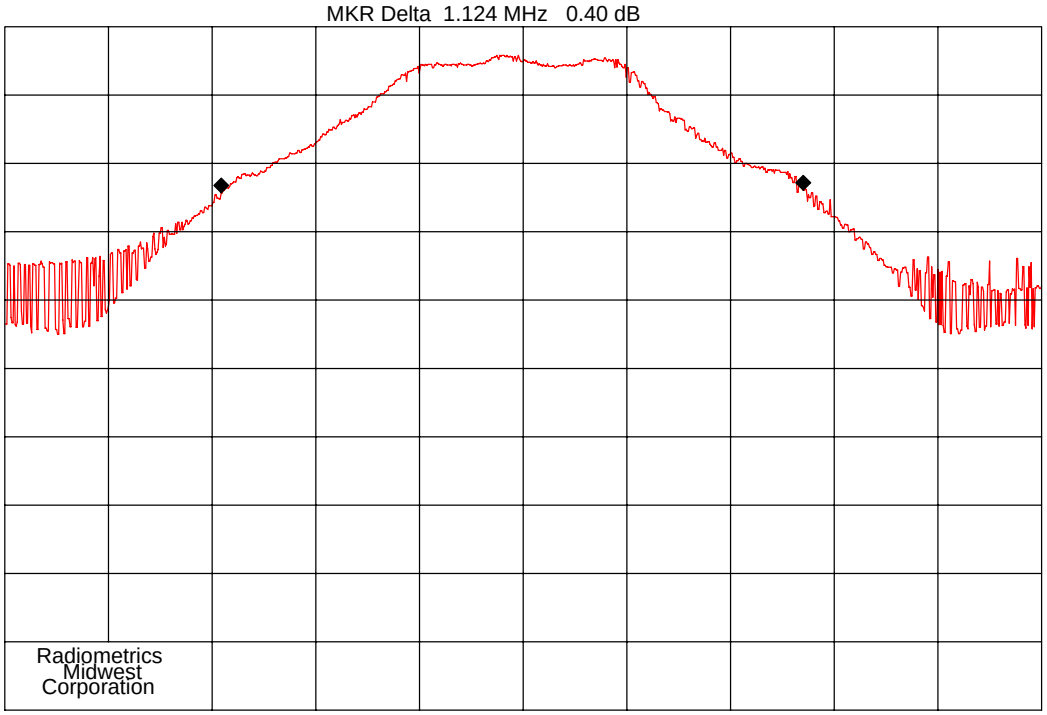
Company: Delsys
CENTER 2.440 00 GHz
RES BW 30 kHz
10 dB/
ITEM : Trigno
REF 20.0 dBm
VBW 100 kHz
Time: 16:56
Date : 04-20-2012
SPAN 2.00 MHz
ATTEN 30 dB
SWP 20.0 msec
File: BW-2C
Notes: Bandwidth (20 dB), 30 kHz RBW; 2440 MHz



