

*FCC PART 15, SUBPART B & C
CLASS B TEST REPORT
TEST METHOD: ANSI C63.4 & ANSI C63.10*

For
**KEY FOB
Model: 926**

Prepared for

**KWIKSET CORP.
19701 DAVINCI
LAKE FOREST, CA 92610**

Prepared by: _____

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DATE: JUNE 4, 2013

	REPORT BODY	APPENDICES					TOTAL
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
PAGES	17	2	2	2	14	16	53

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TABLE OF CONTENTS

Section / Title	PAGE
GENERAL REPORT SUMMARY	4
SUMMARY OF TEST RESULTS	4
1. PURPOSE	5
2. ADMINISTRATIVE DATA	6
2.1 Location of Testing	6
2.2 Traceability Statement	6
2.3 Cognizant Personnel	6
2.4 Date Test Sample was Received	6
2.5 Disposition of the Test Sample	6
2.6 Abbreviations and Acronyms	6
3. APPLICABLE DOCUMENTS	7
4. DESCRIPTION OF TEST CONFIGURATION	8
4.1 Description of Test Configuration - EMI	8
4.1.1 Photograph of Test Configuration - EMI	8
4.1.2 Cable Construction and Termination	9
5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT	10
5.1 EUT and Accessory List	10
5.2 EMI Test Equipment	11
6. TEST SITE DESCRIPTION	12
6.1 Test Facility Description	12
6.2 EUT Mounting, Bonding and Grounding	12
7. CHARACTERISTICS OF THE TRANSMITTER	13
7.1 Channel Number and Frequencies	13
7.2 Antenna	13
8. TEST PROCEDURES	14
8.1 RF Emissions	14
8.1.1 Conducted Emissions Test	14
8.1.2 Radiated Emissions (Spurious and Harmonics) Test	15
8.1.3 Fundamental Field Strength	16
8.1.4 Emissions Radiated Outside of the Fundamental Frequency Band	16
8.1.5 Duty Cycle	16
9. TEST PROCEDURE DEVIATIONS	17
10. CONCLUSIONS	17

LIST OF APPENDICES

APPENDIX	TITLE
A	Laboratory Accreditations
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams, Charts and Photos • Test Setup Diagrams • Antenna and Amplifier Gain Factors • Radiated Emissions Photos
E	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Plot Map And Layout of Test Site

GENERAL REPORT SUMMARY

This electromagnetic emission 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 in any form except in full, without the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested: Key Fob
 Model: 926
 S/N: None

Product Description: The EUT is a Key Fob for operating a wireless door lock via Bluetooth 4.0 Low Energy technology.

Modifications: The EUT was not modified during the testing.

Manufacturer: Kwikset Corp.
 19701 DaVinci
 Lake Forest, Ca 92610

Test Date: May 16, 17, 20, & June 4, 2013

Test Specifications: EMI requirements
 CFR Title 47, Part 15 Subpart C Sections 15.205, 15.209 and 15.249
 FCC Part 15 Subpart B section 15.109
 Test Procedure: ANSI C63.10 and ANSI C63.4

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz.	The EUT is battery operated; therefore this test was not performed.
2	Radiated RF Emissions & Harmonics, 9 kHz – 24,800 MHz	Complies with the limits of CFR Title 47 Part 15 Subpart B section 15.109 and Subpart C Sections 15.205 and 15.209.
3	Fundamental Field Strength	Complies with CFR Title 47 Part 15 Subpart C Section 15.249(a)
4	Emissions Radiated Outside of the Fundamental Frequency Band	Complies with CFR Title 47 Part 15 Subpart C Section 15.249(d) and 15.205

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the KEY FOB Model: 926. The EMI measurements were performed according to the measurement procedure described in ANSI C63.10 and ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT (equipment under test) hereafter, are within the specification limits defined by the Code of Federal Regulations Title 47, Part 15 subpart B sections 15.109, Part 15 Subpart C sections 15.205, 15.209 and 15.249.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 20621 Pascal Way Lake Forest, California 92630.

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

Kwikset Corp.

Chris Taylor Code & Compliance Program Manager

Compatible Electronics, Inc.

Matt Harrison Test Technician

Josh Hansen Lab Manager

2.4 Date Test Sample was Received

The test sample was received on May 16, 2013.

2.5 Disposition of the Test Sample

The test sample remains at Compatible Electronics, 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
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4 2009	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: 2009	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The Key Fob Model: 926 (EUT) was set up in a table top configuration. The transmit antenna of the EUT is a Chip Antenna integrated onto the PCB, which is contained inside the plastic housing. The EUT was explored in 3 orthogonal axes (X-axis, Y-axis and Z-axis).

The battery was replaced with a new battery, the transmitting signal amplitude and frequency did not vary.

It was determined that the Y-axis produced the worst case emissions for all testing. The EUT was continuously transmitting in hopping mode with normal operation duty cycle throughout the spurious emissions tests and in single channel transmit mode with normal operation duty cycle for all other tests. The customer placed the EUT in a worst case representative duty cycle configuration. All initial investigations were performed with the spectrum analyzer in manual mode scanning the frequency range continuously. Please see Appendix E for the data sheets.

4.1.1 Photograph of Test Configuration - EMI



4.1.2 Cable Construction and Termination

The EUT did not have any external signal cables.

