

**FCC PART 15, SUBPART B and C
TEST REPORT***for***SINGLE TOGGLE SWITCH****Model: STLS2-ZWAVE5**

Prepared for

ECOLINK INTELLIGENT TECHNOLOGY, INC.
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CARLSBAD, CALIFORNIA 92011

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DATE: NOVEMBER 30, 2017

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	17	2	2	2	11	35	69

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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: Single Toggle Switch
Model: STLS2-ZWAVE5
S/N: N/A

Product Description: The EUT is a battery-powered device for home automation applications.

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: February 3, 5, 6, and 7, 2017

Test Specifications covered by accreditation:

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



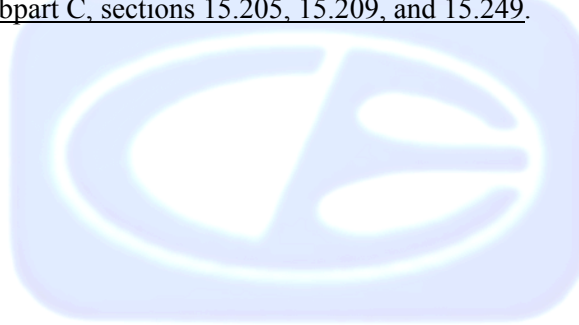
Test Procedures: ANSI C63.4: 2014 and ANSI C63.10: 2013

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 <small>Highest reading in relation to spec limit 93.91 dBuV/m @ 908.42 MHz (*U = 4.54 dB)</small>
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 Single Toggle Switch, Model: STLS2-ZWAVE5. 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.



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 Single Toggle Switch, Model: STLS2-ZWAVE5 (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 firmware is stored in one of the network drives in the company's server.

The final radiated data for the EUT 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
SINGLE TOGGLE SWITCH (EUT)	ECOLINK INTELLIGENT TECHNOLOGY, INC.	STLS2-ZWAVE5	N/A	XQC-SDLS2ZWAVE5
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	MY5120150	December 6, 2017	1 Year
EMI Receiver, 20 Hz – 40 GHz	Rohde & Schwarz	ESIB40	100194	September 26, 2017	1 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.

6.3 Measurement Uncertainty

The uncertainty values are in the table below.

The uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level, using a coverage factor of $k=2$

MEASUREMENT TYPE	PARTICULAR CONFIGURATION	UNCERTAINTY VALUES
RADIATED EMISSIONS	3-METER CHAMBER, COMBILOG ANTENNA	4.54 dB
RADIATED EMISSIONS	3-METER CHAMBER, HORN ANTENNA	3.70 dB
AC LINE CONDUCTED EMISSIONS	3-METER CHAMBER, COM-POWER LISN	2.88 dB

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 ResultsTable 1.0 RADIATED EMISSION RESULTS
Single Toggle Switch
Model: STLS2-ZWAVE5

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)	93.91	93.97	-0.06
916.00 (H) (X-Axis)	93.23	93.97	-0.74
916.00 (V) (Y-Axis)	92.69	93.97	-1.28
908.42 (V) (Y-Axis)	92.45	93.97	-1.52
908.42 (H) (Z-Axis)	90.56	93.97	-3.41
916.00 (H) (Z-Axis)	89.09	93.97	-4.88

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

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

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 = -7.82 dB

Pulse = 40.6 ms

Worst Case Between Pulses = 40.6 ms

40.6 ms / 100.00 ms = 0.4060

20 log (0.4060) = -7.82 dB correction factor

8. CONCLUSIONS

The Single Toggle Switch, Model: STLS2-ZWAVE5, 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

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

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LABORATORY ACCREDITATIONS AND RECOGNITIONS



NVLAP LAB CODE 200528-0



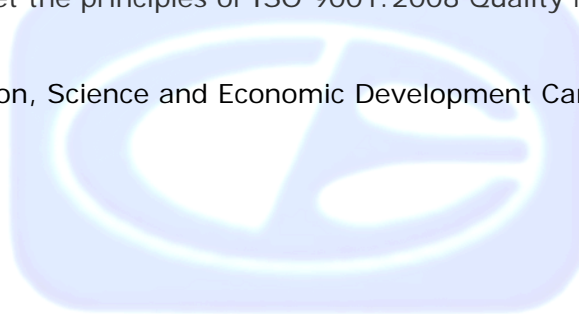
For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025.

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

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."

Test Site Number for Innovation, Science and Economic Development Canada: 2154A-3



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

Single Toggle Switch
Model: STLS2-ZWAVE5
S/N: N/A

There are no additional Models covered under this report.



APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

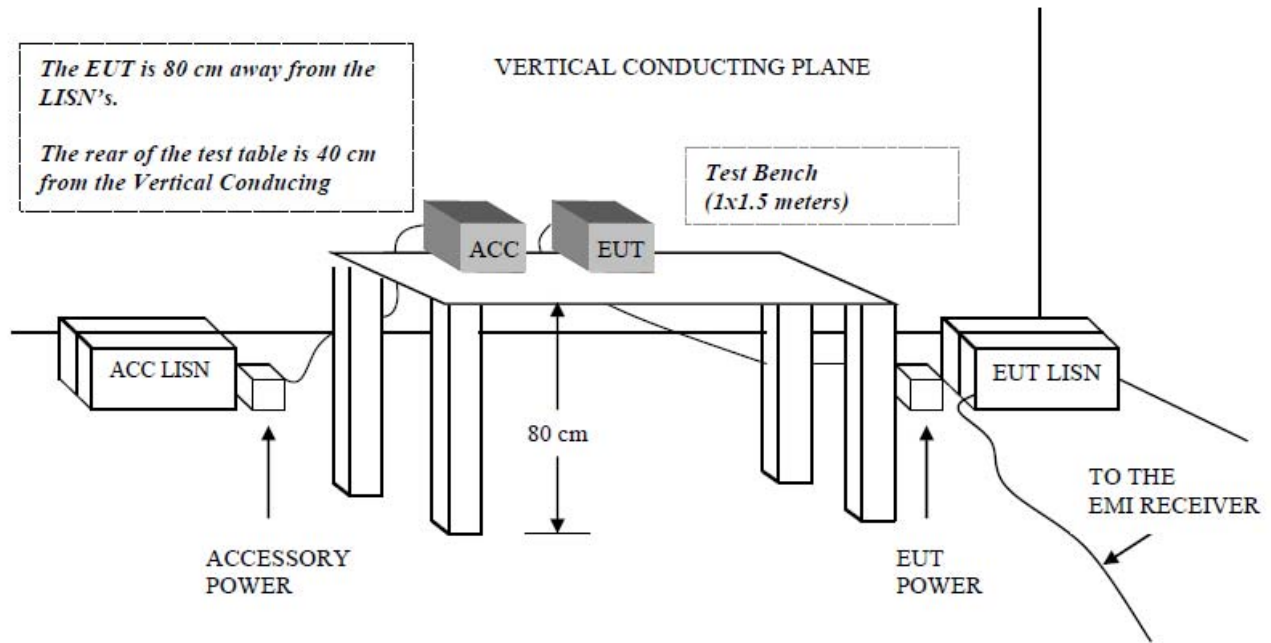
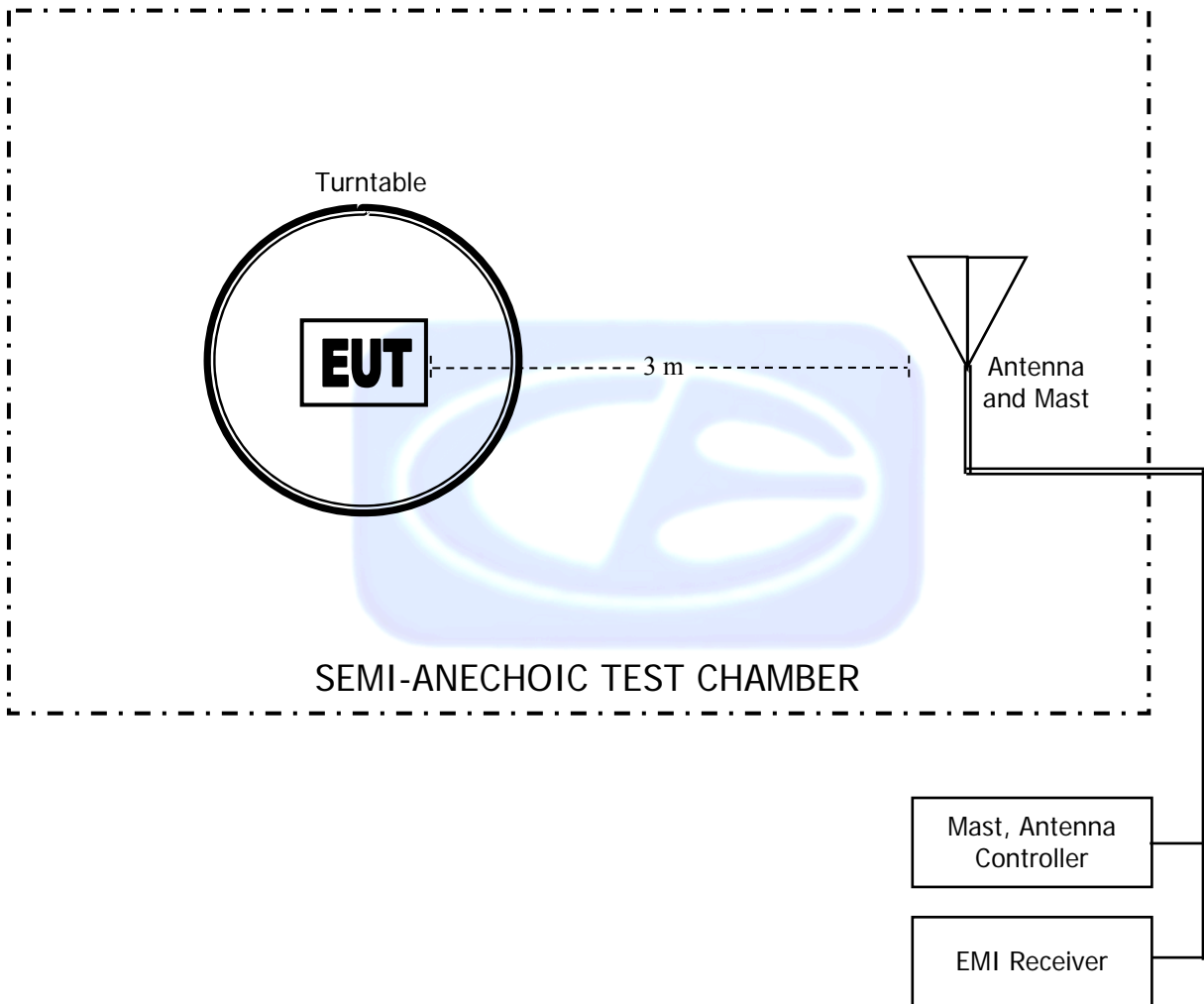


