FCC PART 15, SUBPART B and C
TEST REPORT

for

OHM ZIGBEE V.2

MODEL: 450202

Prepared for

SPECTRUM BRANDS, INC.
19701 DA VINCI
LAKE FOREST, CALIFORNIA 92610

Prepared by:_____

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DATE: MARCH 1, 2018

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
PAGES	23	2	2	2	13	35	**77**

NVLAP TESTING
NVLAP LAB CODE 200528-0

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TABLE OF CONTENTS

LIST OF APPENDICES

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

LIST OF FIGURES

FIGURE	TITLE
1	Conducted Emissions Test Setup
2	Layout of the Semi-Anechoic Test Chamber

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:	OHM Zigbee v.2 Model: 450202 S/N: N/A
Product Description:	This is an RF module used in door handles with smartcode locks.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Spectrum Brands, Inc. 19701 Da Vinci Lake Forest, California 92610
Test Dates:	January 8 and 9, 2018
Test Specifications:	EMI requirements CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247
Test Procedure:	ANSI C63.4, ANSI C63:10
Test Deviations:	The test procedure was not deviated from during the testing.

Test Specifications covered by accreditation:
CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247

Test Procedure: ANSI C63.4, ANSI C63.10

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SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	This test was not performed because the EUT will operate on DC power only and cannot be plugged into the AC public mains.
2	Spurious Radiated RF Emissions, 30 MHz – 1000 MHz	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 15.209 Highest reading in relation to spec limit 93.91 dBuV/m @ 908.42 MHz (*U = 4.54 dB)
3	Spurious Radiated RF Emissions, 9 kHz – 30 MHz and 1000 MHz – 25000 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(d) Highest reading in relation to spec limit 53.78 dBuV/m (Avg) @ 7275 MHz (*U = 3.67 dB)
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)
5	Emissions produced by the intentional radiator in restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and section 15.247 (d)
6	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(3). This test was not performed sine there is no change from the original certification
7	RF Conducted Antenna Test	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (d).
8	Peak Power Spectral Density from the Intentional Radiator to the Antenna	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (e). This test was not performed since there is no change from the original certification

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the OHM Zigbee v.2, Model: 450202. The EMI 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 15.247.

Note #1: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

Note #2: This is a Class II Permissive Change report to add the 954 Obsidian host to the existing application. The original test report for the original application is covered under Compatible Electronics, Inc. report number: B51005D1.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

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

2.2 Traceability Statement

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

2.3 Cognizant Personnel

Spectrum Brands, Inc.

Thuan Nguyen Senior RF Engineer

Compatible Electronics Inc.

James Ross Test Engineer
Kyle Fujimoto Test Engineer

2.4 Date Test Sample was Received

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

2.5 Disposition of the Test Sample

The test sample has not been returned to Spectrum Brands, 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
N/A	Not Applicable

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
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
KDB 558074 D01 DTS Meas Guidance v04	Guidance For Performing Compliance Measurements On Digital Transmission Systems (DTS) Operating Under Section 15.247
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
ANSI C63.10 2013	American National Standard for Testing Unlicensed Wireless Devices

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - Emissions

The OHM Zigbee v.2, Model: 450202 (EUT) was mounted inside the 954 Obsidian host.

The EUT was continuously transmitting during the testing. A laptop was used to program the EUT so that it could transmit at the low, middle and high channels.

The firmware is stored at the company's server.

The final data for the EUT was taken for the host mentioned above. Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

There were no external cables connected to the EUT.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
OHM ZIGBEE V.2 (EUT)	SPECTRUM BRANDS, INC.	450202	N/A	NUL450202ZIG
SMARTCODE DEADBOLT (HOST DEVICE)	SPECTRUM BRANDS, INC.	954 CONVERT	N/A	N/A
LAPTOP*	DELL	PP18L	G0X80C1	N/A
FIRMWARE*	SILICION LABS	SIMPLICITY STUDIO 4	VERSION 5.7.3	N/A

*Used to program the EUT only prior to testing so that it could be tested at the low, middle, and high channels.

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED IN LAB D					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
EMI Receiver, 20 Hz – 26.5 GHz	Keysight	N9038A	MY51210150	December 6, 2017	1 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
Loop Antenna	Com-Power	AL-130R	121090	February 9, 2017	2 Year
CombiLog Antenna	Com-Power	AC-220	61060	July 27, 2017	2 Year
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Horn Antenna	Com-Power	AH-118	071175	February 26, 2016	2 Year
Preamplifier	Com-Power	PAM-118A	551024	May 12, 2016	2 Year
Preamplifier	Com-Power	PA-840	711013	May 13, 2016	2 Year
Horn Antenna	Com-Power	AH-826	71957	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 below 1 GHz: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

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

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Transmitter Power

Transmit power is herein defined as the power delivered to a 50 ohm load at the RF output of the EUT. The levels from the original certification were used and verified prior to the testing.

Peak Power	Frequency
20.332 dBm	2405 MHz
20.883 dBm	2425 MHz
21.280 dBm	2445 MHz
21.335 dBm	2450 MHz
21.311 dBm	2475 MHz
14.904 dBm	2480 MHz

7.2 Channel Number and Frequencies

Channel 11: 2405 MHz
Channel 15: 2425 MHz
Channel 19: 2445 MHz
Channel 20: 2450 MHz
Channel 25: 2475 MHz
Channel 26: 2480 MHz

7.3 Antenna Gain

The antenna has a gain of 2 dBi.

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 spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. 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 C63.4. 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 Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

This test was not performed because the EUT will operate on DC power only and cannot be plugged in the AC public mains.

8.1.2 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. A quasi-peak reading was taken only for those readings, which are marked accordingly on the data sheets.

For frequencies above 1 GHz, the readings were averaged by a "duty cycle correction factor", derived from 20 log (dwell time / 100 ms).

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 25 GHz	1 MHz	Horn Antenna

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 from 9 kHz to 25 GHz.

Test Results:

The EUT 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, Sections 15.209 and 15.247 (d) for radiated emissions. Please see Appendix E for the data sheets.

8.1.3 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS
OHM ZIGBEE v.2, Model: 450202

Frequency MHz	Corrected Reading* dBuV/m	Specification Limit dBuV/m	Delta (Cor. Reading – Spec. Limit) dB
7275 (Horizontal)	53.78 (AVG)	53.97	-0.19
7350 (Vertical)	53.50 (AVG)	53.97	-0.47
2483.5 (Vertical) (BE 2480 MHz)	53.55 (AVG)	53.97	-0.62
7350 (Vertical)	53.33 (AVG)	53.97	-0.64
7275 (Vertical)	53.26 (AVG)	53.97	-0.71
7215 (Vertical)	52.57 (AVG)	53.97	-1.40

Notes:

*	The complete emissions data is given in Appendix E of this report.
QP	Quasi-Peak Reading
AVG	Average Reading
BE	Band Edge

8.2 DTS Bandwidth

The DTS Bandwidth was measured using the EMI Receiver. The bandwidth was measured using a direct connection from the RF output of the EUT. The following steps were performed for measuring the DTS Bandwidth.

1. Set RBW = 100 kHz
2. Set the video bandwidth (VBW) to equal or greater than 3 times the RBW
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep = Auto Couple
6. Allow the trace to stabilize
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Results:

This test was not performed because it was already performed during the original certification. Please see the Compatible Electronics test report B51005D1 that was filed during the original certification.

8.3 Peak Output Power

The Peak Output Power was measured using the EMI Receiver. The peak output power was measured using a direct connection from the RF output of the EUT. The resolution bandwidth was 8 MHz and the video bandwidth was 50 MHz. The cable loss was also added back into the reading using the reference level offset. The Peak Output Power was then taken.

Test Results:

This test was not performed because it was already performed during the original certification. Please see the Compatible Electronics test report B51005D1 that was filed during the original certification.

8.4 RF Antenna Conducted Test

The emissions in the non-restricted frequency bands measurements were performed using the EMI Receiver. The emissions were measured using a direct connection from the RF output of the EUT. The reference level was established by setting the instrument center frequency to DTS channel center frequency. A peak detector was used with sweep set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the level and 20 dB below that was the reference level. For emission level measurement, the center frequency and span were set to encompass the frequency range to be measured. A peak detector was used with a sweep time set to auto. The number of measurement points were greater than the span/RBW. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d) for non-restricted emissions. Please see the data sheets located in Appendix E.

8.5 RF Band Edges

RF band edges were taken at the edges of the ISM spectrum (2400 MHz when the EUT was on the low channel and 2483.5 MHz when the EUT was on the high channel) using the EMI Receiver. A preamplifier was used to boost the signal level, with the plots being taken at a 3 meter test distance. The radiated emissions test procedure as describe in section 8.1.2 of this test report was used to maximize the emission.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power at the restricted bands closest to the band edges at 2390 MHz and 2483.5 MHz meet the limits of section 15.209. Please see the data sheets located in Appendix E.

8.6 Spectral Density Test

The spectrum density output was measured using the EMI Receiver. The spectral density output was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The following steps were performed for measuring the spectral density.

1. Set analyzer center frequency to DTS channel center frequency
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to 3 kHz <= RBW <= 100 kHz
4. Set the VBW >= 3 X RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize
9. Use the peak marker function to determine the maximum amplitude level within the RBW
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Results:

This test was not performed because it was already performed during the original certification. Please see the Compatible Electronics test report B51005D1 that was filed during the original certification.

8.7 Duty Cycle

The Standard Lock / Unlock mode produced the worst case when measured and is as follows:

Note: The data taken in Appendix E was to confirm that the duty cycle will never exceed 11.58%, which is the absolute worst case duty cycle according to the firmware designer.

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

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

Pulse 1 = 692 us
Pulse 2 = 456 us
Pulse 3 = 676 us
Pulse 4 = 464 us
Pulse 5= 1984 us
Pulse 6 = 664 us
Pulse 7 = 1728 us

Total On Time = 6664 us

Number of Pulses in worst case 100 ms was 7.

6.664 ms / 100 ms = 0.06664%

Note: The absolute worst case duty cycle according to the firmware designer is 11.58% and this was used for all duty cycle calculations instead.

20 log (0.1158) = - 18.72 dB correction factor

Note: The following information above is from the Compatible Electronics test report B51005D1 that was filed during the original certification.

9. CONCLUSIONS

The OHM Zigbee v.2, Model: 450202 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP® TESTING
NVLAP LAB CODE 200528-0

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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."

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 15.247 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 MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