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

#	EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER
1	KEY FOB (EUT)	KWIKSET CORP.	926	NONE
2	BATTERY	RAYOVAC	CR2025	NONE

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	HP	s5250t	MXV94400D8	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100219	09/26/2012	09/26/2013
Antenna, Loop	Com Power	AL-130	17085	01/29/2013	01/29/2015
Antenna, CombiLog	Com Power	AC-220	25857	04/16/2013	04/16/2014
Antenna, Horn 1-18GHz	Com Power	AH-118	071250	07/03/2012	07/03/2013
Antenna, Horn 18-26GHz	Com Power	AH-826	081033	N.C.R.	N.C.R.
Pre-Amp, 1-18GHz	Com Power	PAM-118	443013	04/08/2013	04/08/2014
Pre-Amp, 1-18GHz	Com Power	PAM-118	443014	04/08/2013	04/08/2014
Pre-Amp, 18-40GHz	Com Power	PA-840	181289	06/13/2012	06/13/2013
High Pass Filter	AMTI Microwave Circuits	H3G020G4	481230	06/07/2012	06/07/2013
Mast, Antenna Positioner	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Antenna Mast	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Turntable	Sunol Science Corporation	FM 2001	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Science Corporation	SC104V	020808-1	N/A	N/A

6. TEST SITE DESCRIPTION**6.1 Test Facility Description**

Please refer to section 2.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

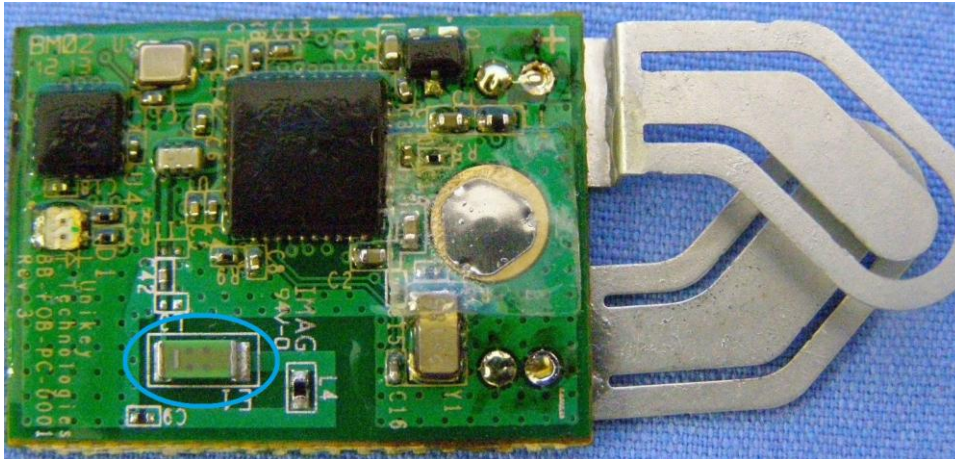
7.1 Channel Number and Frequencies

There are a total of 40 channels. The low channel is at 2402.0 MHz and the high channel is at 2480.0 MHz. There is a 2 MHz separation between each channel.

1 = 2402 MHz
2 = 2404 MHz
3 = 2406 MHz
4 = 2408 MHz
5 = ...

7.2 Antenna

The antenna is a surface mount component.



8. TEST PROCEDURES

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

8.1 RF Emissions

8.1.1 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. 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 received its power through the LISN, which 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 the computer software.

Test Results:

The EUT is a battery operated device; therefore this test was not performed.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The EMI receiver was used as a measuring meter. The receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the receiver records the highest measured reading over all the sweeps. Preamplifiers were used to increase the sensitivity of the instrument. There were two Microwave Preamplifiers used for frequencies above 1 GHz, and one Microwave Preamplifier was used for frequencies above 18 GHz.

The quasi-peak detector was used for frequencies below 1GHz and the average detector was used for frequencies above 1 GHz.

A duty cycle correction factor was used to average fundamental and harmonic emissions.

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

FREQUENCY RANGE (MHz)	TRANSDUCER	EFFECTIVE MEASUREMENT BANDWIDTH
0.009 to 0.150	Active Loop Antenna	200 kHz
0.150 to 30	Active Loop Antenna	9 kHz
30 to 1000	Combilog Antenna	100 kHz
1000 to 24800	Horn Antenna	1 MHz

The TDK FAC-3 shielded test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI 63.10 and 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 in both vertical and horizontal polarizations (for E field radiated field strength).

Test Results:

The EUT complies with the limits of CFR Title 47 Part 15 Subpart B section 15.109, Subpart C sections 15.205, 15.209 and 15.249.

8.1.3 Fundamental Field Strength

The Peak Transmit EMI was measured using the EMI Receiver at a 3-meter test distance to obtain the final test data. The low, mid and high channels were measured. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C Section 15.249.

8.1.4 Emissions Radiated Outside of the Fundamental Frequency Band

The Band Edge measurement was measured using the EMI Receiver at a 3-meter test distance to obtain the final test data. The low and high channels were tuned during the low and high band edge tests respectively. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C, Section 15.205 and 15.249.

8.1.5 Duty Cycle

Duty Cycle Correction Factor = -20dB

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

where

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

$$396.3 \mu\text{s} * 5 = 1.9815 \text{ ms}$$

$$1.9815 \text{ ms} / 100 \text{ ms} = 0.019815$$

$$20 \log (0.019815) = -34.06 \text{ dB} \text{ (Maximum correction factor allowed = -20dB)}$$

9. TEST PROCEDURE DEVIATIONS

There were no deviations from the test procedures.

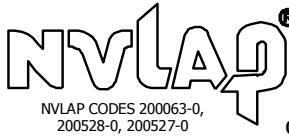
10. CONCLUSIONS

The KEY FOB Model: 926 meets all of the relevant specification requirements defined in the Code of Federal Regulations Title 47, Part 15 subpart B section 15.109 Subpart C sections 15.205, 15.209 and 15.249.

APPENDIX A

LABORATORY ACCREDITATIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS



For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

Silverado/Lake Forest Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2005270.htm>

Brea Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2005280.htm>

Agoura Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2000630.htm>



Compatible Electronics has been accredited by ANSI and appointed by the FCC to serve as a Telecommunications Certification Body (TCB). Compatible Electronics ANSI TCB listing can be found at: http://www.ansi.org/public/ca/ansi_cp.html



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/EU CAB listing can be found at: <http://ts.nist.gov/ts/htdocs/210/gsig/emc-cabs-mar02.pdf>



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/APEC CAB listing can be found at: <http://ts.nist.gov/ts/htdocs/210/gsig/apec/bsmi-cabs-may02.pdf>



Compatible Electronics has been validated by NEMKO against ISO/IEC 17025 under the NEMKO EMC Laboratory Authorization (ELA) program to all EN standards required by the European Union (EU) EMC Directive 89/336/EEC. Please follow the link to the Compatible Electronics' web site for each of our facilities NEMKO ELA certificate and scope of accreditation. <http://www.celectronics.com/certs.htm>

We are also certified/listed for IT products by the following country/agency:



Compatible Electronics VCCI listing can be found at:
http://www.vcci.or.jp/vcci_e/member/tekigo/setsubi_index_id.html

Just type "Compatible Electronics" into the Keyword search box.



