

**FCC PART 15, SUBPART B and C
TEST REPORT***for***RING MOTION DETECTOR****Model: 4SP1S70EN0**

Prepared for

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DATE: AUGUST 11, 2017

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	17	2	2	2	11	32	66

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Device Tested: Ring Motion Detector
Model: 4SP1S70EN0
S/N: N/A

Product Description: The EUT is a wireless PIR motion sensor used in residential and commercial security systems.

Modifications: The EUT was not modified in order to meet the specifications.

Customer: Ecolink Intelligent Technology, Inc.
2055 Corte Del Nogal
Carlsbad, California 92011

Test Dates: June 28; and July 21 and 22, 2017

Test Specifications covered by accreditation:

CFR Title 47, Part 15, Subpart B; and Subpart C sections 15.205, 15.209, and 15.249



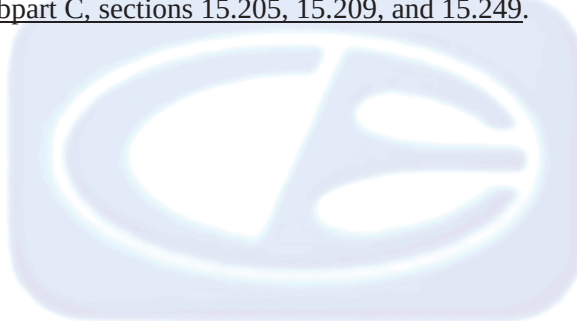
Test Procedures: ANSI C63.4: 2014 and ANSI C63.10: 2013

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Spurious Radiated RF Emissions, 9 kHz –9300 MHz (Transmitter and Digital portion)	Complies with the Class B limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15 Subpart C, section 15.205, 15.209 and 15.249 Highest reading in relation to spec limit 93.08 dBuV/m @ 908.42 MHz (*U = 4.54 dB)
2	Conducted RF Emissions, 150 kHz to 30 MHz	This test was not performed because the EUT does not connect to the AC mains

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Ring Motion Detector, Model: 4SP1S70EN0. The emissions measurements were performed according to the measurement procedure described in ANSI C63.4 and ANSI C63.10. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249.



2. ADMINISTRATIVE DATA

2.1 Location of Testing

The emissions tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Ecolink Intelligent Technology, Inc.

Anna Poltoratska Project Manager

Compatible Electronics Inc.

Kyle Haag Test Technician
James Ross Test Engineer
Kyle Fujimoto Test Engineer

2.4 Date Test Sample was Received

The test sample was received on prior to the initial date of testing.

2.5 Disposition of the Test Sample

The test sample has not been returned to Ecolink Intelligent Technology, Inc. as of the date of this test report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
ASK	Amplitude Shift Key
ITE	Information Technology Equipment
LISN	Line Impedance Stabilization Network
N/A	Not Applicable
Tx	Transmit
Rx	Receive
PIR	Pyroelectric ("Passive") Infrared
Inc.	Incorporated

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this emissions Test Report.

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules – Radio frequency devices (including digital devices) – Intentional Radiators
FCC Title 47, Part 15 Subpart B	FCC Rules – Radio frequency devices (including digital devices) – Unintentional Radiators
ANSI C63.4 2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10 2013	American National Standard of procedure for compliance testing of unlicensed wireless devices

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – Emissions

The Ring Motion Detector, Model: 4SP1S70EN0 (EUT) was setup in a stand-alone configuration. The EUT was investigated in all three orthogonal axis. During the testing, the EUT was continuously transmitting or receiving at the low channel of 908.42 MHz and high channel of 916 MHz.

The X orientation is when the EUT is parallel to the ground. The Y orientation is when the EUT is perpendicular to the ground mounted vertically. The Z orientation is when the EUT is perpendicular to the ground mounted horizontally.

The EUT was programmed to be able to continuously transmit or receive at the low and high channels. Fresh batteries were installed inside the EUT prior to the testing. The EUT was preset via internal firmware to continuously transmit or receive at the low or high, respectively.

The final radiated data for the EUT as was taken in the mode described above. Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

The EUT had no external cables.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
RING MOTION DETECTOR (EUT)	ECOLINK INTELLIGENT TECHNOLOGY, INC.	4SP1S70EN0	N/A	N/A
FIRMWARE FOR EUT*	ECOLINK INTELLIGENT TECHNOLOGY, INC.	1.0	N/A	N/A

*Located inside the EUT to allow the EUT to transmit on a continuous basis.

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED IN LAB D					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
EMI Receiver, 20 Hz – 26.5 GHz	Keysight	N9038A	MY51210150	December 29, 2015	2 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
CombiLog Antenna	Com-Power	AC-220	61060	July 27, 2017	1 Year
Preamplifier	Com-Power	PAM-118A	551024	May 12, 2016	2 Year
Loop Antenna	Com-Power	AL-130R	121090	February 9, 2017	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 26, 2016	2 Year
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for emissions test location.

6.2 EUT Mounting, Bonding and Grounding

For frequencies 1 GHz and below: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

For frequencies above 1 GHz: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 1.5 meters above the ground plane.

The EUT was not grounded.

7. Test Procedures

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The EMI Receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. A transient limiter was used for the protection of the EMI Receiver input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the EMI Receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI 63:4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by computer software. The final qualification data is located in Appendix E.

Test Results:

This device is battery powered and does not connect to the AC public mains, thus this test was not performed.

7.1.2 Radiated Emissions Test

The EMI Receiver was used as the measuring meter. A built-in, internal preamplifier was used to increase the sensitivity of the instrument. The EMI Receiver was initially used with the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. The effective measurement bandwidth used for the radiated emissions test was according to the frequency measured (200 Hz for 9 kHz to 150 kHz, 9 kHz for 150 kHz to 30 MHz, 120 kHz for 30 MHz to 1 GHz and 1 MHz for 1 GHz to 9.3 GHz).

The frequencies above 1 GHz were averaged using a duty cycle correction factor as explained in section 7.1.4 of this test report.

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

The EUT was tested at a 3-meter test distance. The six highest emissions are listed in Table 1.0.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Loop Antenna
150 kHz to 30 MHz	9 kHz	Loop Antenna
30 MHz to 1 GHz	120 kHz	CombiLog Antenna
1 GHz to 9.3 GHz	1 MHz	Horn Antenna

Test Results:

The EUT complies with the **Class B** limits of **CFR** Title 47, Part 15, Subpart B; and Subpart C sections 15.205, 15.209 and 15.249 for radiated emissions.

7.1.3 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS
Ring Motion Detector
Model: 4SP1S70EN0

Frequency MHz	Quasi-Peak EMI Reading (dBuV/m)	Quasi-Peak Specification Limit (dBuV/m)	Delta (Cor. Reading – Spec. Limit) dB
908.42 (H) (X-Axis)	93.44	93.97	-0.53
908.42 (V) (Y-Axis)	93.08	93.97	-0.89
908.42 (V) (Z-Axis)	92.00	93.97	-1.97
916.00 (H) (X-Axis)	91.94	93.97	-2.03
908.42 (H) (Y-Axis)	91.90	93.97	-2.07
916.00 (V) (Y-Axis)	90.22	93.97	-3.75

Notes:

- * The complete emissions data is given in Appendix E of this report.
- (V) Vertical
- (H) Horizontal

7.1.4 Duty Cycle Calculation

The fundamental and harmonics were measured at a 3-meter test distance. The EMI Receiver was used to obtain the final test data. The final qualification data sheets are located in Appendix E.

Where

$$\delta(\text{dB}) = 20 \log \left[\sum (nt_1 + mt_2 + \dots + \xi t_x) / T \right]$$

n is the number of pulses of duration t_1

m is the number of pulses of duration t_2

ξ is the number of pulses of duration t_x

T is the period of the pulse train or 100 ms if the pulse train length is greater than 100 ms

The worst case was when the EUT was attempting to communicate just after inserting the battery:

Duty Cycle Correction Factor = -6.78 dB

Pulse = 45.8 ms

Total On Time = 45.8 ms

Only one pulse during the 100 ms interval, so the maximum 100 ms interval can be used.

45.8 ms / 100 ms = 0.458

20 log (0.458) = -6.78 dB correction factor

8. CONCLUSIONS

The Ring Motion Detector, Model: 4SP1S70EN0, as tested, meets all of the **Class B** specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209 and 15.249.



APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Newbury Park Division
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Newbury Park, CA 91320
(805) 480-4044

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

LABORATORY ACCREDITATIONS AND RECOGNITIONS



NVLAP LAB CODE 200528-0

Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."



For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025.

For the most up-to-date version of our scopes and certificates please visit
<http://celectronics.com/quality/scope/>



APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.249 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.



