FCC PART 15 SUBPART B & SUBPART C SECTION 15.249,
RSS 210, & RSS GEN
TEST REPORT

for

HOMEKIT ENABLED RESIDENTIAL DOOR LOCK
Model: SmartCode 919

Prepared for

SPECTRUM BRANDS
19701 DaVinci
LAKE FOREST, CA 92610

Prepared by:_____

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DATE: MARCH 28th, 2016

	REPORT BODY	APPENDICES					TOTAL
		A	*B*	*C*	*D*	*E*	
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1	Plot Map And Layout of Test Site Below 1GHz
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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 in any form unless done so in full with the written permission of Compatible Electronics.

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:	HomeKit Enabled Residential Door Lock Model: SmartCode 919 S/N: None
Product Description:	The EUT is a HomeKit Enabled Residential Door Lock operating via Bluetooth 4.0 Low Energy technology.
Modifications:	The EUT was not modified in order to comply with specifications.
Manufacturer:	Spectrum Brands 19701 DaVinci Lake Forest, CA 92610
Test Date:	April 8 and 11, 2016
Test Specifications:	EMI requirements CFR Title 47, Part 15 Subpart B Sections 15.107, 15.109, Subpart C Sections 15.205, 15.207, 15.209, and 15.249 RSS 210 & RSS GEN
Test Procedure:	ANSI C63.4 & C63.10

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz.	The EUT is battery powered; therefore this test was not performed.
2	Radiated RF Emissions & Harmonics, 9 kHz – 25,000 MHz.	Complies with the limits of CFR Title 47 Part 15 Subpart B Section 15.109 & Subpart C Sections 15.205, 15.209, & 15.249, RSS 210 & RSS GEN
3	Fundamental Field Strength	Complies with the limits of CFR Title 47 Part 15 Subpart C Section 15.249 & RSS 210
4	Emissions Radiated Outside of the Fundamental Frequency Band	Complies with the limits of CFR Title 47 Part 15 Subpart B Section 15.109 & Subpart C Sections 15.205, 15.209, & 15.249, RSS 210 & RSS GEN
5	Occupied Bandwidth	Complies with the limits of RSS 210 & RSS GEN

TABLE 1:
SIX HIGHEST RADIATED EMISSIONS READINGS

	Reading Type (PK / QP / AV)	Polarization (Vert / Horz)	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Delta (dB)	Test Distance
1	AV	H	7440	48.37	53.98	-5.61	3-Meter
2	AV	V	7440	45.72	53.98	-8.26	3-Meter
3	AV	H	7278	45.56	53.98	-8.42	3-Meter
4	AV	H	7206	43.10	53.98	-10.88	3-Meter
5	AV	V	7278	42.08	53.98	-11.90	3-Meter
6	AV	V	7206	38.67	53.98	-15.31	3-Meter

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the HomeKit Enabled Residential Door Lock Model: SmartCode 919. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 & C63.10. 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, 15.249, RSS GEN, & RSS 210.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The 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

Spectrum Brands

Thuan Nguyen	Senior Electronics Engineer

Compatible Electronics, Inc.

Torey Oliver	Test Technician
Matt Harrison	Lab Manager

2.4 Date Test Sample was Received

The test sample was received on April 8th, 2016.

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
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
PCB	Printed Circuit Board
TX	Transmit
RX	Receive

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4 2014	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 for Testing Unlicensed Wireless Devices
RSS GEN	General Requirements for Compliance of Radio Apparatus
RSS 210	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration

The HomeKit Enabled Residential Door Lock Model: SmartCode 919 (EUT) was setup in a tabletop configuration. The EUT was checked all 3 axis. The worst case was found to be the X-Axis. The EUT was continuously transmitting a data stream during testing.

The tests were performed using new batteries.

It was determined that the emissions were at their highest level when the EUT was transmitting in the configuration described above for Radiated Emissions. The final radiated data was taken in the above configuration. Please see Appendix E for the test data.

4.1.1 Photograph Test Configuration (X-Axis)

4.1.2 Cable Construction and Termination

There were no interconnecting cables.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER
1	HOMEKIT ENABLED RESIDENTIAL DOOR LOCK (EUT)	SPECTRUM BRANDS	SMARTCODE 919	NONE
2	BATTERIES (4)	RAYOVAC	AA	NONE

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	Compatible Electronics	NONE	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100219	09/03/2015	09/03/2016
EMI Receiver	Agilent	N9038A	MY51100115	12/29/2015	12/29/2016
Antenna, Loop	Com Power	AL-130	121049	12/06/2013	12/06/2016
Antenna, CombiLog	Com Power	AC-220	25857	05/21/2014	05/21/2016
Antenna, Horn 1-18GHz	Com Power	AH-118	071250	07/01/2014	07/01/2016
Antenna, Horn 18-26GHz	Com-Power	AH-826	081033	07/06/2014	07/06/2016
Pre-Amp, 1-18GHz	Com Power	PAM-118A	551034	8/25/2015	8/25/2016
Pre-Amp, 18-40GHz	Com-Power	PA-840	181289	6/16/2015	6/16/2016
High Pass Filter	AMTI Microwave Circuits	H3G020G4	481230	8/26/2015	8/26/2016
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 and the figures in Appendix D of this report for test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 by 0.8 meter high non-conductive table, which was placed on the ground plane.

For above 1GHz testing the EUT was placed 1.5 meters above high, above the ground plane.

The EUT was not grounded.

6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

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 approximately 2 MHz separation between channels and the EUT uses GFSK modulation.

7.2 Antenna

The Antenna is a Chip Antenna located on the transmitter PCB.

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

Test Results: The EUT is battery powered; therefore this test was not performed.

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 different configurations were investigated to find the worst case as well the worst case channel. The final data was collected under program control by the computer software. The final qualification data is located in Appendix E.

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. Amplifiers were used to increase the sensitivity of the instrument. There was one Microwave Preamplifier used for frequencies above 1 GHz.

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

For the harmonic and fundamental emissions a duty cycle average was used. For the non-intentional emissions a linear average was used.

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

FREQUENCY RANGE (MHz)	TRANSDUCER	EFFECTIVE MEASUREMENT BANDWIDTH
.009 to .150	Active Loop Antenna	200 Hz
.150 to 30	Active Loop Antenna	9 kHz
30 to 1000	Combilog Antenna	100 kHz (120 kHz for QP Measurements)
1000 to 25000	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 C63.4 & ANSI C63.10. 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, & Part 15 Subpart C sections 15.205, 15.209, 15.249, RSS GEN, & RSS 210. The six highest emissions are listed in table 1.

8.1.3 Fundamental Field Strength

The Peak Transmit Radiated Field Strength was 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

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

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

Duty Cycle Correction Factor = -20.00dB

Pulse Type 1 = 10 * 292.1844 uS = 2921.844 uS

Pulse Type 2 = 5 * 194.7896 uS = 973.948 uS

Total On Time = 2921.844 mS + 973.948 mS = 3895.792 uS = 3.895792 mS

3.895792 mS / 100 mS = 0.03895792 mS

20 log (0.03895792) = -28.188 dB correction factor

Max Duty Cycle Correction Factor = -20.00dB

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 lower and upper channels were tuned during the low and high band edge tests. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C, Section 15.205, 15.249, RSS GEN, & RSS 210.

9. TEST PROCEDURE DEVIATIONS

The test procedures were not deviated from throughout all tests.

10. CONCLUSIONS

The HomeKit Enabled Residential Door Lock Model: SmartCode 919 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, 15.249, RSS GEN, & RSS 210.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP LAB CODES 200063-0, 200528-0, 200527-0

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.