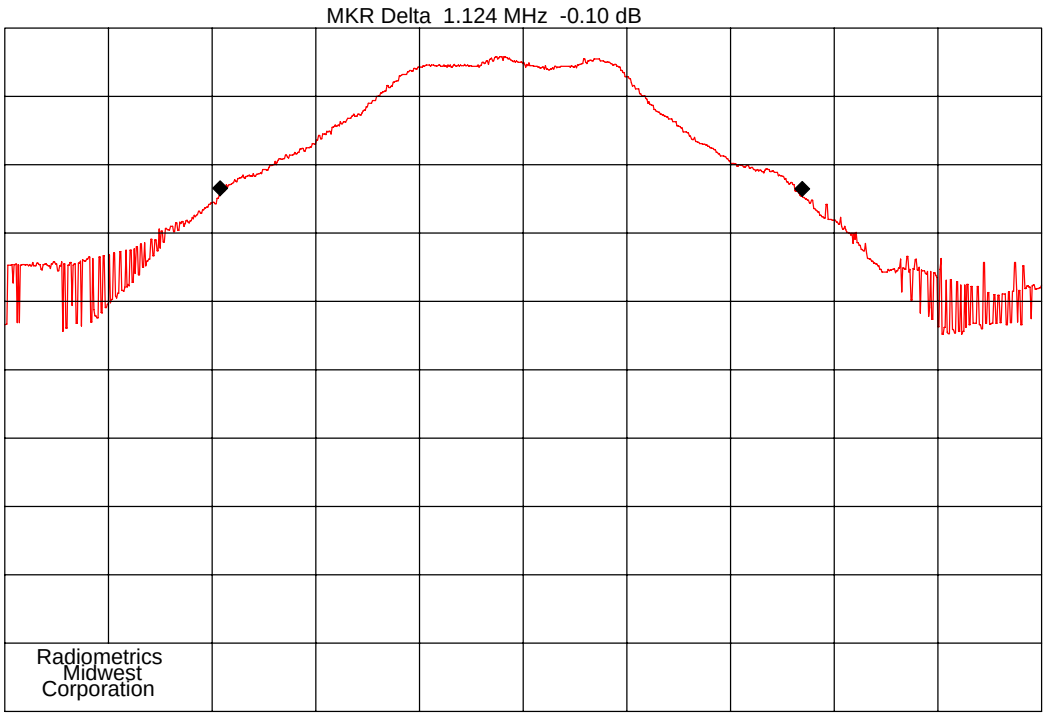
Company: Delsys
CENTER 2.474 00 GHz
RES BW 30 kHz
10 dB/
ITEM : Trigno
REF 20.0 dBm
VBW 100 kHz
Time: 16:58
Date : 04-20-2012
SPAN 2.00 MHz
ATTEN 30 dB
SWP 20.0 msec
File: BW-2C-2
Notes: Bandwidth (20 dB), 30 kHz RBW; 2474 MHz



Company: Delsys
CENTER 2.402 00 GHz
RES BW 100 kHz
10 dB/
ITEM : Trigno
REF 20.0 dBm
VBW 300 kHz
Time: 16:47
Date : 04-20-2012
SPAN 2.00 MHz
ATTEN 30 dB
SWP 20.0 msec
File: BW-1F
Notes: Bandwidth (20 dB), 100 kHz RBW 2402 MHz



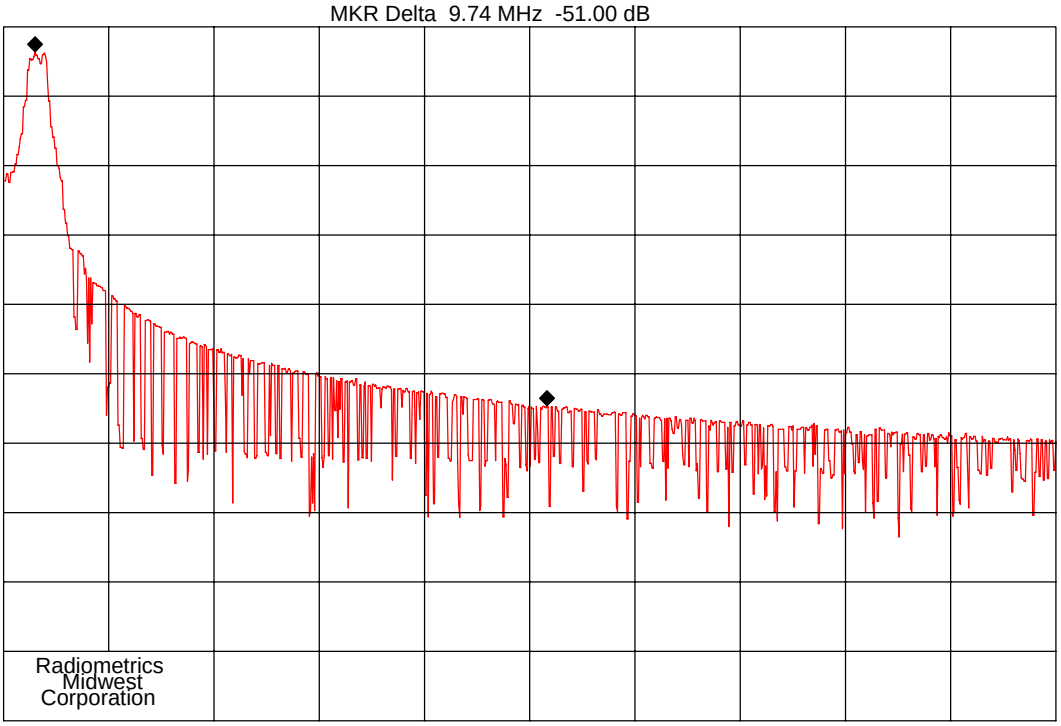
Company: Delsys
CENTER 2.440 00 GHz
RES BW 100 kHz
10 dB/
ITEM : Trigno
REF 20.0 dBm
VBW 300 kHz
Time: 16:49
Date : 04-20-2012
SPAN 2.00 MHz
ATTEN 30 dB
SWP 20.0 msec
File: BW-2F
Notes: Bandwidth (20 dB), 100 kHz RBW; 2440 MHz