APPENDIX C

***ADDITIONAL MODEL COVERED
UNDER THIS REPORT***

ADDITIONAL MODEL COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Ring Motion Detector
Model: 4SP1S70EN0
S/N: N/A

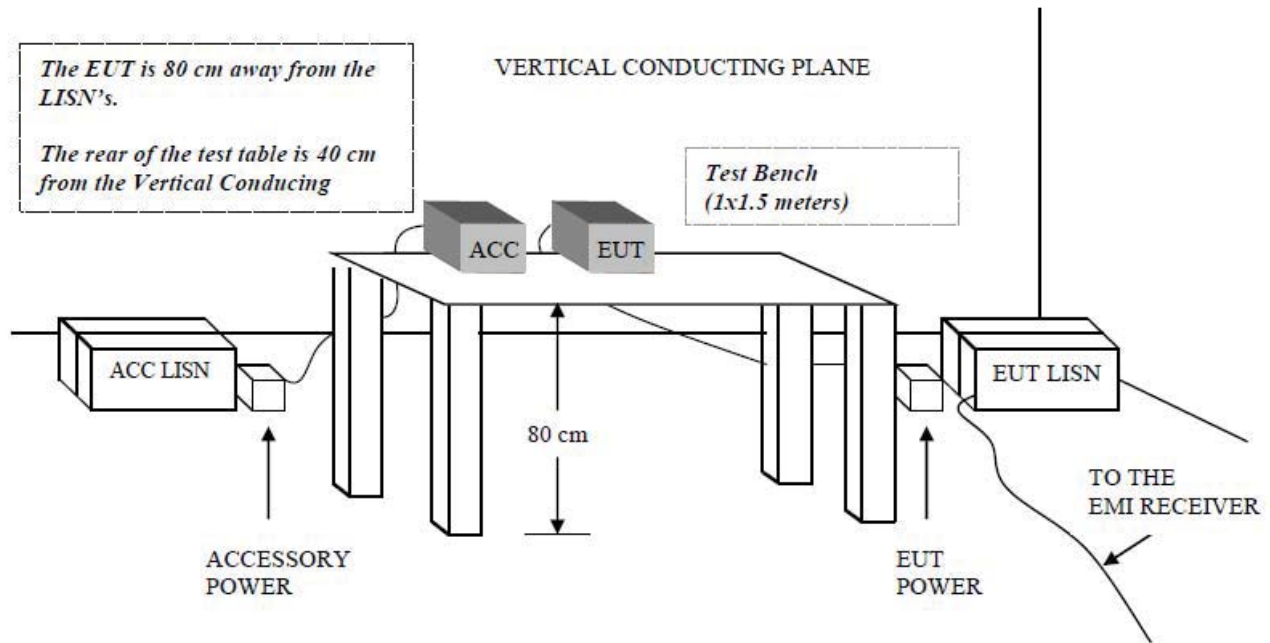
There are no additional Models covered under this report.



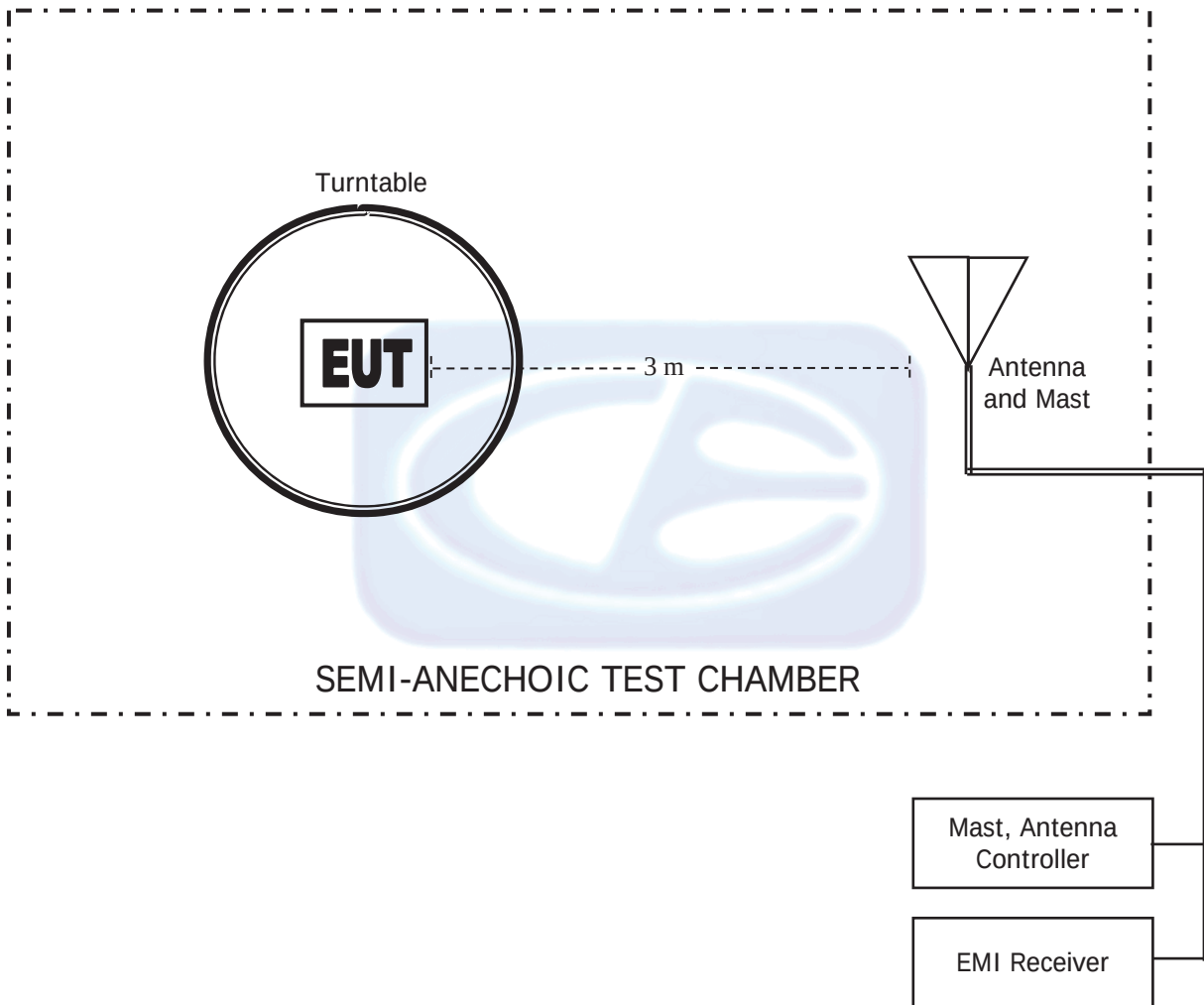


APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

**FIGURE 2: LAYOUT OF THE SEMI -ANECHOIC
TEST CHAMBER**



COM-POWER AL-130**LOOP ANTENNA****S/N: 121090****CALIBRATION DATE: FEBRUARY 9, 2017**

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-36.17	15.33
0.01	-35.86	15.64
0.02	-37.30	14.20
0.03	-36.58	14.92
0.04	-36.99	14.51
0.05	-37.66	13.84
0.06	-37.53	13.97
0.07	-37.64	13.86
0.08	-37.52	13.98
0.09	-37.62	13.88
0.1	-37.59	13.91
0.2	-37.79	13.71
0.3	-37.80	13.70
0.4	-37.70	13.80
0.5	-37.79	13.71
0.6	-37.79	13.71
0.7	-37.69	13.81
0.8	-37.49	14.01
0.9	-37.39	14.11
1	-37.39	14.11
2	-37.09	14.41
3	-37.09	14.41
4	-37.19	14.31
5	-36.98	14.52
6	-37.17	14.33
7	-37.05	14.45
8	-36.85	14.65
9	-36.84	14.66
10	-36.75	14.75
15	-37.16	14.34
20	-36.44	15.06
25	-37.88	13.62
30	-39.14	12.36

COM-POWER AC-220**COMBILOG ANTENNA****S/N: 61060****CALIBRATION DATE: JULY 27, 2017**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	23.80	200	14.10
35	24.00	250	15.30
40	24.70	300	17.70
45	22.90	350	17.70
50	22.10	400	19.00
60	17.60	450	21.30
70	12.70	500	21.00
80	11.20	550	22.30
90	13.10	600	23.40
100	14.40	650	22.90
120	15.30	700	24.60
125	15.00	750	24.50
140	12.80	800	25.40
150	16.50	850	26.40
160	12.90	900	27.20
175	14.30	950	27.80
180	14.50	1000	26.80

COM POWER AH-118**HORN ANTENNA****S/N: 071175****CALIBRATION DATE: FEBRUARY 26, 2016**

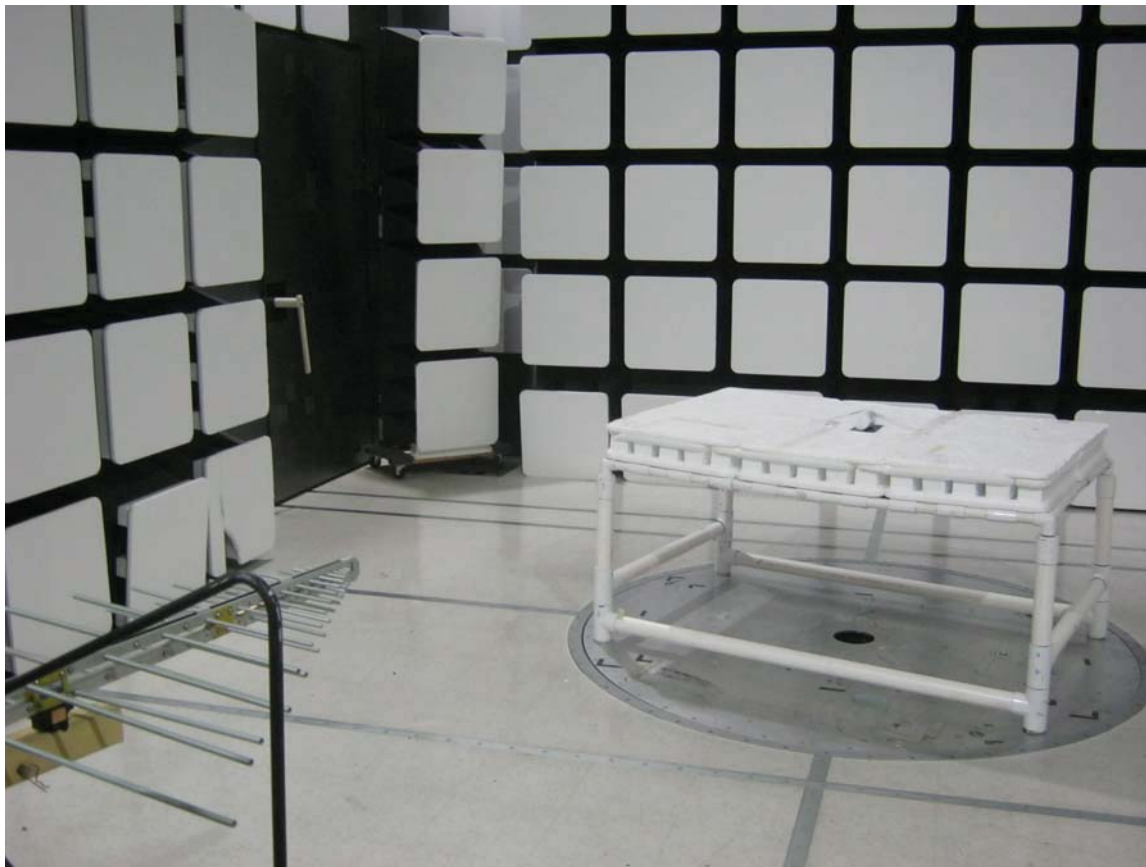
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.93	10.0	39.33
1.5	25.54	10.5	39.64
2.0	28.09	11.0	41.04
2.5	30.21	11.5	44.29
3.0	30.15	12.0	41.22
3.5	30.17	12.5	41.50
4.0	31.90	13.0	41.62
4.5	33.51	13.5	40.63
5.0	33.87	14.0	39.94
5.5	35.08	14.5	41.84
6.0	34.81	15.0	42.69
6.5	34.26	15.5	39.03
7.0	36.33	16.0	39.07
7.5	37.03	16.5	41.40
8.0	37.56	17.0	43.18
8.5	40.07	17.5	47.01
9.0	38.92	18.0	46.48
9.5	38.21		