NVLAP listing links

Agoura Division - http://ts.nist.gov/Standards/scopes/2000630.htm
Brea Division - http://ts.nist.gov/Standards/scopes/2005280.htm
Silverado/Lake Forest Division - http://ts.nist.gov/Standards/scopes/2005270.htm

ANSI listing
CETCB
https://www.ansica.org/wwwversion2/outside/ALLdirectoryDetails.asp?menuID=1&prgID=3&orgID=123&status=4

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

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).

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

VCCI Listing, from VCCI site
Enter "Compatible" in search form http://www.vcci.or.jp/vcci_e/activity/registration/setsubi.html

FCC Listing, from FCC OET site
FCC test lab search https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm

Industry Canada Industrie Canada

Compatible Electronics IC listing can be found at:
http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

There were no modifications were made during testing.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	HOMEKIT ENABLED RESIDENTIAL DOOR LOCK Model: SmartCode 919 S/N: NONE

No additional models were tested.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: PLOT MAP AND LAYOUT OF TEST SITE BELOW 1GHZ

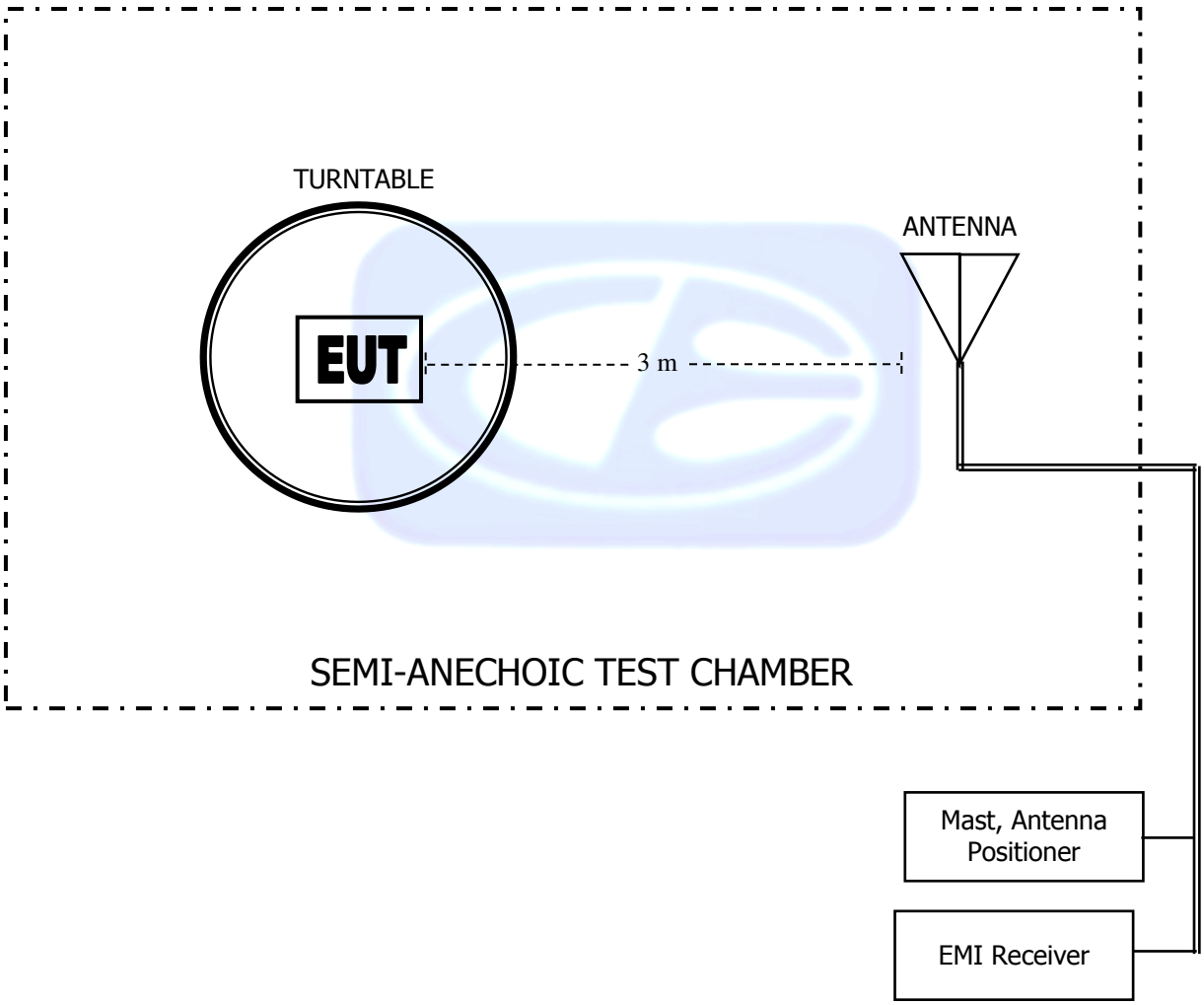
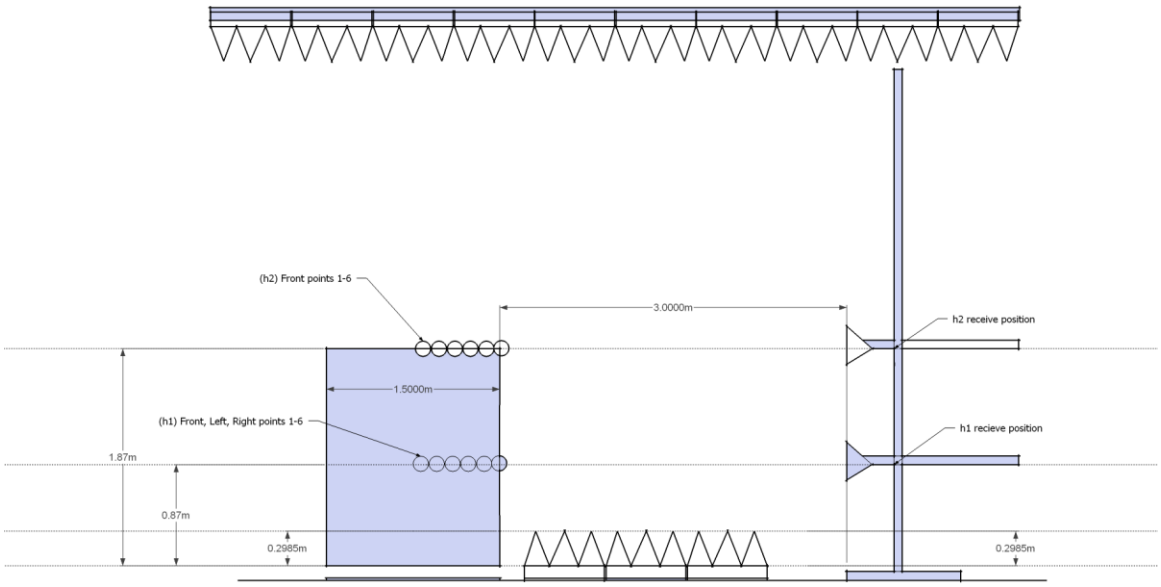


FIGURE 2: PLOT MAP AND LAYOUT OF TEST SITE ABOVE 1GHZ



COM-POWER AL-130

LOOP ANTENNA

S/N: 121049

CALIBRATION DUE: DECEMBER 6, 2016

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)	FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-34.64	16.86	**0.8**	-36.32	15.18
0.01	-34.78	16.72	**0.9**	-36.22	15.28
0.02	-35.91	15.59	**1.0**	-36.22	15.28
0.03	-35.48	16.02	**2.0**	-35.91	15.59
0.04	-35.82	15.68	**3.0**	-35.91	15.59
0.05	-36.49	15.01	**4.0**	-36.01	15.49
0.06	-36.30	15.20	**5.0**	-35.80	15.70
0.07	-36.43	15.07	**6.0**	-36.00	15.50
0.08	-36.30	15.20	**7.0**	-35.90	15.60
0.09	-36.39	15.11	**8.0**	-35.70	15.80
0.1	-36.41	15.09	**9.0**	-35.70	15.80
0.2	-36.61	14.89	**10.0**	-35.60	15.90
0.3	-36.63	14.87	**15.0**	-36.52	14.98
0.4	-36.52	14.99	**20.0**	-35.75	15.75
0.5	-36.63	14.87	**25.0**	-37.78	13.72
0.6	-36.62	14.88	**30.0**	-38.62	12.88
0.7	-36.53	14.97			

