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

for

2GIG Z-Wave-Zigbee Module
Model: 2GIG-ZWZB-500

Prepared for

NORTEK SECURITY & CONTROL, LLC. SECURITY & CONTROL
1950 CAMINO VIDA ROBLE, SUITE 150
CARLSBAD, CA 92008

Prepared by: _____

TOREY OLIVER

Approved by: _____

MATT HARRISON

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DATE: MAY 27, 2017

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
PAGES	19	2	2	2	14	29	**68**

NVLAP TESTING NVLAP LAB CODE 200527-0

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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 • Antenna and Amplifier Gain Factors • Radiated and Conducted Emissions Photos
E	Radiated and Conducted Emissions Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Plot Map and Layout of Test Site Below 1GHz
2	Plot Map and Layout of Test Site Above 1GHz
3	Conducted Emissions Test Setup

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:	2GIG Z-Wave-Zigbee Module Model: 2GIG-ZWZB-500 S/N: None
Product Description:	The 2GIG Z-Wave-ZigBee Module (2GIG-ZWZB-500) provides the system with the ability to communicate with up to 232 smart home devices using the Z-Wave wireless communication protocol.
Modifications:	The EUT was not modified in order to comply with specifications.
Manufacturer:	Nortek Security & Control, LLC. Security & Control 1950 Camino Vida Roble, Suite 150 Carlsbad, CA 92008
Test Date:	May 19, 21, 26, & 27, 2017

Test Specifications Covered by Accreditation:

NVLAP TESTING
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EMI requirements

CFR Title 47, Part 15 Subpart B Sections 15.107, 15.109, Subpart C Sections 15.205, 15.207, 15.209, 15.249, RSS 210, and RSS Gen

Test Procedure: ANSI C63.4 & C63.10

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz.	Complies with the limits of RSS-210, RSS-GEN, CFR Title 47 Part 15 Subpart B, Section 15.107 and Subpart C Sections 15.207
2	Radiated RF Emissions & Harmonics, 9 kHz – 10,000 MHz.	Complies with the limits of RSS-210, RSS-GEN, CFR Title 47 Part 15 Subpart B Section 15.109 & Subpart C Section 15.205, 15.209, & 15.249

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the 2GIG Z-Wave-Zigbee Module Model: 2GIG-ZWZB-500. The EMI measurements were performed according to the measurement procedure described in ANSI 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 RSS-210, RSS-GEN, and the Code of Federal Regulations Title 47, Part 15 Subpart B sections 15.107, 15.109, & Part 15 Subpart C sections 15.205, 15.207, 15.209 and 15.249.

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

Nortek Security & Control, LLC.

Josh Hansen

Compatible Electronics, Inc.

Matt Harrison	Lab Manager
Torey Oliver	Test Engineer
Shayan Aminmadani	Test Technician

2.4 Date Test Sample was Received

The test sample was received on May 10, 2017.

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
RSS 210	License-exempt Radio Apparatus (All Frequency Bands): Category I Equipment
RSS GEN	General Requirements for Compliance of Radio Apparatus
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

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration

The 2GIG Z-Wave-Zigbee Module Model: 2GIG-ZWZB-500 (EUT) was setup in a tabletop configuration. The EUT was connected to a representative power supply. The EUT was continuously transmitting a data stream during transmit tests and continuously receiving during receiver tests. The EUT was checked in all axes.

The voltage was varied ±15%; the transmitting signal amplitude and frequency did not vary.

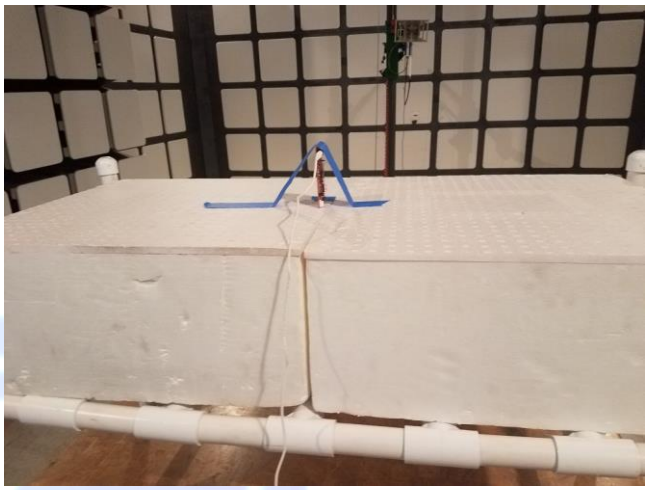
It was determined that the emissions were at their highest level when the EUT was transmitting in the configuration described above for Radiated Emissions. The final radiated data was taken in the above configuration. Please see Appendix E for the test data.

4.1.1 Photograph Test Configuration (X-Axis Shown)

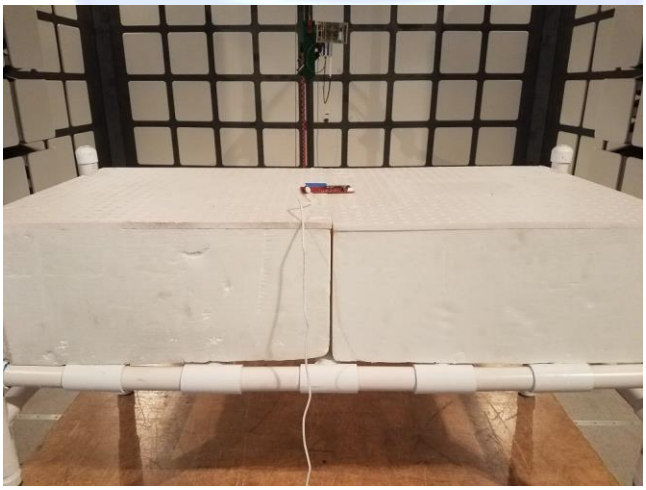
4.1.2 Axis Determination

Y Axis

Z Axis



X Axis



4.1.3 Cable Construction and Termination

Cable 1

This is a 2 meter, foil shielded, USB cable that connect the EUT to the Laptop (for programming only). The cable has a USB Type-A connector at the Laptop end and has an 8-pin plastic ribbon cable connector at the EUT end of the cable. The cable was not bundled. The shield of the cable was terminated at the Laptop end of the cable only.