Compatible Electronics FCC listing can be found at:
https://gullfoss2.fcc.gov/prod/oet/index_ie.html

Just type "Compatible Electronics" into the Test Firms search box.



Compatible Electronics IC listing can be found at:
http://spectrum.ic.gc.ca/~cert/labs/oats_lab_c_e.html

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

There were no modifications made to the EUT during the test.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

KEY FOB
Model: 926
S/N: None

There were no additional models covered under this report.

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APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

**FIGURE 1: RADIATED EMISSIONS 3-METER
SEMI-ANECHOIC TEST CHAMBER BELOW 1GHz**

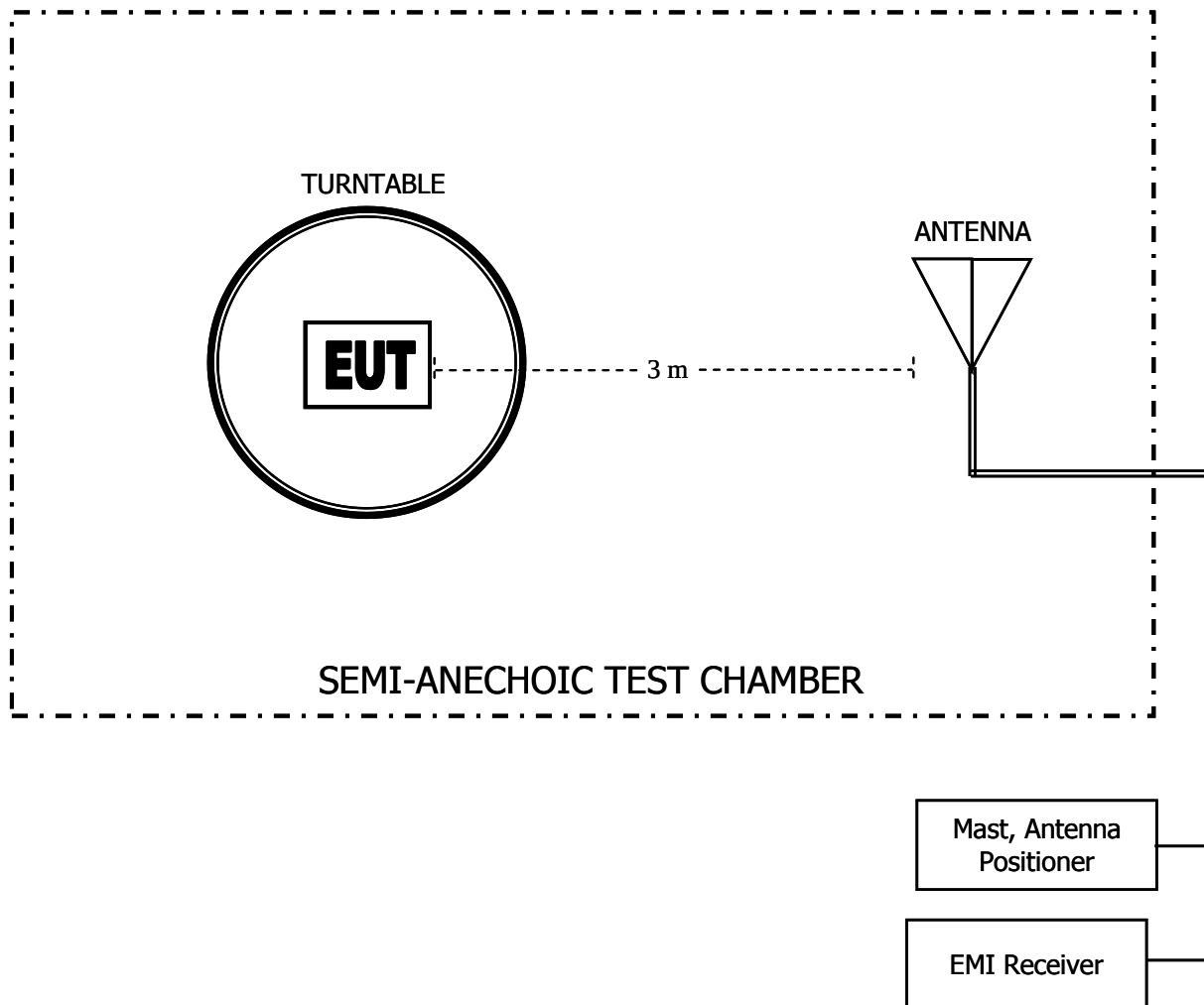
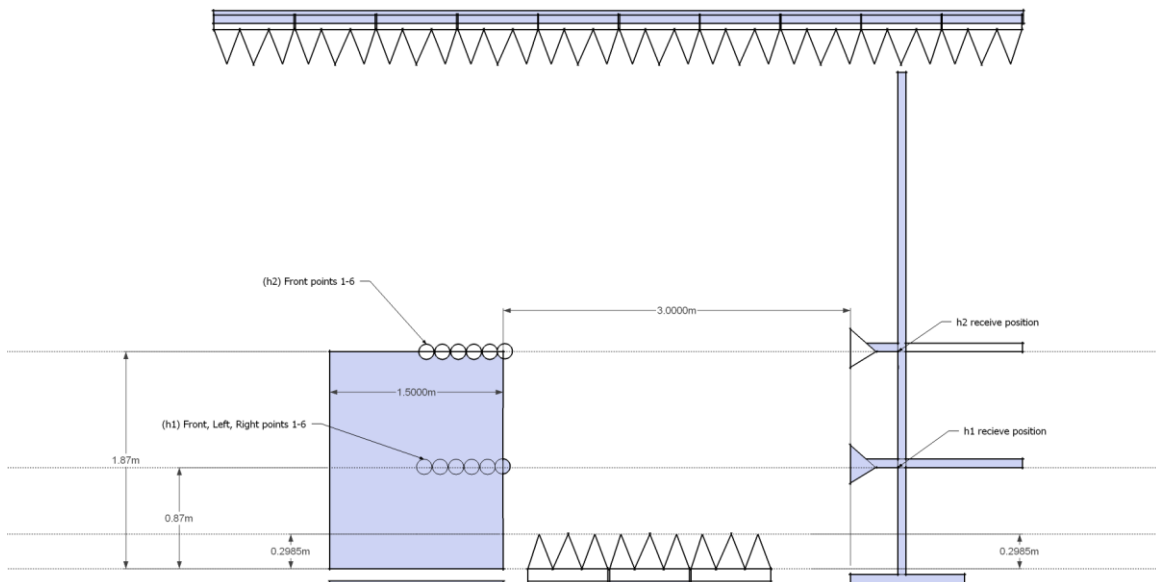