COM-POWER AC-220

LAB R - COMBILOG ANTENNA

S/N: 25857

CALIBRATION DUE: MAY 21, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	22.5	**160**	13.3
35	22.5	**180**	15.0
40	23.0	**200**	14.6
45	21.5	**250**	16.5
50	21.3	**300**	18.1
60	18.2	**400**	19.4
70	13.2	**500**	21.4
80	11.6	**600**	21.6
90	11.9	**700**	23.7
100	12.6	**800**	26.0
120	15.1	**900**	26.6
140	13.6	**1000**	28.5

COM-POWER AH-118

HORN ANTENNA

S/N: 071250

CALIBRATION DUE: JULY 1, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	30.1	**9500**	44.2
1500	29.2	**10000**	43.4
2000	31.6	**10500**	44.6
2500	35.5	**11000**	45.1
3000	33.7	**11500**	45.7
3500	36.0	**12000**	46.2
4000	35.4	**12500**	45.4
4500	35.5	**13000**	44.8
5000	40.1	**13500**	46.7
5500	37.8	**14000**	47.8
6000	39.0	**14500**	46.4
6500	39.9	**15000**	47.2
7000	40.4	**15500**	45.5
7500	44.4	**16000**	45.0
8000	44.1	**16500**	44.5
8500	43.1	**17000**	47.0
9000	43.0	**17500**	47.8
		18000	44.2

COM-POWER PAM-118A

1-18GHz - PREAMPLIFIER

S/N: 551034

CALIBRATION DUE: AUGUST 25, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
500	36.77	**5500**	39.82
1000	38.63	**6000**	38.74
1100	38.72	**6500**	39.60
1200	38.97	**7000**	35.52
1300	38.59	**7500**	36.61
1400	39.18	**8000**	36.92
1500	38.71	**8500**	37.13
1600	39.28	**9000**	36.50
1700	39.25	**9500**	38.92
1800	39.06	**10000**	38.74
1900	40.34	**11000**	35.23
2000	40.07	**12000**	35.64
2500	39.69	**13000**	36.73
3000	40.94	**14000**	36.48
3500	40.41	**15000**	37.57
4000	40.44	**16000**	38.10
4500	41.20	**17000**	37.34
5000	39.35	**18000**	36.80

FRONT VIEW

SPECTRUM BRANDS
HOMEKIT ENABLED RESIDENTIAL DOOR LOCK
Model: SmartCode 919
FCC SUBPART B & C - RADIATED EMISSIONS < 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

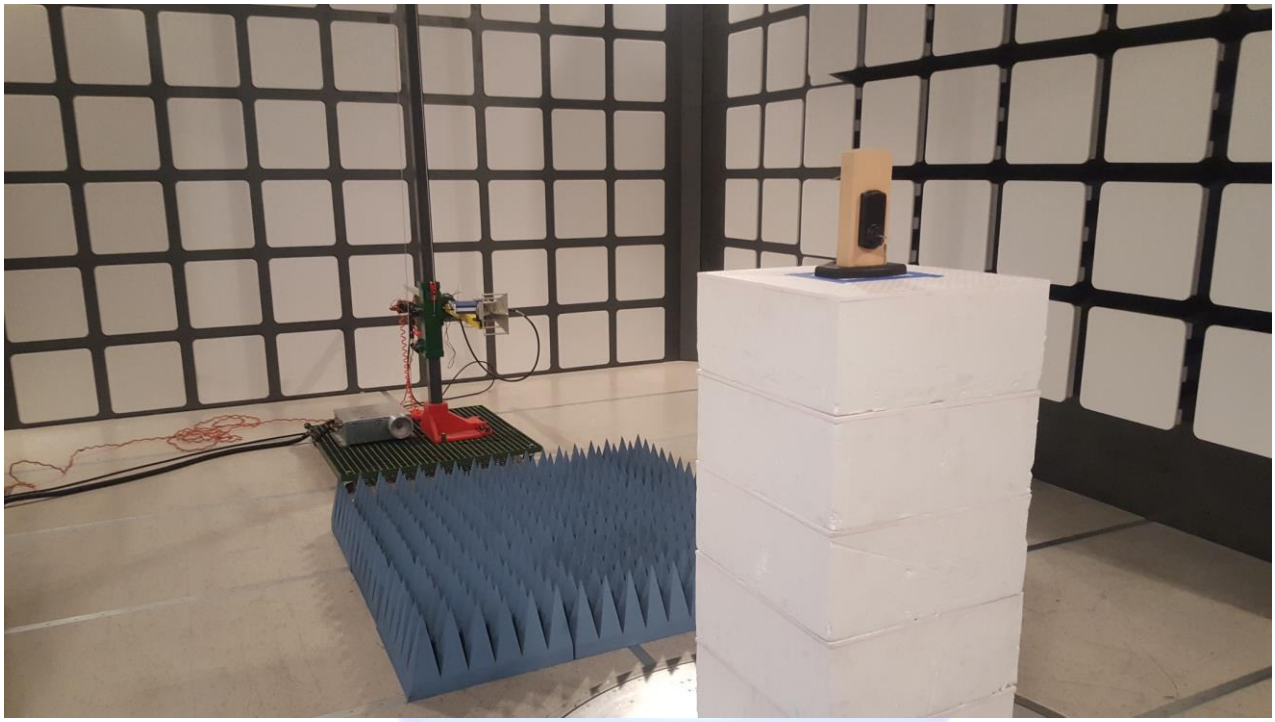
SPECTRUM BRANDS
HOMEKIT ENABLED RESIDENTIAL DOOR LOCK
Model: SmartCode 919
FCC SUBPART B & C - RADIATED EMISSIONS < 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

SPECTRUM BRANDS
HOMEKIT ENABLED RESIDENTIAL DOOR LOCK
Model: SmartCode 919
FCC SUBPART B & C - RADIATED EMISSIONS > 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

SPECTRUM BRANDS
HOMEKIT ENABLED RESIDENTIAL DOOR LOCK
Model: SmartCode 919
FCC SUBPART B & C - RADIATED EMISSIONS > 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