OHM Zibgee v.2
Model: 450202
S/N: N/A

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

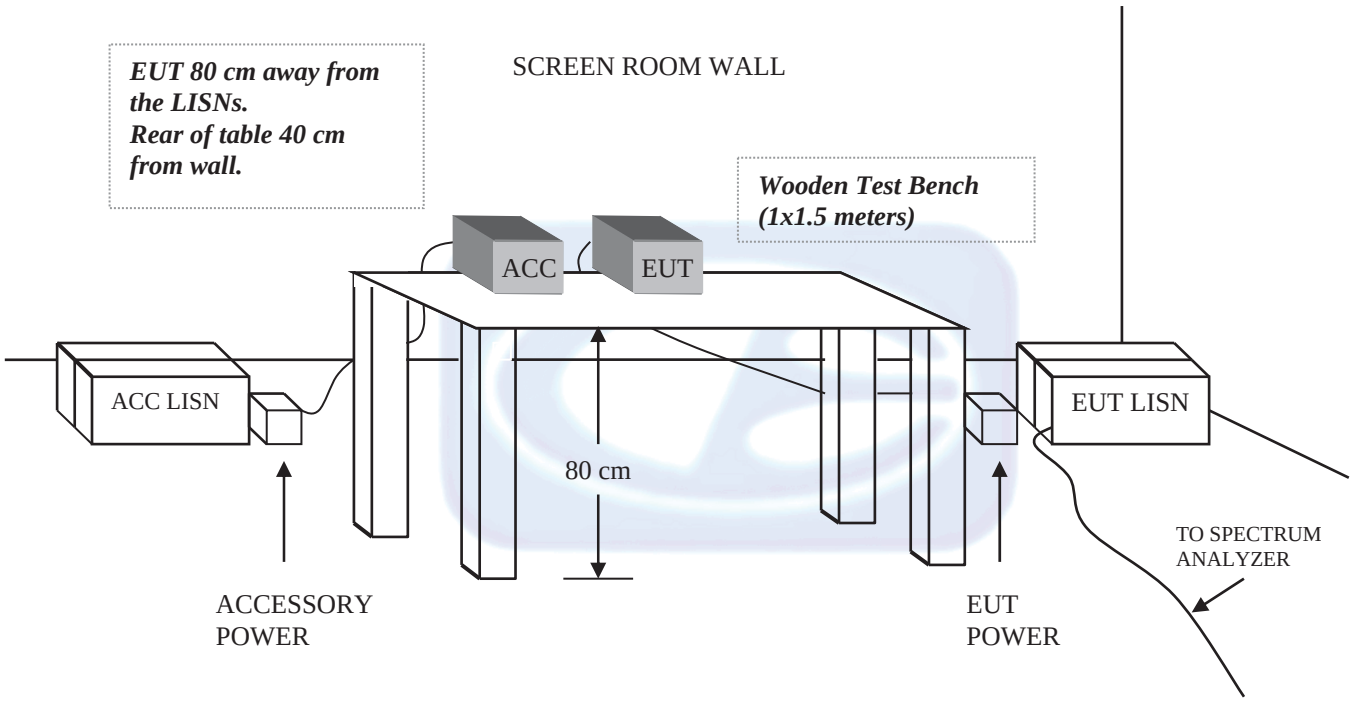
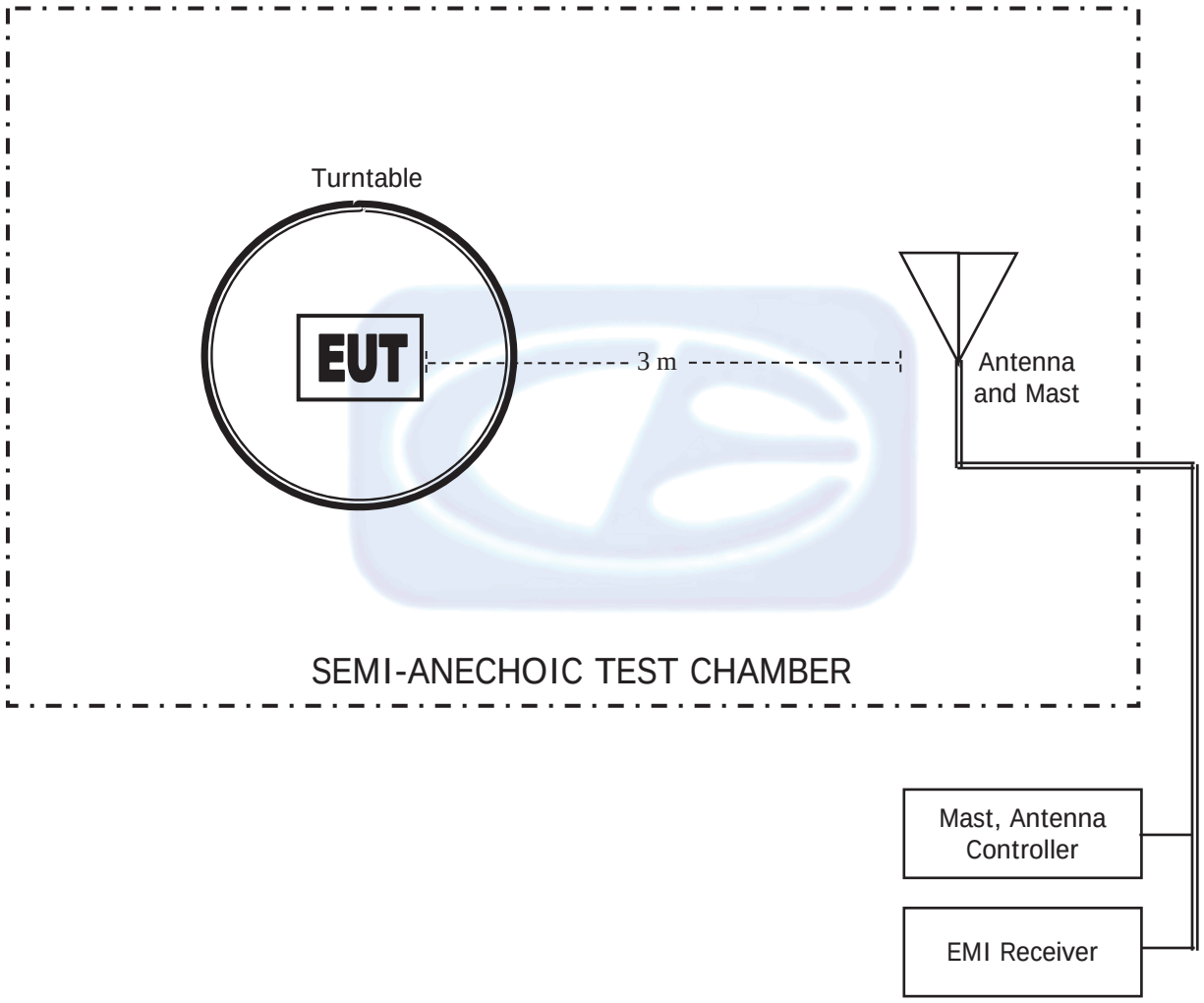


FIGURE 2: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER



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 PA-118

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		

COM-POWER AH-826

HORN ANTENNA

S/N: 71957

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	33.5	22.5	35.5
18.5	33.5	23.0	35.9
19.0	34.0	23.5	35.7
19.5	34.0	24.0	35.6
20.0	34.3	24.5	36.0
20.5	34.9	25.0	36.2
21.0	34.7	25.5	36.1
21.5	35.0	26.0	36.2
22.0	35.0	26.5	35.7

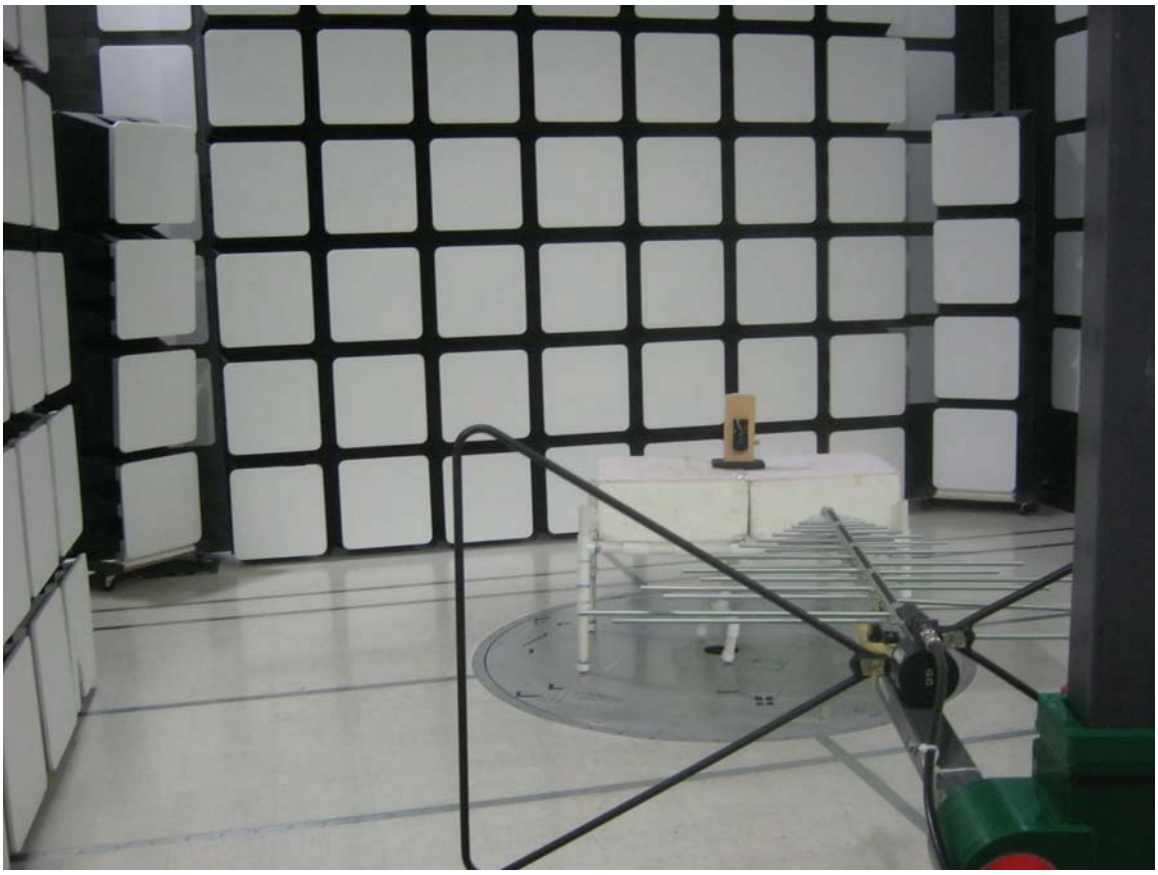
COM-POWER PA-840

MICROWAVE PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: MAY 13, 2016

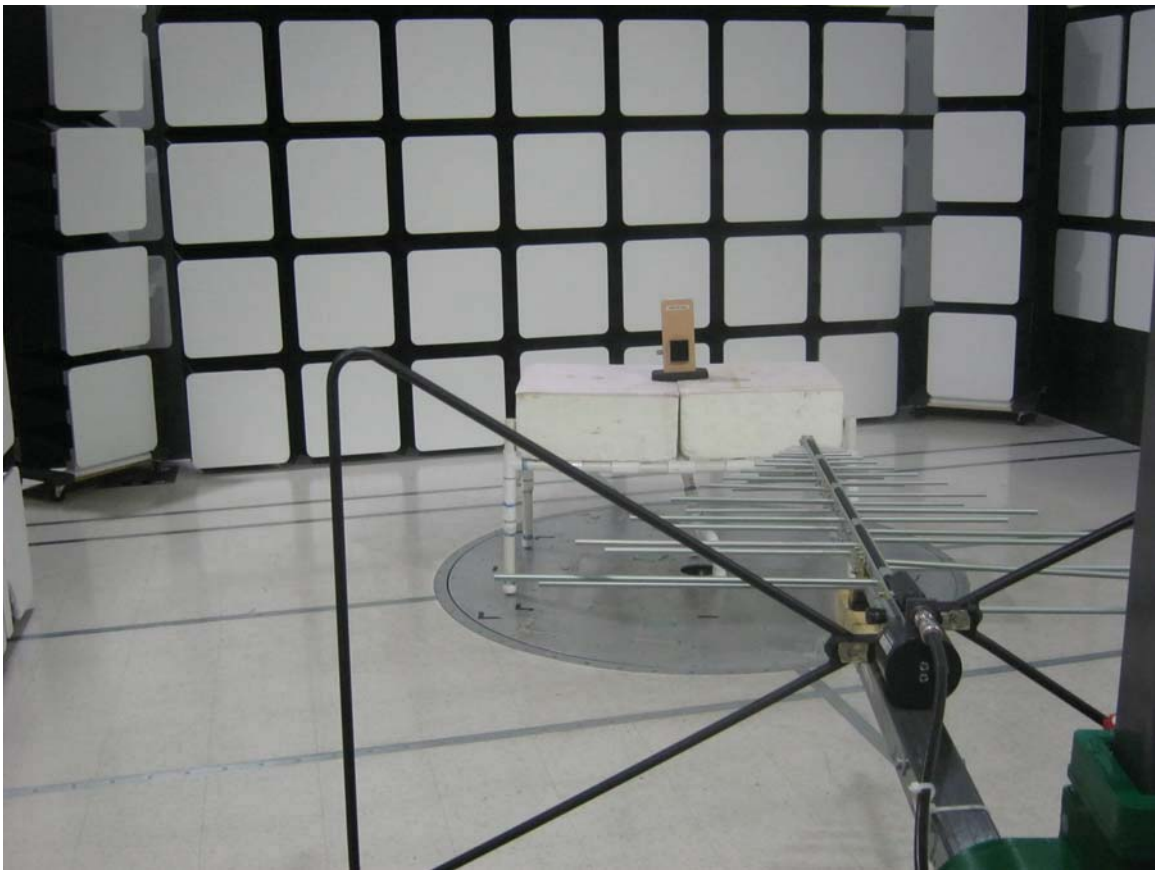
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	25.19	31.0	25.69
19.0	24.48	31.5	25.74
20.0	24.39	32.0	26.35
21.0	24.73	32.5	26.64
22.0	23.49	33.0	25.98
23.0	24.23	33.5	24.68
24.0	24.59	34.0	24.61
25.0	25.32	34.5	23.78
26.0	25.66	35.0	24.74
26.5	25.99	35.5	24.39
27.0	26.26	36.0	23.46
27.5	25.33	36.5	23.71
28.0	24.49	37.0	26.35
28.5	24.74	37.5	23.49
29.0	25.93	38.0	25.42
29.5	26.28	38.5	24.87
30.0	26.17	39.0	22.60
30.5	26.11	39.5	20.57
		40.0	19.15