Cable 2

This is a 2 meter, unshielded, cable that connects the EUT to the power supply. The cable was hardwired into the power supply end and a barrel connector at the EUT end of the cable. The cable was not bundled.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER
1	2GIG Z-WAVE-ZIGBEE MODULE(EUT)	NORTEK	2GIG-ZWZB-500	NONE
2	POWER SUPPLY	HON-KWANG	HK-AX-140A170-CP	NONE
3	Z-WAVE AND ZIGBEE TEST BOARD	NORTEK	10015531	NONE
4	LAPTOP (PROGRAMMING ONLY)	LENOVO	THINKPAD T430	101-2037
5	LAPTOP POWER SUPPLY	LENOVO	92P1156	11S92P1156Z1ZDXN01L1ND

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	100172	3/15/2017	3/15/2018
EMI Receiver	Rohde & Schwarz	ESIB40	100218	3/14/2017	3/14/2018
Antenna, Loop	Com Power	AL-130	121049	2/9/2017	2/9/2018
Antenna, CombiLog	Com Power	AC-220	25857	5/19/2016	5/19/2018
Antenna, Horn 1-18GHz	Com Power	AH-118	071250	5/16/2016	5/16/2018
Pre-Amp, 1-18GHz	Com Power	PAM-118A	551033	5/17/2016	5/17/2018
Notch Filter	Microwave Circuits	N0309153	3709-01 DC0415	3/1/2016	3/1/2018
LISN (EUT)	Com Power	LI-215	191937	5/18/2017	5/18/2018
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
Variable Power Supply	Chroma	61511	615114800078	2/8/2016	2/8/2018

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

For testing below 1 GHz the EUT was mounted on a 1.0 by 1.5 by 0.8 meters high non-conductive table, which was placed on the ground plane.

For testing above 1 GHz the EUT was mounted 1.5 meter 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.

6.4 Measurement Uncertainty

"Compatible Electronics' U_{lab} value is less than U_{cispr}, thus based on this − compliance is deemed to occur if no measured disturbance exceeds the disturbance limit

$$u_c(y) = \sqrt{\sum_i c_i^2 \; u^2(x_i)}$$

Measurement		U_{cispr}	$U_{lab} = 2\,uc\,(y)$
Conducted disturbance (mains port)	(150 kHz – 30 MHz)	4,0 dB	2.88
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(30 MHz – 1 000 MHz)	5,2 dB	4.04

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Number and Frequencies

The EUT was programmed to be in the Z-Wave mode. There are 2 operating channels and the EUT uses FSK modulation for 908.4 MHz and 2GFSK for 916 MHz.

1 == 908.4 MHz = Power Level set to 14
2 == 916.0 MHz = Power Level set to 16

7.2 Antenna

The antenna is a micro strip PCB antenna.

7.3 Software

10016717 Ver. F013 Stored on a local Server, located at NSC headquarters.

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. The final qualification data is located in Appendix E.

Test Results:

The EUT complies with the limits of CFR Title 47 Part 15 Subpart B section 15.107, Subpart C section 15.207, & RSS GEN.

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 linear average detector was used for frequencies above 1 GHz.

For the Harmonic emissions, a linear average detector 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 (120kHz for QP Measurements)
1000 to 10000	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 RSS-210, RSS-GEN, CFR Title 47 Part 15 Subpart B section 15.109, & Part 15 Subpart C sections 15.205, 15.209 and 15.249.

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.

Test Results:

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

9. TEST PROCEDURE DEVIATIONS

The test procedures were not deviated from throughout all tests.

10. CONCLUSIONS

The 2GIG Z-Wave-Zigbee Module Model: 2GIG-ZWZB-500 meets all of the relevant specification requirements defined in RSS-210, RSS-GEN, and the Code of Federal Regulations Title 47, Part 15 Subpart B section 15.107, 15.109, & Subpart C sections 15.205, 15.207, 15.209 and 15.249.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP TESTING
NVLAP LAB CODE 200527-0

ilac-MRA

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."

IC OAT's Test Site Registration Number: 2154C-1

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	2GIG Z-Wave-Zigbee Module MODEL: 2GIG-ZWZB-500 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