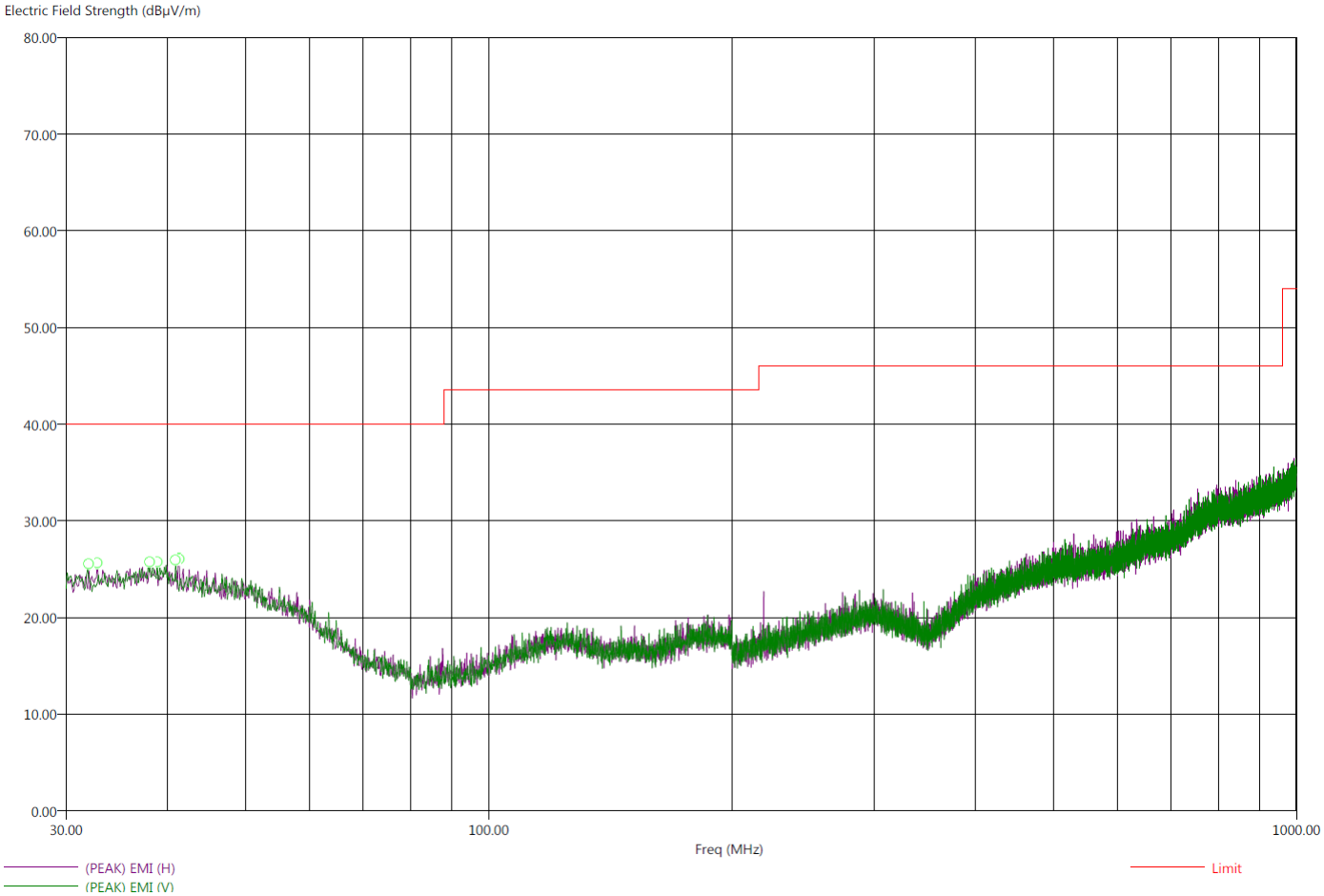
APPENDIX E

RADIATED EMISSIONS DATA SHEETS

Title: FCC 15.209
File: Radiated Pre-Scan 30-1000Mhz.set
Operator: Torey Oliver
EUT Type: Homekit Electronic Lock / SmartCode 919
EUT Condition: The EUT is constantly transmitting 2480 MHz.
Comments:
Temp: 72f
Hum: 38%
Battery Powered

4/11/2016 9:52:29 AM
Sequence: Preliminary Scan

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



There were no radiated emissions other than harmonics found below 30 MHz or above 1GHz.
This is the worst case channel and mode for spurious emissions.

Title: FCC 15.209 4/11/2016 10:14:22 AM
File: Radiated Final 30-1000Mhz.set Sequence: Final Measurements
Operator: Torey Oliver
EUT Type: Homekit Electronic Lock / SmartCode 919
EUT Condition: The EUT is constantly transmitting 2480 MHz.
Comments:
Temp: 72f
Hum: 38%
Battery Powered

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

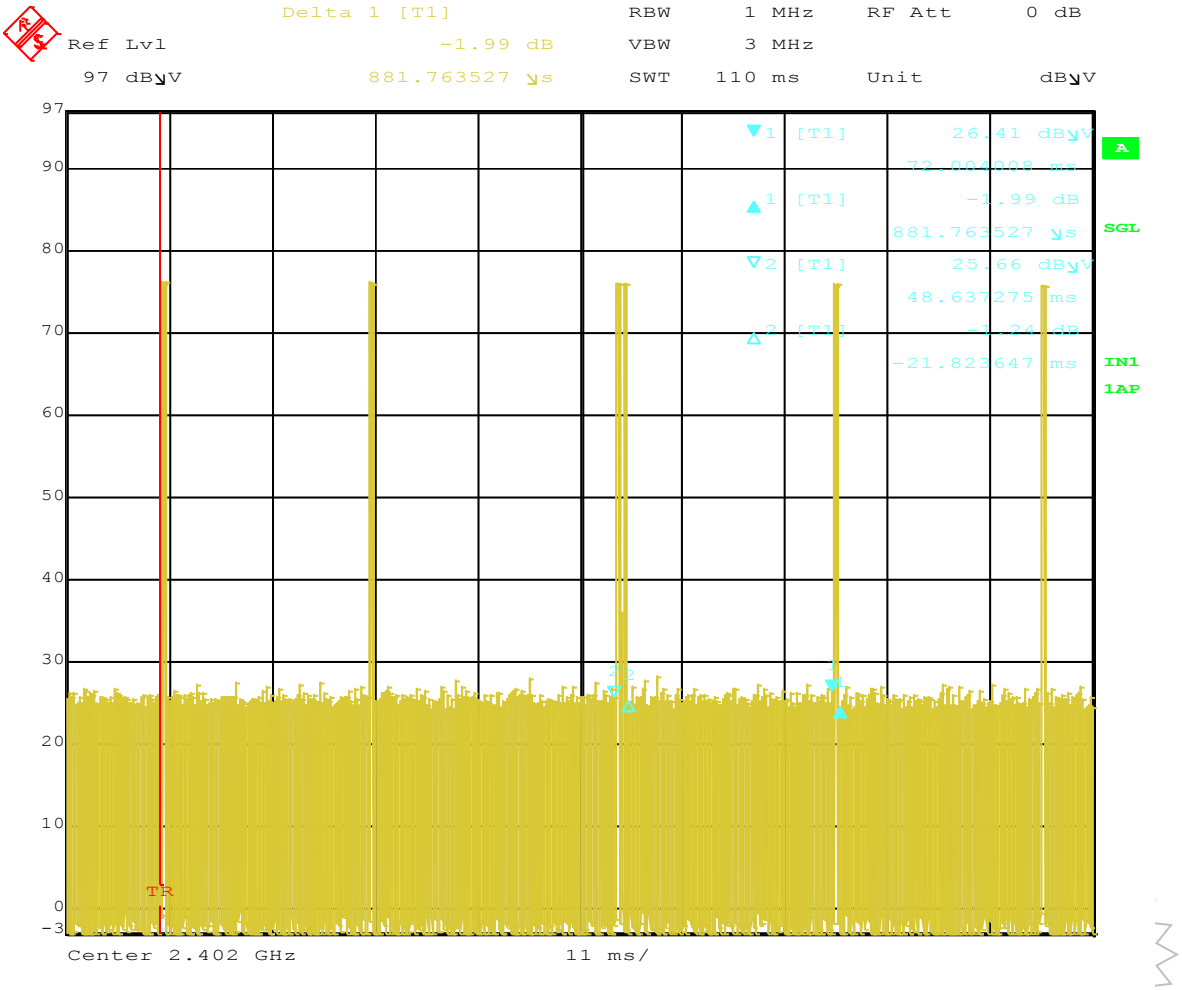
Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBµV/m)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable (dB)
32.00	-20.82	19.18	25.48	40.00	H	10.25	241.82	22.50	0.52
32.80	-20.66	19.34	24.96	40.00	H	156.00	228.74	22.50	0.53
38.10	-20.08	19.92	26.18	40.00	V	307.50	227.19	22.82	0.58
38.90	-20.01	19.99	25.94	40.00	V	84.50	221.82	22.89	0.59
41.00	-20.15	19.85	25.23	40.00	V	245.25	208.62	22.66	0.61
41.40	-20.21	19.79	25.00	40.00	H	146.50	210.00	22.59	0.61

There were no radiated emissions other than harmonics found below 30 MHz or above 1GHz.
This is the worst case channel and mode.