10.3 Band-edge Compliance of RF Conducted Emissions

The spectrum analyzer was set to the MAX HOLD mode to record the worst case of the modulation at the band-edge, with the EUT set to the lowest frequency. The trace was allowed to stabilize. A Delta Marker was used to measure the Difference between the peak of the inband signal and level at the band edges (2400 and 2483.5 MHz).

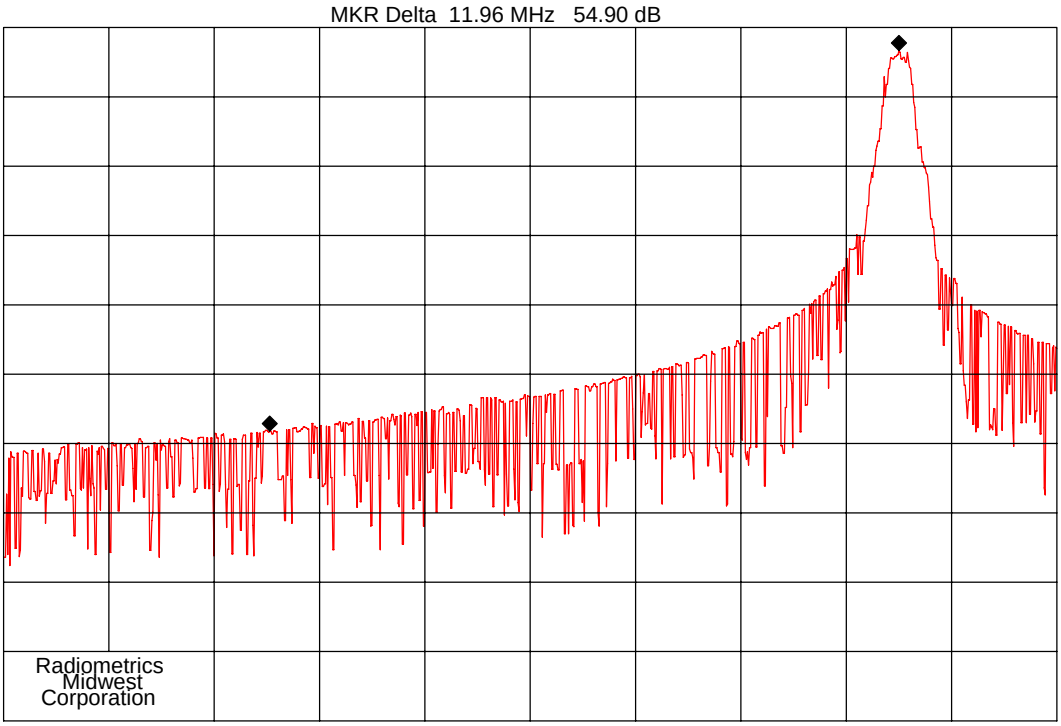
Band edge Description	Band Edge Delta Readings dB	Minimum Allowed dB
2402 MHz channel to 2390 MHz	54.9	20
2402 MHz channel to 2400 MHz	38.6	20
2474 MHz channel to 2483.5 MHz	51.0	20



Company: Delsys
CENTER 2.483 5 GHz
RES BW 100 kHz
10 dB/
Notes: Band Edge, 2474 MHz