COM-POWER PAM-118A**PREAMPLIFIER**

S/N: 551024

CALIBRATION DATE: MAY 12, 2016

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	39.84	6.0	39.05
1.1	39.40	6.5	38.94
1.2	39.58	7.0	39.25
1.3	39.68	7.5	39.09
1.4	39.91	8.0	39.01
1.5	39.78	8.5	38.60
1.6	39.50	9.0	38.64
1.7	39.81	9.5	39.67
1.8	39.89	10.0	39.30
1.9	39.94	11.0	39.15
2.0	39.57	12.0	39.24
2.5	40.39	13.0	39.49
3.0	40.63	14.0	39.44
3.5	40.80	15.0	39.94
4.0	40.86	16.0	40.09
4.5	39.94	17.0	40.06
5.0	34.47	18.0	39.76
5.5	39.32		



FRONT VIEW

ECOLINK INTELLIGENT TECHNOLOGY, INC.
RING MOTION DETECTOR
MODEL: 4SP1S70EN0
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

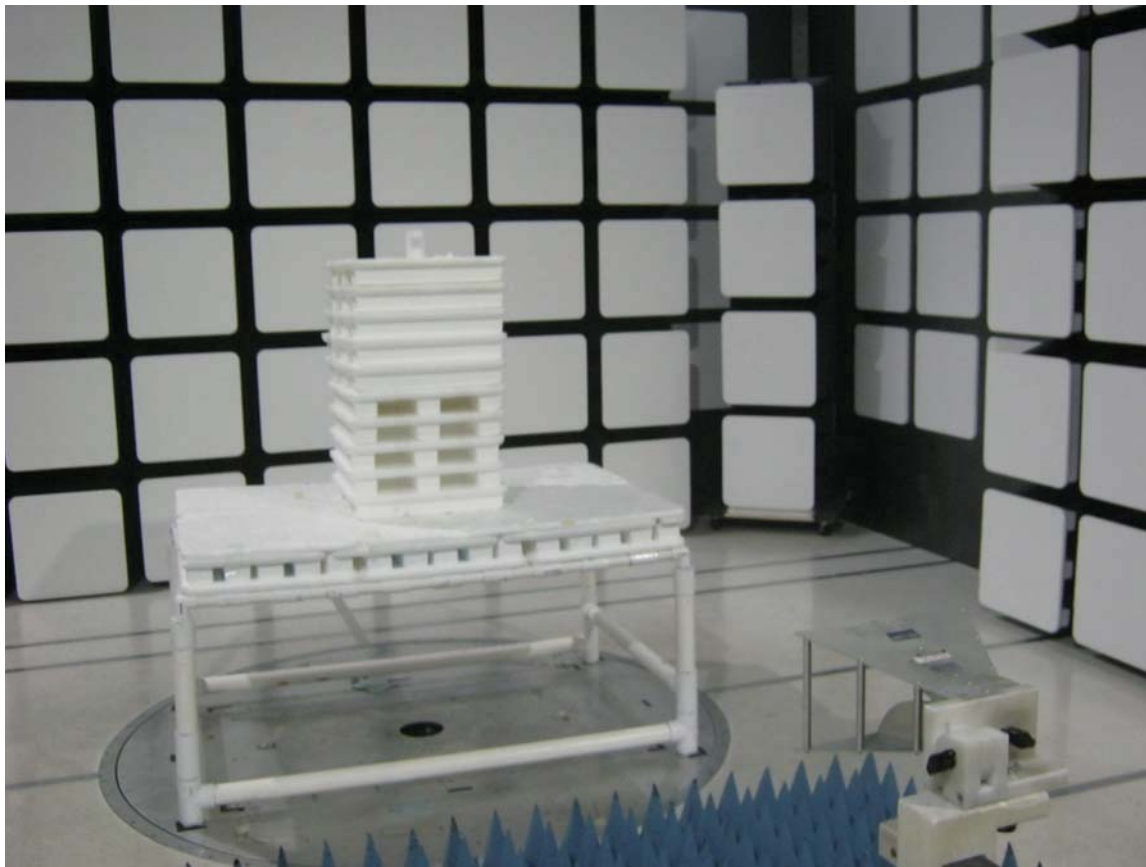
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

ECOLINK INTELLIGENT TECHNOLOGY, INC.
RING MOTION DETECTOR
MODEL: 4SP1S70EN0
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

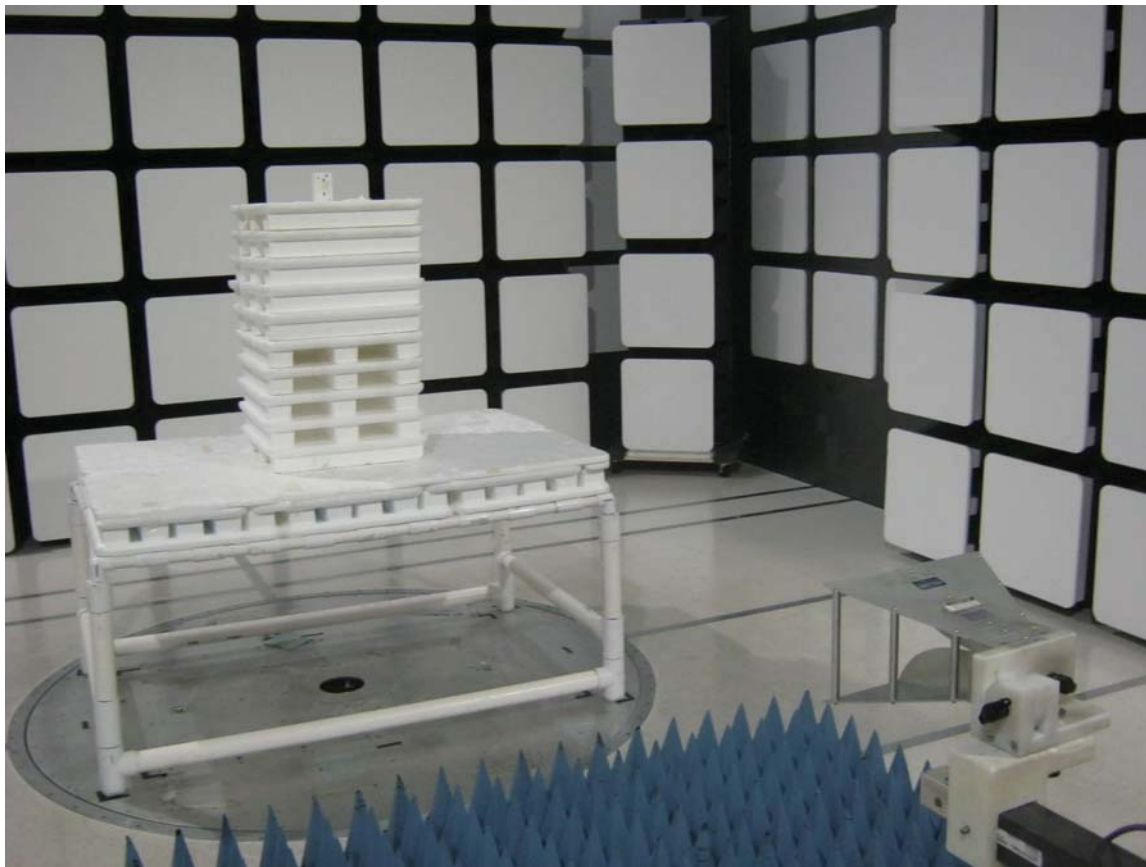
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

ECOLINK INTELLIGENT TECHNOLOGY, INC.
RING MOTION DETECTOR
MODEL: 4SP1S70EN0
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

ECOLINK INTELLIGENT TECHNOLOGY, INC.
RING MOTION DETECTOR
MODEL: 4SP1S70EN0
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONs**