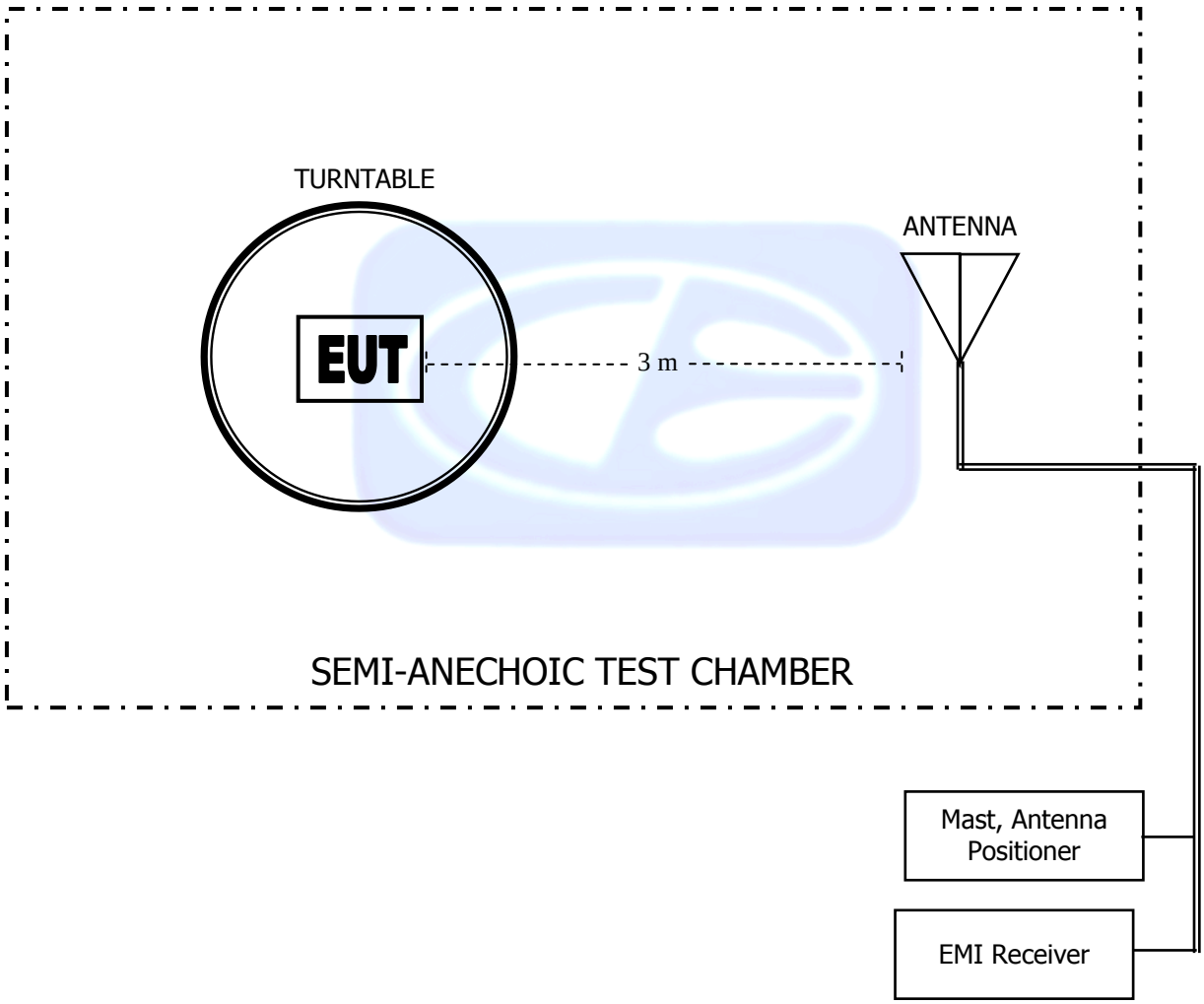


FIGURE 2: PLOT MAP AND LAYOUT OF TEST SITE ABOVE 1GHZ

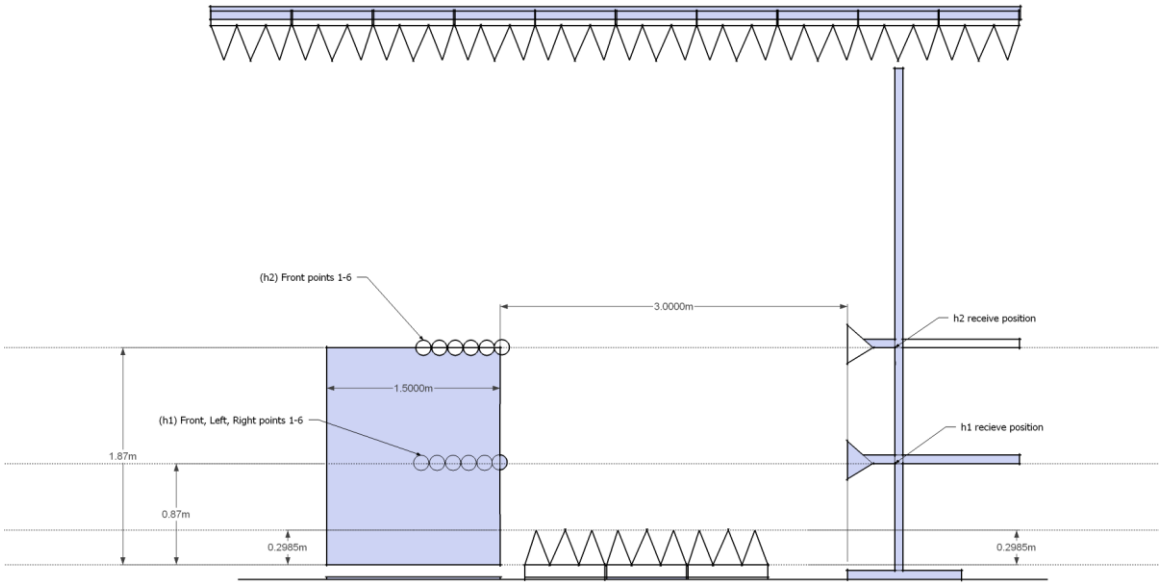
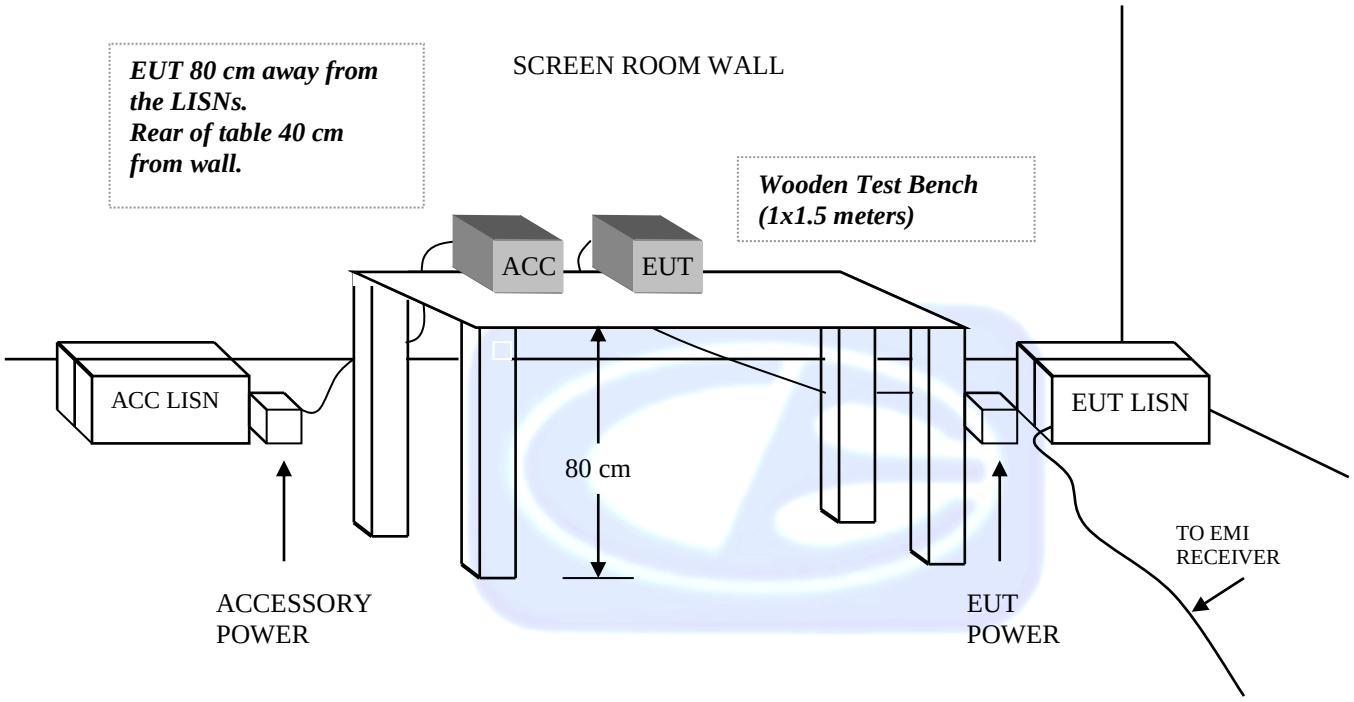


FIGURE 3: CONDUCTED EMISSIONS TEST SETUP



COM-POWER AL-130

LOOP ANTENNA

S/N: 121049

CALIBRATION DUE: FEBRUARY 9, 2018

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)	FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-34.68	16.82	**0.8**	-37.44	14.06
0.01	-35.54	15.96	**0.9**	-37.34	14.16
0.02	-37.22	14.28	**1.0**	-37.34	14.16
0.03	-36.44	15.06	**2.0**	-37.03	14.47
0.04	-36.90	14.60	**3.0**	-37.02	14.48
0.05	-37.56	13.94	**4.0**	-37.12	14.38
0.06	-37.45	14.05	**5.0**	-36.92	14.58
0.07	-37.55	13.95	**6.0**	-37.12	14.38
0.08	-37.46	14.04	**7.0**	-37.02	14.48
0.09	-37.56	13.94	**8.0**	-36.81	14.69
0.1	-37.56	13.94	**9.0**	-36.81	14.69
0.2	-37.75	13.75	**10.0**	-36.70	14.80
0.3	-37.75	13.75	**15.0**	-37.08	14.42
0.4	-37.65	13.85	**20.0**	-36.60	14.90
0.5	-37.75	13.75	**25.0**	-38.62	12.88
0.6	-37.75	13.75	**30.0**	-38.92	12.58
0.7	-37.64	13.86			