ITEM : Trigno
REF 20.0 dBm
VBW 300 kHz
Time: 11:22

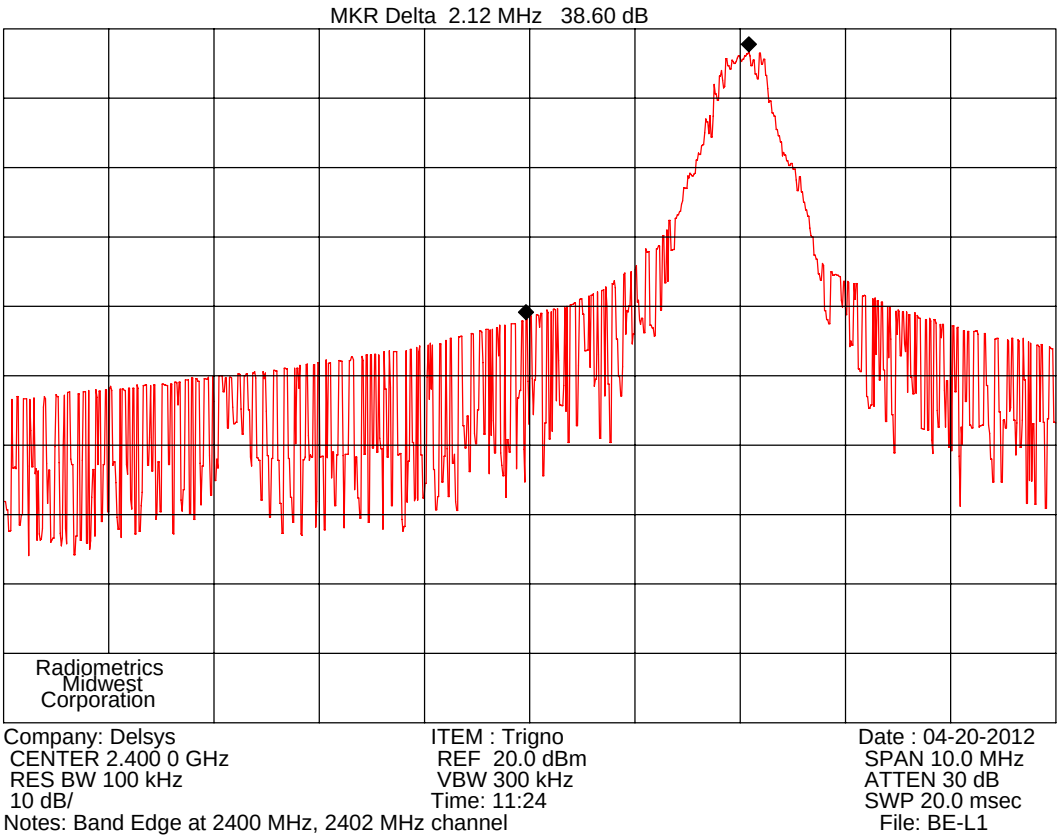
Date : 04-20-2012
SPAN 20.0 MHz
ATTEN 30 dB
SWP 20.0 msec
File: BE-U1



Company: Delsys
CENTER 2.395 0 GHz
RES BW 100 kHz
10 dB/
Notes: Band Edge at 2390 MHz, 2402 MHz channel

ITEM : Trigno
REF 20.0 dBm
VBW 300 kHz
Time: 11:28

Date : 04-20-2012
SPAN 20.0 MHz
ATTEN 30 dB
SWP 20.0 msec
File: BE-L2



10.4 Average & Peak RF Power

FCC part 15 and RSS-210 do not have limits on average power. The purpose of this is for RF Exposure Compliance requirements. Radiated tests were used to measure compliance. The peak field strength was measured using the procedures described in section 10.5, except with a 3 MHz RBW. Using the peak level, the transmitter's power was calculated using the following equation:

P = (E x d)^2 / (30 x G)
Where: E = the measured maximum peak field strength in V/m, using the bandwiths in this section.
G = The numeric gain of the transmitting antenna over an isotropic radiator.
d = Distance in meters from which the field strength was measured. (3 meters)
P = The EUT power in watts