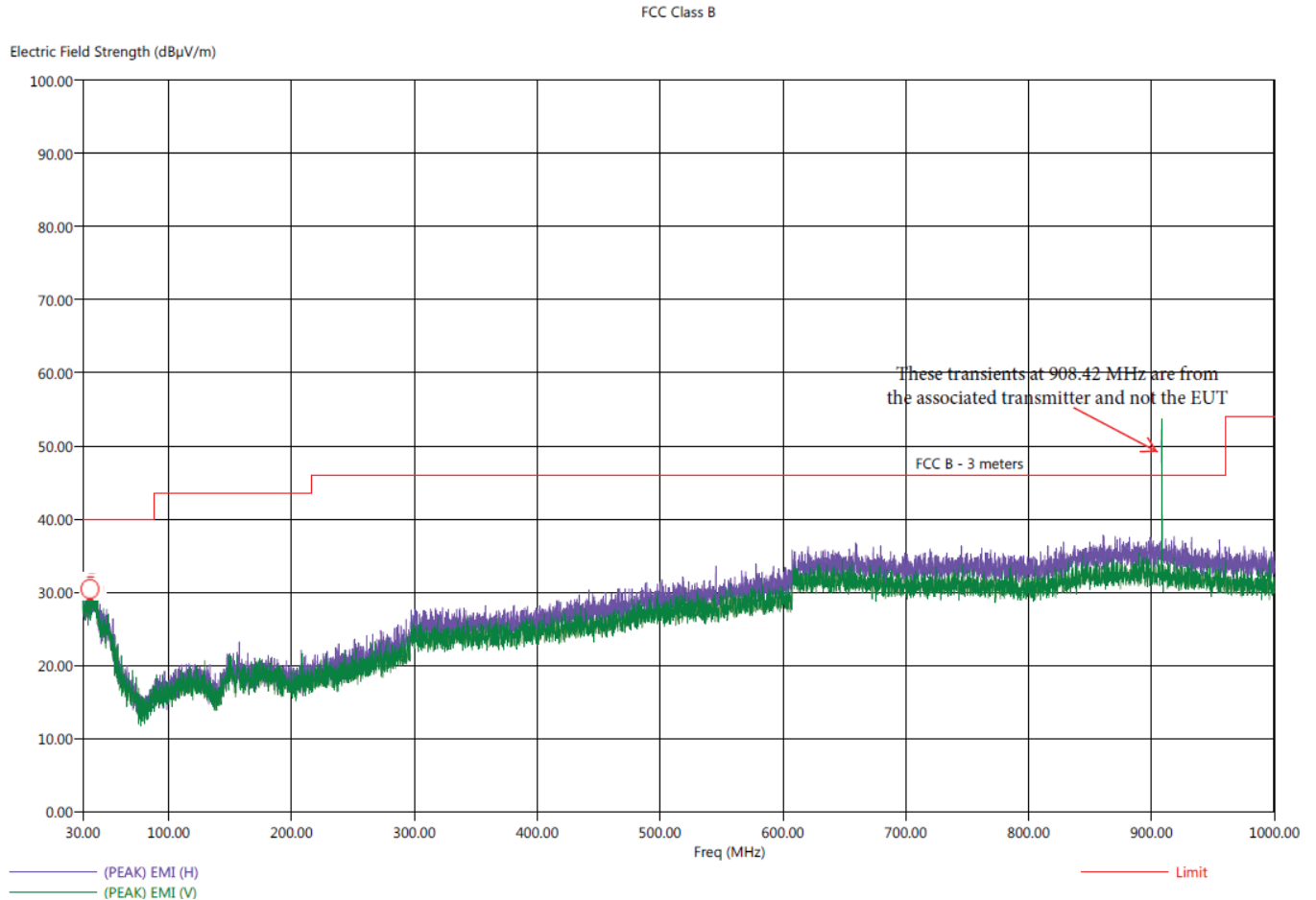
APPENDIX E

DATA SHEETS

***RADIATED EMISSIONS
DATA SHEETS***

Title: Pre-Scan - FCC Class B
File: 1 - Agilent - Pre-Scan- FCC Class B - 30 MHz to 1000 MHz - 908.42MHz - Y -Axis - 6-28-2017.set
Operator: Kyle Haag
EUT Type: Ring Motion Detector
EUT Condition: Continuously Receiving Signals From its Associated Transmitter - 908.42 MHz
Company: Ecolink Intelligent Technology, Inc.
Model: 4SP1S70EN0
EUT Orientation: Y-Axis (worst case)

6/28/2017 3:08:08 PM
Sequence: Preliminary Scan



Title: Radiated Final - FCC Class B
File: 1 - Agilent - Final Scan - FCC Class B - 30 MHz to 1000 MHz - 908.42MHz - Y -Axis - 6-28-2017.set
Operator: Kyle Haag
EUT Type: Ring Motion Detector
EUT Condition: Continuously Reciving Signals From its Associated Transmitter - 908.42 MHz
Company: Ecolink Intelligent Technology, Inc.
Model: 4SP1S70EN0
EUT Oreintation: Y-Axis (worst case)

6/28/2017 3:20:17 PM
Sequence: Final Measurements

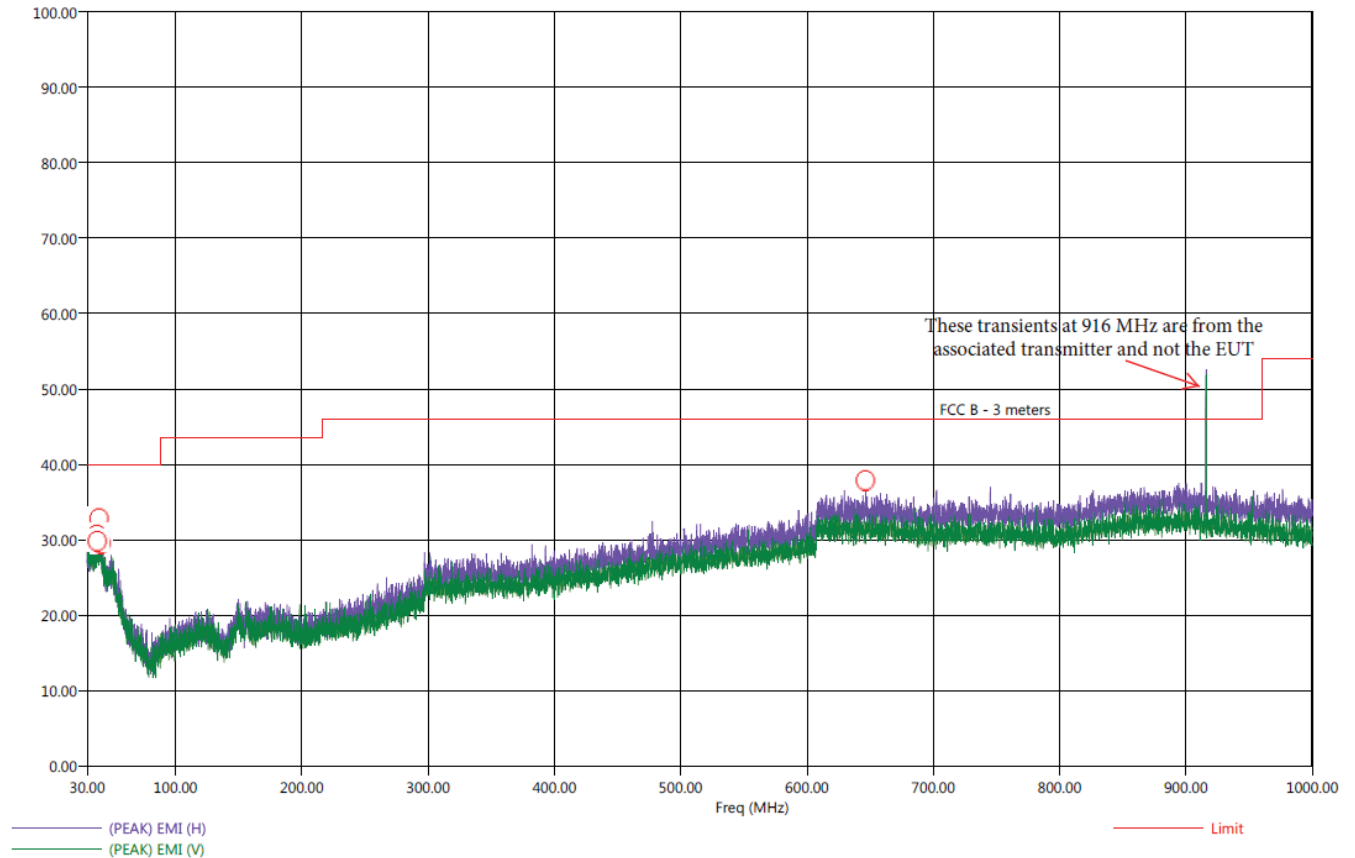
FCC Class B										
Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (dea)	Twr Ht (cm)
36.00	V	32.51	26.50	-7.49	-13.50	40.00	24.49	0.36	49.25	237.20
36.50	V	31.96	26.61	-8.04	-13.39	40.00	24.63	0.37	220.75	205.44
37.50	V	32.27	26.85	-7.73	-13.15	40.00	24.89	0.38	174.50	363.71
38.90	H	32.13	27.07	-7.87	-12.93	40.00	25.12	0.39	162.50	158.58
39.20	H	32.66	27.22	-7.34	-12.78	40.00	25.24	0.39	20.75	301.32
40.40	H	31.76	27.17	-8.24	-12.83	40.00	25.07	0.40	85.00	175.35



Title: Pre-Scan - FCC Class B
File: 1 - Agilent - Pre-Scan- FCC Class B - 30 MHz to 1000 MHz - 916MHz - Z -Axis - 6-28-2017.set
Operator: Kyle Haag
EUT Type: Ring Motion Detector
EUT Condition: Continuously Receiving Signals From its Associated Transmitter - 916 MHz
Company: Ecolink Intelligent Technology, Inc.
Model: 4SP1S70EN0
EUT Orientation: Z-Axis (worst case)

6/28/2017 2:01:20 PM
Sequence: Preliminary Scan

FCC Class B

Electric Field Strength (dB μ V/m)

Title: Radiated Final - FCC Class B

File: 1 - Agilent - Final Scan - FCC Class B - 30 MHz to 1000 MHz - 916MHz - Z -Axis - 6-28-2017.set

Operator: Kyle Haag

EUT Type: Ring Motion Detector

EUT Condition: Continuously Reciving Signals From its Associated Transmitter - 916 MHz

Company: Eocolink Intelligent Technology, Inc.