COM-POWER AC-220

LAB P - COMBILOG ANTENNA

S/N: 003

CALIBRATION DUE: MAY 19, 2018

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	23.6	**160**	13.5
35	23.6	**180**	14.4
40	23.7	**200**	14.5
45	23.9	**250**	15.7
50	24.2	**300**	18.1
60	22.6	**400**	19.9
70	19.1	**500**	22.3
80	13.8	**600**	24.4
90	12.9	**700**	26.6
100	14.6	**800**	26.2
120	14.4	**900**	27.5
140	16.2	**1000**	28.9

COM-POWER AH-118

HORN ANTENNA

S/N: 071225

CALIBRATION DUE: MAY 17, 2018

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	24.40	**9500**	39.11
1500	25.61	**10000**	39.38
2000	28.71	**10500**	39.55
2500	29.09	**11000**	39.66
3000	30.24	**11500**	40.28
3500	30.94	**12000**	40.26
4000	31.77	**12500**	40.64
4500	32.29	**13000**	41.33
5000	33.70	**13500**	41.74
5500	34.28	**14000**	41.52
6000	34.83	**14500**	41.80
6500	35.07	**15000**	43.51
7000	36.79	**15500**	41.03
7500	37.45	**16000**	40.88
8000	37.67	**16500**	40.18
8500	37.75	**17000**	42.59
9000	38.15	**17500**	44.49
		18000	45.27

COM-POWER PAM-118A

1-18GHz - PREAMPLIFIER

S/N: 551033

CALIBRATION DUE: MAY 16, 2018

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
500	41.06	**5500**	40.63
1000	41.06	**6000**	40.18
1100	41.12	**6500**	40.33
1200	41.09	**7000**	39.97
1300	41.20	**7500**	40.45
1400	41.28	**8000**	39.83
1500	41.34	**8500**	39.79
1600	41.37	**9000**	39.71
1700	41.43	**9500**	39.80
1800	41.47	**10000**	41.07
1900	41.53	**11000**	40.05
2000	41.59	**12000**	40.21
2500	41.87	**13000**	40.61
3000	42.13	**14000**	39.09
3500	42.21	**15000**	39.36
4000	42.22	**16000**	38.32
4500	41.53	**17000**	38.32
5000	41.16	**18000**	36.85

FRONT VIEW

NORTEK SECURITY & CONTROL, LLC.
2GIG Z-Wave-Zigbee Module
Model: 2GIG-ZWZB-500
FCC SUBPART B & C - RADIATED EMISSIONS < 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

NORTEK SECURITY & CONTROL, LLC.
2GIG Z-Wave-Zigbee Module
Model: 2GIG-ZWZB-500
FCC SUBPART B & C - RADIATED EMISSIONS < 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

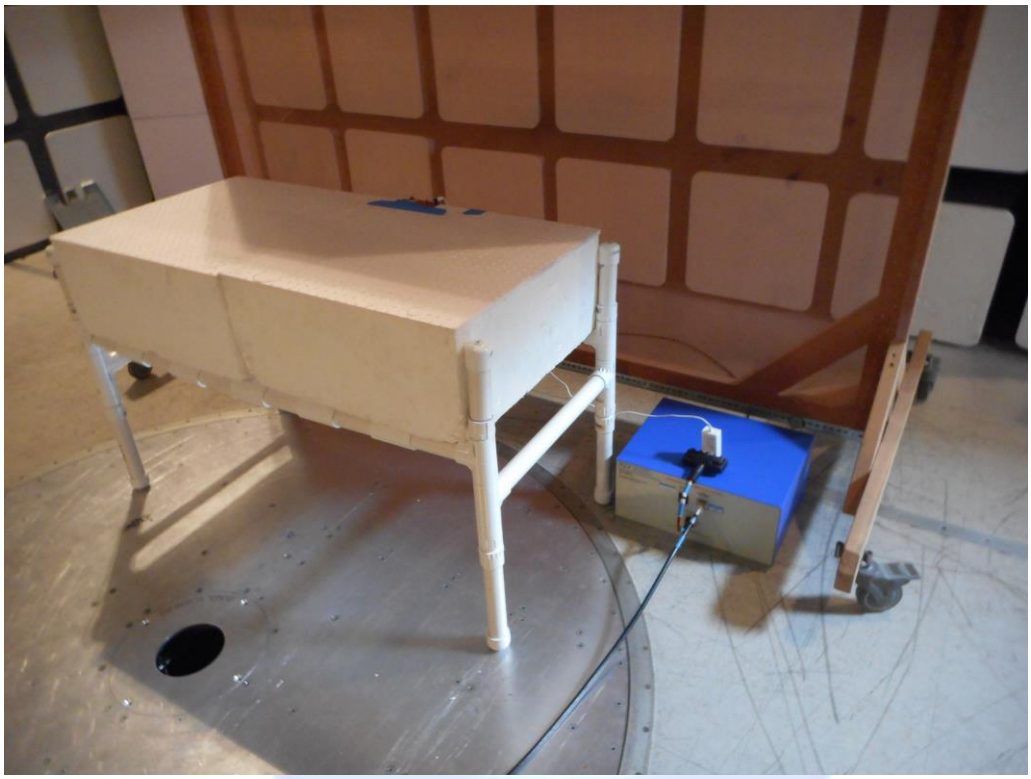
NORTEK SECURITY & CONTROL, LLC.
2GIG Z-Wave-Zigbee Module
Model: 2GIG-ZWZB-500
FCC SUBPART B & C - RADIATED EMISSIONS > 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

NORTEK SECURITY & CONTROL, LLC.
2GIG Z-Wave-Zigbee Module
Model: 2GIG-ZWZB-500
FCC SUBPART B & C - RADIATED EMISSIONS > 1GHz