FRONT VIEW

SPECTRUM BRANDS, INC.
OHM ZIGBEE V.2
MODEL: 450202
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz
INSTALLED INSIDE THE 954 OBSIDIAN

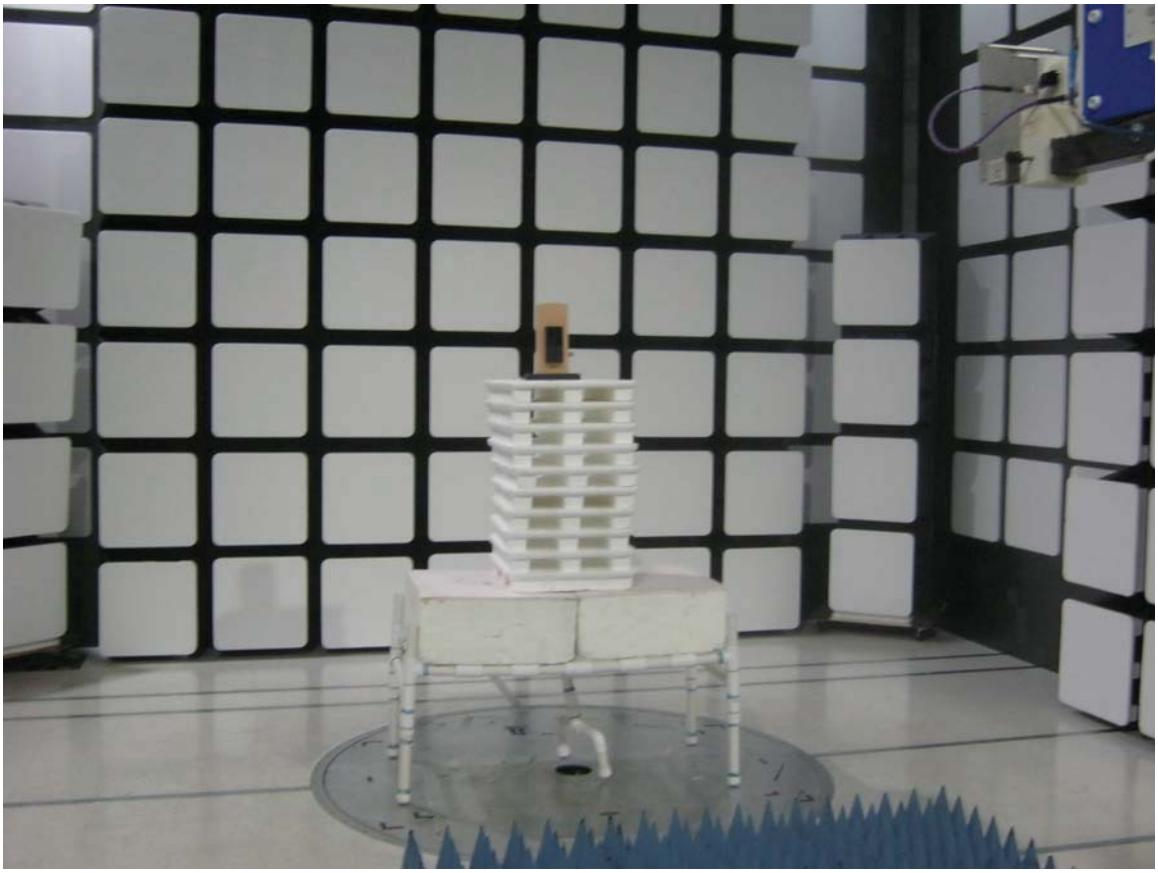
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

SPECTRUM BRANDS, INC.
OHM ZIGBEE V.2
MODEL: 450202
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz
INSTALLED INSIDE THE 954 OBSIDIAN

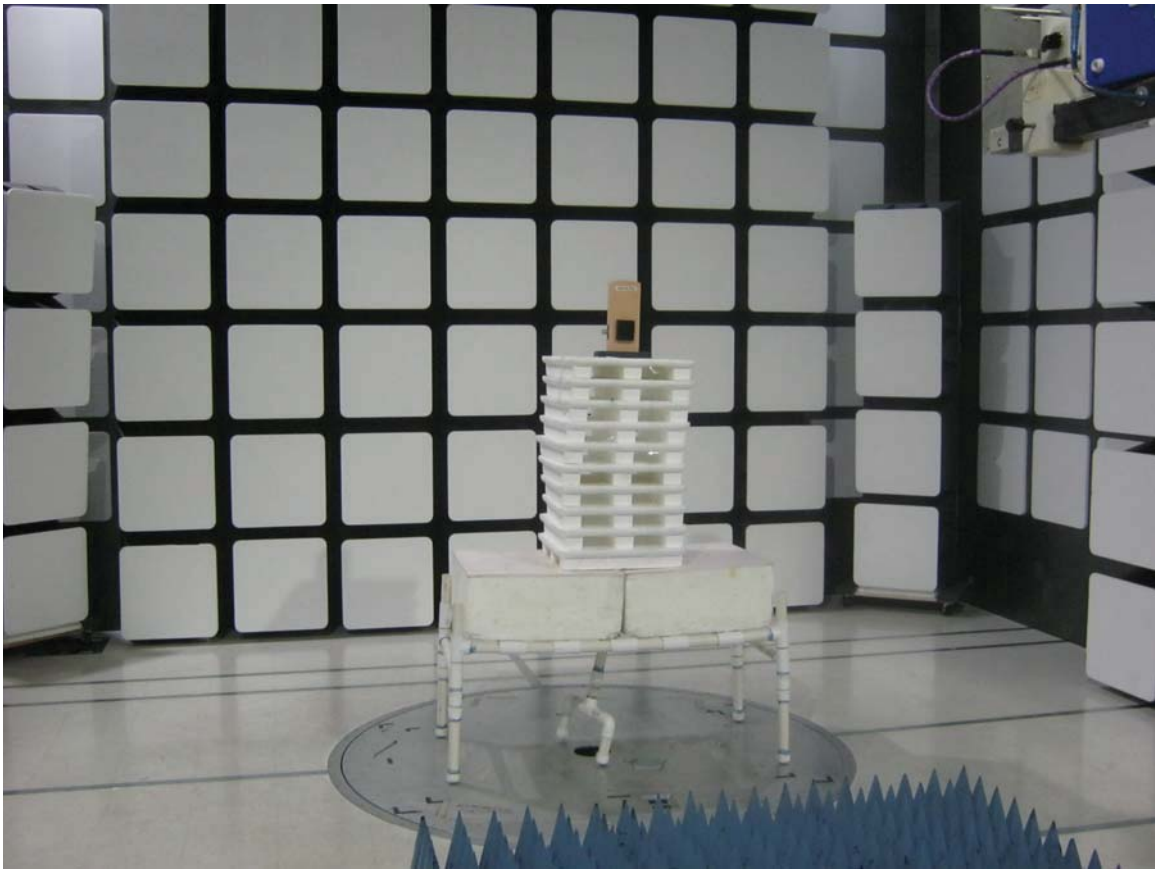
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

SPECTRUM BRANDS, INC.
OHM ZIGBEE V.2
MODEL: 450202
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz
INSTALLED INSIDE THE 954 OBSIDIAN

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

SPECTRUM BRANDS, INC.
OHM ZIGBEE V.2
MODEL: 450202
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz
INSTALLED INSIDE THE 954 OBSIDIAN