Freq MHz	Peak dBuV/m	V/m	Test Dist meters	Peak Power		Peak to average factor dB	Average power	
				mW	dBm		dBm	mW
2402	109.7	0.305	3	28.00	14.47	-25	-10.5	0.0885
2440	110.2	0.325	3	31.41	14.97	-25	-10.0	0.0993
2474	112.4	0.417	3	52.13	17.17	-25	-7.8	0.165

10.5 RF Radiated Emissions

Radiated emission measurements were performed with linearly polarized broadband antennas. The results obtained with these antennas can be correlated with results obtained with a tuned dipole antenna. The radiated emission measurements were performed with a spectrum analyzer. The bandwidth used from 150 kHz to 30 MHz is 9 or 10 kHz and the bandwidth from 30 MHz to 1000 MHz is 100 or 120 kHz. Above 1 GHz, a 1 MHz bandwidth is used. A 10 dB linearity check is performed prior to start of testing in order to determine if an overload condition exists.

From 30 to 1000 MHz, an Anritsu spectrum analyzer was used. For tests from 1 to 25 GHz, an HP 8566 spectrum analyzer was used. For tests from 1 to 10 GHz, a high pass filter was used to reduce the fundamental emission. A harmonic mixer was used from 18 to 25 GHz. Figure 4 herein lists the details of the test equipment used during radiated emissions tests.

The Sensor was rotated through three orthogonal axis as per 13.1.4.1 of ANSI C63.4 during the prescans and during final radiated tests.

Final radiated emissions measurements were performed inside of an anechoic chamber at a test distance of 3 meters. The anechoic chamber is designated as Chamber E. This Chamber meets the Site Attenuation requirements of ANSI C63.4 and CISPR 16-1. Chamber E is located at 12 East Devonwood Ave. Romeoville, Illinois EMI test lab.

The entire frequency range from 30 MHz to 25 GHz was slowly scanned with particular attention paid to those frequency ranges which appeared high. Measurements were performed using two antenna polarizations, (vertical and horizontal). The worst case emissions were recorded. All measurements may be performed using either the peak, average or quasi-peak detector functions. If the peak detector data exceeds or is marginally close to the limits, the measurements are repeated using a quasi-peak detector or average function as required by the specification for final determination of compliance.

The detected emission levels were maximized by rotating the EUT, adjusting the positions of all cables, and by scanning the measurement antenna from 1 to 4 meters above the ground.