FIGURE 2: RADIATED EMISSIONS 3-METER SEMI-ANECHOIC TEST CHAMBER ABOVE 1 GHz



COM-POWER AL-130

LOOP ANTENNA

S/N: 17085

CALIBRATION DUE: JANUARY 29, 2015

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)	FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-40.70	10.80	0.8	-40.91	10.59
0.01	-40.50	11.00	0.9	-40.80	10.70
0.02	-40.70	10.80	1.0	-40.81	10.69
0.03	-40.10	11.40	2.0	-40.51	10.99
0.04	-40.50	11.00	3.0	-40.54	10.96
0.05	-41.10	10.40	4.0	-40.44	11.06
0.06	-41.00	10.50	5.0	-40.32	11.18
0.07	-41.10	10.40	6.0	-40.69	10.81
0.08	-41.10	10.40	7.0	-40.37	11.13
0.09	-41.20	10.30	8.0	-39.99	11.51
0.1	-41.20	10.30	9.0	-40.00	11.50
0.2	-41.40	10.10	10.0	-40.08	11.42
0.3	-41.30	10.20	15.0	-42.36	9.14
0.4	-41.20	10.30	20.0	-38.75	12.75
0.5	-41.40	10.10	25.0	-40.70	10.80
0.6	-41.40	10.10	30.0	-41.09	10.41
0.7	-41.20	10.30			

COM-POWER AC-220

LAB R - COMBILOG ANTENNA

S/N: 25857

CALIBRATION DUE: APRIL 16, 2014

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	17.8	160	8.3
35	18.4	180	9.4
40	19.2	200	9.0
45	17.2	250	12.0
50	17.2	300	13.4
60	13.5	400	15.0
70	8.9	500	17.3
80	6.0	600	17.8
90	7.1	700	20.0
100	8.0	800	20.5
120	9.2	900	20.8
140	7.5	1000	22.4

COM-POWER AH-118

LAB R - HORN ANTENNA

S/N: 071250

CALIBRATION DUE: JULY 3, 2013

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	26.5	9500	40.4
1500	27.2	10000	40.3
2000	31.5	10500	41.7
2500	31.9	11000	42.1
3000	32.7	11500	42.3
3500	34.0	12000	42.6
4000	33.5	12500	41.4
4500	34.9	13000	42.7
5000	36.2	13500	43.6
5500	36.6	14000	42.4
6000	36.8	14500	42.7
6500	37.4	15000	45.4
7000	39.4	15500	45.1
7500	39.6	16000	42.9
8000	42.4	16500	44.0
8500	40.3	17000	46.8
9000	39.6	17500	47.5
		18000	46.6

COM-POWER AH-826

HORN ANTENNA

S/N: 81033

CALIBRATION DUE: N.C.R.

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	32.8	22500	32.7
18500	32.2	23000	32.7
19000	31.9	23500	32.0
19500	31.5	24000	32.9
20000	33.3	24500	33.7
20500	33.2	25000	34.1
21000	32.6	25500	33.6
21500	33.2	26000	35.1
22000	33.0	26500	33.6

COM-POWER PAM-118

1-18GHz - PREAMPLIFIER

S/N: 443013

CALIBRATION DUE: APRIL 08, 2014

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
0500	26.32	7500	25.82
1000	24.72	8000	26.04
1500	25.89	8500	25.96
2000	25.41	9000	23.15
2500	26.28	9500	24.41
3000	25.94	10000	25.71
3500	25.59	11000	26.07
4000	26.95	12000	26.17
4500	25.52	13000	24.72
5000	25.75	14000	23.19
5500	26.00	15000	25.42
6000	25.38	16000	25.07
6500	26.06	17000	24.24
7000	26.24	18000	24.92

COM-POWER PAM-118

1-18GHz - PREAMPLIFIER

S/N: 443014

CALIBRATION DUE: APRIL 8, 2014

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
0500	26.75	7500	23.83
1000	25.15	8000	23.86
1500	26.17	8500	23.55
2000	25.85	9000	24.39
2500	26.75	9500	25.57
3000	26.27	10000	26.24
3500	26.09	11000	26.43
4000	27.23	12000	26.79
4500	26.08	13000	25.66
5000	26.24	14000	23.50
5500	26.50	15000	25.78
6000	25.99	16000	25.45
6500	26.86	17000	26.45
7000	27.13	18000	26.70

COM-POWER PA-840**18-40 GHz PREAMPLIFIER****S/N: 181289****CALIBRATION DUE: JUNE 13, 2013**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	30.33	31500	29.12
19000	29.21	32000	28.84
20000	29.33	32500	28.04
21000	31.35	33000	28.72
22000	30.81	33500	28.09
23000	28.37	34000	27.91
24000	28.77	34500	27.87
25000	29.14	35000	27.82
26000	31.88	35500	27.70
26500	31.08	36000	25.38
27000	31.47	36500	27.82
27500	30.73	37000	27.45
28000	29.87	37500	27.62
28500	30.02	38000	28.40
29000	29.78	38500	29.00
29500	29.81	39000	30.33
30000	28.82	39500	31.43
30500	28.56	39999	29.61
31000	29.78		