FIGURE 2: LAYOUT OF THE SEMI -ANECHOIC TEST CHAMBER



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

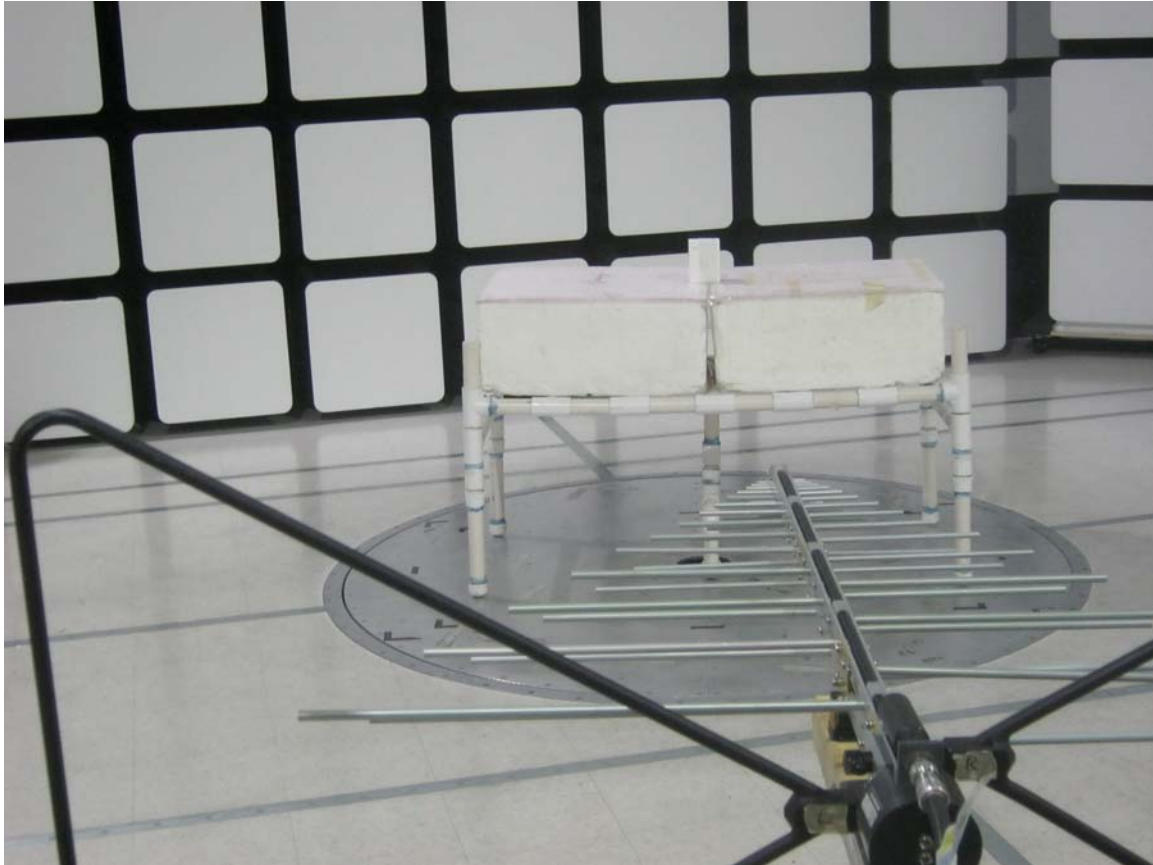
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.93	10.0	39.33
1.5	25.54	10.5	39.64
2.0	28.09	11.0	41.04
2.5	30.21	11.5	44.29
3.0	30.15	12.0	41.22
3.5	30.17	12.5	41.50
4.0	31.90	13.0	41.62
4.5	33.51	13.5	40.63
5.0	33.87	14.0	39.94
5.5	35.08	14.5	41.84
6.0	34.81	15.0	42.69
6.5	34.26	15.5	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

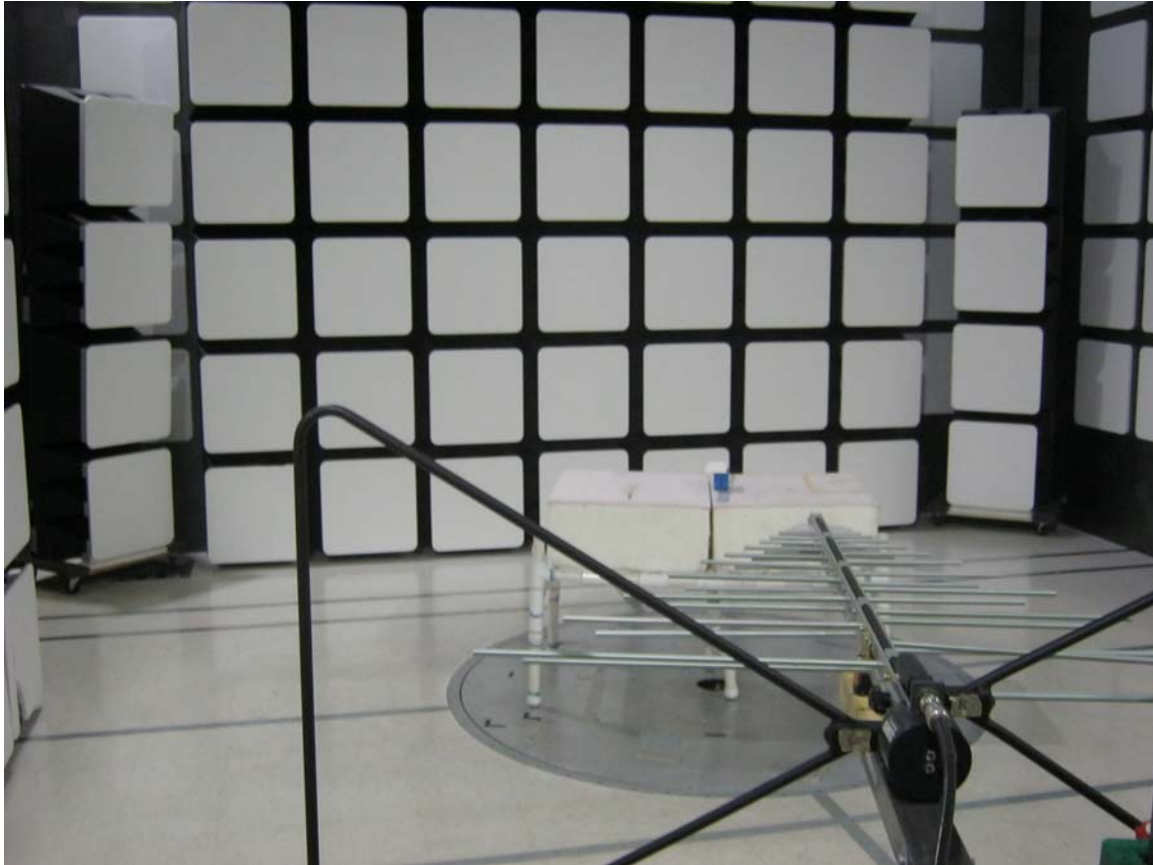
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	39.84	6.0	39.05
1.1	39.40	6.5	38.94
1.2	39.58	7.0	39.25
1.3	39.68	7.5	39.09
1.4	39.91	8.0	39.01
1.5	39.78	8.5	38.60
1.6	39.50	9.0	38.64
1.7	39.81	9.5	39.67
1.8	39.89	10.0	39.30
1.9	39.94	11.0	39.15
2.0	39.57	12.0	39.24
2.5	40.39	13.0	39.49
3.0	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.
SINGLE TOGGLE SWITCH
MODEL: STLS2-ZWAVE5
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

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



REAR VIEW

ECOLINK INTELLIGENT TECHNOLOGY, INC.
SINGLE TOGGLE SWITCH
MODEL: STLS2-ZWAVE5
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

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



FRONT VIEW

ECOLINK INTELLIGENT TECHNOLOGY, INC.
SINGLE TOGGLE SWITCH
MODEL: STLS2-ZWAVE5
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

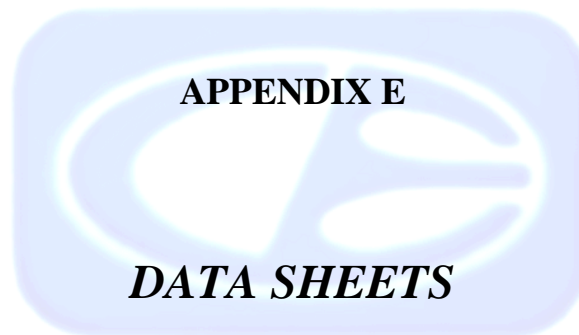
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

ECOLINK INTELLIGENT TECHNOLOGY, INC.
SINGLE TOGGLE SWITCH
MODEL: STLS2-ZWAVE5
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

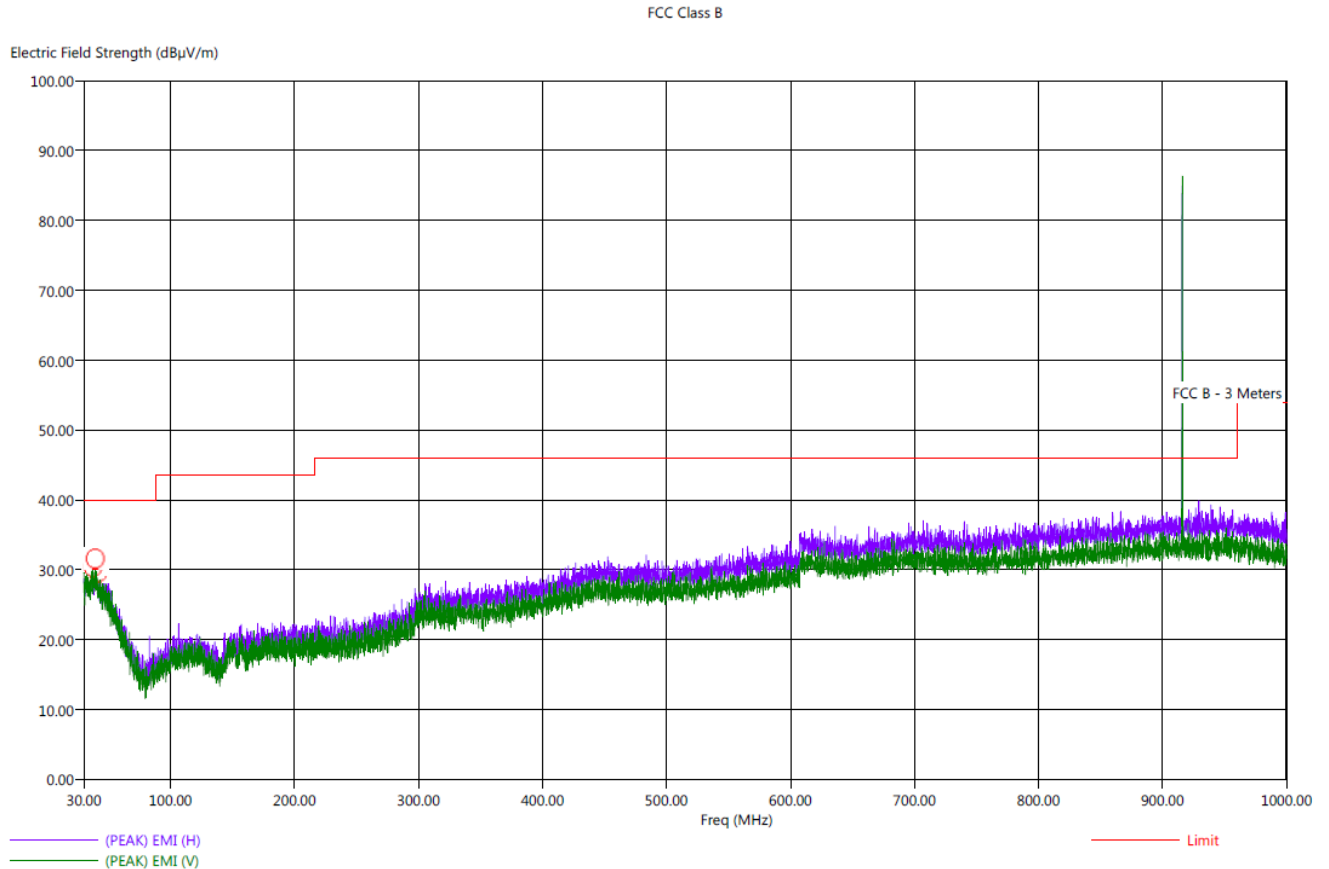
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**