10.5.1 Radiated Emissions Field Strength Sample Calculation

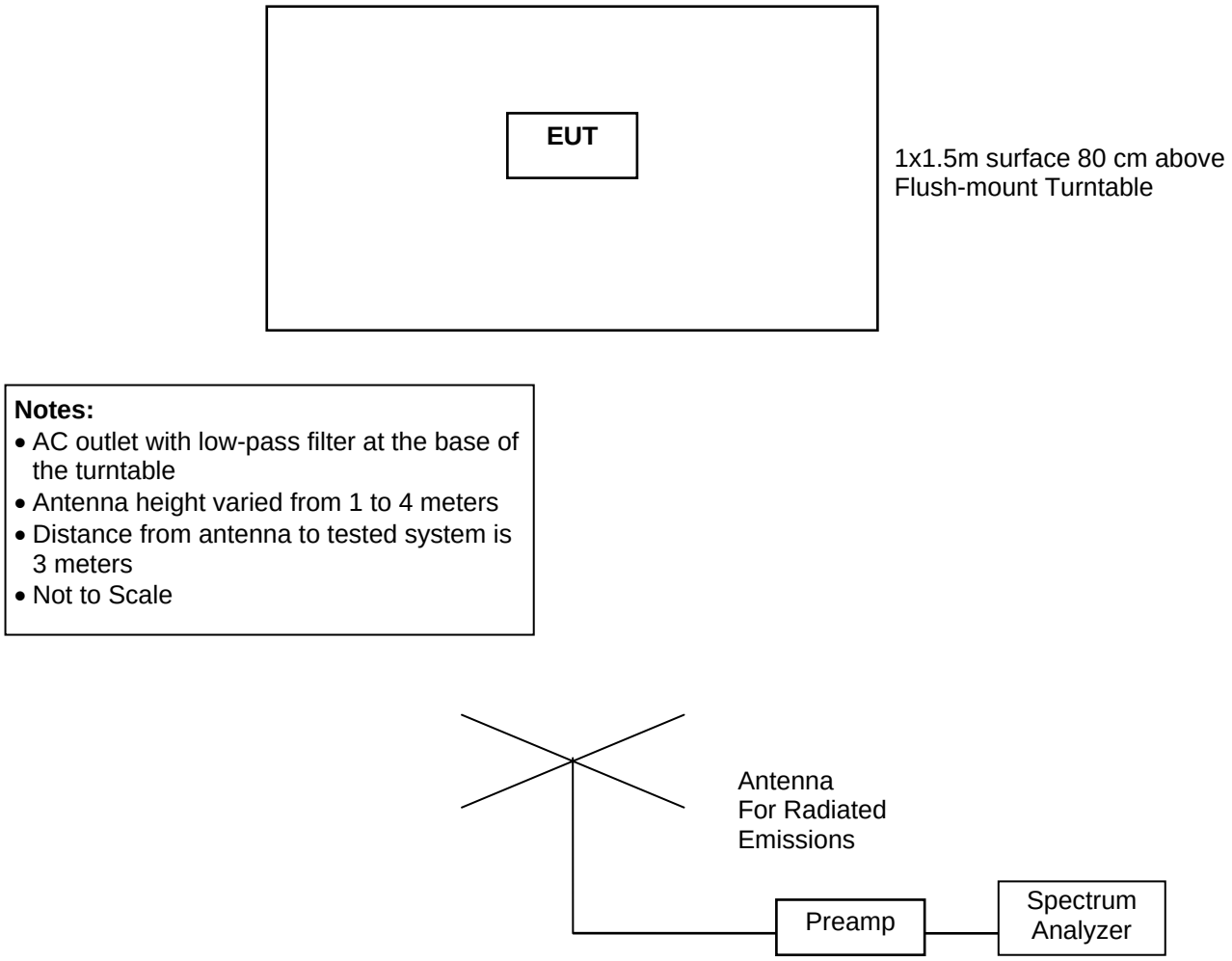
The field strength is calculated by adding the Antenna Factor and Cable Loss, and by subtracting the Amplifier Gain from the measured reading. The basic equation is as follows:

FS = RA + AF + CF - AG

Where: FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Attenuation Factor
AG = Amplifier Gain
PKA = Peak to Average Factor (This is zero for non-average measurements)

The Peak to average factor is used when average measurements are required. It is calculated by the highest duty cycle in percent over any 100mS transmission. The factor in dB is 20 * Log(Duty cycle/100).

Figure 2. Drawing of Radiated Emissions Setup



10.5.2 Spurious Radiated Emissions Test Results

The following spectrum analyzer settings were used.

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

A Video Bandwidth of 10 Hz was used for Average measurements above 1 GHz.

Emissions Below 1 GHz

Test Date	April 13, 2012
Test Distance	3 Meters
Specification	FCC Part 15 Subpart C & RSS-210
Abbreviations	P = peak; Q = QP Pol = Antenna Polarization; V = Vertical; H = Horizontal; For Antenna Type Bi-Log = (ANT-44); Horn = (ANT-13)

Freq. MHz	Meter Reading dBuV	Antenna Factor dB	Antenna Pol/ Type	Corr. Factors dB	Field Strength dBuV/m EUT	Field Strength dBuV/m Limit	Margin Under Limit dB
32.8	29.2 P	16.3	H/44	-28.0	17.5	40.0	22.5
83.2	29.9 P	7.3	H/44	-27.3	10.0	40.0	30.0
120.4	32.9 P	14.5	H/44	-26.7	20.7	43.5	22.8
192.4	29.2 P	9.9	H/44	-26.0	13.1	43.5	30.4
241.2	29.5 P	11.8	H/44	-25.7	15.6	46.0	30.4
376.8	28.3 P	15.4	H/44	-25.0	18.7	46.0	27.3
504.4	29.2 P	17.6	H/44	-24.3	22.5	46.0	23.5
700.0	27.9 P	19.8	H/44	-23.1	24.6	46.0	21.4
993.0	27.8 P	22.9	H/44	-19.6	31.1	54.0	22.9
32.8	28.7 P	16.3	V/44	-28.0	17.0	40.0	23.0
81.2	29.3 P	7.2	V/44	-27.3	9.2	40.0	30.8
120.4	30.6 P	14.5	V/44	-26.7	18.4	43.5	25.1
195.6	28.2 P	10.3	V/44	-26.0	12.6	43.5	30.9
229.6	28.9 P	11.6	V/44	-25.9	14.6	46.0	31.4
305.1	28.6 P	13.3	V/44	-25.4	16.5	46.0	29.5
383.5	29.9 P	15.5	V/44	-25.0	20.4	46.0	25.6
462.4	29.0 P	16.7	V/44	-24.3	21.4	46.0	24.6
501.1	29.2 P	17.5	V/44	-24.3	22.3	46.0	23.7
630.0	28.6 P	20.2	V/44	-23.3	25.6	46.0	20.4
994.0	28.0 P	22.9	V/44	-19.6	31.3	54.0	22.7