Model: 4SP1S70EN0

EUT Oreintation: Z-Axis (worst case)

6/28/2017 2:28:53 PM

Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(QP) EMI (dBμV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (deg)	Twr Ht (cm)
37.70	H	32.45	26.88	-7.55	-13.12	40.00	24.89	0.38	81.25	223.53
38.10	V	32.37	27.19	-7.63	-12.81	40.00	24.99	0.38	275.50	256.07
38.30	V	32.10	27.22	-7.90	-12.78	40.00	25.03	0.38	134.25	223.59
39.50	H	32.54	27.36	-7.46	-12.64	40.00	25.26	0.39	164.25	384.37
41.10	V	31.14	26.71	-8.86	-13.29	40.00	24.34	0.40	80.75	287.95
646.40	H	36.62	31.29	-9.38	-14.71	46.00	24.26	2.10	70.75	287.71



FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1816.84	33.44	V	73.97	-40.53	Peak	147.00	176.80	
1816.84	26.66	V	53.97	-27.31	Avg	147.00	176.80	
2725.26	53.03	V	73.97	-20.94	Peak	190.75	206.77	
2725.26	46.25	V	53.97	-7.72	Avg	190.75	206.77	
3633.68	40.02	V	73.97	-33.95	Peak	174.75	181.82	
3633.68	33.24	V	53.97	-20.73	Avg	174.75	181.82	
4542.10	47.14	V	73.97	-26.83	Peak	239.50	178.17	
4542.10	40.36	V	53.97	-13.61	Avg	239.50	178.17	
5450.52	43.65	V	73.97	-30.32	Peak	189.75	160.50	
5450.52	36.87	V	53.97	-17.10	Avg	189.75	160.50	
6358.94	50.90	V	73.97	-23.07	Peak	168.75	160.32	
6358.94	44.12	V	53.97	-9.85	Avg	168.75	160.32	
7267.36	50.06	V	73.97	-23.91	Peak	145.00	166.41	
7267.36	43.28	V	53.97	-10.69	Avg	145.00	166.41	
8175.78	51.42	V	73.97	-22.55	Peak	163.00	151.07	
8175.78	44.64	V	53.97	-9.33	Avg	163.00	151.07	
9084.20	49.04	V	73.97	-24.93	Peak	202.75	127.31	
9084.20	42.26	V	53.97	-11.71	Avg	202.75	127.31	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - Low Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1816.84	32.67	V	73.97	-41.30	Peak	155.50	135.13	
1816.84	25.89	V	53.97	-28.08	Avg	155.50	135.13	
2725.26	52.15	V	73.97	-21.82	Peak	315.25	143.19	
2725.26	45.37	V	53.97	-8.60	Avg	315.25	143.19	
3633.68	39.97	V	73.97	-34.00	Peak	211.25	156.02	
3633.68	33.19	V	53.97	-20.78	Avg	211.25	156.02	
4542.10	44.50	V	73.97	-29.47	Peak	121.75	133.22	
4542.10	37.72	V	53.97	-16.25	Avg	121.75	133.22	
5450.52	43.78	V	73.97	-30.19	Peak	191.75	157.88	
5450.52	37.00	V	53.97	-16.97	Avg	191.75	157.88	
6358.94	49.67	V	73.97	-24.30	Peak	4.00	156.74	
6358.94	42.89	V	53.97	-11.08	Avg	4.00	156.74	
7267.36	48.21	V	73.97	-25.76	Peak	299.50	176.44	
7267.36	41.43	V	53.97	-12.54	Avg	299.50	176.44	
8175.78	51.19	V	73.97	-22.78	Peak	13.50	118.17	
8175.78	44.41	V	53.97	-9.56	Avg	13.50	118.17	
9084.20	49.93	V	73.97	-24.04	Peak	157.00	130.95	
9084.20	43.15	V	53.97	-10.82	Avg	157.00	130.95	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1816.84	33.19	V	73.97	-40.78	Peak	200.00	154.05	
1816.84	26.41	V	53.97	-27.56	Avg	200.00	154.05	
2725.26	52.78	V	73.97	-21.19	Peak	240.00	207.31	
2725.26	46.00	V	53.97	-7.97	Avg	240.00	207.31	
3633.68	41.00	V	73.97	-32.97	Peak	210.75	160.86	
3633.68	34.22	V	53.97	-19.75	Avg	210.75	160.86	
4542.10	45.66	V	73.97	-28.31	Peak	183.75	176.20	
4542.10	38.88	V	53.97	-15.09	Avg	183.75	176.20	
5450.52	43.31	V	73.97	-30.66	Peak	154.00	146.00	
5450.52	36.53	V	53.97	-17.44	Avg	154.00	146.00	
6358.94	49.67	V	73.97	-24.30	Peak	278.50	150.47	
6358.94	42.89	V	53.97	-11.08	Avg	278.50	150.47	
7267.36	48.52	V	73.97	-25.45	Peak	227.25	126.77	
7267.36	41.74	V	53.97	-12.23	Avg	227.25	126.77	
8175.78	50.94	V	73.97	-23.03	Peak	334.25	137.10	
8175.78	44.16	V	53.97	-9.81	Avg	334.25	137.10	
9084.20	48.50	V	73.97	-25.47	Peak	173.00	159.31	
9084.20	41.72	V	53.97	-12.25	Avg	173.00	159.07	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1816.84	33.98	H	73.97	-39.99	Peak	158.50	138.05	
1816.84	27.20	H	53.97	-26.77	Avg	158.50	138.05	
2725.26	53.42	H	73.97	-20.55	Peak	202.50	169.70	
2725.26	46.64	H	53.97	-7.33	Avg	202.50	169.70	
3633.68	41.12	H	73.97	-32.85	Peak	116.75	161.04	
3633.68	34.34	H	53.97	-19.63	Avg	116.75	161.04	
4542.10	47.04	H	73.97	-26.93	Peak	194.25	149.28	
4542.10	40.26	H	53.97	-13.71	Avg	194.25	149.28	
5450.52	43.77	H	73.97	-30.20	Peak	221.75	139.49	
5450.52	36.99	H	53.97	-16.98	Avg	221.75	139.49	
6358.94	51.43	H	73.97	-22.54	Peak	137.00	172.14	
6358.94	44.65	H	53.97	-9.32	Avg	137.00	172.14	
7267.36	46.47	H	73.97	-27.50	Peak	62.25	185.82	
7267.36	39.69	H	53.97	-14.28	Avg	62.25	185.82	
8175.78	52.02	H	73.97	-21.95	Peak	161.50	149.16	
8175.78	45.24	H	53.97	-8.73	Avg	161.50	149.16	
9084.20	49.31	H	73.97	-24.66	Peak	188.50	163.85	
9084.20	42.53	H	53.97	-11.44	Avg	188.50	163.85	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - Low Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1816.84	33.44	H	73.97	-40.53	Peak	147.00	176.80	
1816.84	26.66	H	53.97	-27.31	Avg	147.00	176.80	
2725.26	44.97	H	73.97	-29.00	Peak	190.75	191.07	
2725.26	38.19	H	53.97	-15.78	Avg	190.75	191.07	
3633.68	40.02	H	73.97	-33.95	Peak	174.75	181.82	
3633.68	33.24	H	53.97	-20.73	Avg	174.75	181.82	
4542.10	45.56	H	73.97	-28.41	Peak	166.00	197.88	
4542.10	38.78	H	53.97	-15.19	Avg	166.00	197.88	
5450.52	43.67	H	73.97	-30.30	Peak	176.00	147.61	
5450.52	36.89	H	53.97	-17.08	Avg	176.00	147.61	
6358.94	46.91	H	73.97	-27.06	Peak	184.00	234.89	
6358.94	40.13	H	53.97	-13.84	Avg	184.00	234.89	
7267.36	47.06	H	73.97	-26.91	Peak	179.50	127.25	
7267.36	40.28	H	53.97	-13.69	Avg	179.50	127.25	
8175.78	52.21	H	73.97	-21.76	Peak	174.00	132.44	
8175.78	45.43	H	53.97	-8.54	Avg	174.00	132.44	
9084.20	48.41	H	73.97	-25.56	Peak	127.75	148.32	
9084.20	41.63	H	53.97	-12.34	Avg	127.75	148.32	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1816.84	33.52	H	73.97	-40.45	Peak	194.25	154.11	
1816.84	26.74	H	53.97	-27.23	Avg	194.25	154.11	
2725.26	52.81	H	73.97	-21.16	Peak	204.25	157.58	
2725.26	46.03	H	53.97	-7.94	Avg	204.25	157.58	
3633.68	40.19	H	73.97	-33.78	Peak	164.50	146.05	
3633.68	33.41	H	53.97	-20.56	Avg	164.50	146.05	
4542.10	45.76	H	73.97	-28.21	Peak	176.25	141.70	
4542.10	38.98	H	53.97	-14.99	Avg	176.25	141.70	
5450.52	43.38	H	73.97	-30.59	Peak	108.25	138.29	
5450.52	36.60	H	53.97	-17.37	Avg	108.25	138.29	
6358.94	48.70	H	73.97	-25.27	Peak	200.75	216.68	
6358.94	41.92	H	53.97	-12.05	Avg	200.75	216.68	
7267.36	46.66	H	73.97	-27.31	Peak	162.50	122.05	
7267.36	39.88	H	53.97	-14.09	Avg	162.50	122.05	
8175.78	49.42	H	73.97	-24.55	Peak	217.25	101.64	
8175.78	42.64	H	53.97	-11.33	Avg	217.25	101.64	
9084.20	48.41	H	73.97	-25.56	Peak	158.00	172.20	
9084.20	41.63	H	53.97	-12.34	Avg	158.00	172.20	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1832.00	33.20	V	73.97	-40.77	Peak	190.50	158.47	
1832.00	26.42	V	53.97	-27.55	Avg	190.50	158.47	
2748.00	54.09	V	73.97	-19.88	Peak	203.00	180.74	
2748.00	47.31	V	53.97	-6.66	Avg	203.00	180.74	
3664.00	38.60	V	73.97	-35.37	Peak	154.75	134.71	
3664.00	31.82	V	53.97	-22.15	Avg	154.75	134.71	
4580.00	47.12	V	73.97	-26.85	Peak	248.25	159.43	
4580.00	40.34	V	53.97	-13.63	Avg	248.25	159.43	
5496.00	43.77	V	73.97	-30.20	Peak	266.50	145.10	
5496.00	36.99	V	53.97	-16.98	Avg	266.50	145.50	
6412.00	52.20	V	73.97	-21.77	Peak	140.75	172.68	
6412.00	45.42	V	53.97	-8.55	Avg	140.75	172.68	
7328.00	47.37	V	73.97	-26.60	Peak	143.75	127.25	
7328.00	40.59	V	53.97	-13.38	Avg	143.75	127.25	
8244.00	50.82	V	73.97	-23.15	Peak	181.25	149.64	
8244.00	44.04	V	53.97	-9.93	Avg	181.25	149.64	
9160.00	48.75	V	73.97	-25.22	Peak	80.25	147.67	
9160.00	41.97	V	53.97	-12.00	Avg	80.25	147.67	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - High Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1832.00	32.52	V	73.97	-41.46	Peak	186.25	150.65	
1832.00	25.74	V	53.97	-28.24	Avg	186.25	150.65	
2748.00	52.91	V	73.97	-21.07	Peak	302.50	206.17	
2748.00	46.13	V	53.97	-7.85	Avg	302.50	206.17	
3664.00	40.64	V	73.97	-33.33	Peak	61.25	197.52	
3664.00	33.86	V	53.97	-20.11	Avg	61.25	197.52	
4580.00	44.65	V	73.97	-29.32	Peak	114.25	147.97	
4580.00	37.87	V	53.97	-16.10	Avg	114.25	147.97	
5496.00	44.18	V	73.97	-29.79	Peak	153.25	144.08	
5496.00	37.40	V	53.97	-16.57	Avg	153.25	144.08	
6412.00	47.92	V	73.97	-26.05	Peak	176.75	148.86	
6412.00	41.14	V	53.97	-12.83	Avg	176.75	148.86	
7328.00	46.01	V	73.97	-27.96	Peak	199.75	141.16	
7328.00	39.23	V	53.97	-14.74	Avg	199.75	141.16	
8244.00	50.93	V	73.97	-23.04	Peak	10.75	103.25	
8244.00	44.15	V	53.97	-9.82	Avg	10.75	103.25	
9160.00	48.43	V	73.97	-25.54	Peak	130.00	145.04	
9160.00	41.65	V	53.97	-12.32	Avg	130.00	145.04	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - High Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1832.00	33.57	V	73.97	-40.40	Peak	146.25	179.19	
1832.00	26.79	V	53.97	-27.18	Avg	146.25	179.19	
2748.00	53.25	V	73.97	-20.72	Peak	242.25	183.91	
2748.00	46.47	V	53.97	-7.50	Avg	242.25	183.91	
3664.00	39.18	V	73.97	-34.79	Peak	211.25	187.55	
3664.00	32.40	V	53.97	-21.57	Avg	211.25	187.55	
4580.00	45.24	V	73.97	-28.73	Peak	186.00	146.29	
4580.00	38.46	V	53.97	-15.51	Avg	186.00	146.29	
5496.00	43.93	V	73.97	-30.04	Peak	161.00	155.73	
5496.00	37.15	V	53.97	-16.82	Avg	161.00	155.73	
6412.00	49.43	V	73.97	-24.54	Peak	154.25	134.17	
6412.00	42.65	V	53.97	-11.32	Avg	154.25	134.17	
7328.00	46.34	V	73.97	-27.63	Peak	234.50	154.36	
7328.00	39.56	V	53.97	-14.41	Avg	234.50	154.35	
8244.00	49.84	V	73.97	-24.13	Peak	321.75	146.41	
8244.00	43.06	V	53.97	-10.91	Avg	321.75	146.41	
9160.00	48.86	V	73.97	-25.11	Peak	297.25	172.74	
9160.00	42.08	V	53.97	-11.89	Avg	297.25	172.74	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1832.00	33.57	H	73.97	-40.40	Peak	159.00	148.14	
1832.00	26.79	H	53.97	-27.18	Avg	159.00	148.14	
2748.00	54.85	H	73.97	-19.12	Peak	196.50	147.85	
2748.00	48.07	H	53.97	-5.90	Avg	196.50	147.85	
3664.00	42.38	H	73.97	-31.59	Peak	118.75	155.67	
3664.00	35.60	H	53.97	-18.37	Avg	118.75	155.67	
4580.00	46.41	H	73.97	-27.56	Peak	231.50	176.02	
4580.00	39.63	H	53.97	-14.34	Avg	231.50	176.02	
5496.00	49.93	H	73.97	-24.04	Peak	158.00	182.23	
5496.00	43.15	H	53.97	-10.82	Avg	158.00	182.23	
6412.00	52.18	H	73.97	-21.79	Peak	173.50	155.97	
6412.00	45.40	H	53.97	-8.57	Avg	173.50	155.97	
7328.00	49.01	H	73.97	-24.96	Peak	148.75	169.52	
7328.00	42.23	H	53.97	-11.74	Avg	148.75	169.52	
8244.00	49.59	H	73.97	-24.38	Peak	72.50	146.83	
8244.00	42.81	H	53.97	-11.16	Avg	72.50	146.83	
9160.00	49.64	H	73.97	-24.33	Peak	200.00	121.40	
9160.00	42.86	H	53.97	-11.11	Avg	200.00	121.40	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - High Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1832.00	33.60	H	73.97	-40.37	Peak	360.00	172.26	
1832.00	26.82	H	53.97	-27.15	Avg	360.00	172.26	
2748.00	51.91	H	73.97	-22.06	Peak	283.25	137.76	
2748.00	45.13	H	53.97	-8.84	Avg	283.25	137.76	
3664.00	40.44	H	73.97	-33.53	Peak	319.25	203.85	
3664.00	33.66	H	53.97	-20.31	Avg	319.25	203.85	
4580.00	45.00	H	73.97	-28.97	Peak	106.50	221.88	
4580.00	38.22	H	53.97	-15.75	Avg	106.50	221.88	
5496.00	44.23	H	73.97	-29.74	Peak	345.12	184.98	
5496.00	37.45	H	53.97	-16.52	Avg	345.12	184.98	
6412.00	47.84	H	73.97	-26.13	Peak	76.00	163.37	
6412.00	41.06	H	53.97	-12.91	Avg	76.00	163.37	
7328.00	45.92	H	73.97	-28.05	Peak	144.25	200.98	
7328.00	39.14	H	53.97	-14.83	Avg	144.25	200.98	
8244.00	50.43	H	73.97	-23.54	Peak	237.00	125.16	
8244.00	43.65	H	53.97	-10.32	Avg	237.00	125.16	
9160.00	48.17	H	73.97	-25.80	Peak	115.23	154.89	
9160.00	41.39	H	53.97	-12.58	Avg	115.23	154.89	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Ring Motion Detector
 Model: 4SP1S70EN0