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2405 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	55.35	V	73.97	-18.62	Peak	340.75	159.16	
4810	36.63	V	53.97	-17.34	Avg	340.75	159.16	
7215	71.29	V	73.97	-2.68	Peak	19.00	110.92	
7215	52.57	V	53.97	-1.40	Avg	19.00	110.92	
9620								**Done via Conducted -**
9620								**Not in Restricted Band**
12025	59.58	V	73.97	-14.39	Peak	310.25	238.68	
12025	40.86	V	53.97	-13.11	Avg	310.25	238.68	
14430								**Done via Conducted -**
14430								**Not in Restricted Band**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2405 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	57.66	H	73.97	-18.62	Peak	309.00	111.46	
4810	38.94	H	53.97	-15.03	Avg	309.00	111.46	
7215	69.58	H	73.97	-4.39	Peak	18.25	190.92	
7215	50.86	H	53.97	-3.11	Avg	18.25	190.92	
9620								**Done via Conducted -**
9620								**Not in Restricted Band**
12025	51.85	H	73.97	-22.12	Peak	135.25	158.26	
12025	33.13	H	53.97	-20.84	Avg	135.25	158.26	
14430								**Done via Conducted -**
14430								**Not in Restricted Band**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2425 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850	52.63	V	73.97	-21.34	Peak	0.50	175.10	
4850	33.91	V	53.97	-20.06	Avg	0.50	175.10	
7275	71.98	V	73.97	-1.99	Peak	0.00	110.80	
7275	53.26	V	53.97	-0.71	Avg	0.00	110.80	
9700								**Done via Conducted -**
9700								**Not in Restricted Band**
12125	62.76	V	73.97	-11.21	Peak	300.25	175.88	
12125	44.04	V	53.97	-9.93	Avg	300.25	175.88	
14550								**Done via Conducted -**
14550								**Not in Restricted Band**
16975								**No Emissions**
16975								**Detected**
19400								**No Emissions**
19400								**Detected**
21825								**No Emissions**
21825								**Detected**
24250								**No Emissions**
24250								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2425 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850	50.25	H	73.97	-23.72	Peak	321.25	127.28	
4850	31.53	H	53.97	-22.44	Avg	321.25	127.28	
7275	72.50	H	73.97	-1.47	Peak	15.75	174.92	
7275	53.78	H	53.97	-0.19	Avg	15.75	174.92	
9700								**Done via Conducted -**
9700								**Not in Restricted Band**
12125	62.25	H	73.97	-11.72	Peak	15.50	111.46	
12125	43.53	H	53.97	-10.44	Avg	15.50	111.46	
14550								**Done via Conducted -**
14550								**Not in Restricted Band**
16975								**No Emissions**
16975								**Detected**
19400								**No Emissions**
19400								**Detected**
21825								**No Emissions**
21825								**Detected**
24250								**No Emissions**
24250								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2445 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4890	53.14	V	73.97	-20.83	Peak	353.00	111.34	
4890	34.42	V	53.97	-19.55	Avg	353.00	111.34	
7335	70.45	V	73.97	-3.52	Peak	285.00	110.98	
7335	51.73	V	53.97	-2.24	Avg	285.00	110.98	
9780								**Done via Conducted -**
9780								**Not in Restricted Band**
12225	62.23	V	73.97	-11.74	Peak	354.25	159.10	
12225	43.51	V	53.97	-10.46	Avg	354.25	159.10	
14670								**Done via Conducted -**
14670								**Not in Restricted Band**
17115								**No Emissions**
17115								**Detected**
19560								**No Emissions**
19560								**Detected**
22005								**No Emissions**
22005								**Detected**
24450								**No Emissions**
24450								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2445 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4890	51.90	H	73.97	-22.07	Peak	322.00	175.04	
4890	33.18	H	53.97	-20.79	Avg	322.00	175.04	
7335	69.32	H	73.97	-4.65	Peak	33.75	111.46	
7335	50.60	H	53.97	-3.37	Avg	33.75	111.46	
9780								**Done via Conducted -**
9780								**Not in Restricted Band**
12225	61.34	H	73.97	-12.63	Peak	14.75	111.52	
12225	42.62	H	53.97	-11.35	Avg	14.75	111.52	
14670								**Done via Conducted -**
14670								**Not in Restricted Band**
17115								**No Emissions**
17115								**Detected**
19560								**No Emissions**
19560								**Detected**
22005								**No Emissions**
22005								**Detected**
24450								**No Emissions**
24450								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2450 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900	52.37	V	73.97	-21.60	Peak	329.50	127.28	
4900	33.65	V	53.97	-20.32	Avg	329.50	127.28	
7350	72.05	V	73.97	-1.92	Peak	27.75	111.46	
7350	53.33	V	53.97	-0.64	Avg	27.75	111.46	
9800								**Done via Conducted -**
9800								**Not in Restricted Band**
12250	63.24	V	73.97	-10.73	Peak	353.00	190.92	
12250	44.52	V	53.97	-9.45	Avg	353.00	190.92	
14700								**Done via Conducted -**
14700								**Not in Restricted Band**
17150								**No Emissions**
17150								**Detected**
19600								**No Emissions**
19600								**Detected**
22050								**No Emissions**
22050								**Detected**
24500								**No Emissions**
24500								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2450 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900	53.46	H	73.97	-20.51	Peak	300.75	127.10	
4900	34.74	H	53.97	-19.23	Avg	300.75	127.10	
7350	72.22	H	73.97	-1.75	Peak	31.75	111.46	
7350	53.50	H	53.97	-0.47	Avg	31.75	111.46	
9800								**Done via Conducted -**
9800								**Not in Restricted Band**
12250	62.81	H	73.97	-11.16	Peak	15.25	111.46	
12250	44.09	H	53.97	-9.88	Avg	15.25	111.46	
14700								**Done via Conducted -**
14700								**Not in Restricted Band**
17150								**No Emissions**
17150								**Detected**
19600								**No Emissions**
19600								**Detected**
22050								**No Emissions**
22050								**Detected**
24500								**No Emissions**
24500								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2475 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950	55.72	V	73.97	-18.25	Peak	170.25	127.04	
4950	37.00	V	53.97	-16.97	Avg	170.25	127.04	
7425	70.72	V	73.97	-3.25	Peak	220.75	110.98	
7425	52.00	V	53.97	-1.97	Avg	220.75	110.98	
9900								**Done via Conducted -**
9900								**Not in Restricted Band**
12375	64.79	V	73.97	-9.18	Peak	121.75	111.34	
12375	46.07	V	53.97	-7.90	Avg	121.75	111.34	
14850								**Done via Conducted -**
14850								**Not in Restricted Band**
17325								**No Emissions**
17325								**Detected**
19800								**No Emissions**
19800								**Detected**
22275								**No Emissions**
22275								**Detected**
24750								**No Emissions**
24750								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2475 MHz Harmonics - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950	56.13	H	73.97	-17.84	Peak	136.00	158.80	
4950	37.41	H	53.97	-16.56	Avg	136.00	158.80	
7425	68.94	H	73.97	-5.03	Peak	210.75	127.16	
7425	50.22	H	53.97	-3.75	Avg	210.75	127.16	
9900								**Done via Conducted -**
9900								**Not in Restricted Band**
12375	60.43	H	73.97	-13.54	Peak	190.00	110.92	
12375	41.71	H	53.97	-12.26	Avg	190.00	110.92	
14850								**Done via Conducted -**
14850								**Not in Restricted Band**
17325								**No Emissions**
17325								**Detected**
19800								**No Emissions**
19800								**Detected**
22275								**No Emissions**
22275								**Detected**
24750								**No Emissions**
24750								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2480 MHz Harmonics - Power Setting = -a
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	52.42	V	73.97	-21.55	Peak	1.00	142.98	
4960	33.70	V	53.97	-20.27	Avg	1.00	142.98	
7440	59.23	V	73.97	-14.74	Peak	356.75	111.46	
7440	40.51	V	53.97	-13.46	Avg	356.75	111.46	
9920								**Done via Conducted -**
9920								**Not in Restricted Band**
12400	48.45	V	73.97	-25.52	Peak	182.50	110.92	
12400	29.73	V	53.97	-24.24	Avg	182.50	110.92	
14880								**Done via Conducted -**
14880								**Not in Restricted Band**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

2480 MHz Harmonics - Power Setting = -a
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	53.38	H	73.97	-20.59	Peak	327.25	143.10	
4960	34.66	H	53.97	-19.31	Avg	327.25	143.10	
7440	59.31	H	73.97	-14.66	Peak	36.50	174.98	
7440	40.59	H	53.97	-13.38	Avg	36.50	174.98	
9920								**Done via Conducted -**
9920								**Not in Restricted Band**
12400	48.67	H	73.97	-25.30	Peak	12.00	126.92	
12400	29.95	H	53.97	-24.02	Avg	12.00	126.92	
14880								**Done via Conducted -**
14880								**Not in Restricted Band**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247 and FCC Class B

Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

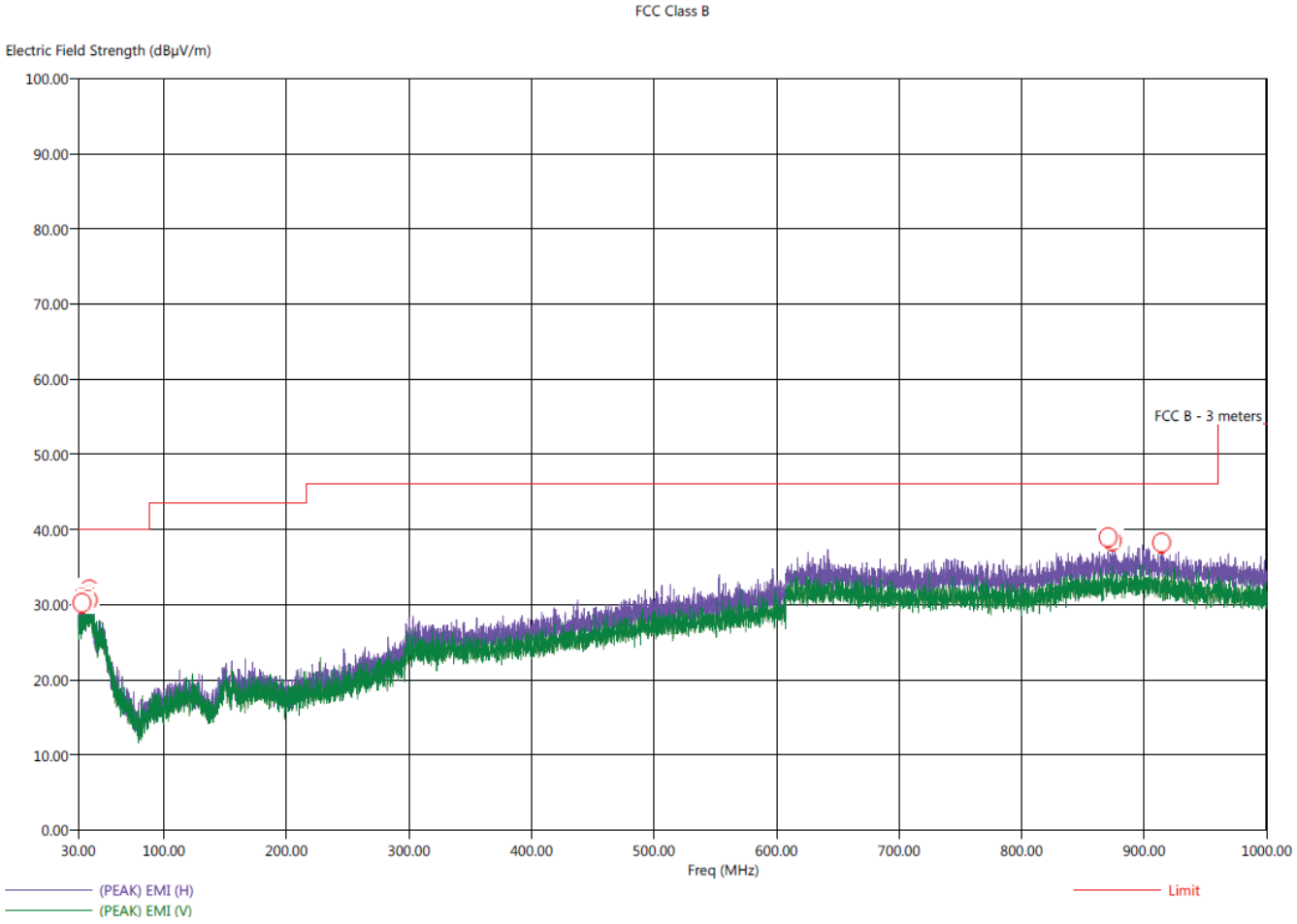
Date: 01/08/2018
Lab: D
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion – 1 GHz to 25000 MHz
Vertical and Horizontal Polarizations

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 1 GHz to 25000 MHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic Emissions Found
								for the Tx Mode
								from 1 GHz to 25000 MHz
								for both Vertical and Horizontal
								Polarizations

Title: Pre-Scan - FCC Class B
File: Agilent - Pre-Scan - FCC Class B - 30 MHz to 1000 MHz - 1-9-2019.set
Operator: Kyle Fujimoto
EUT Type: Ohm ZigBee V.2
EUT Condition: The EUT was transmitting at the low channel (worst case)
Comments: Company: Spectrum Brands, Inc.
Model Number: 450202

1/09/2018 1:05:35 PM
Sequence: Preliminary Scan



Note #1: The EUT was continuously transmitting at the low channel
Note #2: The EUT had no emissions detected from 9 kHz to 30 MHz

-

Title: Radiated Final - FCC Class B
File: Agilent - Final Scan - FCC Class B - 30 MHz to 1000 MHz – 1-9-2019.set
Operator: Kyle Fujimoto
EUT Type: Ohm ZigBee V.2
EUT Condition: The EUT was transmitting at the low channel (worst case)
Comments: Company: Spectrum Brands, Inc.
Model Number: 450202

1/09/2019 1:55:45 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 Agl (deg)	Twr Ht (cm)
32.90	H	31.70	26.85	-8.30	-13.15	40.00	24.19	0.33	226.25	121.92
33.20	V	32.77	28.24	-7.23	-11.76	40.00	24.20	0.34	226.25	345.53
38.20	H	32.89	27.46	-7.11	-12.54	40.00	25.07	0.39	180.75	103.29
38.40	V	32.64	27.32	-7.36	-12.68	40.00	24.99	0.38	90.25	255.59
39.20	H	33.36	27.53	-6.64	-12.47	40.00	25.20	0.39	0.00	352.21
39.70	H	32.98	27.82	-7.02	-12.18	40.00	25.25	0.39	160.75	124.25
870.80	H	37.45	32.61	-8.55	-13.39	46.00	26.55	2.60	96.50	254.23
874.30	H	37.93	33.08	-8.07	-12.92	46.00	26.59	2.60	327.00	170.98
914.50	H	37.88	32.65	-8.12	-13.35	46.00	26.64	2.60	223.25	365.05

Note #1: The EUT was continuously transmitting at the low channel
Note #2: The EUT had no emissions detected from 9 kHz to 30 MHz

BAND EDGES

DATA SHEETS

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/09/2018
Lab: D
Tested By: Kyle Fujimoto

2405 MHz - Band Edges - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2405	104.50	V	--	--	Peak	136.75	245.73	
2405	85.78	V	--	--	Avg	136.75	245.73	
2390	47.15	V	73.97	-26.82	Peak	136.75	245.73	
2390	28.43	V	53.97	-25.54	Avg	136.75	245.73	
2405	107.84	H	--	--	Peak	310.50	183.40	
2405	89.12	H	--	--	Avg	310.50	183.40	
2390	51.45	H	73.97	-22.52	Peak	310.50	183.40	
2390	32.73	H	53.97	-21.24	Avg	310.50	183.40	