Judgment: Passed by 20.4 dB
No other emissions were detected in the restricted bands.

Emissions above 1 GHz while Transmitting

		Spectrum Analyzer Readings									EUT	Peak	Ave	Peak	Ave	Margin
hrm	Tx	Peak			Ave	Peak			Ave	Corr.	Emission	Tot. FS		Limit		Under
		Vertical Polarization				Horizontal Polarization					Freq					
#	Freq	X	Y	Z	Max	X	Y	Z	Max	Fact.	MHz	dBuV/m		dBuV/m		Limit
1	2402	107.4	105.3	103.4	82.4	102.1	107.3	102.2	82.3	2.2	2402	109.6	84.6	114	94	4.4
be	2402	52.5	50.4	48.5	27.5	47.2	52.4	47.3	27.4	2.2	2400	54.7	29.7	74	54	19.3
2	2402	39.6	47.3	37.0	22.3	39.8	48.0	40.9	23.0	8.3	4804	56.3	31.3	74	54	17.7
3	2402	37.2	38.2	36.9	13.2	36.0	37.0	37.6	12.6	8.9	7206	47.1	22.1	74	54	26.9
4	2402	40.3	40.5	40.2	15.5	40.1	40.3	39.7	15.3	14.5	9608	55.0	30.0	74	54	19.0
5	2402	39.0	39.4	39.3	14.4	40.0	39.9	39.4	15.0	14.8	12010	54.8	29.8	74	54	19.2
6	2402	41.9	41.8	41.6	16.9	41.0	41.4	41.2	16.4	19.5	14412	61.4	36.4	74	54	12.6
7	2402	41.6	42.6	41.6	17.6	41.9	41.8	42.4	17.4	18.3	16814	60.9	35.9	74	54	13.1
1	2440	107.9	105.9	103.1	82.9	104.9	106.8	102.7	81.8	2.3	2440	110.2	85.2	114	94	3.8
2	2440	48.1	46.0	45.3	23.1	43.1	40.5	46.3	21.3	7.7	4880	55.8	30.8	74	54	18.2
3	2440	36.0	36.0	36.0	11.0	36.0	37.0	37.0	12.0	9.3	7320	46.3	21.3	74	54	27.7
4	2440	41.7	40.4	40.7	16.7	42.0	41.6	41.4	17.0	14.6	9760	56.6	31.6	74	54	17.4
5	2440	39.8	39.5	39.2	14.8	39.4	39.5	40.1	15.1	14.3	12200	54.4	29.4	74	54	19.6
6	2440	42.1	42.0	42.1	17.1	41.9	41.8	42.1	17.1	19.5	14640	61.6	36.6	74	54	12.4
7	2440	41.8	41.7	41.6	16.8	41.7	41.9	42.0	17.0	19.9	17080	61.9	36.9	74	54	12.1
1	2474	110.0	106.8	105.1	85.0	106.8	108.7	106.6	83.7	2.4	2474	112.4	87.4	114	94	1.6
BE	2474	59.0	55.8	54.1	34.0	55.8	57.7	55.6	32.7	2.4	2484	61.4	36.4	74	54	12.6
2	2474	45.1	44.2	41.8	20.1	45.7	38.6	40.3	20.7	7.4	4948	53.1	28.1	74	54	20.9
3	2474	42.0	43.2	39.6	18.2	41.0	42.1	43.9	18.9	9.6	7422	53.5	28.5	74	54	20.5
4	2474	45.4	44.1	47.7	22.7	46.9	43.5	44.3	21.9	14.9	9896	62.6	37.6	74	54	11.4
5	2474	44.6	47.5	49.6	24.6	53.6	45.1	46.7	28.6	13.9	12370	67.5	42.5	74	54	6.5
6	2474	42.5	42.5	43.1	18.1	43.9	41.9	42.3	18.9	19.0	14844	62.9	37.9	74	54	11.1
7	2474	41.7	41.9	41.8	16.9	42.0	41.7	42.0	17.0	19.8	17318	61.8	36.8	74	54	12.2
Column numbers (see below for explanations)																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Judgment: Passed by 1.6 dB
No other emissions were detected from 18 to 25 GHz.