DUTY CYCLE DATA SHEETS

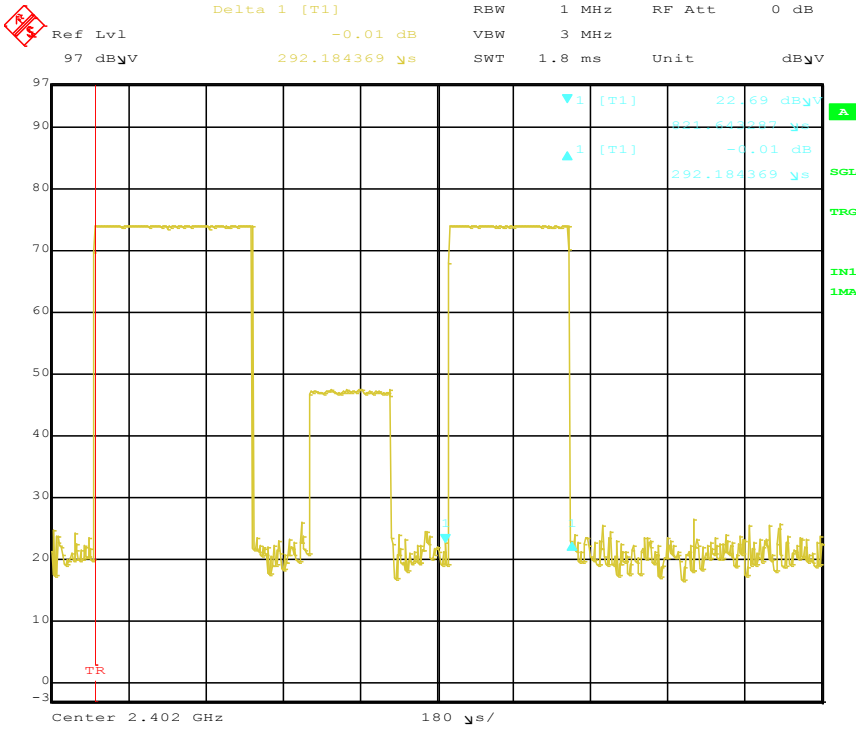
DUTY CYCLE

Pulse Train On Time (ms)	# of Pulses in Train	Total on Time (ms)	period (ms)	Duty Cycle	Correction (db)	Applied Correction (db)
0.192282565	5	3.895792	100	0.0390	-28.188	-20.00

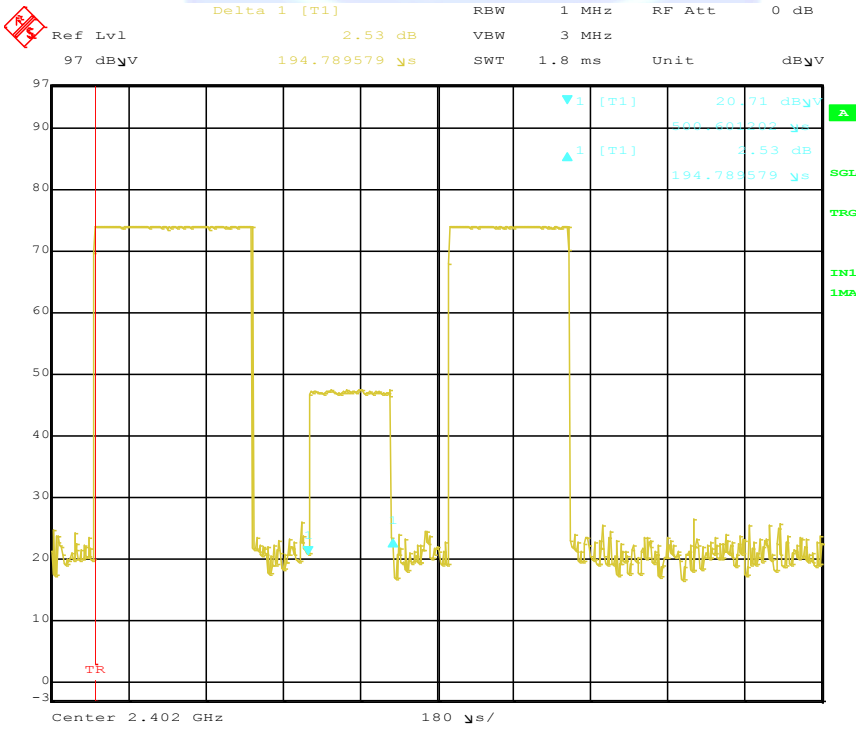


Comment A: 100ms Duty Cycle
Date: 8.APR.2016 09:35:52

DUTY CYCLE



Comment A: Pulse Type 1
Date: 8.APR.2016 09:53:23



Comment A: Pulse Type 2
Date: 8.APR.2016 09:53:55

FUNDAMENTAL & HARMONICS

DATA SHEETS

FUNDAMENTAL FIELD STRENGTH

FCC 15.249 & RSS 210

Company: Spectrum Brands
EUT: Homekit Enabled Residential Door Lock
Model: SmartCode 919
Duty Cycle Correction Factor = -20

Date: 4/11/2016
Lab: R
Tested By: Torey Oliver

Compatible Electronics, Inc. FAC-3

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table	Tower	Comments
2402.00	85.62	H	113.97	-28.35	Peak	1.57	360	X-Axis
2402.00	65.62	H	93.97	-28.35	Avg	1.57	360	X-Axis
2402.00	82.41	V	113.97	-31.56	Peak	1.66	25	X-Axis
2402.00	62.41	V	93.97	-31.56	Avg	1.66	25	X-Axis
2426.00	86.55	H	113.97	-27.42	Peak	1.53	360	X-Axis
2426.00	66.55	H	93.97	-27.42	Avg	1.53	360	X-Axis
2426.00	84.19	V	113.97	-29.78	Peak	1.10	24	X-Axis
2426.00	64.19	V	93.97	-29.78	Avg	1.10	24	X-Axis
2480.00	83.47	H	113.97	-30.50	Peak	1.63	360	X-Axis
2480.00	63.47	H	93.97	-30.50	Avg	1.63	360	X-Axis
2480.00	79.55	V	113.97	-34.42	Peak	2.10	28	X-Axis
2480.00	59.55	V	93.97	-34.42	Avg	2.10	28	X-Axis

Test distance
3 meter

HARMONICS LOW CHANNEL HORIZONTAL

FCC 15.249 & RSS 210

Company: Spectrum Brands
EUT: Homekit Enabled Residential Door Lock
Model: SmartCode 919
Duty Cycle Correction Factor = -20

Date: 4/8/2016
Lab: R
Tested By: Torey Oliver

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804.0	50.64	H	73.98	-23.34	Peak	1.07	177	
4804.0	30.64	H	53.98	-23.34	Avg	1.07	177	
7206.0	63.10	H	73.98	-10.88	Peak	1.06	148	
7206.0	43.10	H	53.98	-10.88	Avg	1.06	148	
9608.0		H	73.98		Peak			No Emissions Found
9608.0		H	53.98		Avg			No Emissions Found
12010.0		H	73.98		Peak			No Emissions Found
12010.0		H	53.98		Avg			No Emissions Found
14412.0		H	73.98		Peak			No Emissions Found
14412.0		H	53.98		Avg			No Emissions Found
16814.0		H	73.98		Peak			No Emissions Found
16814.0		H	53.98		Avg			No Emissions Found
19216.0		H	73.98		Peak			No Emissions Found
19216.0		H	53.98		Avg			No Emissions Found
21618.0		H	73.98		Peak			No Emissions Found
21618.0		H	53.98		Avg			No Emissions Found
24020.0		H	73.98		Peak			No Emissions Found
24020.0		H	53.98		Avg			No Emissions Found