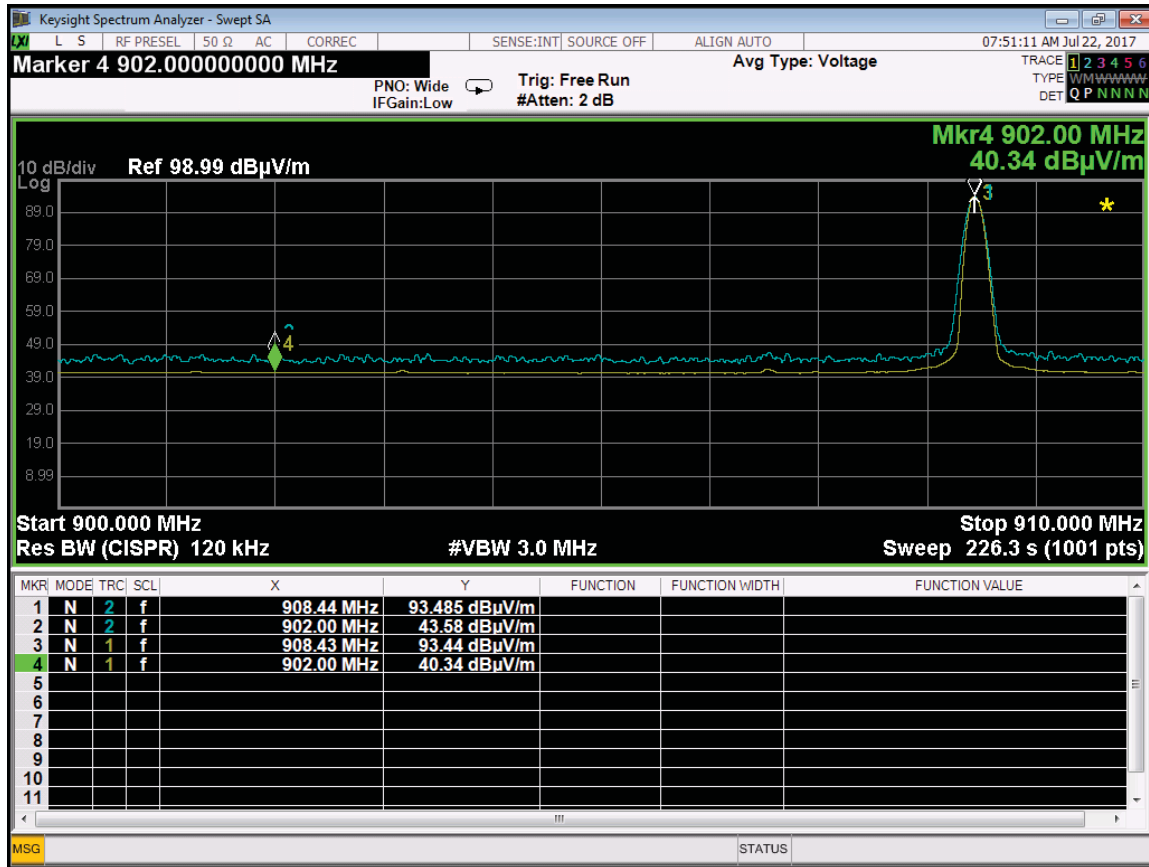
Date: 07/21/2017
 Lab: D
 Tested By: Kyle Haag