***RADIATED EMISSIONS
DATA SHEETS***

Title: Radiated Emissions - FCC Class B
File: Agilent - Pre-Scan - FCC Class B -Tx - 908.42 MHz - 30 MHz to 1000 MHz - 02-06-18.set
Operator: Kyle Fujimoto
EUT Type: Single Toggle Switch
EUT Condition: The EUT is continuously transmitting at 908.42 MHz - Y-Axis Worst Case
Comments: Company: Ecolink Intelligent Technology, Inc.
M/N: STLS2-ZWAVE5
S/N: N/A
Note: The Frequency at 908.42 MHz is from the transmitter and is subject to the limits of FCC 15.249 instead

2/6/2018 2:58:54 PM
Sequence: Preliminary Scan



Title: Radiated Emissions - FCC Class B

File: Agilent - Final Scan - FCC Class B -Tx - 908.42 MHz - 30 MHz to 1000 MHz - 02-02-18.set

Operator: Kyle Fujimoto

EUT Type: Single Toggle Switch

EUT Condition: The EUT is continuously transmitting at 908.42 MHz - Y-Axis Worst Case

Comments: Company: Ecolink Intelligent Technology, Inc.

M/N: STLS2-ZWAVE5

S/N: N/A

2/6/2018 3:17:14 PM

Sequence: Final Measurements

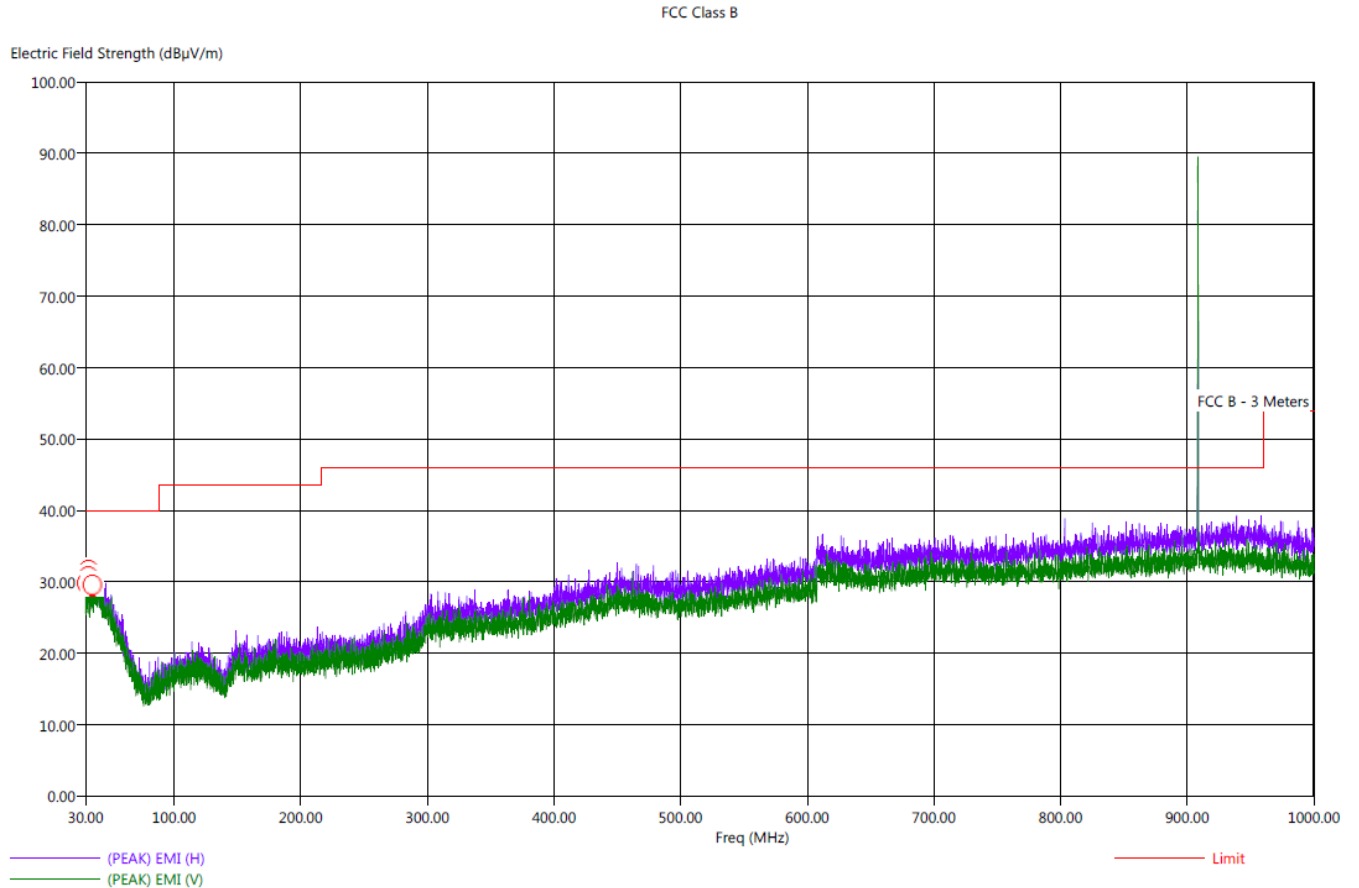
FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(QP) EMI (dBμV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Ttbi Aql (deo)	Twr Ht (cm)
37.60	H	32.55	26.86	-7.45	-13.14	40.00	24.37	0.88	321.25	334.77
38.90	H	32.17	27.19	-7.83	-12.81	40.00	24.57	0.89	198.75	366.41
39.30	V	32.35	27.16	-7.65	-12.84	40.00	24.58	0.89	146.00	286.77
40.70	H	32.59	26.88	-7.41	-13.12	40.00	24.35	0.90	98.50	159.07
41.50	H	31.85	27.24	-8.15	-12.76	40.00	24.20	0.90	344.25	238.65



Title: Radiated Emissions - FCC Class B
File: Agilent - Pre-Scan - FCC Class B -Tx - 916 MHz - 30 MHz to 1000 MHz - 02-06-18.set
Operator: Kyle Fujimoto
EUT Type: Single Toggle Switch
EUT Condition: The EUT is continuously transmitting at 916 MHz - Y-Axis Worst Case
Comments: Company: Ecolink Intelligent Technology, Inc.
M/N: STLS2-ZWAVE5
S/N: N/A
Note: The Frequency at 916 MHz is from the transmitter and is subject to the limits of FCC 15.249 instead

2/6/2018 3:37:25 PM
Sequence: Preliminary Scan



Title: Radiated Emissions - FCC Class B
 File: Agilent - Final Scan - FCC Class B -Tx - 916 MHz - 30 MHz to 1000 MHz - 02-02-18.set
 Operator: Kyle Fujimoto
 EUT Type: Single Toggle Switch
 EUT Condition: The EUT is continuously transmitting at 916 MHz - Y-Axis Worst Case
 Comments: Company: Ecolink Intelligent Technology, Inc.
 M/N: STLS2-ZWAVE5
 S/N: N/A

2/6/2018 3:17:14 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)	
37.60	H	32.55	26.86	-7.45	-13.14	40.00	24.37	0.88	321.25	334.77	
38.90	H	32.17	27.19	-7.83	-12.81	40.00	24.57	0.89	198.75	366.41	
39.30	V	32.35	27.16	-7.65	-12.84	40.00	24.58	0.89	146.00	286.77	
40.70	H	32.59	26.88	-7.41	-13.12	40.00	24.35	0.90	98.50	159.07	
41.50	H	31.85	27.24	-8.15	-12.76	40.00	24.20	0.90	344.25	238.65	