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

Date: 01/09/2018
Lab: D
Tested By: Kyle Fujimoto

2475 MHz - Band Edges - Power Setting = 0
Transmit Mode - Duty Cycle 11.58%

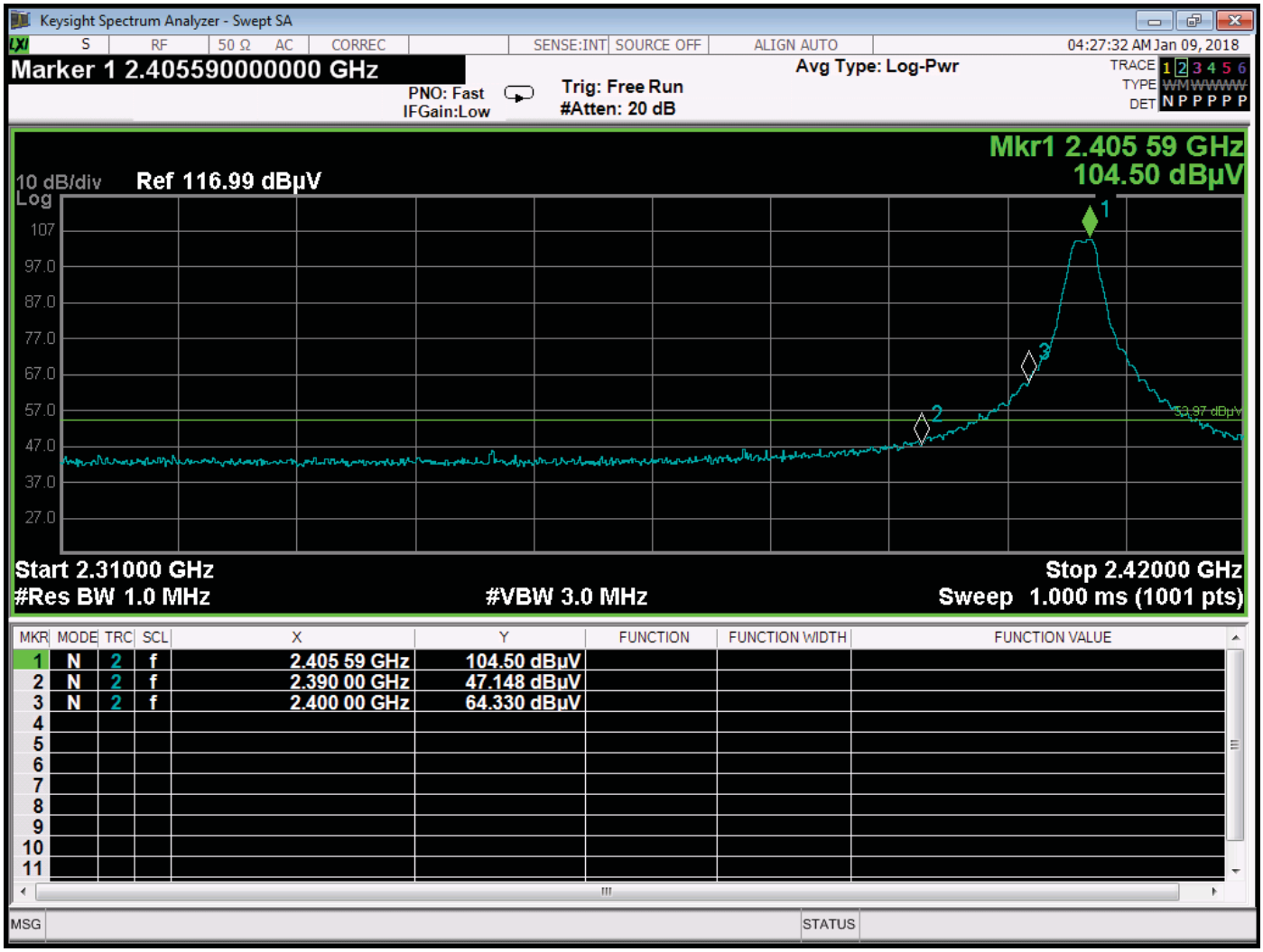
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475	104.93	V	--	--	Peak	121.00	169.37	
2475	86.21	V	--	--	Avg	121.00	169.37	
2483.5	58.58	V	73.97	-15.39	Peak	121.00	169.37	
2483.5	39.86	V	53.97	-14.11	Avg	121.00	169.37	
2475	108.26	H	--	--	Peak	133.50	183.88	
2475	89.54	H	--	--	Avg	133.50	183.88	
2483.5	62.09	H	73.97	-11.88	Peak	133.50	183.88	
2483.5	43.37	H	53.97	-10.60	Avg	133.50	183.88	

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian

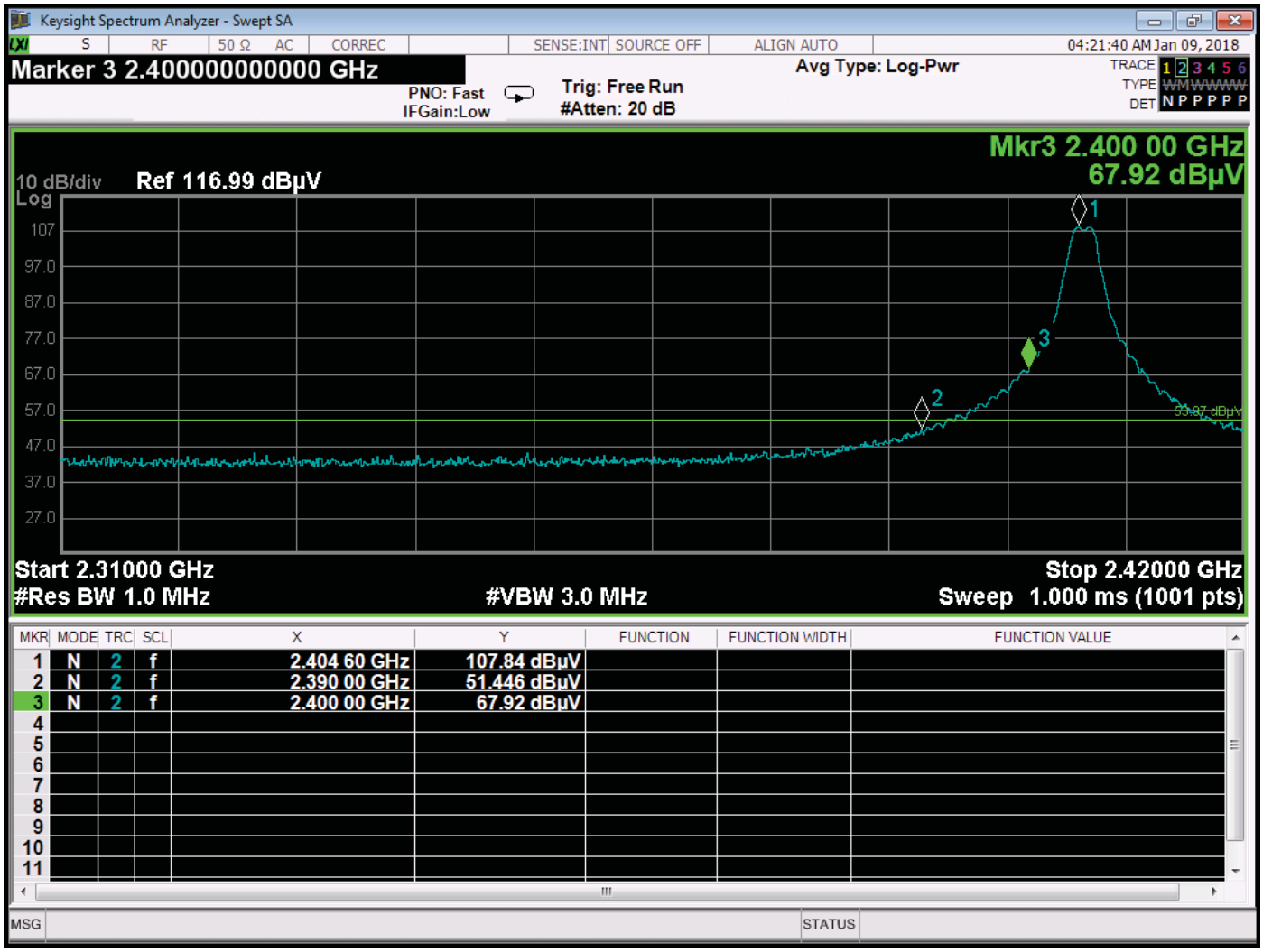
Date: 01/09/2018
Lab: D
Tested By: Kyle Fujimoto

2480 MHz - Band Edges - Power Setting = -a
Transmit Mode - Duty Cycle 11.58%

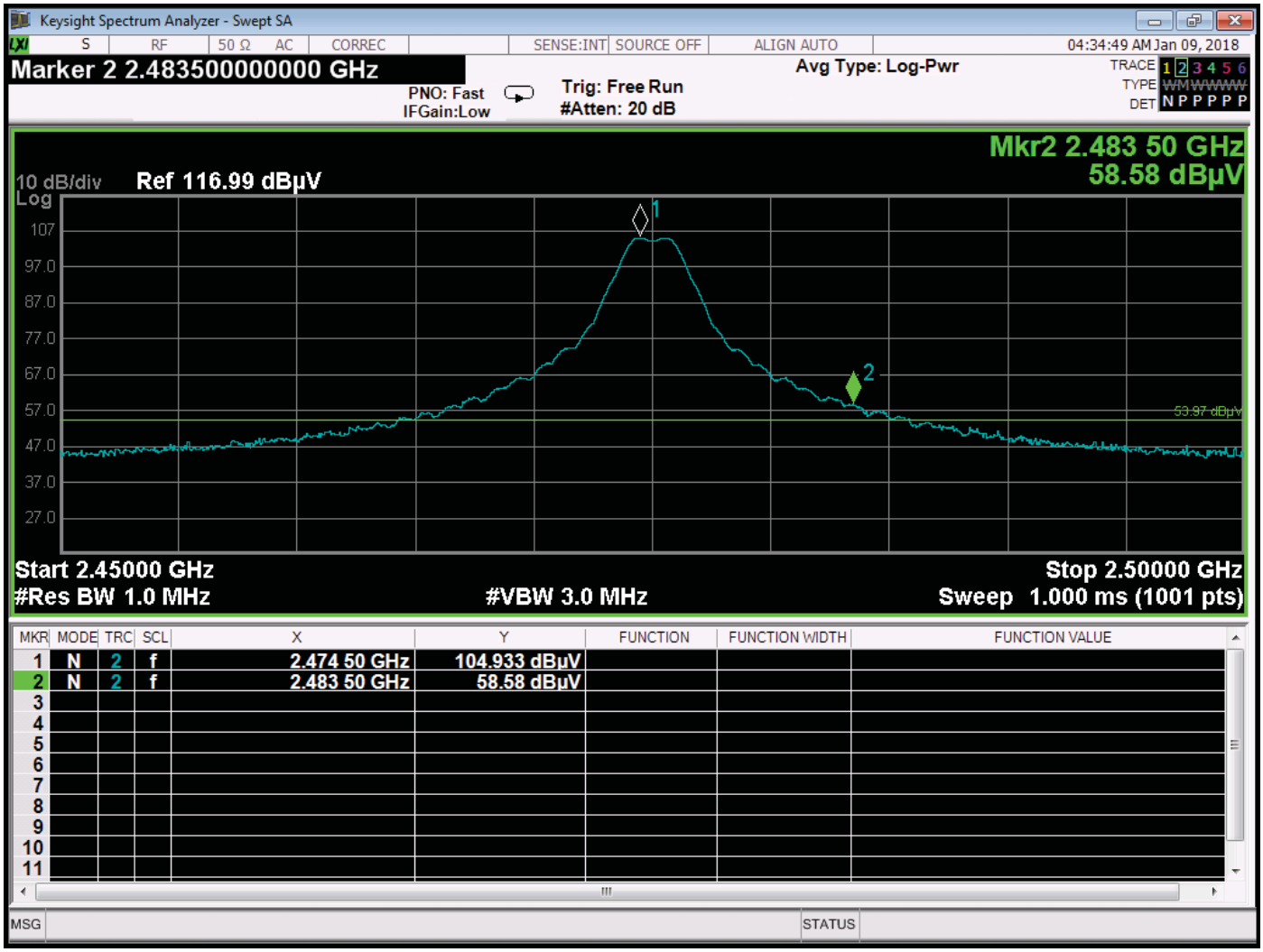
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2480	103.37	V	--	--	Peak	94.75	182.92	
2480	84.65	V	--	--	Avg	94.75	182.92	
2483.5	72.07	V	73.97	-1.90	Peak	204.00	142.25	
2483.5	53.35	V	53.97	-0.62	Avg	204.00	142.25	
2480	97.61	H	--	--	Peak	305.00	206.44	
2480	78.89	H	--	--	Avg	305.00	206.44	
2483.5	66.95	H	73.97	-7.02	Peak	305.00	206.44	
2483.5	48.23	H	53.97	-5.74	Avg	305.00	206.44	