Test distance
3 meter

HARMONICS LOW CHANNEL VERTICAL, ANTENNA 1

FCC 15.249 & RSS 210

Company: Spectrum Brands
EUT: Homekit Enabled Residential Door Lock
Model: SmartCode 919
Duty Cycle Correction Factor = -20

Date: 4/8/2016
Lab: R
Tested By: Torey Oliver

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804.0	45.67	V	73.98	-28.31	Peak	3.74	92	
4804.0	25.67	V	53.98	-28.31	Avg	3.74	92	
7206.0	58.67	V	73.98	-15.31	Peak	2.16	193	
7206.0	38.67	V	53.98	-15.31	Avg	2.16	193	
9608.0		V	73.98		Peak			No Emissions Found
9608.0		V	53.98		Avg			No Emissions Found
12010.0		V	73.98		Peak			No Emissions Found
12010.0		V	53.98		Avg			No Emissions Found
14412.0		V	73.98		Peak			No Emissions Found
14412.0		V	53.98		Avg			No Emissions Found
16814.0		V	73.98		Peak			No Emissions Found
16814.0		V	53.98		Avg			No Emissions Found
19216.0		V	73.98		Peak			No Emissions Found
19216.0		V	53.98		Avg			No Emissions Found
21618.0		V	73.98		Peak			No Emissions Found
21618.0		V	53.98		Avg			No Emissions Found
24020.0		V	73.98		Peak			No Emissions Found
24020.0		V	53.98		Avg			No Emissions Found

Test distance
3 meter

HARMONICS MID CHANNEL HORIZONTAL

FCC 15.249 & RSS 210

Company: Spectrum Brands
EUT: Homekit Enabled Residential Door Lock
Model: SmartCode 919
Duty Cycle Correction Factor = -20

Date: 4/8/2016
Lab: R
Tested By: Torey Oliver

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4852.0	52.09	H	73.98	-21.89	Peak	1.20	26	
4852.0	32.09	H	53.98	-21.89	Avg	1.20	26	
7278.0	65.56	H	73.98	-8.42	Peak	1.01	329	
7278.0	45.56	H	53.98	-8.42	Avg	1.01	329	
9704.0		H	73.98		Peak			No Emissions Found
9704.0		H	53.98		Avg			No Emissions Found
12130.0		H	73.98		Peak			No Emissions Found
12130.0		H	53.98		Avg			No Emissions Found
14556.0		H	73.98		Peak			No Emissions Found
14556.0		H	53.98		Avg			No Emissions Found
16982.0		H	73.98		Peak			No Emissions Found
16982.0		H	53.98		Avg			No Emissions Found
19408.0		H	73.98		Peak			No Emissions Found
19408.0		H	53.98		Avg			No Emissions Found
21834.0		H	73.98		Peak			No Emissions Found
21834.0		H	53.98		Avg			No Emissions Found
24260.0		H	73.98		Peak			No Emissions Found
24260.0		H	53.98		Avg			No Emissions Found

Test distance
3 meter

HARMONICS MID CHANNEL VERTICAL

FCC 15.249 & RSS 210

Company: Spectrum Brands
EUT: Homekit Enabled Residential Door Lock
Model: SmartCode 919
Duty Cycle Correction Factor = -20

Date: 4/8/2016
Lab: R
Tested By: Torey Oliver

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4852.0	50.19	V	73.98	-23.79	Peak	2.42	30	
4852.0	30.19	V	53.98	-23.79	Avg	2.42	30	
7278.0	62.08	V	73.98	-11.90	Peak	2.17	349	
7278.0	42.08	V	53.98	-11.90	Avg	2.17	349	
9704.0		V	73.98		Peak			No Emissions Found
9704.0		V	53.98		Avg			No Emissions Found
12130.0		V	73.98		Peak			No Emissions Found
12130.0		V	53.98		Avg			No Emissions Found
14556.0		V	73.98		Peak			No Emissions Found
14556.0		V	53.98		Avg			No Emissions Found
16982.0		V	73.98		Peak			No Emissions Found
16982.0		V	53.98		Avg			No Emissions Found
19408.0		V	73.98		Peak			No Emissions Found
19408.0		V	53.98		Avg			No Emissions Found
21834.0		V	73.98		Peak			No Emissions Found
21834.0		V	53.98		Avg			No Emissions Found
24260.0		V	73.98		Peak			No Emissions Found
24260.0		V	53.98		Avg			No Emissions Found

Test distance
3 meter

HARMONICS HIGH CHANNEL HORIZONTAL

FCC 15.249 & RSS 210

Company: Spectrum Brands
EUT: Homekit Enabled Residential Door Lock
Model: SmartCode 919
Duty Cycle Correction Factor = -20

Date: 4/8/2016
Lab: R
Tested By: Torey Oliver

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960.0		H	73.98		Peak			No Emissions Found
4960.0		H	53.98		Avg			No Emissions Found
7440.0	68.37	H	73.98	-5.61	Peak	1.26	321	
7440.0	48.37	H	53.98	-5.61	Avg	1.26	321	
9920.0		H	73.98		Peak			No Emissions Found
9920.0		H	53.98		Avg			No Emissions Found
12400.0		H	73.98		Peak			No Emissions Found
12400.0		H	53.98		Avg			No Emissions Found
14880.0		H	73.98		Peak			No Emissions Found
14880.0		H	53.98		Avg			No Emissions Found
17360.0		H	73.98		Peak			No Emissions Found
17360.0		H	53.98		Avg			No Emissions Found
19840.0		H	73.98		Peak			No Emissions Found
19840.0		H	53.98		Avg			No Emissions Found
22320.0		H	73.98		Peak			No Emissions Found
22320.0		H	53.98		Avg			No Emissions Found
24800.0		H	73.98		Peak			No Emissions Found
24800.0		H	53.98		Avg			No Emissions Found

Test distance
3 meter

HARMONICS HIGH CHANNEL VERTICAL

FCC 15.249 & RSS 210

Company: Spectrum Brands
EUT: Homekit Enabled Residential Door Lock
Model: SmartCode 919
Duty Cycle Correction Factor = -20

Date: 4/8/2016
Lab: R
Tested By: Torey Oliver

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960.0		V	73.98		Peak			No Emissions Found
4960.0		V	53.98		Avg			No Emissions Found
7440.0	65.72	V	73.98	-8.26	Peak	2.02	23	
7440.0	45.72	V	53.98	-8.26	Avg	2.02	23	
9920.0		V	73.98		Peak			No Emissions Found
9920.0		V	53.98		Avg			No Emissions Found
12400.0		V	73.98		Peak			No Emissions Found
12400.0		V	53.98		Avg			No Emissions Found
14880.0		V	73.98		Peak			No Emissions Found
14880.0		V	53.98		Avg			No Emissions Found
17360.0		V	73.98		Peak			No Emissions Found
17360.0		V	53.98		Avg			No Emissions Found
19840.0		V	73.98		Peak			No Emissions Found
19840.0		V	53.98		Avg			No Emissions Found
22320.0		V	73.98		Peak			No Emissions Found
22320.0		V	53.98		Avg			No Emissions Found
24800.0		V	73.98		Peak			No Emissions Found
24800.0		V	53.98		Avg			No Emissions Found