FRONT VIEW

KWIKSET CORP.
KEY FOB
Model: 926

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS 30-1000MHz

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



REAR VIEW

KWIKSET CORP.
KEY FOB
Model: 926

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS 30-1000MHz

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



FRONT VIEW

KWIKSET CORP.
KEY FOB
Model: 926

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS ABOVE 1GHz

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



REAR VIEW

KWIKSET CORP.
KEY FOB
Model: 926

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS ABOVE 1GHz

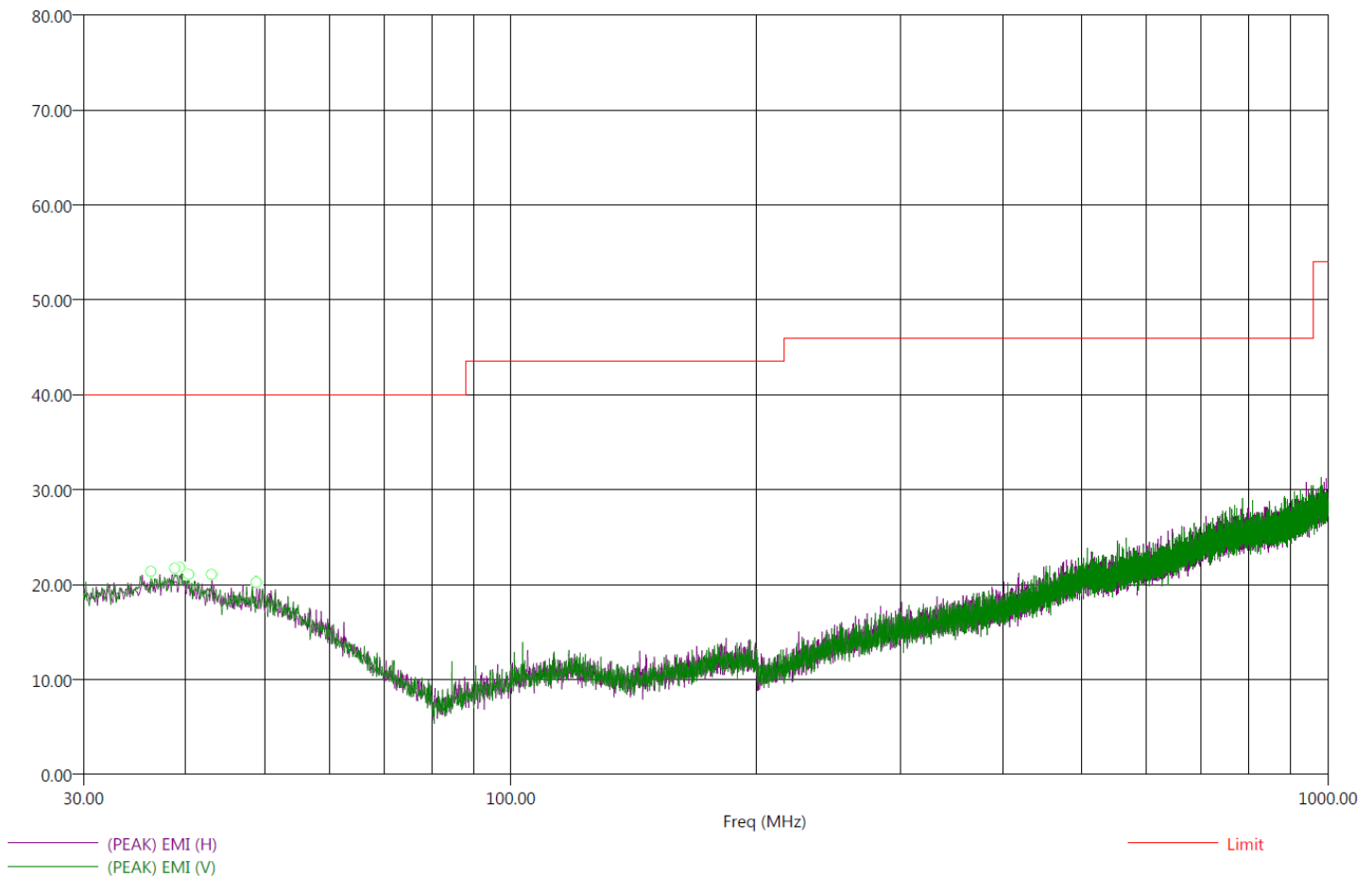
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

APPENDIX E

DATASHEETS

Title: FCC 15.209
File: Radiated Pre-Scan 30-1000MHz.set
Operator: Matt Harrison
EUT Type: Key Fob, MN: 926.
EUT Condition: Constantly Transmitting.
Comments: Y-Axis
Temp: 68f
Hum: 45%
Battery Operated

5/16/2013 3:46:49 PM
Sequence: Preliminary Scan

Compatible Electronics, Inc. FAC-3 (Lab R)Electric Field Strength (dB μ V/m)

There were no spurious radiated emissions found below 30 MHz or above 1GHz

Title: FCC 15.209
File: Radiated Final 30-1000MHz.set
Operator: Matt Harrison
EUT Type: Key Fob, MN: 926.
EUT Condition: Constantly Transmitting.
Comments: Y-Axis
Temp: 68f
Hum: 45%
Battery Operated

5/16/2013 3:57:38 PM
Sequence: Final Measurements

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBµV/m)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable(dB)
36.30	-24.45	15.55	20.93	40.00	V	189.50	241.46	18.61	0.57
38.80	-24.15	15.85	21.70	40.00	V	258.25	353.88	19.03	0.59
39.40	-24.08	15.92	21.86	40.00	V	353.00	322.41	19.10	0.59
40.40	-23.95	16.05	21.10	40.00	V	100.75	196.02	19.08	0.60
43.10	-24.84	15.16	20.75	40.00	H	329.00	157.70	17.98	0.60
48.90	-25.42	14.58	19.90	40.00	H	360.25	256.38	17.20	0.60