Harmonics - High Channel
Transmit Mode - Z-Axis

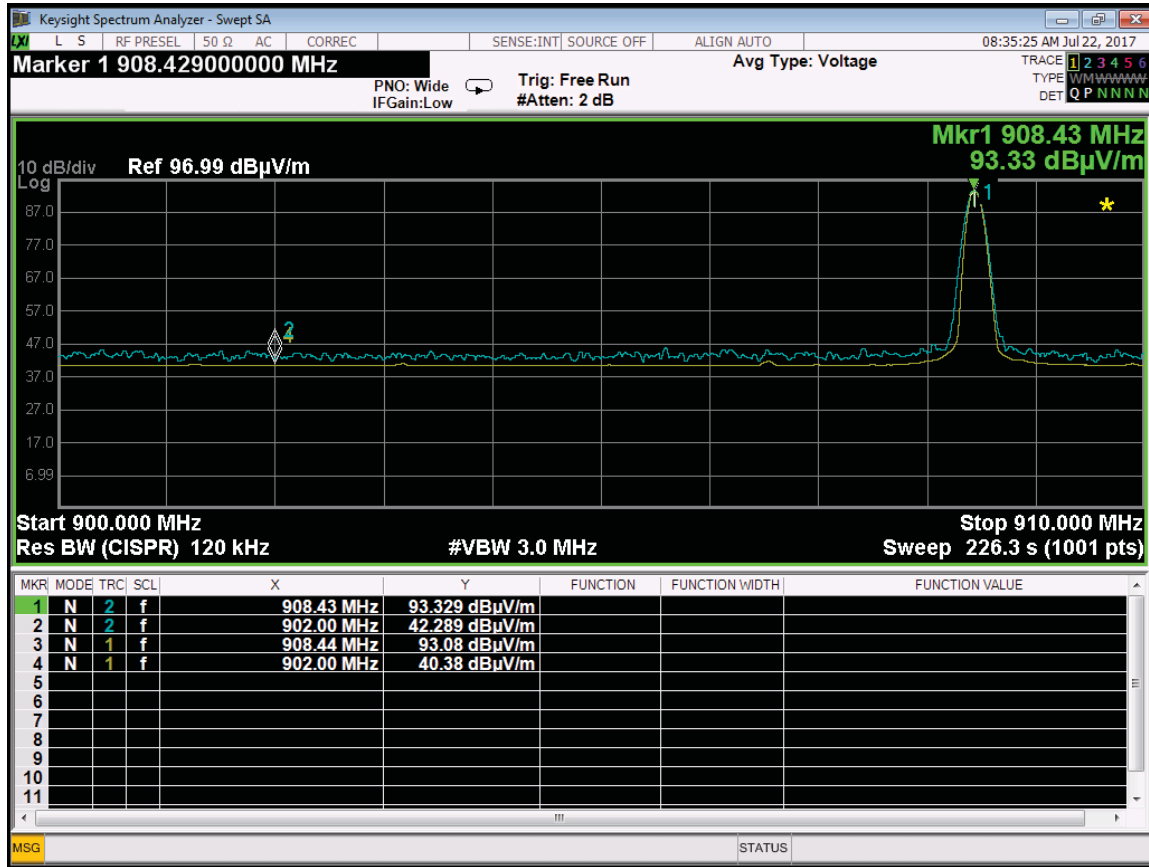
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1832.00	34.07	H	73.97	-39.90	Peak	190.75	172.26	
1832.00	27.29	H	53.97	-26.68	Avg	190.75	172.26	
2748.00	53.33	H	73.97	-20.64	Peak	181.50	159.55	
2748.00	46.55	H	53.97	-7.42	Avg	181.50	159.55	
3664.00	48.66	H	73.97	-25.31	Peak	222.25	152.26	
3664.00	41.88	H	53.97	-12.09	Avg	222.25	152.26	
4580.00	45.31	H	73.97	-28.66	Peak	174.00	167.91	
4580.00	38.53	H	53.97	-15.44	Avg	174.00	167.91	
5496.00	44.23	H	73.97	-29.74	Peak	224.75	167.61	
5496.00	37.45	H	53.97	-16.52	Avg	224.75	167.61	
6412.00	52.07	H	73.97	-21.90	Peak	185.25	200.68	
6412.00	45.29	H	53.97	-8.68	Avg	185.25	200.68	
7328.00	45.84	H	73.97	-28.13	Peak	173.50	156.92	
7328.00	39.06	H	53.97	-14.91	Avg	173.50	156.92	
8244.00	51.44	H	73.97	-22.53	Peak	196.25	207.73	
8244.00	44.66	H	53.97	-9.31	Avg	196.25	207.73	
9160.00	48.46	H	73.97	-25.51	Peak	139.50	162.00	
9160.00	41.68	H	53.97	-12.29	Avg	139.50	162.00	

Report Number: **B70724D1**
FCC Part 15 Subpart B and FCC Section 15.249 Test Report
Z-Wave Plus Redsky for Ring PIR Motion Sensor
Model: 4SP1S70EN0