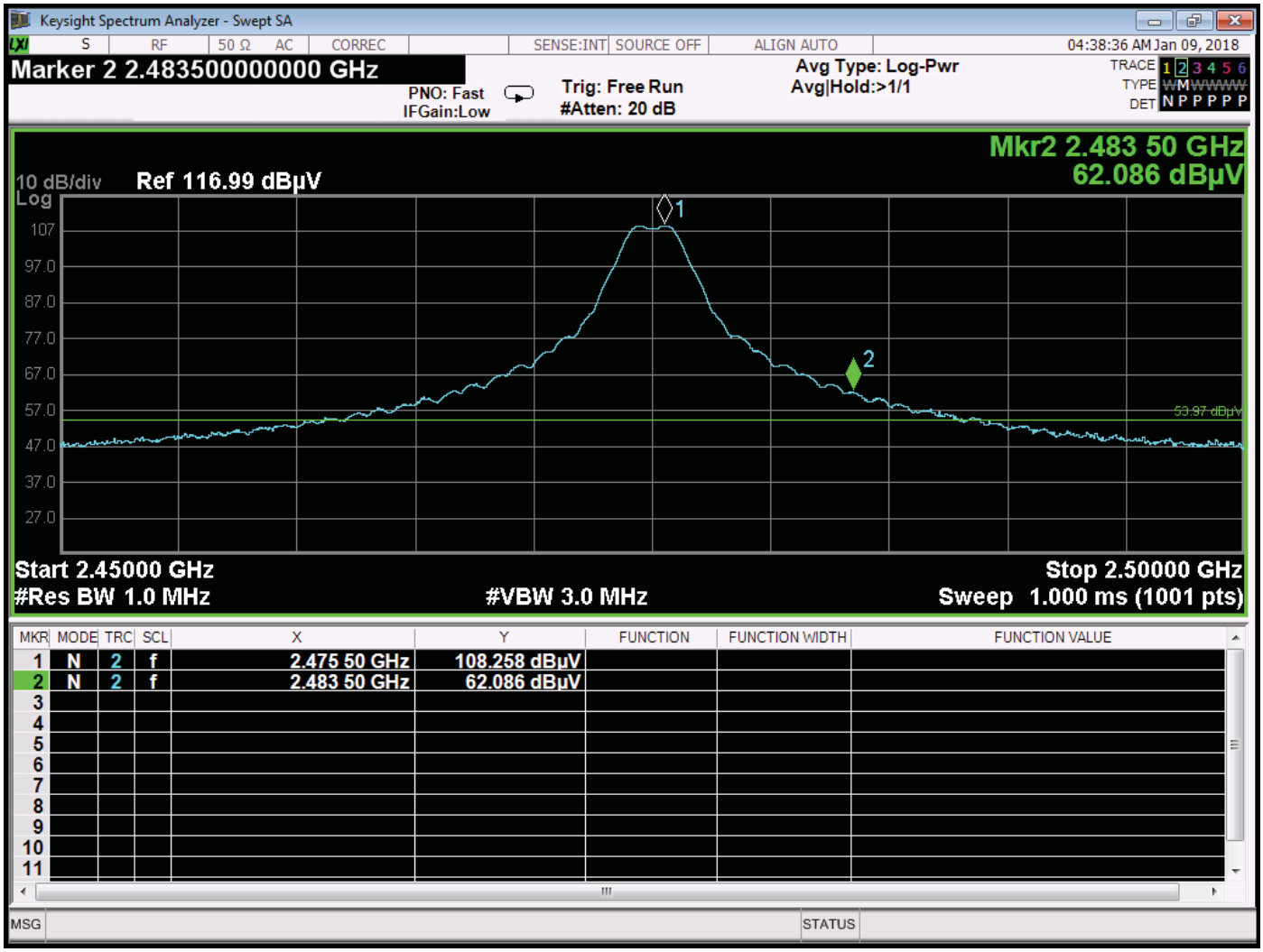
Band Edge for 2405 MHz Fundamental – Vertical Polarization



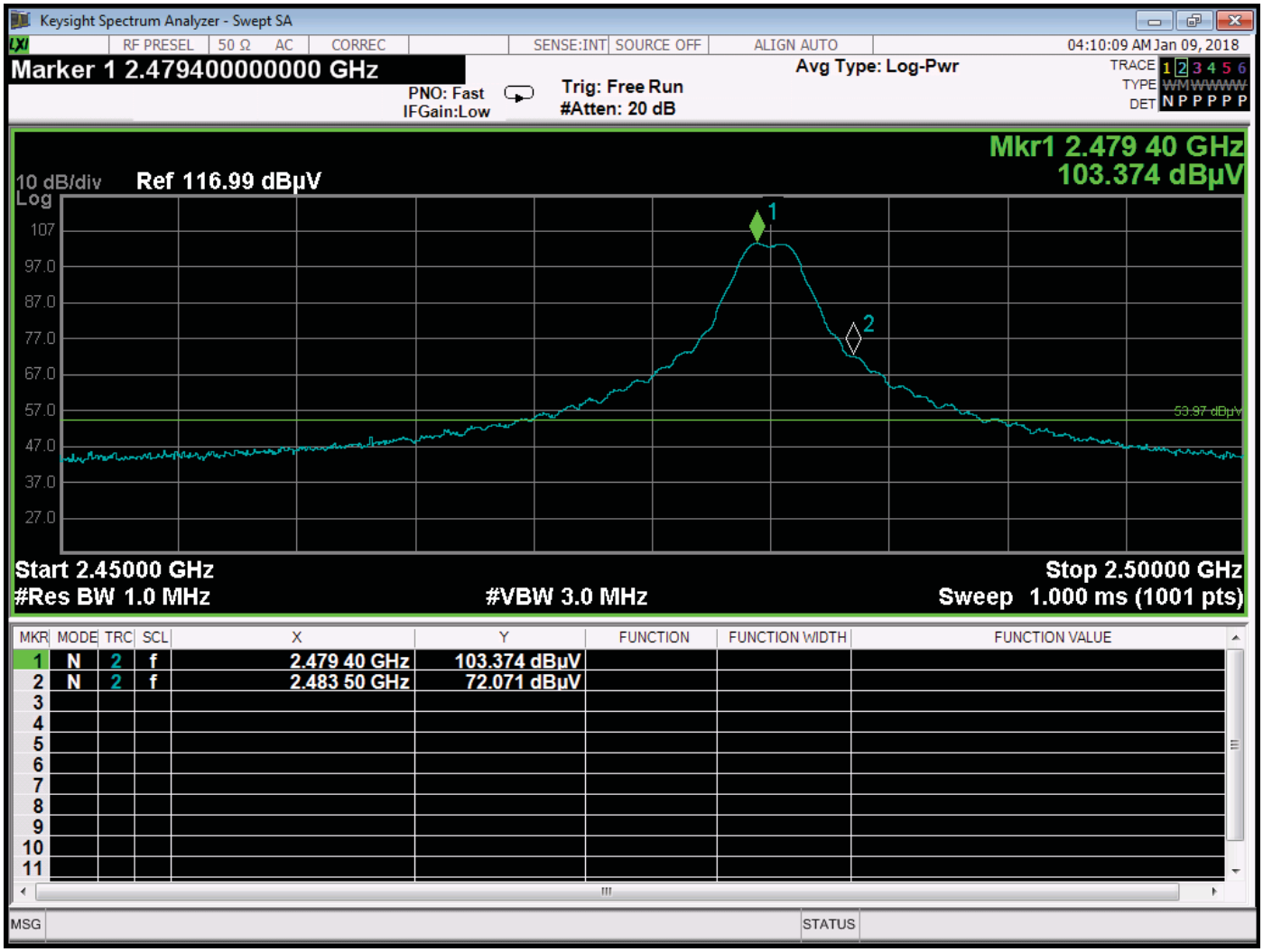
Band Edge for 2405 MHz Fundamental – Horizontal Polarization



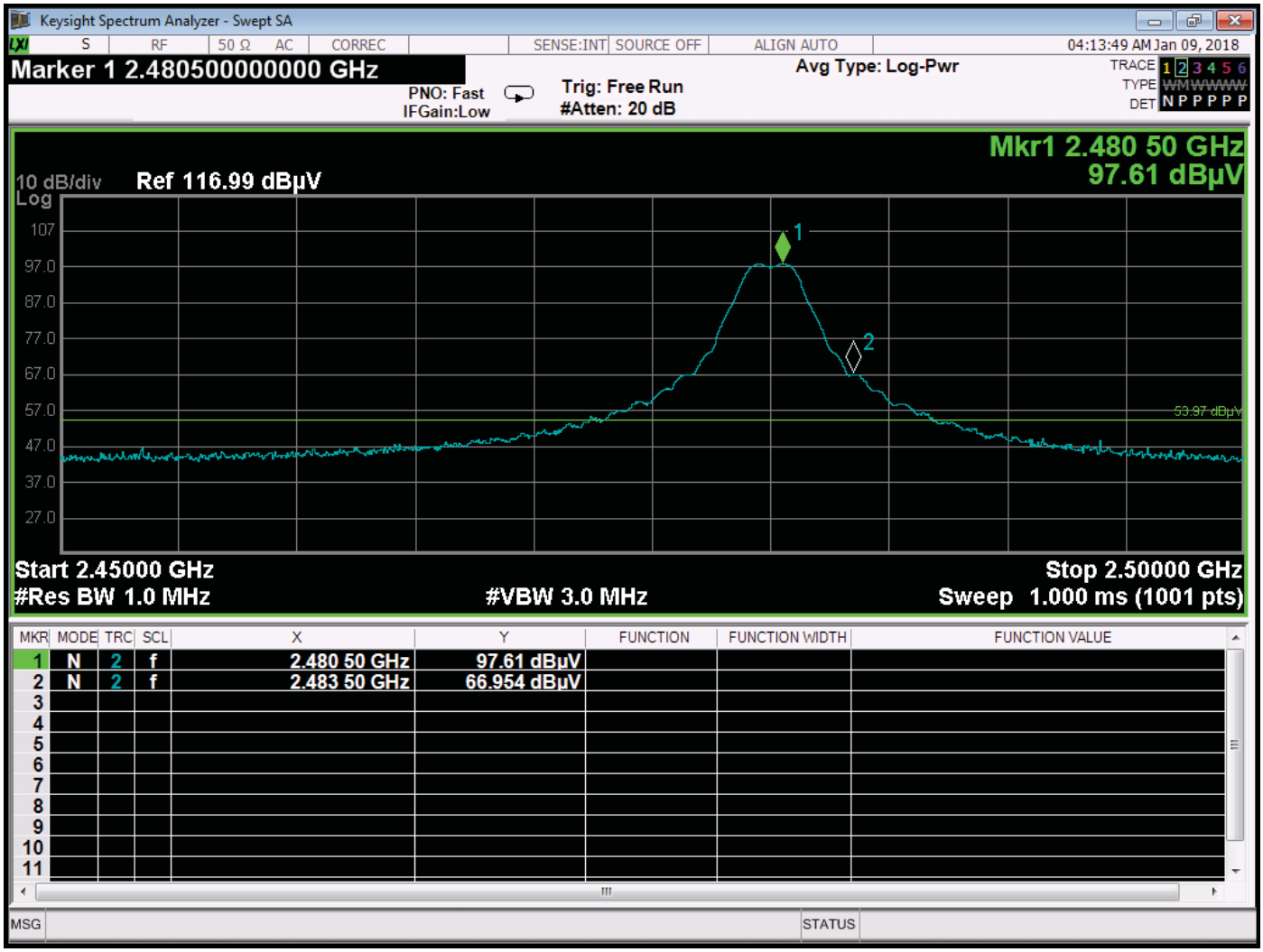
Band Edge for 2475 MHz Fundamental – Vertical Polarization