There were no spurious radiated emissions found below 30 MHz or above 1GHz

FUNDAMENTAL & HARMONICS

DATASHEETS

RADIATED FUNDAMENTAL EMISSIONS

FCC 15.249

Company: Kwikset
EUT: Key Fob / Bluetooth
Model: 926
Duty Cycle Correction Factor: -20.00 dB

Date: 6/4/2013
Lab: R
Test ENG: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBμV)	Pol	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	87.32	H	93.97	-6.65	Peak	1.40	357	
2402	--	H	--	--	AVG	--	--	
2402	96.93	V	--	--	Peak	1.14	342	
2402	76.93	V	93.97	-17.04	AVG	1.14	342	
2426	87.80	H	93.97	-6.17	Peak	2.37	0	
2426	--	H	--	--	AVG	--	--	
2426	96.99	V	--	--	Peak	1.90	289	
2426	76.99	V	93.97	-16.98	AVG	1.90	289	
2480	73.00	H	93.97	-20.97	Peak	1.43	360	
2480	--	H	--	--	AVG	--	--	
2480	96.43	V	--	--	Peak	1.75	29	
2480	76.43	V	93.97	-17.54	AVG	1.75	29	

Test distance
3 meter

HARMONIC EMISSIONS LOW CHANNEL

FCC 15.249Company: Kwikset
EUT: Key Fob / Bluetooth
Model: 926Date: 6/4/2013
Lab: R
Test ENG: Matt Harrison**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804.00	48.82	H	53.98	-5.16	Peak	1.35	0	
4804.00	--	H	--	--	Avg	--	--	
7206.00		H	--	--	Peak			No Emission Found
7206.00		H	--	--	Avg			No Emission Found
9608.00		H	--	--	Peak			No Emission Found
9608.00		H	--	--	Avg			No Emission Found
12010.00		H	--	--	Peak			No Emission Found
12010.00		H	--	--	Avg			No Emission Found
14412.00		H	--	--	Peak			No Emission Found
14412.00		H	--	--	Avg			No Emission Found
16814.00		H	--	--	Peak			No Emission Found
16814.00		H	--	--	Avg			No Emission Found
19216.00		H	--	--	Peak			No Emission Found
19216.00		H	--	--	Avg			No Emission Found
21618.00		H	--	--	Peak			No Emission Found
21618.00		H	--	--	Avg			No Emission Found
24020.00		H	--	--	Peak			No Emission Found
24020.00		H	--	--	Avg			No Emission Found

Test distance
3 meter

HARMONIC EMISSIONS LOW CHANNEL

FCC 15.249

Company: Kwikset
EUT: Key Fob / Bluetooth
Model: 926

Date: 6/4/2013
Lab: R
Test ENG: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804.00	49.41	V	53.98	-4.57	Peak	1	360	
4804.00	--	V	--	--	Avg	--	--	
7206.00		V	--	--	Peak			No Emission Found
7206.00		V	--	--	Avg			No Emission Found
9608.00		V	--	--	Peak			No Emission Found
9608.00		V	--	--	Avg			No Emission Found
12010.00		V	--	--	Peak			No Emission Found
12010.00		V	--	--	Avg			No Emission Found
14412.00		V	--	--	Peak			No Emission Found
14412.00		V	--	--	Avg			No Emission Found
16814.00		V	--	--	Peak			No Emission Found
16814.00		V	--	--	Avg			No Emission Found
19216.00		V	--	--	Peak			No Emission Found
19216.00		V	--	--	Avg			No Emission Found
21618.00		V	--	--	Peak			No Emission Found
21618.00		V	--	--	Avg			No Emission Found
24020.00		V	--	--	Peak			No Emission Found
24020.00		V	--	--	Avg			No Emission Found

Test distance
3 meter

HARMONIC EMISSIONS MID CHANNEL

FCC 15.249Company: Kwikset
EUT: Key Fob / Bluetooth
Model: 926Date: 5/20/2013
Lab: R
Test ENG: Matt Harrison**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4852.00	49.08	H	53.98	-4.90	Peak	1.00	170	
4852.00	--	H	--	--	Avg	--	--	
7278.00		H	--	--	Peak			No Emission Found
7278.00		H	--	--	Avg			No Emission Found
9704.00		H	--	--	Peak			No Emission Found
9704.00		H	--	--	Avg			No Emission Found
12130.00		H	--	--	Peak			No Emission Found
12130.00		H	--	--	Avg			No Emission Found
14556.00		H	--	--	Peak			No Emission Found
14556.00		H	--	--	Avg			No Emission Found
16982.00		H	--	--	Peak			No Emission Found
16982.00		H	--	--	Avg			No Emission Found
19408.00		H	--	--	Peak			No Emission Found
19408.00		H	--	--	Avg			No Emission Found
21834.00		H	--	--	Peak			No Emission Found
21834.00		H	--	--	Avg			No Emission Found
24260.00		H	--	--	Peak			No Emission Found
24260.00		H	--	--	Avg			No Emission Found

Test distance
3 meter

HARMONIC EMISSIONS MID CHANNEL

FCC 15.249

Company: Kwikset
EUT: Key Fob / Bluetooth
Model: 926

Date: 5/20/2013
Lab: R
Test ENG: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4852.00	50.69	V	53.98	-3.29	Peak	1.11	360	
4852.00		V	--	--	Avg			
7278.00		V	--	--	Peak			No Emission Found
7278.00		V	--	--	Avg			No Emission Found
9704.00		V	--	--	Peak			No Emission Found
9704.00		V	--	--	Avg			No Emission Found
12130.00		V	--	--	Peak			No Emission Found
12130.00		V	--	--	Avg			No Emission Found
14556.00		V	--	--	Peak			No Emission Found
14556.00		V	--	--	Avg			No Emission Found
16982.00		V	--	--	Peak			No Emission Found
16982.00		V	--	--	Avg			No Emission Found
19408.00		V	--	--	Peak			No Emission Found
19408.00		V	--	--	Avg			No Emission Found
21834.00		V	--	--	Peak			No Emission Found
21834.00		V	--	--	Avg			No Emission Found
24260.00		V	--	--	Peak			No Emission Found
24260.00		V	--	--	Avg			No Emission Found