Column #1. hrm = Harmonic; BE = Band Edge emissions
Column #2. Frequency of Transmitter.
Column #3. Uncorrected readings from the spectrum analyzer with First Axis Rotation.
Column #4. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.
Column #5. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.
Column #6. Average Reading based on peak reading reduced by the Duty cylce correction
Column #7. Uncorrected readings from the spectrum analyzer with First Axis Rotation.
Column #8. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.
Column #9. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.
Column #10. Average Reading based on peak reading reduced by the Duty cylce correction
Column #11. Corr. Factors = Cable Loss – Preamp Gain + Antenna Factor
Column #12. Frequency of Tested Emission
Column #13. Highest peak field strength at listed frequency.
Column #14. Highest Average field strength at listed frequency.
Column #15. Peak Limit.
Column #16. Average Limit.
Column #17. The margin (last column) is the worst case margin under the peak or average limits for that row.

10.6 Unintentional Emissions (Receive Mode)

Manufacturer	Delsys	Specification	FCC Part 15.247 & RSS-210
Model	SP-W05	Test Date	April 13, 2012
Serial Number	none	Test Distance	3 Meters
Abbreviations	Pol = Antenna Polarization; V = Vertical; H = Horizontal; P = peak; Q = QP		
Notes	Corr. Factors = Cable Loss – Preamp Gain – Duty Cycle Factor + HP Filter Loss		
Configuration	Receive mode		

Freq. MHz	Meter Reading dBuV	Dect. Type	Antenna		Corr. Factors dB	Field Strength dBuV/m		Margin Under Limit dB
			Factor dB	Pol/ ID#		EUT	Limit	
45.2	28.9	P	15.0	V/44	-27.7	16.2	40.0	23.8
88.4	28.1	P	7.8	V/44	-27.1	8.8	43.5	34.7
120.4	28.5	P	14.5	V/44	-26.7	16.4	43.5	27.1
135.6	28.6	P	12.4	V/44	-26.5	14.5	43.5	29.0
191.6	27.9	P	9.9	V/44	-26.0	11.8	43.5	31.7
327.5	28.8	P	13.7	V/44	-25.3	17.3	46.0	28.7
431.6	29.0	P	16.5	V/44	-24.7	20.8	46.0	25.2
601.0	26.1	P	19.3	V/44	-23.5	21.9	46.0	24.1
785.0	26.7	P	20.8	V/44	-22.0	25.5	46.0	20.5
906.0	26.1	P	22.0	V/44	-20.8	27.3	46.0	18.7
65.6	29.1	P	8.7	H/44	-27.5	10.3	40.0	29.7
120.4	30.7	P	14.5	H/44	-26.7	18.5	43.5	25.0
191.6	29.0	P	9.9	H/44	-26.0	12.9	43.5	30.6
264.2	26.0	P	12.7	H/44	-25.6	13.1	46.0	32.9
452.4	26.7	P	16.3	H/44	-24.4	18.6	46.0	27.4
646.0	26.3	P	20.0	H/44	-23.1	23.1	46.0	22.9
846.0	24.6	P	21.5	H/44	-21.5	24.6	46.0	21.4
916.0	28.3	P	21.8	H/44	-20.7	29.4	46.0	16.6

Judgment: Passed by 16.6 dB