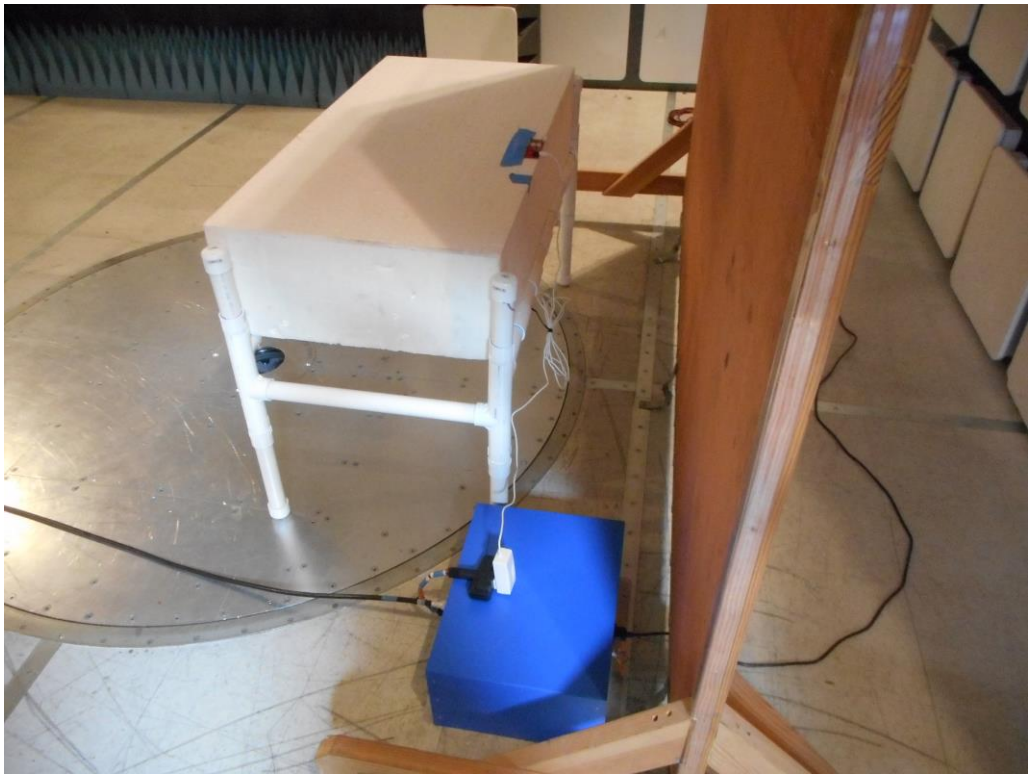
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

NORTEK SECURITY & CONTROL, LLC.
2GIG Z-Wave-Zigbee Module
Model: 2GIG-ZWZB-500
FCC SUBPART B & C - CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

NORTEK SECURITY & CONTROL, LLC.
2GIG Z-Wave-Zigbee Module
Model: 2GIG-ZWZB-500
FCC SUBPART B & C - CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

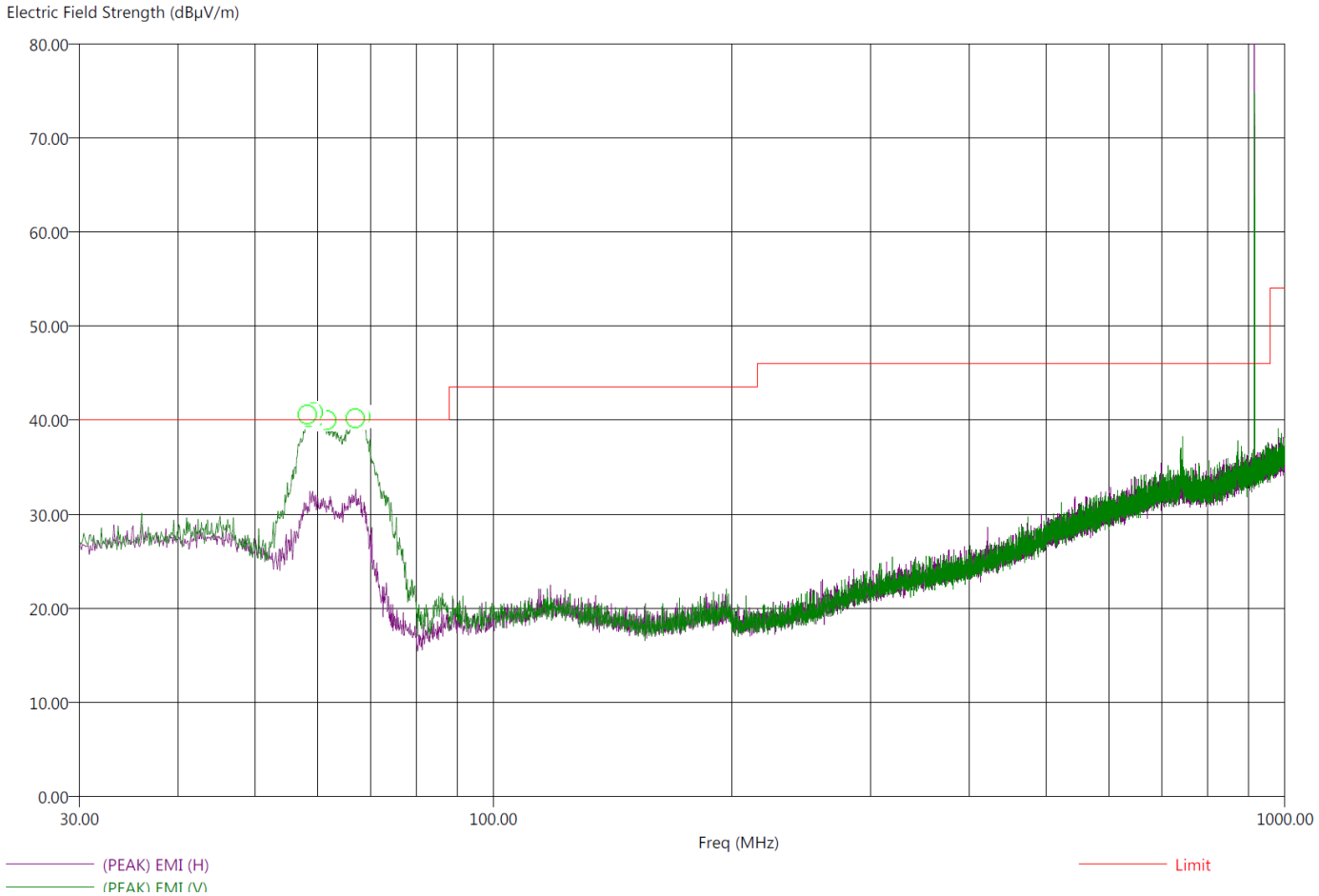
APPENDIX E

RADIATED EMISSIONS DATA SHEETS

Title: FCC 15.209
File: Radiated Pre-Scan 30-1000Mhz.set
Operator: Torey Oliver
EUT Type: 2GIG Z-Wave-ZigBee Module / 2GIG-ZWZB-500
EUT Condition: The EUT is in a normal operating condition.
Comments: Temp: 71f
Hum: 48%
120V 60Hz

5/19/2017 11:25:12 AM
Sequence: Preliminary Scan

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



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

Title: FCC 15.209 5/19/2017 11:51:34 AM
File: Radiated Final 30-1000Mhz.set Sequence: Final Measurements
Operator: Torey Oliver
EUT Type: 2GIG Z-Wave-ZigBee Module / 2GIG-ZWZB-500
EUT Condition: The EUT is in a normal operating condition.
Comments: Temp: 71f
Hum: 48%
120V 60Hz