Test distance
3 meter

HARMONIC EMISSIONS HIGH CHANNEL

FCC 15.249

Company: Kwikset
EUT: Key Fob / Bluetooth
Model: 926

Date: 5/20/2013
Lab: R
Test ENG: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960.00	49.01	H	53.98	-4.97	Peak	1	338	
4960.00		H	--	--	Avg			
7440.00		H	--	--	Peak			No Emission Found
7440.00		H	--	--	Avg			No Emission Found
9920.00		H	--	--	Peak			No Emission Found
9920.00		H	--	--	Avg			No Emission Found
12400.00		H	--	--	Peak			No Emission Found
12400.00		H	--	--	Avg			No Emission Found
14880.00		H	--	--	Peak			No Emission Found
14880.00		H	--	--	Avg			No Emission Found
17360.00		H	--	--	Peak			No Emission Found
17360.00		H	--	--	Avg			No Emission Found
19840.00		H	--	--	Peak			No Emission Found
19840.00		H	--	--	Avg			No Emission Found
22320.00		H	--	--	Peak			No Emission Found
22320.00		H	--	--	Avg			No Emission Found
24800.00		H	--	--	Peak			No Emission Found
24800.00		H	--	--	Avg			No Emission Found

Test distance
3 meter

HARMONIC EMISSIONS HIGH CHANNEL

FCC 15.249

Company: Kwikset
EUT: Key Fob / Bluetooth
Model: 926

Date: 5/20/2013
Lab: R
Test ENG: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960.00	50.84	V	53.98	-3.14	Peak	1	0	
4960.00		V	--	--	Avg			
7440.00		V	--	--	Peak			No Emission Found
7440.00		V	--	--	Avg			No Emission Found
9920.00		V	--	--	Peak			No Emission Found
9920.00		V	--	--	Avg			No Emission Found
12400.00		V	--	--	Peak			No Emission Found
12400.00		V	--	--	Avg			No Emission Found
14880.00		V	--	--	Peak			No Emission Found
14880.00		V	--	--	Avg			No Emission Found
17360.00		V	--	--	Peak			No Emission Found
17360.00		V	--	--	Avg			No Emission Found
19840.00		V	--	--	Peak			No Emission Found
19840.00		V	--	--	Avg			No Emission Found
22320.00		V	--	--	Peak			No Emission Found
22320.00		V	--	--	Avg			No Emission Found
24800.00		V	--	--	Peak			No Emission Found
24800.00		V	--	--	Avg			No Emission Found

Test distance
3 meter

***EMISSIONS RADIATED OUTSIDE OF THE FUNDAMENTAL
FREQUENCY BAND***

DATA SHEETS

BAND EDGES- HORIZONTAL

FCC 15.249

Company: Kwikset
EUT: Key Fob / Bluetooth
Model: 926
Duty Cycle Correction Factor: -20.00 dB

Date: 6/4/2013
Lab: R
Test ENG: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	87.32	H	--	--	Peak	1.4	357	Fundamental of Low Channel
2402	--	H	--	--	Avg	1.4	357	@ 3 meters
2400	67.64	H	--	--	Peak	1.4	357	No Marker Delta Method
2400	47.64	H	53.98	-6.34	Avg	1.4	357	Method Used
2480	73.00	H	--	--	Peak	1.43	360	Fundamental of High Channel
2480	--	H	--	--	Avg	1.43	360	@ 3 meters
2483.5	55.14	H	--	--	Peak	1.43	360	No Marker Delta Method
2483.5	35.14	H	53.98	-18.84	Avg	1.43	360	Method Used

Test distance
3 meter

BAND EDGES- VERTICAL

FCC 15.249

Company: Kwikset
EUT: Key Fob / Bluetooth
Model: 926
Duty Cycle Correction Factor: -20.00 dB