Band Edge for 2475 MHz Fundamental – Horizontal Polarization



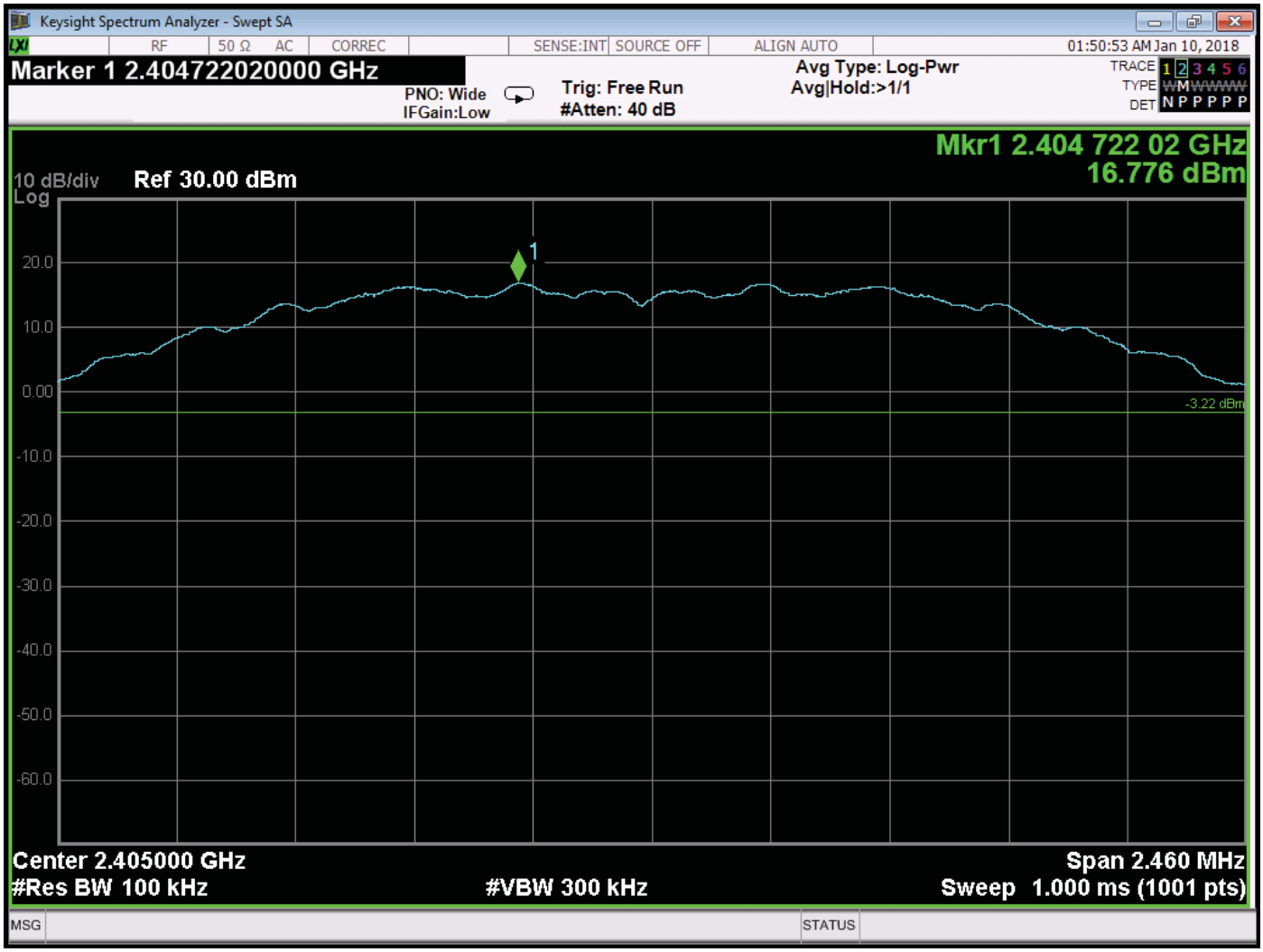
Band Edge for 2480 MHz Fundamental – Vertical Polarization



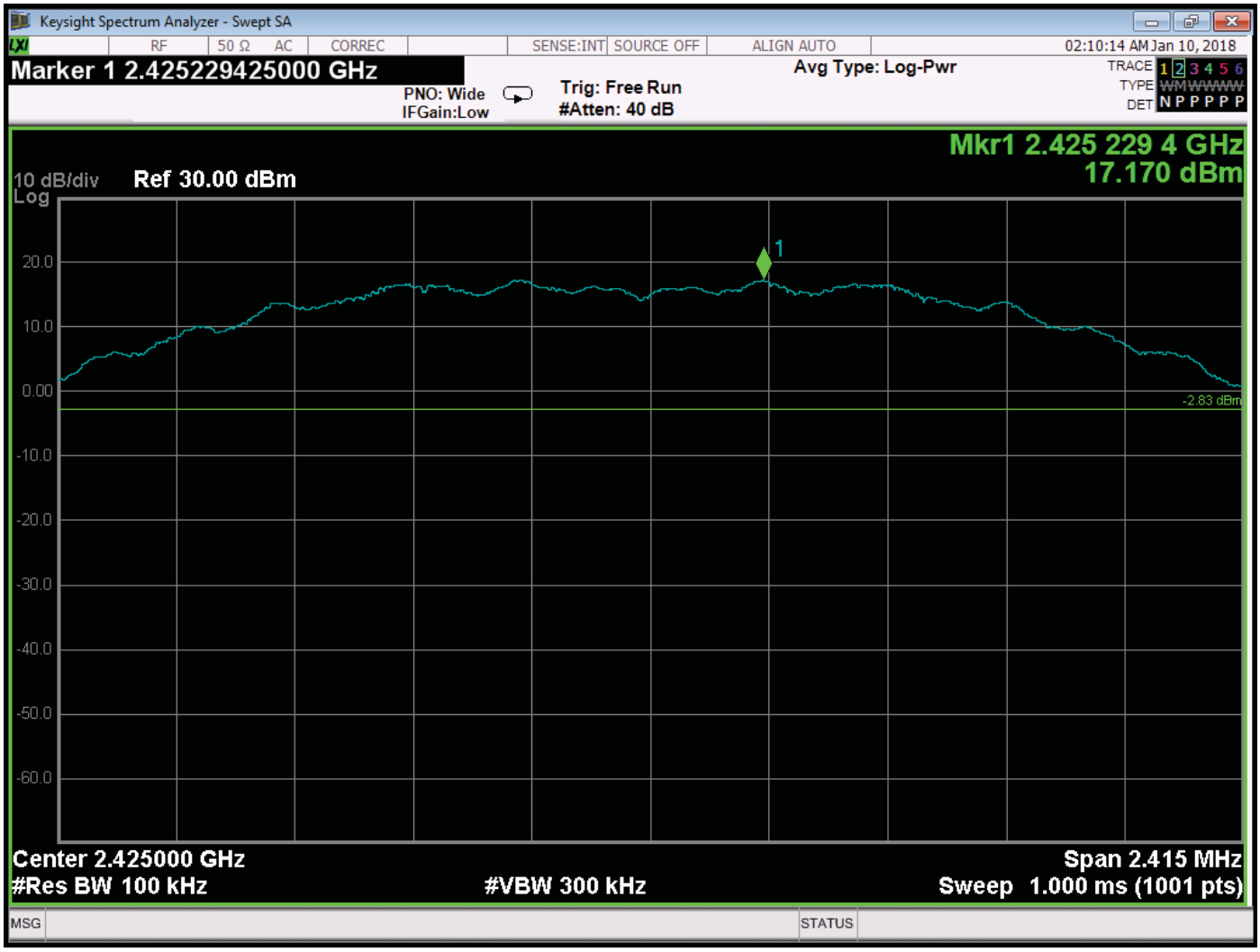
Band Edge for 2480 MHz Fundamental – Horizontal Polarization