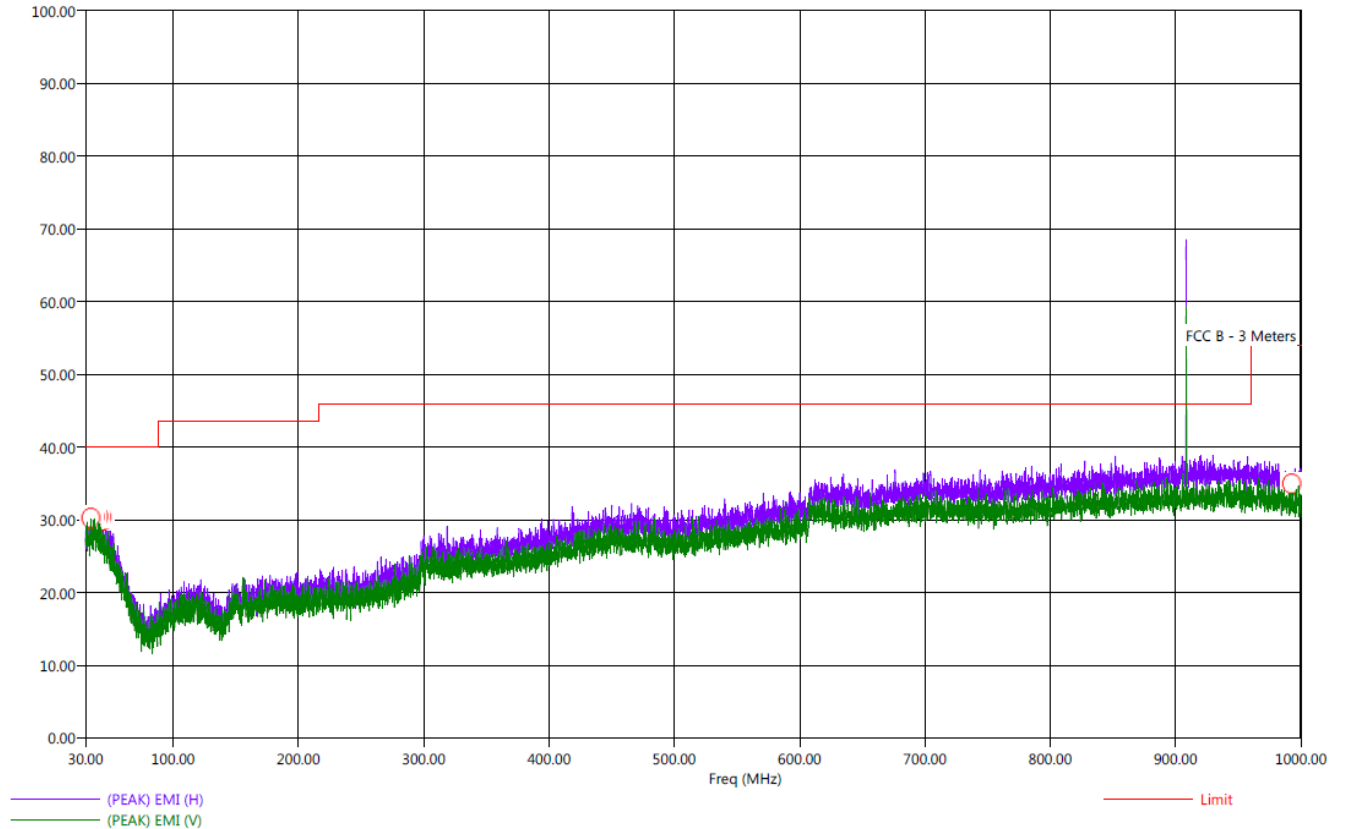


Title: Radiated Emissions - FCC Class B
File: Agilent - Pre-Scan - FCC Class B -Rx - 908.42 MHz - 30 MHz to 1000 MHz - 02-06-18.set
Operator: Kyle Fujimoto
EUT Type: Single Toggle Switch
EUT Condition: The EUT is continuously receiving at 908.42 MHz - Y-Axis Worst Case
Comments: Company: Ecolink Intelligent Technology, Inc.
M/N: STLS2-ZWAVE5
S/N: N/A
Note: The Frequency at 908.42 MHz is from an accessory unit (and not the EUT) that was transmitting at 908.42 MHz inside the chamber so that the EUT could receiver at 908.42 MHz.

2/6/2018 4:46:04 PM
Sequence: Preliminary Scan

FCC Class B

Electric Field Strength (dB μ V/m)



Title: Radiated Emissions - FCC Class B
 File: Agilent - Final Scan - FCC Class B -Rx - 908.42 MHz - 30 MHz to 1000 MHz - 02-06-18.set
 Operator: Kyle Fujimoto
 EUT Type: Single Toggle Switch
 EUT Condition: The EUT is continuously receiving at 908.42 MHz - Y-Axis Worst Case
 Comments: Company: Ecolink Intelligent Technology, Inc.
 M/N: STLS2-ZWAVE5
 S/N: N/A

2/6/2018 4:54:21 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)
32.90	H	33.22	26.59	-6.78	-13.41	40.00	23.93	0.83	236.00	175.31
34.60	V	31.90	26.66	-8.10	-13.34	40.00	23.99	0.85	284.75	158.95
36.40	V	31.65	26.70	-8.35	-13.30	40.00	24.18	0.87	189.75	127.55
38.50	H	32.59	27.22	-7.41	-12.78	40.00	24.47	0.88	300.25	175.01
41.10	H	32.21	26.68	-7.79	-13.32	40.00	24.24	0.90	257.00	143.25
42.20	H	31.66	26.32	-8.34	-13.68	40.00	23.93	0.90	24.75	207.07

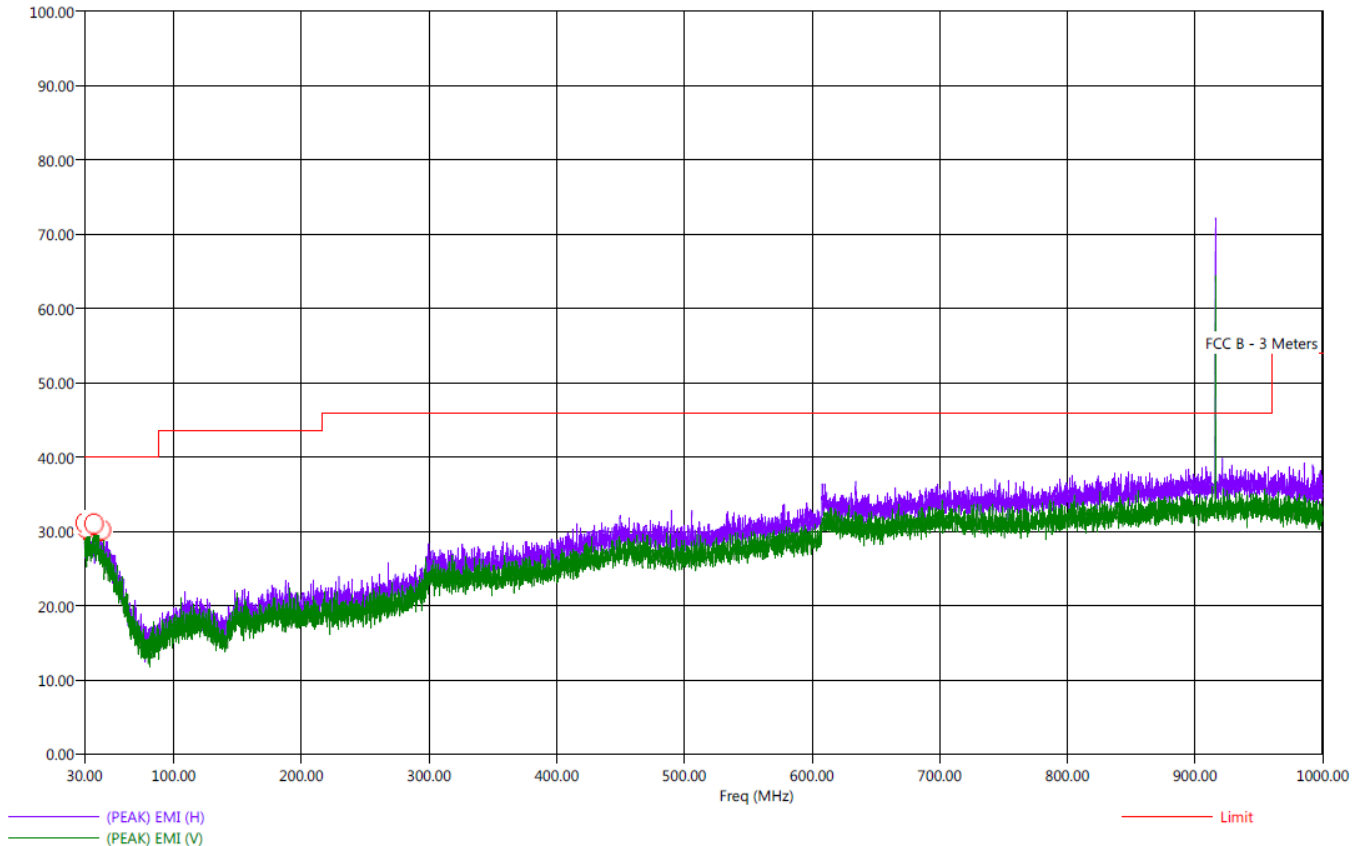


Title: Radiated Emissions - FCC Class B
File: Agilent - Pre-Scan - FCC Class B -Rx - 916 MHz - 30 MHz to 1000 MHz - 02-06-18.set
Operator: Kyle Fujimoto
EUT Type: Single Toggle Switch
EUT Condition: The EUT is continuously receiving at 908.42 MHz - Y-Axis Worst Case
Comments: Company: Ecolink Intelligent Technology, Inc.
M/N: STLS2-ZWAVE5
S/N: N/A
Note: The Frequency at 916 MHz is from an accessory unit (and not the EUT) that was transmitting at 916 MHz inside the chamber so that the EUT could receiver at 908.42 MHz.

2/6/2018 5:15:56 PM
Sequence: Preliminary Scan

FCC Class B

Electric Field Strength (dB μ V/m)



Title: Radiated Emissions - FCC Class B
 File: Agilent - Final Scan - FCC Class B -Rx - 916 MHz - 30 MHz to 1000 MHz - 02-06-18.set
 Operator: Kyle Fujimoto
 EUT Type: Single Toggle Switch
 EUT Condition: The EUT is continuously receiving at 916 MHz - Y-Axis Worst Case
 Comments: Company: Ecolink Intelligent Technology, Inc.
 M/N: STLS2-ZWAVE5
 S/N: N/A

2/6/2018 5:26:12 PM
 Sequence: Final Measurements

FCC Class B										
Freq (MHz)	Pol	(PEAK) EMI (dB μ V/m)	(QP) EMI (dB μ V/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dB μ V/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (dea)	Twr Ht (cm)
30.70	H	32.10	26.55	-7.90	-13.45	40.00	23.83	0.81	110.25	334.29
31.50	H	31.80	26.61	-8.20	-13.39	40.00	23.87	0.82	360.00	334.41
32.90	H	31.78	26.60	-8.22	-13.40	40.00	23.92	0.83	70.75	159.07
33.90	H	32.74	26.59	-7.26	-13.41	40.00	23.95	0.84	338.75	350.17
37.60	V	31.80	26.96	-8.20	-13.04	40.00	24.38	0.88	287.75	318.17
43.30	H	31.86	25.75	-8.14	-14.25	40.00	23.46	0.90	279.25	366.11



FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/07/2018
 Lab: D
 Tested By: Kyle Fujimoto

**Fundamental
 Low Channel**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
908.42	84.33	V	113.97	-29.64	Peak	234.00	171.13	X-Axis
908.42	83.97	V	93.97	-10.00	QP	234.00	171.13	Vertical Polarization
908.42	92.63	V	113.97	-21.34	Peak	259.00	115.55	Y-Axis
908.42	92.45	V	93.97	-1.52	QP	259.00	115.55	Vertical Polarization
908.42	86.35	V	113.97	-27.62	Peak	251.75	210.00	Z-Axis
908.42	86.15	V	93.97	-7.82	QP	251.75	210.00	Vertical Polarization
908.42	94.04	H	113.97	-19.93	Peak	290.50	146.23	X-Axis
908.42	93.91	H	93.97	-0.06	QP	290.50	146.23	Horizontal Polarization
908.42	80.11	H	113.97	-33.86	Peak	310.75	113.40	Y-Axis
908.42	79.90	H	93.97	-14.07	QP	310.75	113.40	Horizontal Polarization
908.42	90.61	H	113.97	-23.36	Peak	169.00	147.37	Z-Axis
908.42	90.56	H	93.97	-3.41	QP	169.00	147.37	Horizontal Polarization