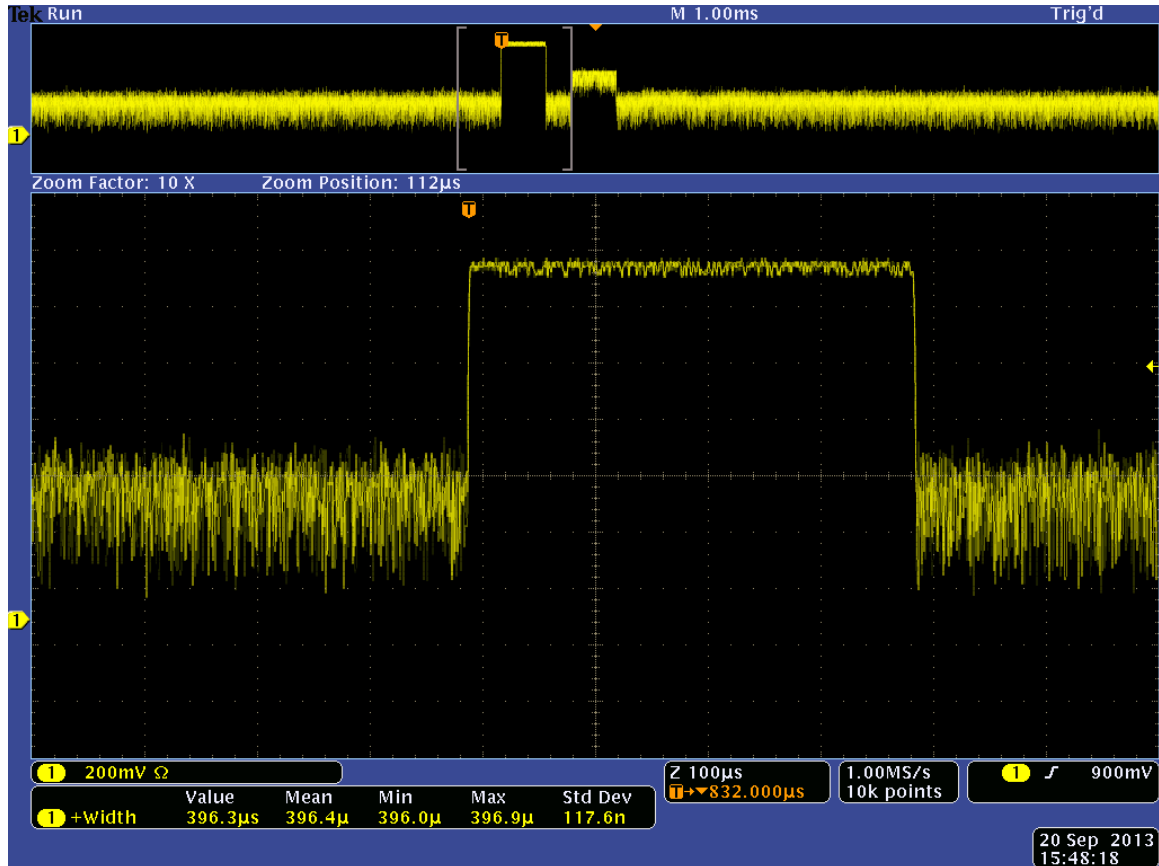
Date: 6/4/2013
Lab: R
Test ENG: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	96.93	V	--	--	Peak	1.14	342	Fundamental of Low Channel
2402	76.93	V	--	--	Avg	1.14	342	@ 3 meters
2400	59.87	V	--	--	Peak	1.14	342	No Marker Delta
2400	39.87	V	53.98	-14.11	Avg	1.14	342	Method Used
2480	96.43	V	--	--	Peak	1.75	29	Fundamental of High Channel
2480	76.43	V	--	--	Avg	1.75	29	@ 3 meters
2483.5	58.08	V	--	--	Peak	1.75	29	No Marker Delta
2483.5	38.08	V	53.98	-15.90	Avg	1.75	29	Method Used

Test distance
3 meter

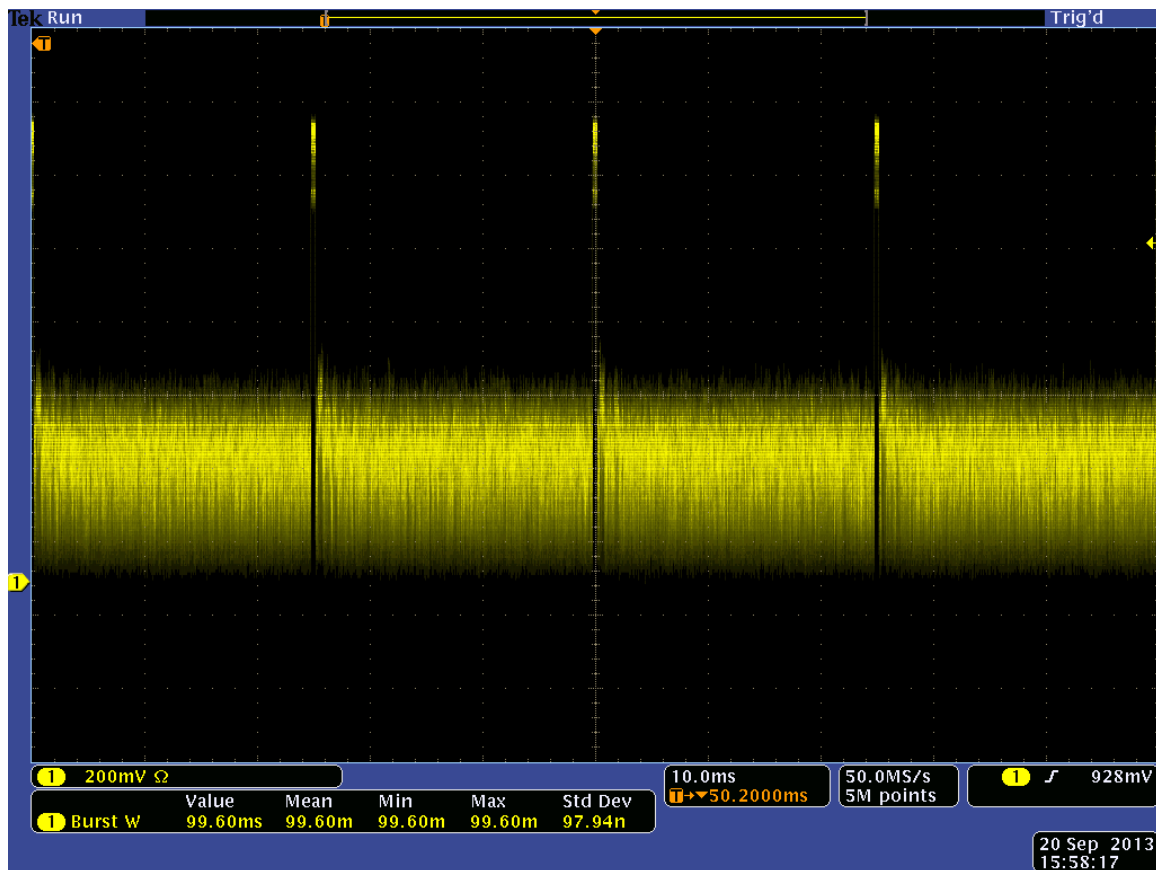
DUTY CYCLE PULSE WIDTH



Pulse width = 0.3963ms

DUTY CYCLE

PULSE TRAIN



$\text{Number of Pulses in } 100\text{ms} = 5$
 $\text{Total Pulse Time Within } 100\text{ms period} = 0.3963\text{ms} * 5 = 1.9815\text{ ms}$
 $\text{Duty Cycle} = 1.9815\text{ms} / 100\text{ms} = 0.019815$
 $\text{Correction Factor} = 20 * \log 0.019815 = -34.06\text{ dB}$

Maximum Correction Factor Allowed -20dB