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

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)
58.30	-3.38	36.62	40.43	40.00	V	6.00	111.11	19.62	0.66
58.50	-3.04	36.96	40.54	40.00	V	0.00	99.29	19.56	0.66
59.30	-2.27	37.73	41.31	40.00	V	350.50	112.17	19.29	0.67
59.60	-3.06	36.94	40.46	40.00	V	175.25	99.88	19.20	0.67
61.70	-3.36	36.64	39.92	40.00	V	-0.25	109.70	18.09	0.67
67.00	-0.75	39.25	41.64	40.00	V	215.25	99.52	15.29	0.67
67.30	-2.58	37.42	39.99	40.00	V	166.50	104.11	15.12	0.67
68.10	-1.81	38.19	40.82	40.00	V	190.25	111.35	14.70	0.67

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

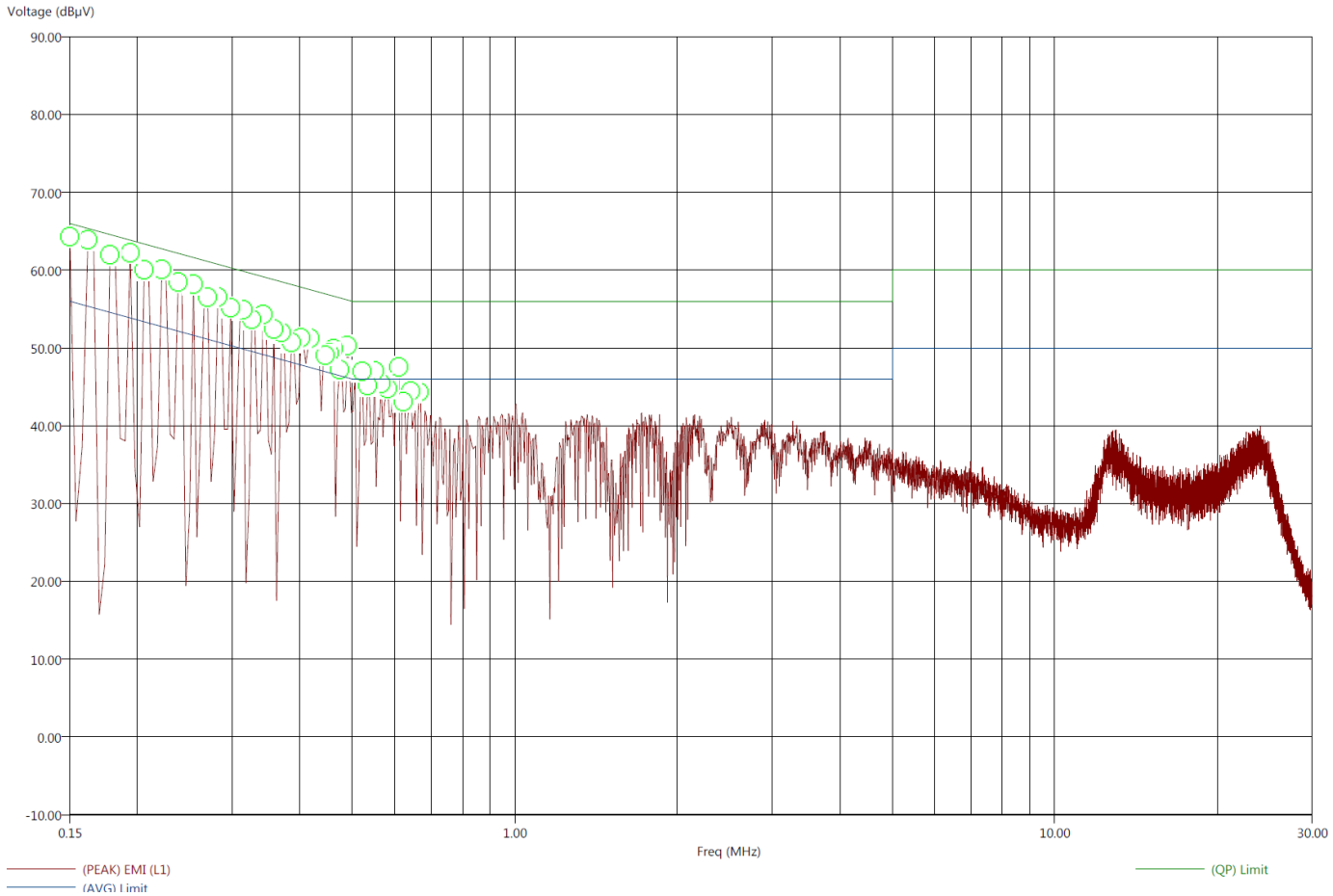
CONDUCTED EMISSIONS

DATA SHEETS

Title: FCC 15.207
File: Conducted Pre-Line.set
Operator: Shayan Aminmadani
EUT Type: 2GIG Z-Wave-ZigBee Module / 2GIG-ZWZB-500
EUT Condition: Transmitting on channel 916MHz
Comments: Temp: 72f
Hum: 48%
120V 60Hz

5/26/2017 10:00:49 AM
Sequence: Preliminary Scan

Compatible Electronics, Inc. FAC-3 (LAB P)



This is worst case channel and mode.

Title: FCC 15.207 5/26/2017 10:04:50 AM
File: Conducted Final-Line.set Sequence: Final Measurements
Operator: Shayan Aminmadani
EUT Type: 2GIG Z-Wave-ZigBee Module / 2GIG-ZWZB-500
EUT Condition: Transmitting on channel 916MHz
Comments: Temp: 72f
Hum: 48%
120V 60Hz

Compatible Electronics, Inc. FAC-3 (LAB P)

Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dBµV)	(QP) EMI (dBµV)	(PEAK) EMI (dBµV)	(AVG) Limit (dBµV)	(QP) Limit (dB V	Transducer (dB)	Cable (dB)
0.15	-18.46	-5.02	37.54	60.98	67.81	56.00	66.00	0.44	0.01
0.16	-20.56	-5.16	34.80	60.20	66.88	55.36	65.36	0.40	0.01
0.18	-20.39	-5.34	34.19	59.24	66.37	54.58	64.58	0.36	0.01
0.19	-18.16	-5.72	35.71	58.15	65.35	53.86	63.86	0.32	0.01
0.21	-19.73	-6.25	33.63	57.12	64.18	53.37	63.37	0.29	0.01
0.22	-18.46	-6.50	34.28	56.25	63.73	52.74	62.74	0.25	0.01
0.24	-18.23	-6.69	33.94	55.47	62.57	52.17	62.17	0.22	0.01
0.25	-18.43	-6.70	33.20	54.93	61.70	51.63	61.63	0.19	0.01
0.27	-15.13	-7.76	35.98	53.36	61.51	51.12	61.12	0.16	0.01
0.28	-18.27	-8.07	32.48	52.68	60.52	50.76	60.76	0.14	0.01
0.30	-16.37	-8.58	33.93	51.72	59.40	50.30	60.30	0.12	0.01
0.31	-17.25	-8.80	32.62	51.06	58.03	49.86	59.86	0.09	0.01
0.33	-18.72	-8.31	30.83	51.25	58.50	49.55	59.55	0.07	0.01
0.34	-14.88	-9.27	34.28	49.89	57.94	49.15	59.15	0.05	0.01
0.36	-19.34	-9.58	29.43	49.19	56.71	48.77	58.77	0.04	0.01
0.37	-19.31	-10.21	29.19	48.29	55.80	48.50	58.50	0.04	0.01
0.39	-15.70	-9.87	32.45	48.28	55.32	48.15	58.15	0.03	0.01
0.40	-19.35	-10.23	28.46	47.58	55.64	47.81	57.81	0.03	0.01
0.42	-8.88	-8.25	38.61	49.24	55.89	47.49	57.49	0.03	0.01
0.45	-13.58	-8.56	33.37	48.39	55.98	46.95	56.95	0.03	0.01
0.45	-8.79	-7.98	38.01	48.82	55.27	46.80	56.80	0.03	0.01
0.46	-10.44	-9.51	36.22	47.15	55.44	46.66	56.66	0.03	0.01
0.47	-18.44	-11.06	28.01	45.38	54.35	46.44	56.44	0.03	0.01
0.49	-14.46	-11.52	31.71	44.65	54.20	46.17	56.17	0.03	0.01
0.52	-19.36	-12.44	26.64	43.56	51.89	46.00	56.00	0.03	0.01

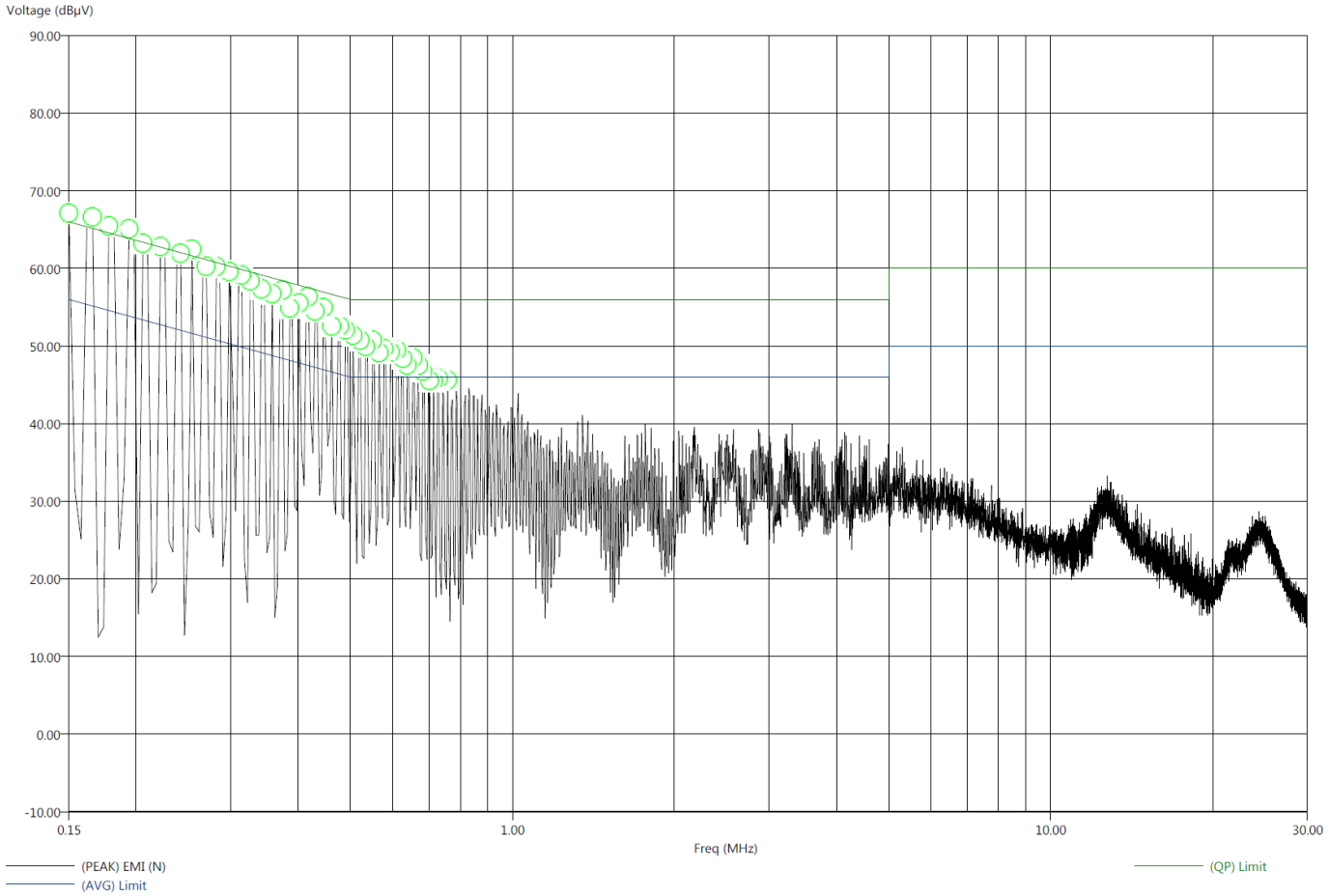
Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dBµV)	(QP) EMI (dBµV)	(PEAK) EMI (dBµV)	(AVG) Limit (dBµV)	(QP) Limit (dB V	Transducer (dB)	Cable (dB)
0.53	-16.79	-12.44	29.21	43.56	51.60	46.00	56.00	0.03	0.01
0.55	-19.85	-13.57	26.15	42.43	51.23	46.00	56.00	0.03	0.02
0.57	-15.39	-13.24	30.61	42.76	51.39	46.00	56.00	0.03	0.02
0.58	-15.83	-13.45	30.17	42.55	52.00	46.00	56.00	0.03	0.02
0.61	-14.44	-13.23	31.56	42.77	50.32	46.00	56.00	0.03	0.02
0.62	-15.96	-13.34	30.04	42.66	49.61	46.00	56.00	0.03	0.03
0.64	-16.74	-14.73	29.26	41.27	50.31	46.00	56.00	0.03	0.03
0.67	-16.18	-15.38	29.82	40.62	49.61	46.00	56.00	0.03	0.03

This is worst case channel and mode.

Title: FCC 15.207
File: Conducted Pre-Neutral.set
Operator: Shayan Aminmadani
EUT Type: 2GIG Z-Wave-ZigBee Module / 2GIG-ZWZB-500
EUT Condition: Transmitting on channel 916MHz
Comments: Temp: 72f
Hum: 48%
120V 60Hz

5/26/2017 10:17:04 AM
Sequence: Preliminary Scan

Compatible Electronics, Inc. FAC-3 (LAB P)



This is worst case channel and mode.