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/07/2018
 Lab: D
 Tested By: Kyle Fujimoto

**Fundamental
 High Channel**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
916.00	83.56	V	113.97	-30.41	Peak	235.75	102.58	X-Axis
916.00	81.04	V	93.97	-12.93	QP	235.75	102.58	Vertical Polarization
916.00	92.85	V	113.97	-21.12	Peak	286.75	138.35	Y-Axis
916.00	92.69	V	93.97	-1.28	QP	286.75	138.35	Vertical Polarization
916.00	87.36	V	113.97	-26.61	Peak	66.75	133.88	Z-Axis
916.00	87.17	V	93.97	-6.80	QP	66.75	133.88	Vertical Polarization
916.00	93.58	H	113.97	-20.39	Peak	285.75	144.62	X-Axis
916.00	93.23	H	93.97	-0.74	QP	285.75	144.62	Horizontal Polarization
916.00	78.85	H	113.97	-35.12	Peak	219.25	182.77	Y-Axis
916.00	78.56	H	93.97	-15.41	QP	219.25	182.77	Horizontal Polarization
916.00	89.47	H	113.97	-24.50	Peak	200.75	152.98	Z-Axis
916.00	89.09	H	93.97	-4.88	QP	200.75	152.98	Horizontal Polarization

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

**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	34.21	V	73.97	-39.76	Peak	214.00	249.99	
1816.84	26.38	V	53.97	-27.59	Avg	214.00	249.99	
2725.26	50.87	V	73.97	-23.10	Peak	233.75	111.13	
2725.26	43.04	V	53.97	-10.93	Avg	233.75	111.13	
3633.68	41.09	V	73.97	-32.88	Peak	76.00	175.01	
3633.68	33.26	V	53.97	-20.71	Avg	76.00	175.01	
4542.10	48.67	V	73.97	-25.30	Peak	240.25	174.77	
4542.10	40.84	V	53.97	-13.13	Avg	240.25	174.77	
5450.52	43.53	V	73.97	-30.44	Peak	168.25	174.77	
5450.52	35.70	V	53.97	-18.27	Avg	168.25	174.77	
6358.94	41.58	V	73.97	-32.39	Peak	208.50	238.47	
6358.94	33.75	V	53.97	-20.22	Avg	208.50	238.47	
7267.36	44.68	V	73.97	-29.29	Peak	276.50	222.53	
7267.36	36.85	V	53.97	-17.12	Avg	276.50	222.53	
8175.78	46.56	V	73.97	-27.41	Peak	65.00	222.65	
8175.78	38.73	V	53.97	-15.24	Avg	65.00	222.65	
9084.20	45.80	V	73.97	-28.17	Peak	223.75	191.01	
9084.20	37.97	V	53.97	-16.00	Avg	223.75	191.01	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

**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	34.59	V	73.97	-39.38	Peak	104.00	190.83	
1816.84	26.76	V	53.97	-27.21	Avg	104.00	190.83	
2725.26	49.36	V	73.97	-24.61	Peak	344.00	127.37	
2725.26	41.53	V	53.97	-12.44	Avg	344.00	127.37	
3633.68	38.69	V	73.97	-35.28	Peak	273.75	206.59	
3633.68	30.86	V	53.97	-23.11	Avg	273.75	206.59	
4542.10	44.90	V	73.97	-29.07	Peak	239.50	127.19	
4542.10	37.07	V	53.97	-16.90	Avg	239.50	127.19	
5450.52	42.86	V	73.97	-31.11	Peak	57.00	111.37	
5450.52	35.03	V	53.97	-18.94	Avg	57.00	111.37	
6358.94	42.40	V	73.97	-31.57	Peak	206.25	159.11	
6358.94	34.57	V	53.97	-19.40	Avg	206.25	159.11	
7267.36	45.20	V	73.97	-28.77	Peak	44.50	249.11	
7267.36	37.37	V	53.97	-16.60	Avg	44.50	249.11	
8175.78	46.79	V	73.97	-27.18	Peak	222.00	111.19	
8175.78	38.96	V	53.97	-15.01	Avg	222.00	111.19	
9084.20	45.90	V	73.97	-28.07	Peak	0.25	250.00	
9084.20	38.07	V	53.97	-15.90	Avg	0.25	250.00	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

**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	35.30	V	73.97	-38.67	Peak	276.00	111.31	
1816.84	27.47	V	53.97	-26.50	Avg	276.00	111.31	
2725.26	51.30	V	73.97	-22.67	Peak	2.25	174.83	
2725.26	43.47	V	53.97	-10.50	Avg	2.25	174.83	
3633.68	41.30	V	73.97	-32.67	Peak	321.50	127.25	
3633.68	33.47	V	53.97	-20.50	Avg	321.50	127.25	
4542.10	47.29	V	73.97	-26.68	Peak	305.00	174.83	
4542.10	39.46	V	53.97	-14.51	Avg	305.00	174.83	
5450.52	43.04	V	73.97	-30.93	Peak	103.00	127.37	
5450.52	35.21	V	53.97	-18.76	Avg	103.00	127.37	
6358.94	42.63	V	73.97	-31.34	Peak	327.25	143.07	
6358.94	34.80	V	53.97	-19.17	Avg	327.25	143.07	
7267.36	45.70	V	73.97	-28.27	Peak	139.75	175.19	
7267.36	37.87	V	53.97	-16.10	Avg	139.75	175.19	
8175.78	46.27	V	73.97	-27.70	Peak	300.00	190.89	
8175.78	38.44	V	53.97	-15.53	Avg	300.00	190.89	
9084.20	46.34	V	73.97	-27.63	Peak	42.25	111.19	
9084.20	38.51	V	53.97	-15.46	Avg	42.25	111.19	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

**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	35.00	H	73.97	-38.97	Peak	321.75	207.01	
1816.84	27.17	H	53.97	-26.80	Avg	321.75	207.01	
2725.26	46.74	H	73.97	-27.23	Peak	26.00	111.37	
2725.26	38.91	H	53.97	-15.06	Avg	26.00	111.37	
3633.68	38.76	H	73.97	-35.21	Peak	269.25	159.19	
3633.68	30.93	H	53.97	-23.04	Avg	269.25	159.19	
4542.10	46.05	H	73.97	-27.92	Peak	300.00	222.71	
4542.10	38.22	H	53.97	-15.75	Avg	300.00	222.71	
5450.52	43.37	H	73.97	-30.60	Peak	46.25	238.65	
5450.52	35.54	H	53.97	-18.43	Avg	46.25	238.65	
6358.94	41.65	H	73.97	-32.32	Peak	261.75	238.71	
6358.94	33.82	H	53.97	-20.15	Avg	261.75	238.71	
7267.36	45.37	H	73.97	-28.60	Peak	250.00	159.19	
7267.36	37.54	H	53.97	-16.43	Avg	250.00	159.19	
8175.78	49.44	H	73.97	-24.53	Peak	107.25	159.19	
8175.78	41.61	H	53.97	-12.36	Avg	107.25	159.19	
9084.20	46.53	H	73.97	-27.44	Peak	357.25	222.83	
9084.20	38.70	H	53.97	-15.27	Avg	357.25	222.83	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

**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	35.39	H	73.97	-38.58	Peak	87.50	175.13	
1816.84	27.56	H	53.97	-26.41	Avg	87.50	175.13	
2725.26	51.19	H	73.97	-22.78	Peak	341.25	143.19	
2725.26	43.36	H	53.97	-10.61	Avg	341.25	143.19	
3633.68	41.36	H	73.97	-32.61	Peak	20.00	158.95	
3633.68	33.53	H	53.97	-20.44	Avg	20.00	158.95	
4542.10	47.43	H	73.97	-26.54	Peak	0.25	111.25	
4542.10	39.60	H	53.97	-14.37	Avg	0.25	111.25	
5450.52	43.98	H	73.97	-29.99	Peak	189.25	175.01	
5450.52	36.15	H	53.97	-17.82	Avg	189.25	175.01	
6358.94	41.79	H	73.97	-32.18	Peak	141.25	175.13	
6358.94	33.96	H	53.97	-20.01	Avg	141.25	175.13	
7267.36	44.42	H	73.97	-29.55	Peak	302.75	206.71	
7267.36	36.59	H	53.97	-17.38	Avg	302.75	206.71	
8175.78	50.57	H	73.97	-23.40	Peak	300.00	127.13	
8175.78	42.74	H	53.97	-11.23	Avg	300.00	127.13	
9084.20	46.25	H	73.97	-27.72	Peak	300.00	250.00	
9084.20	38.42	H	53.97	-15.55	Avg	300.00	250.00	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

**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	34.87	H	73.97	-39.10	Peak	255.50	207.07	
1816.84	27.04	H	53.97	-26.93	Avg	255.50	207.07	
2725.26	49.30	H	73.97	-24.67	Peak	9.25	174.80	
2725.26	41.47	H	53.97	-12.50	Avg	9.25	174.80	
3633.68	37.81	H	73.97	-36.16	Peak	145.50	111.37	
3633.68	29.98	H	53.97	-23.99	Avg	145.50	111.37	
4542.10	45.62	H	73.97	-28.35	Peak	319.50	127.25	
4542.10	37.79	H	53.97	-16.18	Avg	319.50	127.25	
5450.52	43.07	H	73.97	-30.90	Peak	102.00	250.00	
5450.52	35.24	H	53.97	-18.73	Avg	102.00	250.00	
6358.94	41.86	H	73.97	-32.11	Peak	358.25	238.59	
6358.94	34.03	H	53.97	-19.94	Avg	358.25	238.59	
7267.36	45.10	H	73.97	-28.87	Peak	20.50	174.71	
7267.36	37.27	H	53.97	-16.70	Avg	20.50	174.71	
8175.78	48.68	H	73.97	-25.29	Peak	290.75	127.19	
8175.78	40.85	H	53.97	-13.12	Avg	290.75	127.19	
9084.20	46.24	H	73.97	-27.73	Peak	110.25	191.13	
9084.20	38.41	H	53.97	-15.56	Avg	110.25	191.13	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

**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	33.21	V	73.97	-40.76	Peak	40.75	190.71	
1832.00	25.38	V	53.97	-28.59	Avg	40.75	190.71	
2748.00	45.61	V	73.97	-28.36	Peak	56.00	143.07	
2748.00	37.78	V	53.97	-16.19	Avg	56.00	143.07	
3664.00	37.52	V	73.97	-36.45	Peak	95.50	175.01	
3664.00	29.69	V	53.97	-24.28	Avg	95.50	175.01	
4580.00	40.04	V	73.97	-33.93	Peak	273.75	238.59	
4580.00	32.21	V	53.97	-21.76	Avg	273.75	238.59	
5496.00	42.98	V	73.97	-30.99	Peak	215.25	174.89	
5496.00	35.15	V	53.97	-18.82	Avg	215.25	174.89	
6412.00	41.02	V	73.97	-32.95	Peak	51.50	238.59	
6412.00	33.19	V	53.97	-20.78	Avg	51.50	238.59	
7328.00	47.67	V	73.97	-26.30	Peak	65.25	127.37	
7328.00	39.84	V	53.97	-14.13	Avg	65.25	127.37	
8244.00	49.06	V	73.97	-24.91	Peak	81.50	249.95	
8244.00	41.23	V	53.97	-12.74	Avg	81.50	249.95	
9160.00	44.97	V	73.97	-29.00	Peak	164.50	159.25	
9160.00	37.14	V	53.97	-16.83	Avg	164.50	159.25	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