Test distance
3 meter

EMISSIONS RADIATED OUTSIDE OF THE FUNDAMENTAL FREQUENCY BAND

DATA SHEETS

BAND EDGES HORIZONTAL

FCC 15.249 & RSS 210

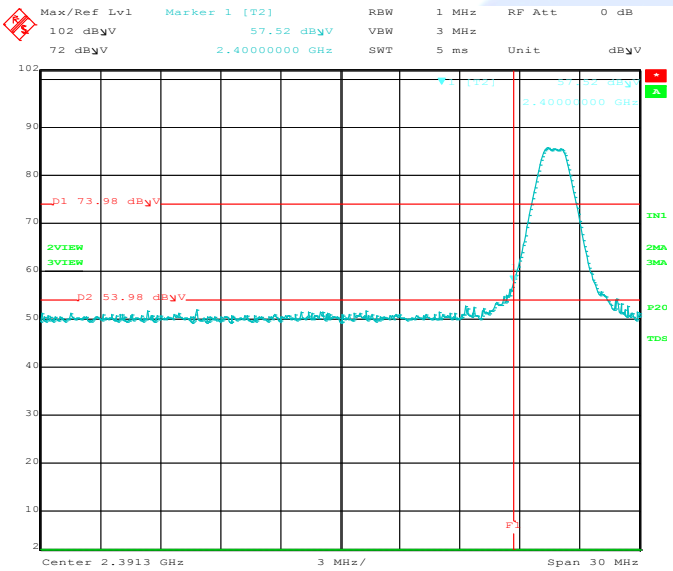
Company:	Spectrum Brands	Date:	4/11/2016
EUT:	Homekit Enabled Residential Door Lock	Lab:	R
Model:	SmartCode 919	Test ENG:	Torey Oliver

Duty Cycle Correction Factor = -20

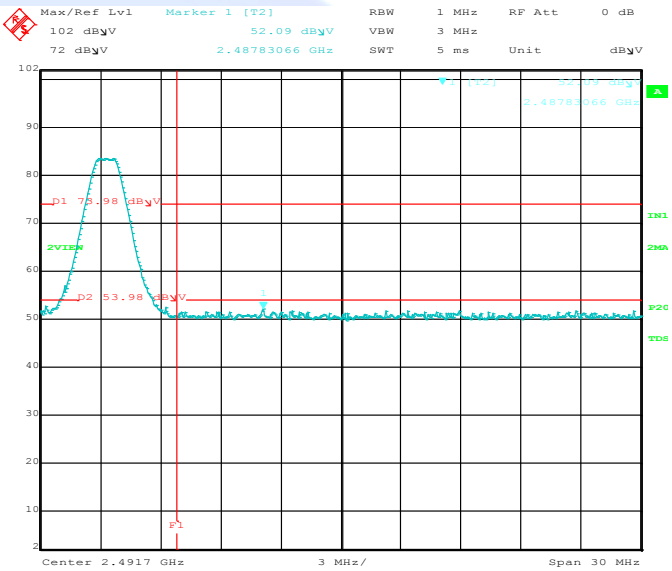
Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV/m)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2400.00	57.52	H	73.98	-16.46	Peak	1.57	360	No Marker Delta
2400.00	37.52	H	53.98	-16.46	AVG	1.57	360	Method Used
2487.83	52.09	H	73.98	-21.89	Peak	1.63	360	No Marker Delta
2487.83	32.09	H	53.98	-21.89	AVG	1.63	360	Method Used

Test distance
3 meter



Comment A: Lower Band Edge Horizontal
Date: 11.APR.2016 07:36:44



Comment A: Upper Band Edge Horizontal
Date: 11.APR.2016 08:46:50

BAND EDGES VERTICAL

FCC 15.249 & RSS 210

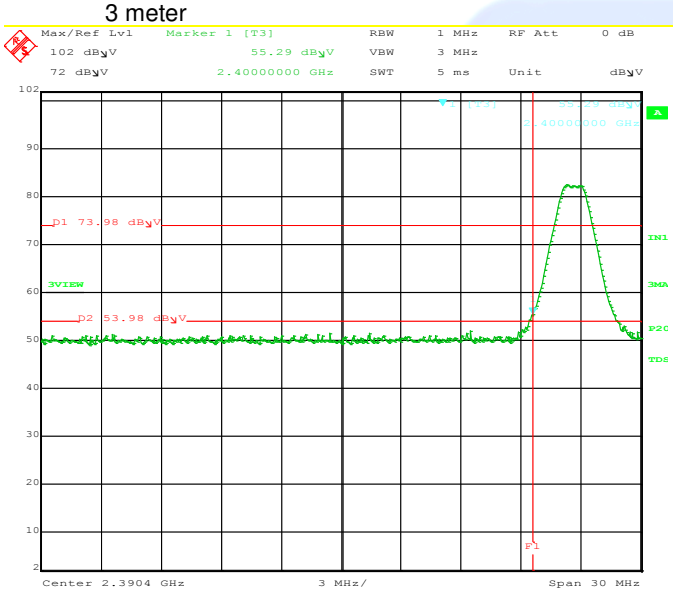
Company:	Spectrum Brands	Date:	4/11/2016
EUT:	Homekit Enabled Residential Door Lock	Lab:	R
Model:	SmartCode 919	Test ENG:	Torey Oliver

Duty Cycle Correction Factor = -20

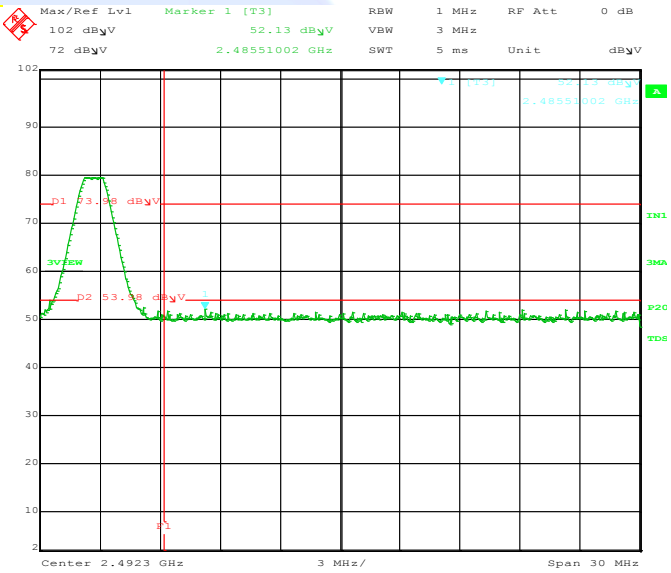
Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV/m)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2400.00	55.29	V	73.98	-18.69	Peak	1.66	25	No Marker Delta
2400.00	35.29	V	53.98	-18.69	AVG	1.66	25	Method Used
2485.51	52.13	V	73.98	-21.85	Peak	2.10	28	No Marker Delta
2485.51	32.13	V	53.98	-21.85	AVG	2.10	28	Method Used