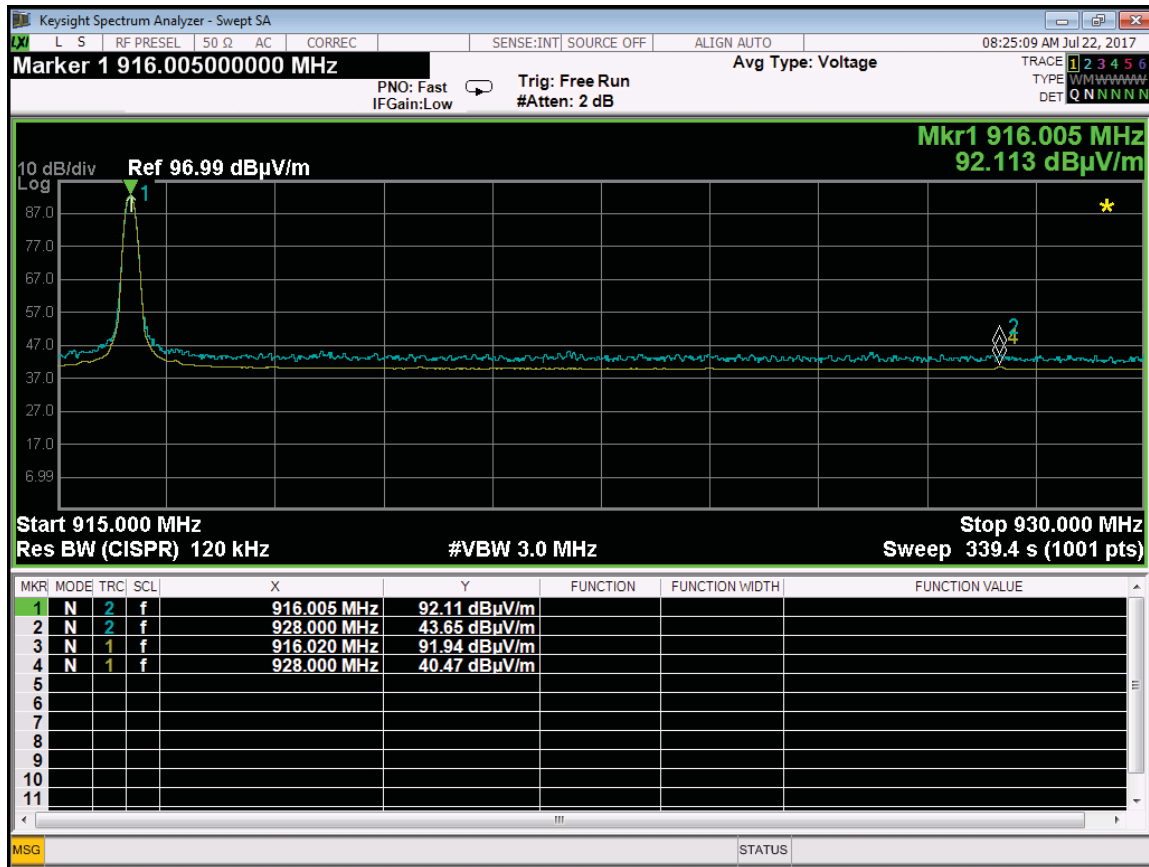
***BAND EDGES
DATA SHEETS***



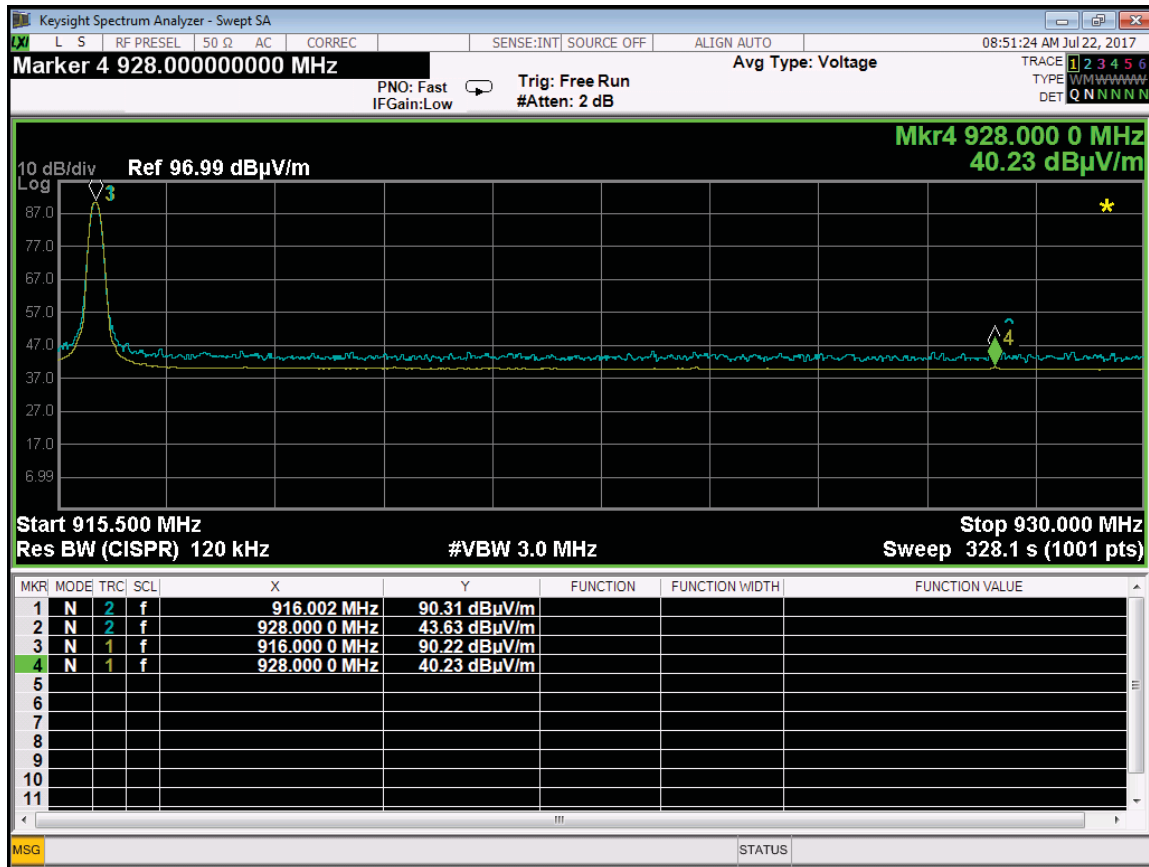
Band Edge - 908.42 MHz - Horizontal - X-Axis - Worst Case



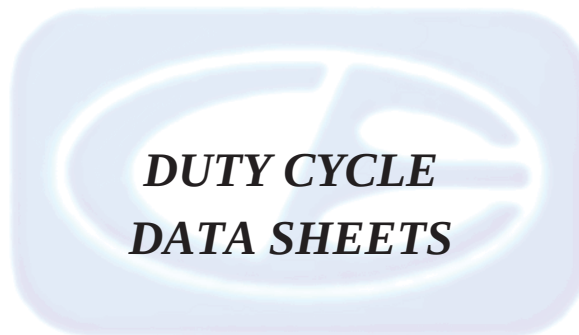
Band Edge - 908.42 MHz - Vertical - Y-Axis - Worst Case

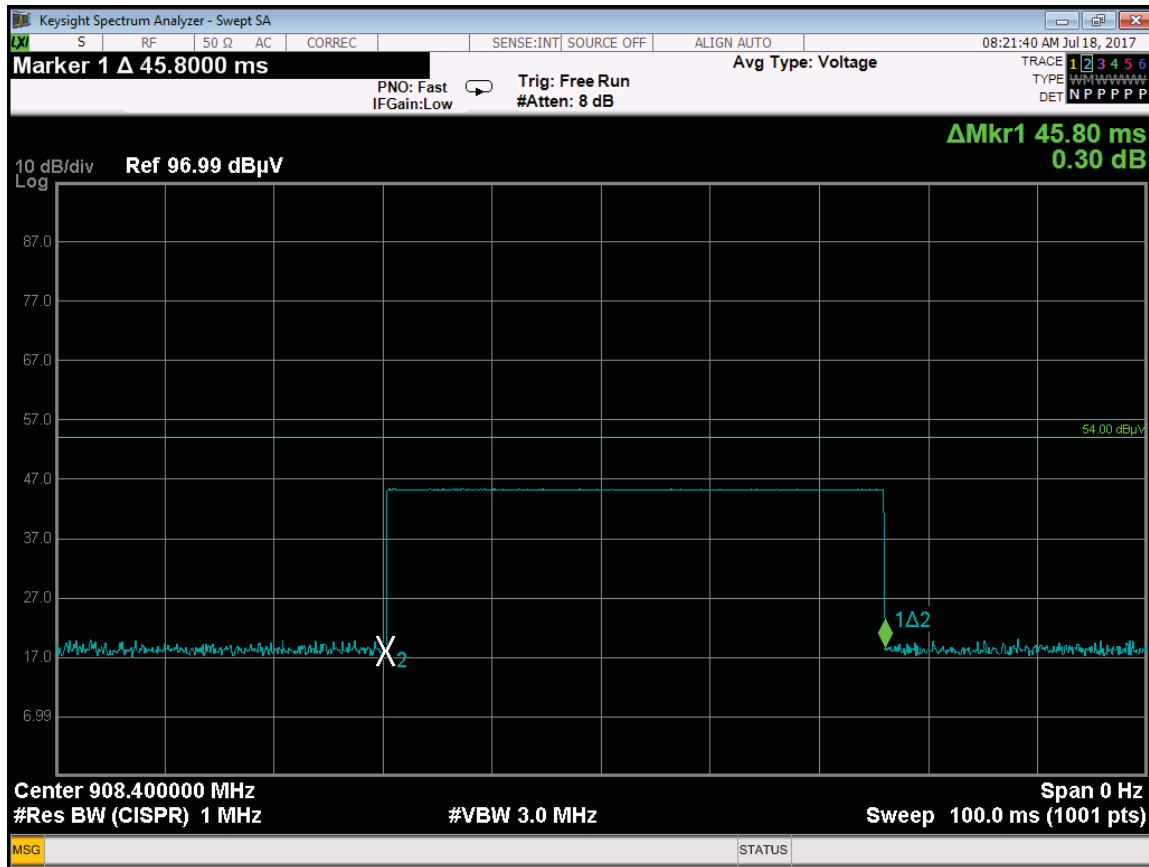


Band Edge - 916 MHz - Horizontal - X-Axis - Worst Case

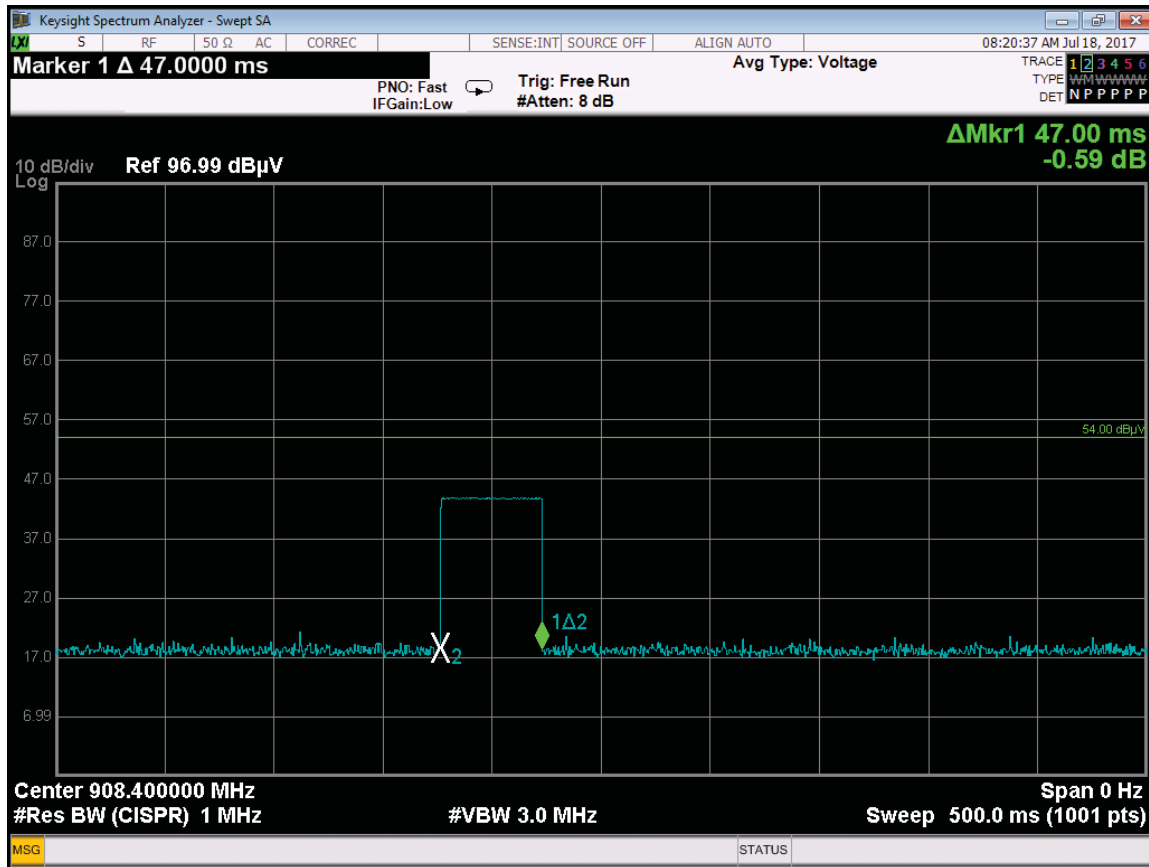


Band Edge - 916 MHz - Vertical - Y-Axis - Worst Case





Pulse = 45.8 ms



Plot Showing only 1 pulse appears every 100 ms

Total Duty Cycle = 45.8 ms / 100 ms = 45.8% Duty Cycle

The Peak to Average Ratio is -6.78 dB