RF ANTENNA CONDUCTED

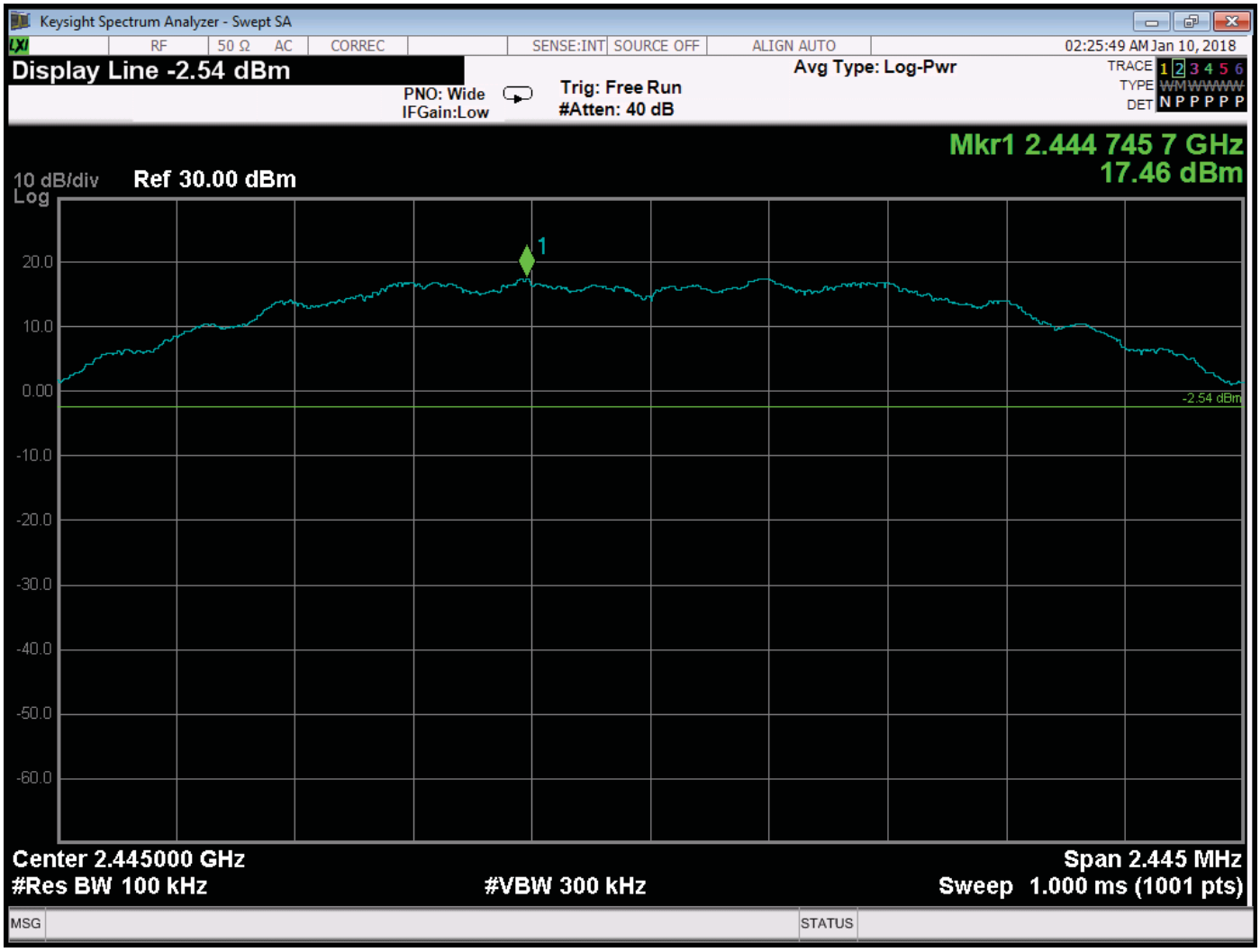
DATA SHEETS



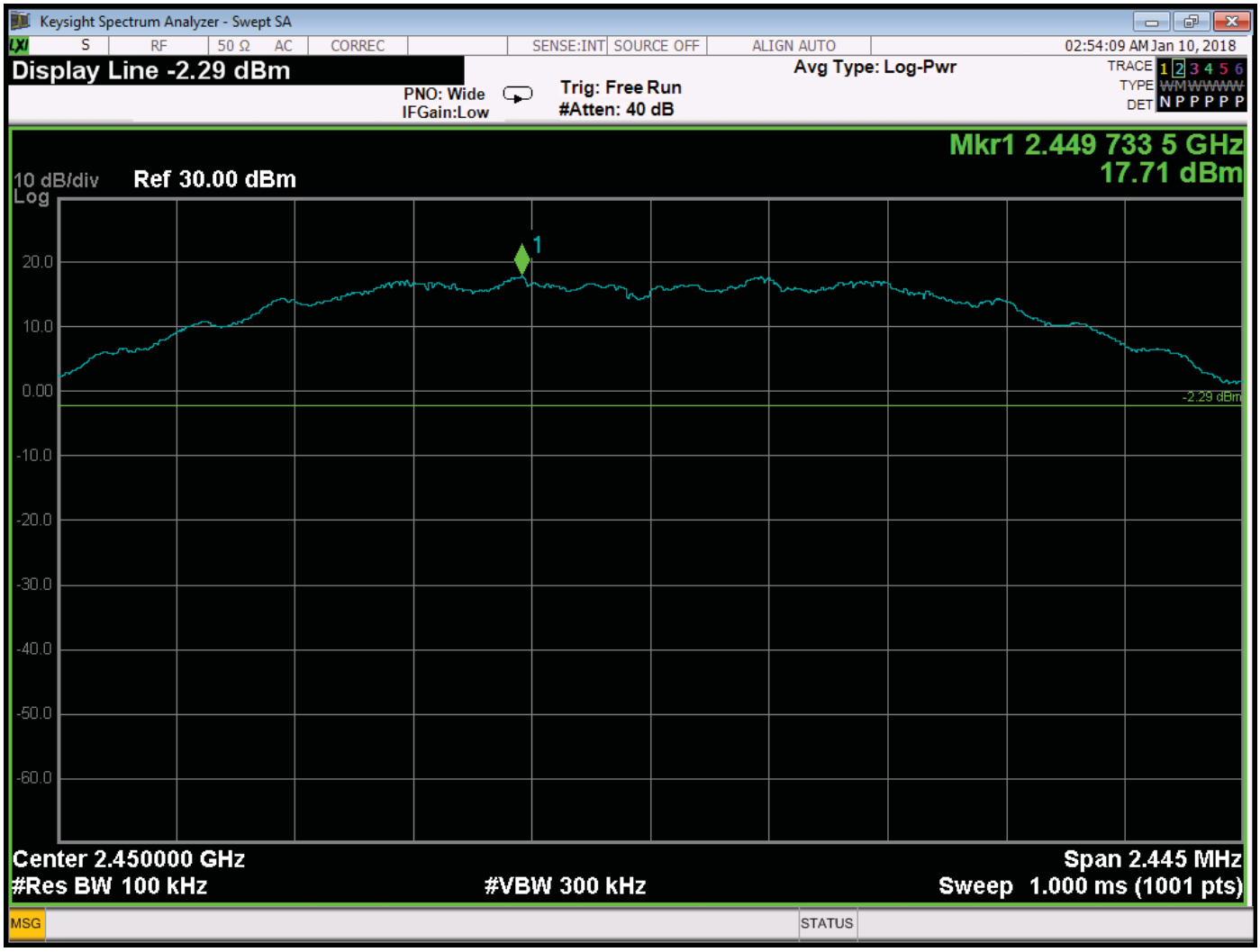
RF Antenna Conducted – Reference Level – 2405 MHz Fundamental



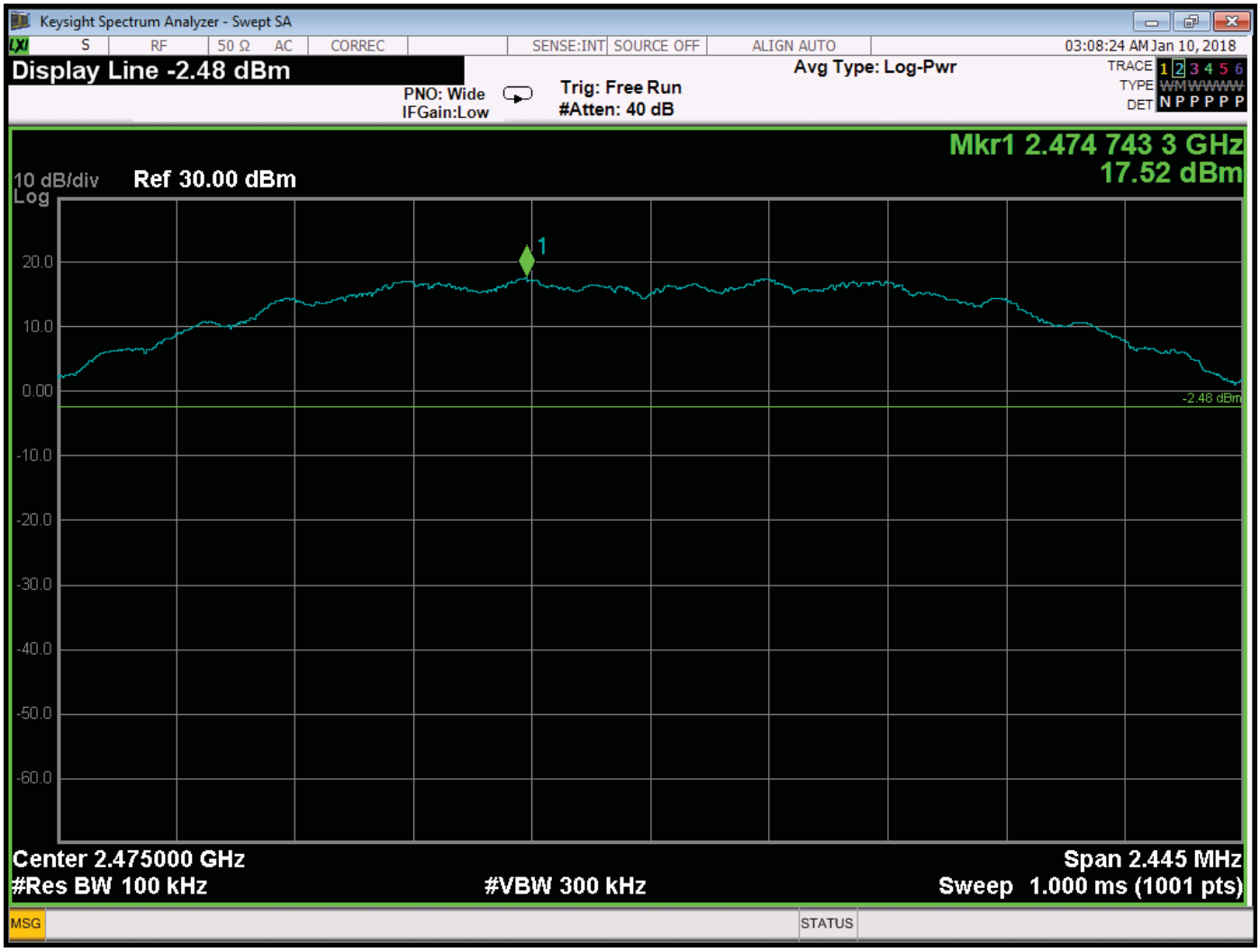
RF Antenna Conducted – Reference Level – 2425 MHz Fundamental



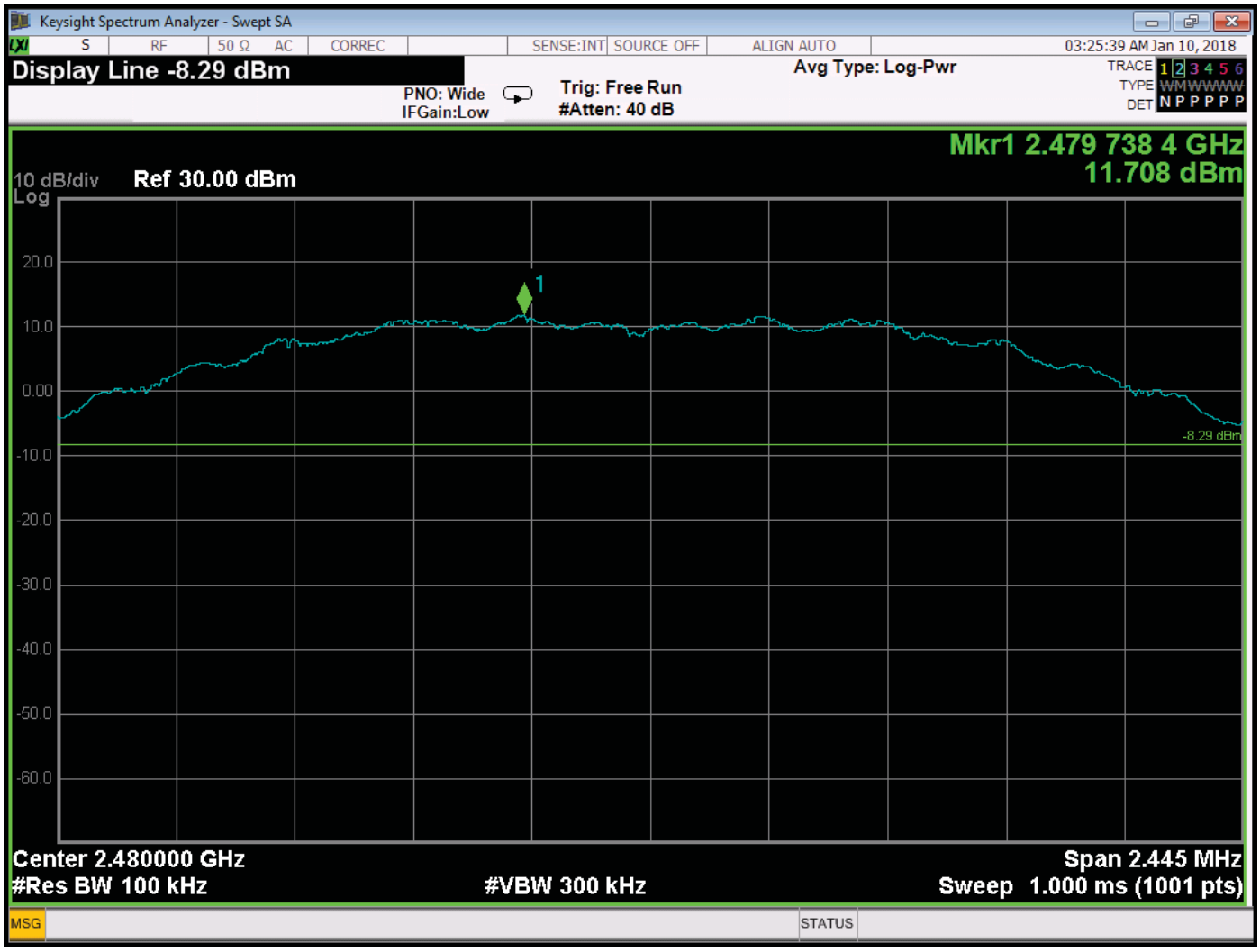
RF Antenna Conducted – Reference Level – 2445 MHz Fundamental



RF Antenna Conducted – Reference Level – 2450 MHz Fundamental



RF Antenna Conducted – Reference Level – 2475 MHz Fundamental



RF Antenna Conducted – Reference Level – 2480 MHz Fundamental

FCC 15.247
Spectrum Brands, Inc.
OHM Zigbee v.2
Model: 450202
Installed Inside the 954 Obsidian
Three Highest Non-Restricted Band Harmonics

Date: 01/09/2018
Lab: D
Tested By: Kyle Fujimoto

Freq. (MHz)	Level (dBm)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475	17.52	--	--	--	Peak	--	--	**Highest Fundamental**
								Done via Conducted
9700	-42.35	--	-2.48	-39.87	Peak	--	--	**Highest emission**
								Relative to the limit
								Done via Conducted
9617.5	-44.59	--	-2.48	-42.11	Peak	--	--	**2nd Highest emission**
								Relative to the limit
								Done via Conducted
9802.5	-44.85	--	-2.48	-42.37	Peak	--	--	**3rd Highest emission**
								Relative to the limit
								Done via Conducted

Note: Per Section 11.11.2 of ANSI C63.10: 2013, the channel found to contain the maximum PSD level can be used to establish the reference level. The fundamental at 2475 MHz is the channel that has the maximum PSD level and thus is used to determine the limit for the non-restricted harmonics.