**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	33.07	V	73.97	-40.90	Peak	310.50	110.95	
1832.00	25.24	V	53.97	-28.73	Avg	310.50	110.95	
2748.00	48.89	V	73.97	-25.08	Peak	311.75	111.19	
2748.00	41.06	V	53.97	-12.91	Avg	311.75	111.19	
3664.00	37.94	V	73.97	-36.03	Peak	239.50	174.95	
3664.00	30.11	V	53.97	-23.86	Avg	239.50	174.95	
4580.00	41.83	V	73.97	-32.14	Peak	134.50	127.31	
4580.00	34.00	V	53.97	-19.97	Avg	134.50	127.31	
5496.00	42.90	V	73.97	-31.07	Peak	223.50	111.37	
5496.00	35.07	V	53.97	-18.90	Avg	223.50	111.37	
6412.00	41.13	V	73.97	-32.84	Peak	165.25	249.99	
6412.00	33.30	V	53.97	-20.67	Avg	165.25	249.99	
7328.00	44.44	V	73.97	-29.53	Peak	359.75	143.13	
7328.00	36.61	V	53.97	-17.36	Avg	359.75	143.13	
8244.00	48.55	V	73.97	-25.42	Peak	183.75	158.89	
8244.00	40.72	V	53.97	-13.25	Avg	183.75	158.89	
9160.00	45.62	V	73.97	-28.35	Peak	248.00	159.01	
9160.00	37.79	V	53.97	-16.18	Avg	248.00	159.01	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

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	34.28	V	73.97	-39.69	Peak	100.25	250.00	
1832.00	26.45	V	53.97	-27.52	Avg	100.25	250.00	
2748.00	47.46	V	73.97	-26.51	Peak	170.50	159.19	
2748.00	39.63	V	53.97	-14.34	Avg	170.50	159.19	
3664.00	45.57	V	73.97	-28.40	Peak	174.25	143.13	
3664.00	37.74	V	53.97	-16.23	Avg	174.25	143.13	
4580.00	43.20	V	73.97	-30.77	Peak	177.06	175.07	
4580.00	35.37	V	53.97	-18.60	Avg	177.06	175.07	
5496.00	43.19	V	73.97	-30.78	Peak	325.00	249.95	
5496.00	35.36	V	53.97	-18.61	Avg	325.00	249.95	
6412.00	41.59	V	73.97	-32.38	Peak	86.25	207.01	
6412.00	33.76	V	53.97	-20.21	Avg	86.25	207.01	
7328.00	47.05	V	73.97	-26.92	Peak	118.50	111.07	
7328.00	39.22	V	53.97	-14.75	Avg	118.50	111.07	
8244.00	45.79	V	73.97	-28.18	Peak	201.50	222.53	
8244.00	37.96	V	53.97	-16.01	Avg	201.50	222.53	
9160.00	45.90	V	73.97	-28.07	Peak	83.25	222.71	
9160.00	38.07	V	53.97	-15.90	Avg	83.25	222.71	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

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	39.63	H	73.97	-34.34	Peak	150.00	238.77	
1832.00	31.80	H	53.97	-22.17	Avg	150.00	238.77	
2748.00	49.90	H	73.97	-24.07	Peak	300.00	206.89	
2748.00	42.07	H	53.97	-11.90	Avg	300.00	206.89	
3664.00	46.79	H	73.97	-27.18	Peak	305.25	175.07	
3664.00	38.96	H	53.97	-15.01	Avg	305.25	175.07	
4580.00	41.16	H	73.97	-32.81	Peak	89.75	174.29	
4580.00	33.33	H	53.97	-20.64	Avg	89.75	174.29	
5496.00	44.22	H	73.97	-29.75	Peak	124.00	175.07	
5496.00	36.39	H	53.97	-17.58	Avg	124.00	175.07	
6412.00	42.41	H	73.97	-31.56	Peak	230.50	175.07	
6412.00	34.58	H	53.97	-19.39	Avg	230.50	175.07	
7328.00	48.74	H	73.97	-25.23	Peak	239.25	127.07	
7328.00	40.91	H	53.97	-13.06	Avg	239.25	127.07	
8244.00	45.77	H	73.97	-28.20	Peak	33.25	174.77	
8244.00	37.94	H	53.97	-16.03	Avg	33.25	174.77	
9160.00	45.97	H	73.97	-28.00	Peak	139.50	159.07	
9160.00	38.14	H	53.97	-15.83	Avg	139.50	159.07	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

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	38.49	H	73.97	-35.48	Peak	138.25	222.71	
1832.00	30.66	H	53.97	-23.31	Avg	138.25	222.71	
2748.00	50.79	H	73.97	-23.18	Peak	156.25	206.59	
2748.00	42.96	H	53.97	-11.01	Avg	156.25	206.59	
3664.00	50.56	H	73.97	-23.41	Peak	187.75	158.95	
3664.00	42.73	H	53.97	-11.24	Avg	187.75	158.95	
4580.00	46.91	H	73.97	-27.06	Peak	152.00	159.07	
4580.00	39.08	H	53.97	-14.89	Avg	152.00	159.07	
5496.00	44.21	H	73.97	-29.76	Peak	129.25	127.37	
5496.00	36.38	H	53.97	-17.59	Avg	129.25	127.37	
6412.00	43.97	H	73.97	-30.00	Peak	110.50	159.19	
6412.00	36.14	H	53.97	-17.83	Avg	110.50	159.19	
7328.00	52.37	H	73.97	-21.60	Peak	143.00	159.01	
7328.00	44.54	H	53.97	-9.43	Avg	143.00	159.01	
8244.00	45.98	H	73.97	-27.99	Peak	256.75	174.95	
8244.00	38.15	H	53.97	-15.82	Avg	256.75	174.95	
9160.00	46.92	H	73.97	-27.05	Peak	147.00	191.01	
9160.00	39.09	H	53.97	-14.88	Avg	147.00	191.01	

FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: STLS2-ZWAVE5

Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

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	36.38	H	73.97	-37.59	Peak	118.75	111.43	
1832.00	28.55	H	53.97	-25.42	Avg	118.75	111.43	
2748.00	48.92	H	73.97	-25.05	Peak	177.50	222.83	
2748.00	41.09	H	53.97	-12.88	Avg	177.50	222.83	
3664.00	45.59	H	73.97	-28.38	Peak	116.50	111.43	
3664.00	37.76	H	53.97	-16.21	Avg	116.50	111.43	
4580.00	40.69	H	73.97	-33.28	Peak	153.75	111.49	
4580.00	32.86	H	53.97	-21.11	Avg	153.75	111.49	
5496.00	45.30	H	73.97	-28.67	Peak	185.00	174.89	
5496.00	37.47	H	53.97	-16.50	Avg	185.00	174.89	
6412.00	42.47	H	73.97	-31.50	Peak	209.50	207.61	
6412.00	34.64	H	53.97	-19.33	Avg	209.50	207.61	
7328.00	48.16	H	73.97	-25.81	Peak	202.00	174.95	
7328.00	40.33	H	53.97	-13.64	Avg	202.00	174.95	
8244.00	46.35	H	73.97	-27.62	Peak	90.75	222.65	
8244.00	38.52	H	53.97	-15.45	Avg	90.75	222.65	
9160.00	46.26	H	73.97	-27.71	Peak	337.25	196.77	
9160.00	38.43	H	53.97	-15.54	Avg	337.25	196.77	

FCC Class B and FCC 15.249

Ecolink Intelligent Technology, Inc.
 Single Toggle Switch
 Model: DTLS2-ZWAVE5

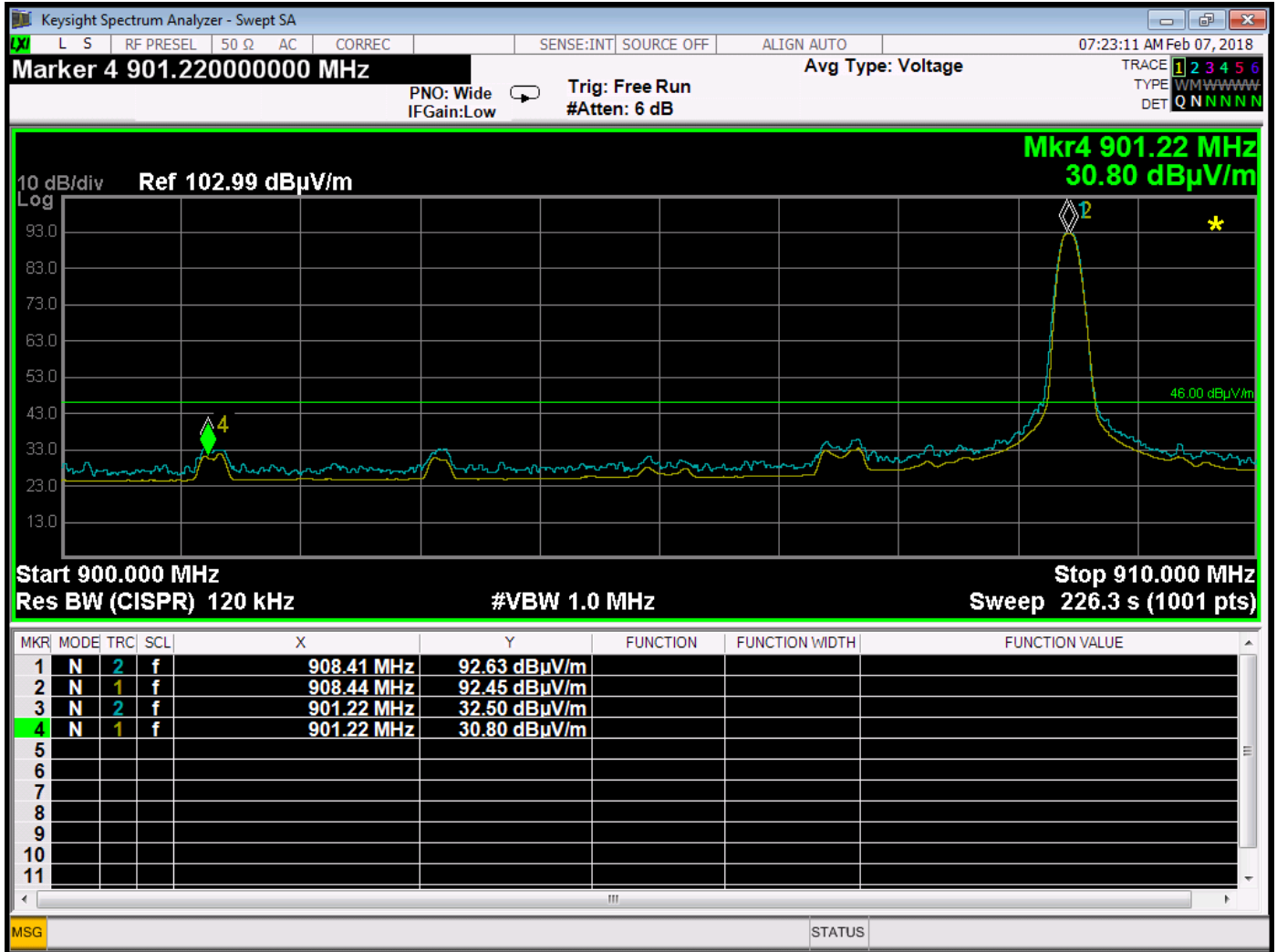
Date: 02/05/2018
 Lab: D
 Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz
Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 9.3 GHz