Test distance
3 meter



Comment A: Lower Band Edge Vertical
Date: 11.APR.2016 07:42:50



Comment A: Upper Band Edge Vertical
Date: 11.APR.2016 08:53:07

OCCUPIED BANDWIDTH

DATA SHEETS

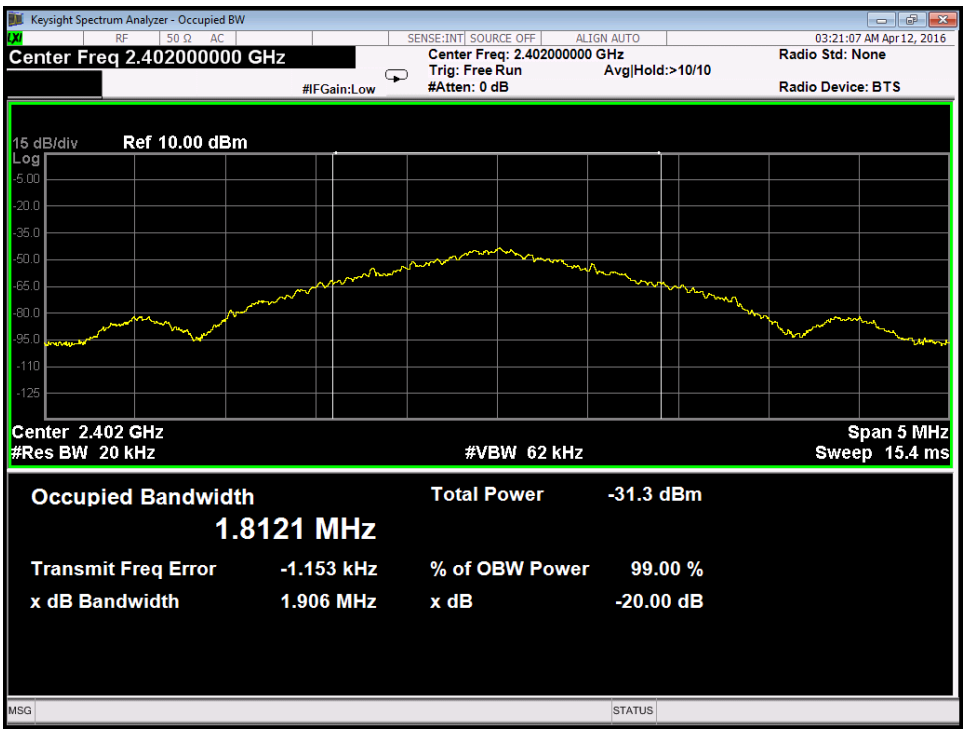
RSS GEN

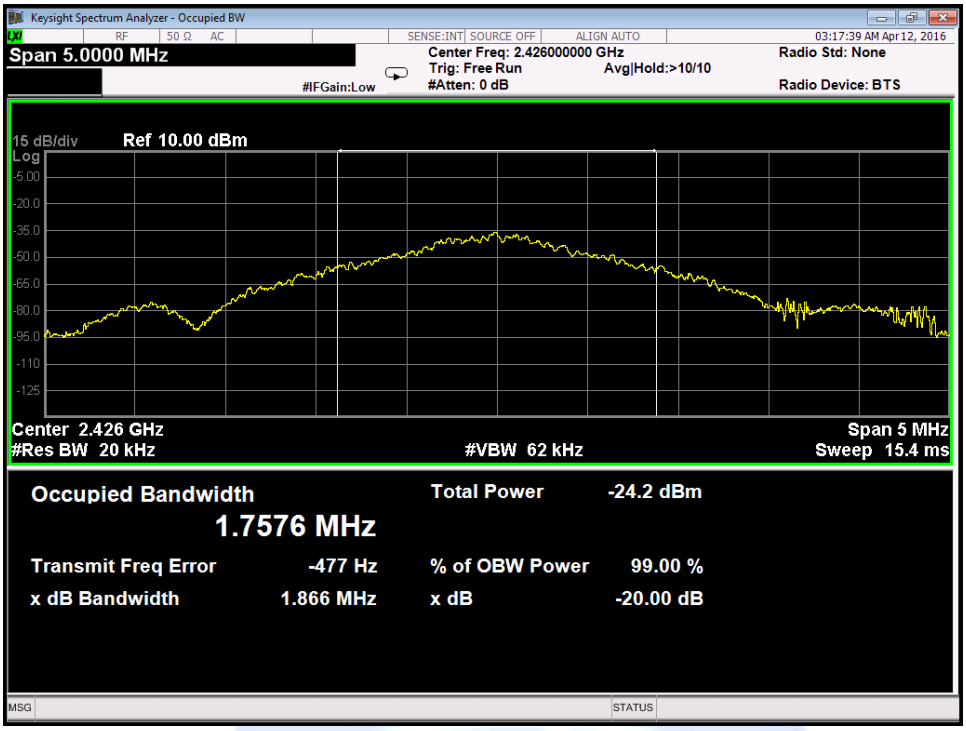
Company:	Spectrum Brands	Date:	4/11/2016
EUT:	HomeKit Enabled Residential Door Lock	Lab:	R
Model:	SmartCode 919	Test ENG:	Torey Oliver

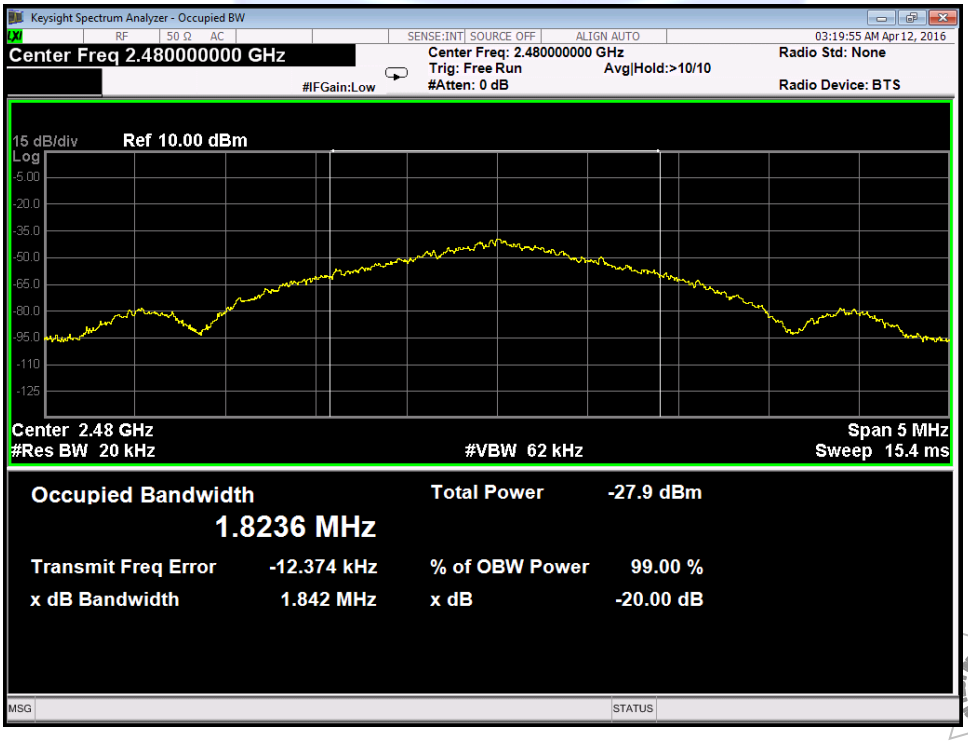
Compatible Electronics, Inc. FAC-3 (Lab R)

Occupied Bandwidth

Freq. (MHz)	Measured BW (kHz)	Peak / QP / Avg	Comments
2412	1812.10	Peak	
2426	1757.60	Peak	
2462	1823.60	Peak	




Keysight Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT SOURCE OFF ALIGN AUTO
03:17:39 AM Apr 12, 2016
Span 5.0000 MHz
Center Freq: 2.426000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 0 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
15 dB/div
Ref 10.00 dBm
Log
-5.00
-20.0
-35.0
-50.0
-65.0
-80.0
-95.0
-110
-125
Center 2.426 GHz
#Res BW 20 kHz
#VBW 62 kHz
Span 5 MHz
Sweep 15.4 ms
Occupied Bandwidth
1.7576 MHz
Total Power -24.2 dBm
Transmit Freq Error -477 Hz
% of OBW Power 99.00 %
x dB Bandwidth 1.866 MHz
x dB -20.00 dB
MSG
STATUS


Keysight Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT SOURCE OFF ALIGN AUTO
03:19:55 AM Apr 12, 2016
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 0 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
15 dB/div
Ref 10.00 dBm
Log
-5.00
-20.0
-35.0
-50.0
-65.0
-80.0
-95.0
-110
-125
Center 2.48 GHz
#Res BW 20 kHz
#VBW 62 kHz
Span 5 MHz
Sweep 15.4 ms
Occupied Bandwidth
1.8236 MHz
Total Power -27.9 dBm
Transmit Freq Error -12.374 kHz
% of OBW Power 99.00 %
x dB Bandwidth 1.842 MHz
x dB -20.00 dB
MSG
STATUS