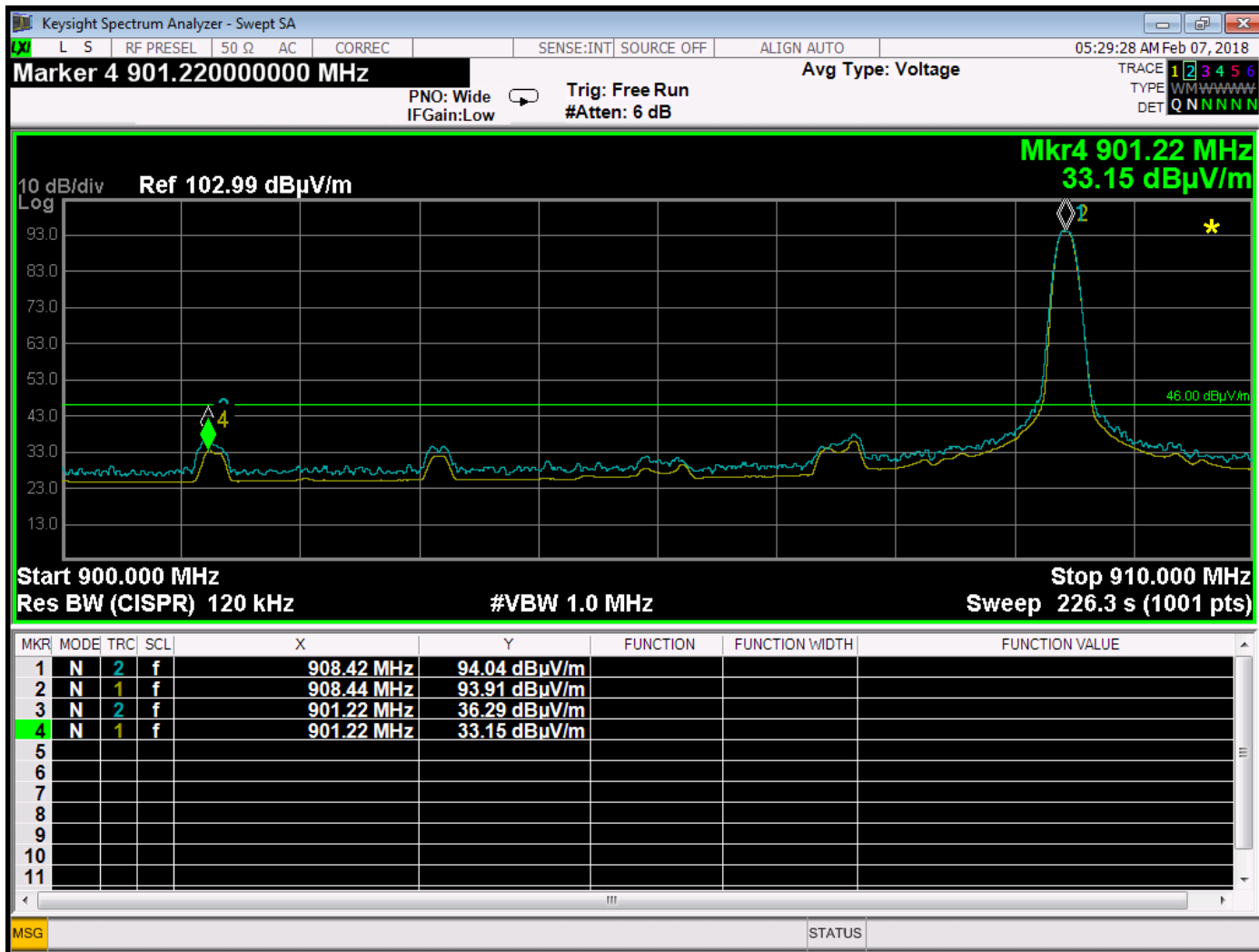
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
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								from 9 kHz to 30 MHz
								for the digital portion
								of the EUT
								from 9 kHz to 30 MHz
								for the Non-Harmonic Emissions
								of the Transmitter for the EUT
								No Emissions Detected
								from 1 GHz to 9.3 GHz
								for the digital portion
								of the EUT
								No Emissions Detected
								from 1 GHz to 9.3 GHz
								for the Non-Harmonic Emissions
								of the Transmitter for the EUT
								Investigated in the X-Axis,
								Y-Axis, and Z-Axis



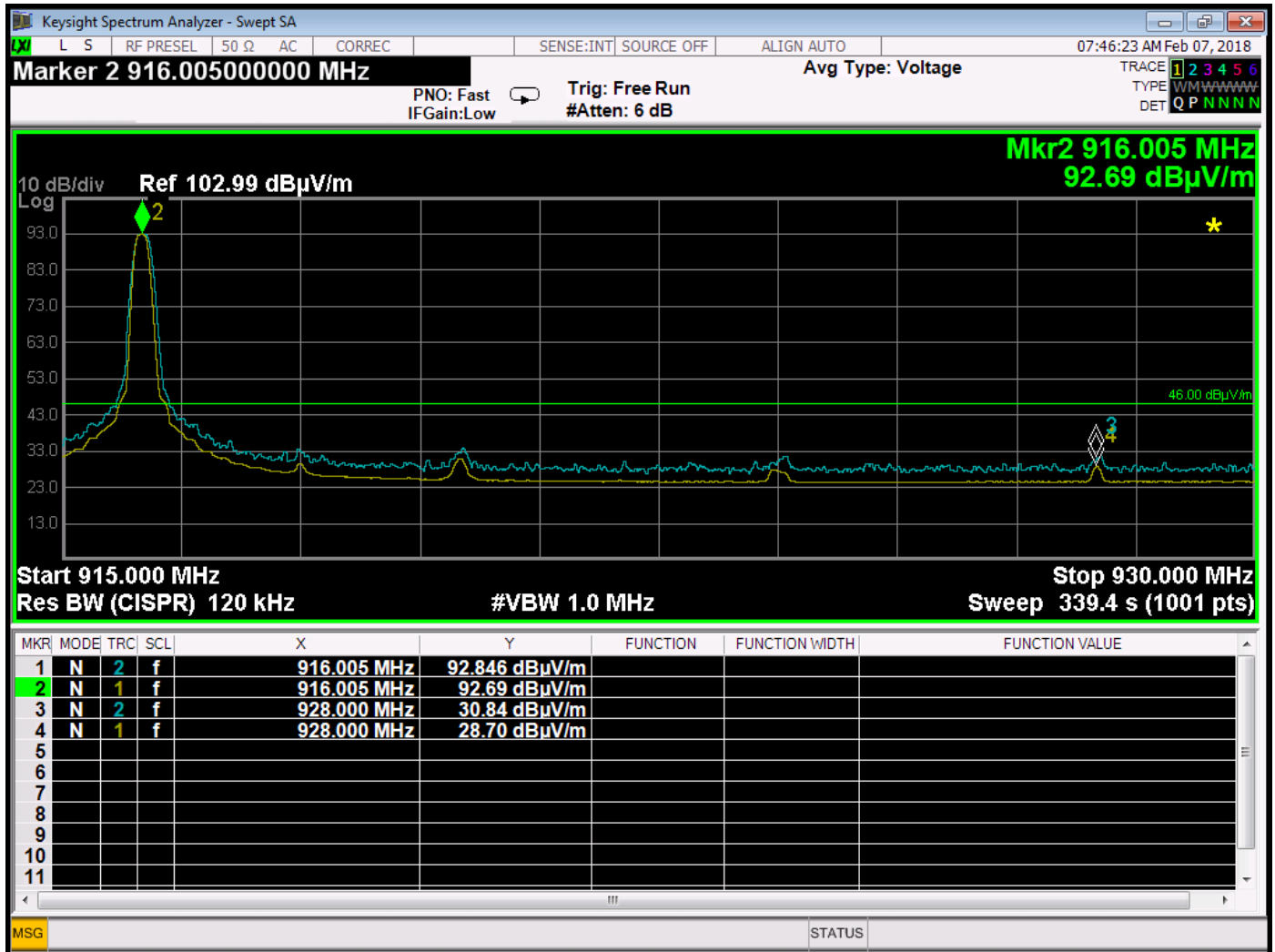
***BAND EDGES
DATA SHEETS***



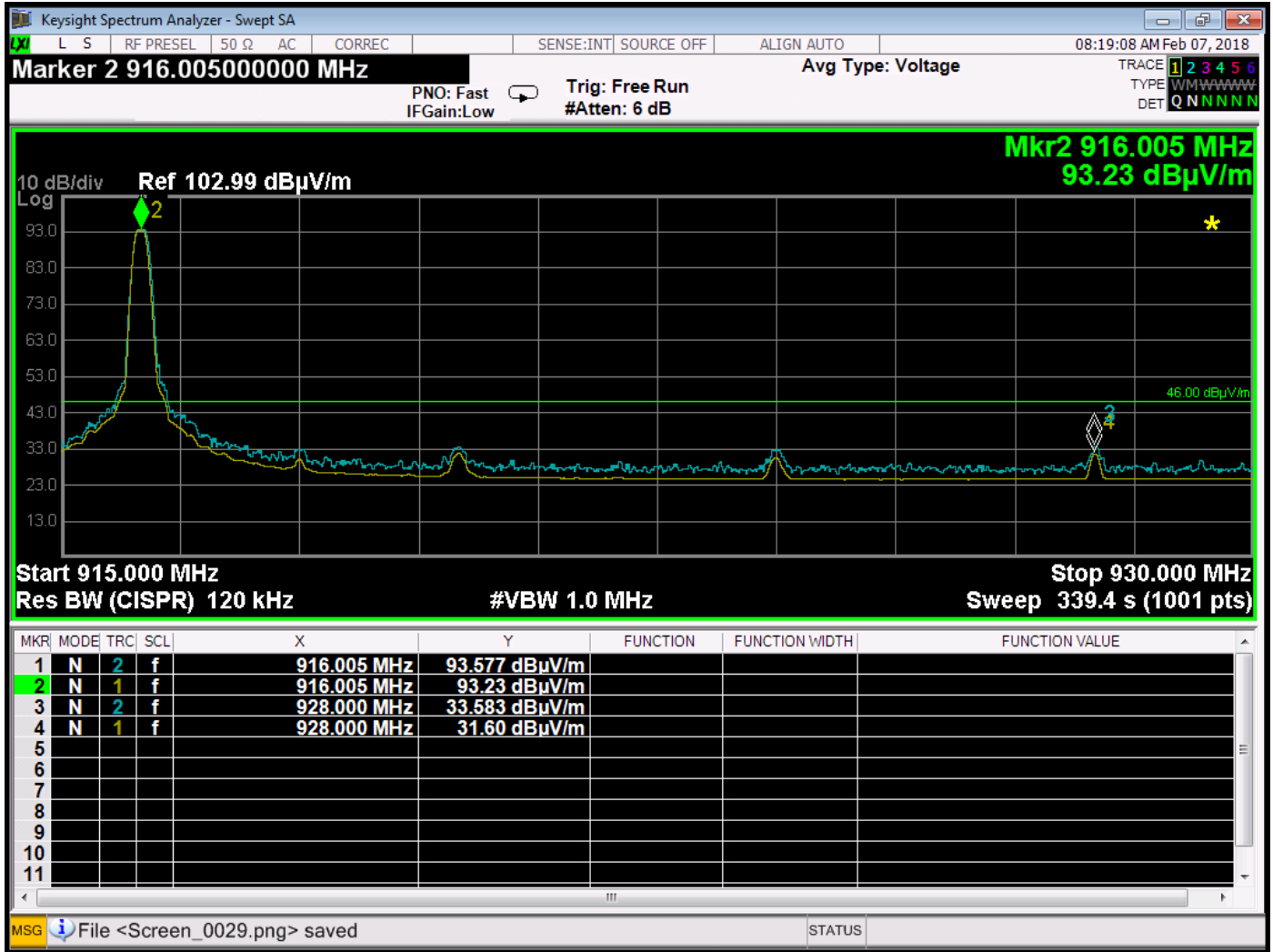
Band Edge - 908.42 MHz - Vertical - Y-Axis - Worst Case



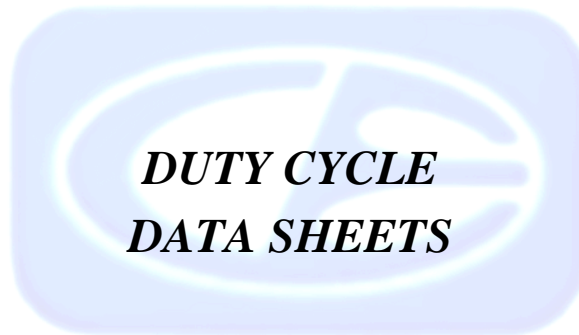
Band Edge - 908.42 MHz - Horizontal - X-Axis - Worst Case

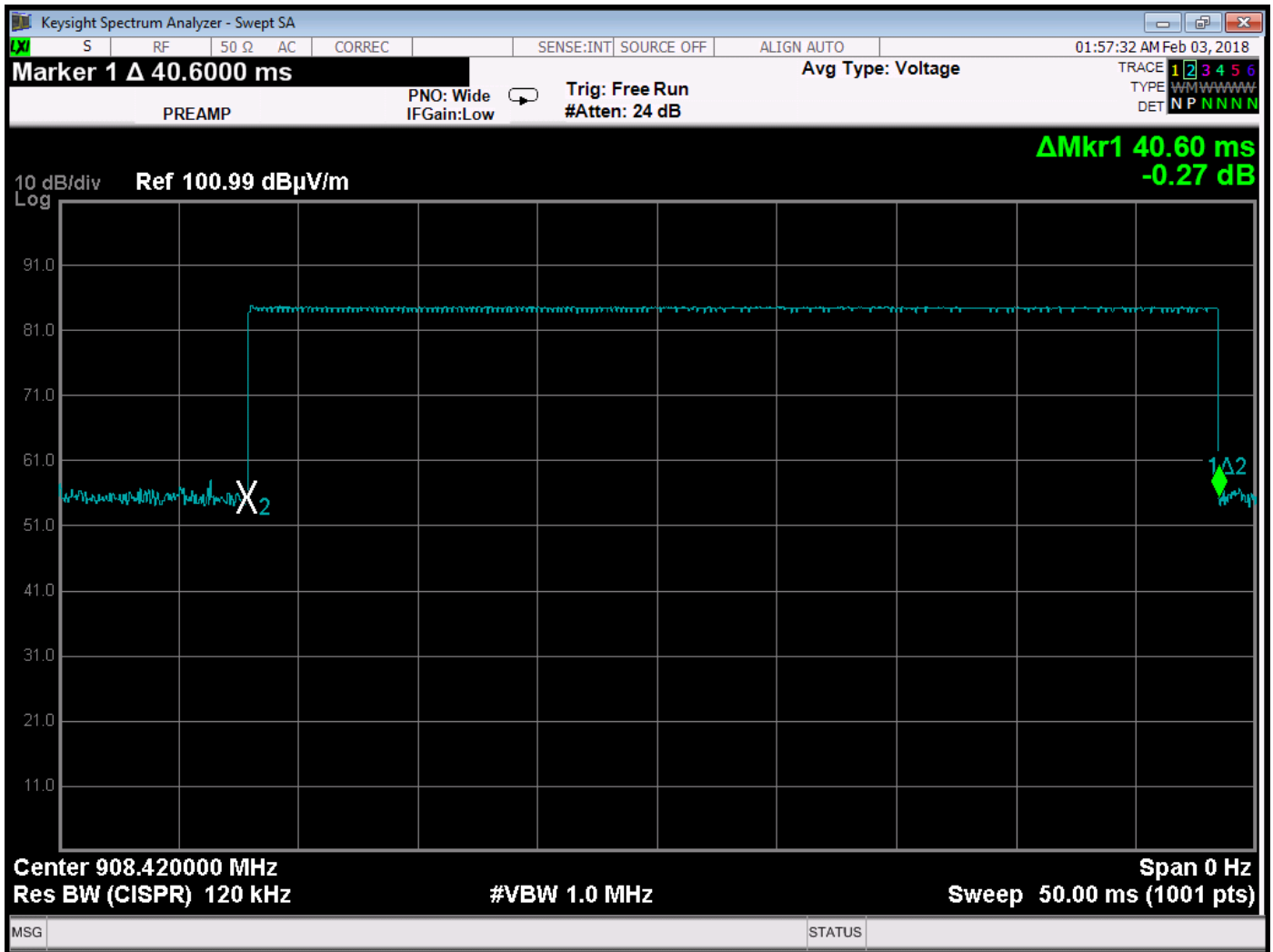


Band Edge - 916 MHz - Horizontal - X-Axis - Worst Case

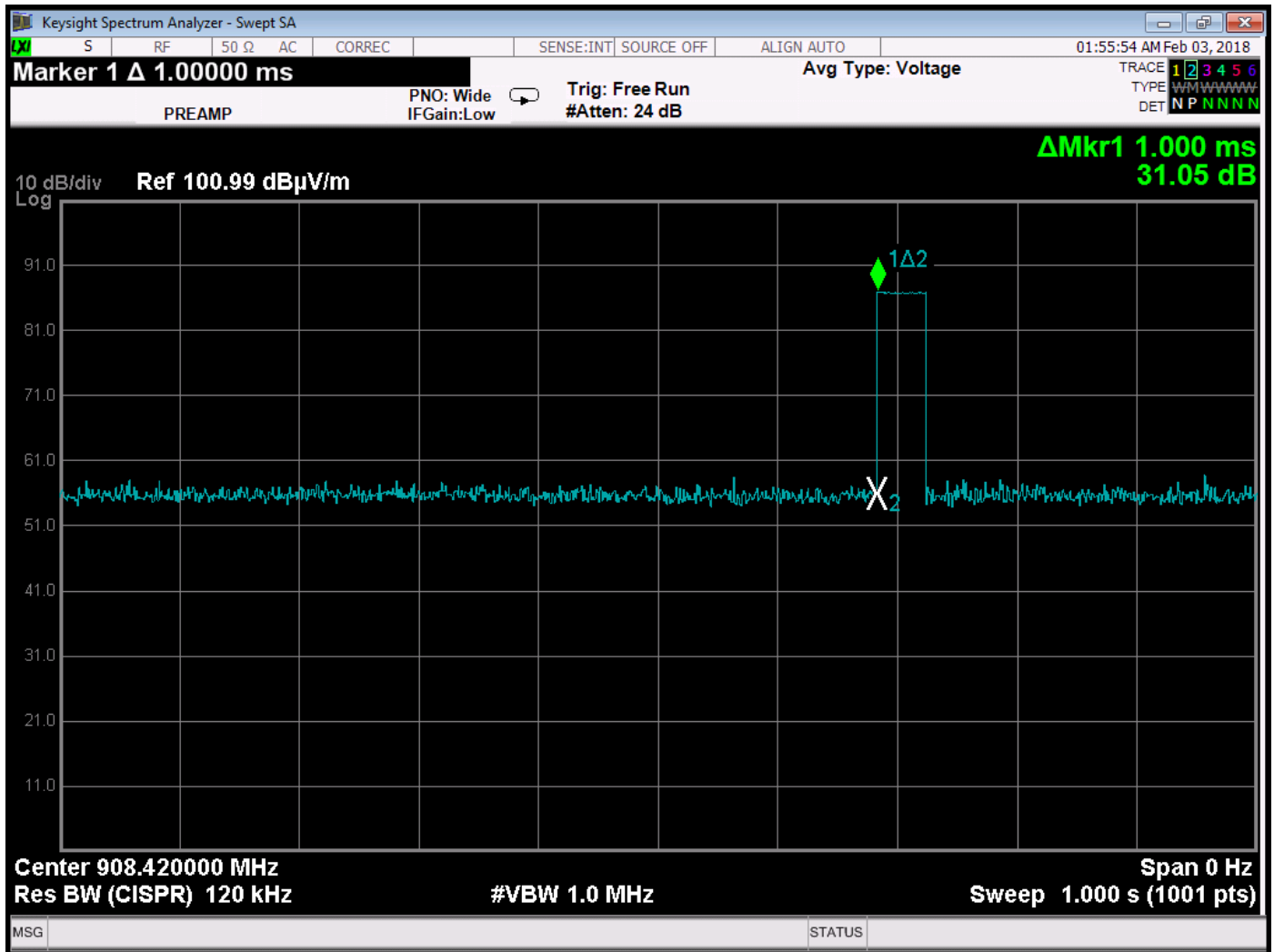


Band Edge - 916 MHz - Horizontal - X-Axis - Worst Case





Pulse = 40.6 ms



Plot Showing that the pulses repeats at a worst case of 40.60 ms

Total Duty Cycle = 40.6 ms / 100.00 ms = 40.60 % Duty Cycle

The Peak to Average Ratio is -7.83 dB