Title: FCC 15.207 5/26/2017 10:21:25 AM
File: Conducted Final-Neutral.set Sequence: Final Measurements
Operator: Shayan Aminmadani
EUT Type: 2GIG Z-Wave-ZigBee Module / 2GIG-ZWZB-500
EUT Condition: Transmitting on channel 916MHz
Comments: Temp: 72f
Hum: 48%
120V 60Hz

Compatible Electronics, Inc. FAC-3 (LAB P)

Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dBµV)	(QP) EMI (dBµV)	(PEAK) EMI (dBµV)	(AVG) Limit (dBµV)	(QP) Limit (dBµV)	Transducer (dB)	Cable (dB)
0.15	-20.20	-4.98	35.80	61.02	68.52	56.00	66.00	0.44	0.01
0.17	-20.72	-4.86	34.43	60.29	67.43	55.16	65.16	0.39	0.01
0.18	-20.36	-5.11	34.22	59.46	66.80	54.58	64.58	0.36	0.01
0.19	-19.31	-5.33	34.55	58.53	65.79	53.86	63.86	0.32	0.01
0.21	-19.53	-5.57	33.83	57.80	64.94	53.37	63.37	0.29	0.01
0.22	-18.96	-6.25	33.79	56.49	63.92	52.74	62.74	0.25	0.01
0.24	-18.41	-6.57	33.62	55.46	62.94	52.03	62.03	0.21	0.01
0.25	-18.27	-6.60	33.35	55.03	62.27	51.63	61.63	0.19	0.01
0.27	-17.14	-6.77	33.98	54.34	61.93	51.12	61.12	0.16	0.01
0.28	-18.16	-6.81	32.59	53.95	61.37	50.76	60.76	0.13	0.01
0.30	-17.68	-7.22	32.62	53.08	60.21	50.30	60.30	0.11	0.01
0.31	-18.22	-7.66	31.65	52.20	59.44	49.86	59.86	0.08	0.01
0.33	-18.45	-8.08	31.10	51.48	59.10	49.55	59.55	0.06	0.01
0.34	-16.36	-8.69	32.80	50.46	58.07	49.15	59.15	0.04	0.01
0.36	-19.22	-8.91	29.55	49.87	57.38	48.77	58.77	0.03	0.01
0.37	-19.26	-8.92	29.15	49.49	57.15	48.41	58.41	0.04	0.01
0.39	-18.74	-9.21	29.41	48.94	55.82	48.15	58.15	0.04	0.01
0.40	-19.82	-10.03	27.99	47.78	55.57	47.81	57.81	0.05	0.01
0.42	-14.71	-9.42	32.78	48.06	56.10	47.49	57.49	0.04	0.01
0.43	-17.23	-10.43	30.02	46.82	55.28	47.25	57.25	0.03	0.01
0.45	-16.90	-9.88	30.05	47.07	54.89	46.95	56.95	0.02	0.01
0.46	-15.84	-10.60	30.81	46.05	54.51	46.66	56.66	0.02	0.01
0.48	-20.26	-11.39	26.12	44.98	52.69	46.37	56.37	0.03	0.01
0.49	-18.26	-11.18	27.91	44.99	52.59	46.17	56.17	0.04	0.01
0.51	-19.40	-11.87	26.60	44.13	52.28	46.00	56.00	0.04	0.01

Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dBµV)	(QP) EMI (dBµV)	(PEAK) EMI (dBµV)	(AVG) Limit (dBµV)	(QP) Limit (dBµV)	Transducer (dB)	Cable (dB)
0.52	-20.30	-12.24	25.70	43.76	51.94	46.00	56.00	0.04	0.01
0.53	-19.80	-12.82	26.20	43.18	51.51	46.00	56.00	0.04	0.01
0.55	-20.87	-13.23	25.13	42.77	51.27	46.00	56.00	0.04	0.02
0.57	-19.35	-13.23	26.65	42.77	51.03	46.00	56.00	0.04	0.02
0.58	-19.27	-13.78	26.73	42.22	50.30	46.00	56.00	0.04	0.02
0.59	-20.62	-14.61	25.38	41.39	49.85	46.00	56.00	0.04	0.02
0.61	-19.08	-14.48	26.92	41.52	50.66	46.00	56.00	0.04	0.02
0.63	-20.87	-15.66	25.13	40.34	49.25	46.00	56.00	0.03	0.03
0.64	-20.29	-15.66	25.71	40.34	48.97	46.00	56.00	0.03	0.03
0.65	-20.11	-15.65	25.89	40.35	48.14	46.00	56.00	0.03	0.03
0.67	-17.43	-16.85	28.57	39.15	48.17	46.00	56.00	0.03	0.03
0.68	-19.30	-16.69	26.70	39.31	47.23	46.00	56.00	0.03	0.03
0.70	-21.93	-17.87	24.07	38.13	46.48	46.00	56.00	0.03	0.03
0.71	-22.41	-17.69	23.59	38.31	46.30	46.00	56.00	0.03	0.04
0.73	-22.09	-18.43	23.91	37.57	46.61	46.00	56.00	0.03	0.04
0.76	-22.87	-19.24	23.13	36.76	45.98	46.00	56.00	0.03	0.04

This is worst case channel and mode.

FUNDAMENTAL & HARMONICS

DATA SHEETS

FUNDAMENTAL FIELD STRENGTH

FCC 15.249

Company: Nortek
EUT: 2GIG Z-Wave-Zigbee
Model: 2GIG-ZWZB-500

Date: 5/21/2017
Lab: P
Tested By: Torey Oliver

Compatible Electronics, Inc. FAC-3

Freq. (MHz)	Level (dBµV/m)	Pol (v/h)	Limit (dBµV/m	Margin (dB)	Peak / QP / Avg	Table	Tower	Comments
908.40	96.11	H	113.97	-17.86	Peak	52.00	1.52	PWR: 14
908.40	93.05	H	93.97	-0.92	QP	52.00	1.52	PWR: 14
908.40	88.25	V	113.97	-25.72	Peak	69.00	1.14	PWR: 14
908.40	85.75	V	93.97	-8.22	QP	69.00	1.14	PWR: 14
916.00	96.71	H	113.97	-17.26	Peak	337.00	1.45	PWR: 16
916.00	93.41	H	93.97	-0.56	QP	337.00	1.45	PWR: 16
916.00	88.99	V	113.97	-24.98	Peak	247.00	1.00	PWR: 16
916.00	86.58	V	93.97	-7.39	QP	247.00	1.00	PWR: 16

Test distance
3 meter

HARMONICS LOW CHANNEL HORIZONTAL X-AXIS

FCC 15.249

Company: Nortek
EUT: 2GIG Z-Wave-Zigbee
Model: 2GIG-ZWZB-500

Date: 5/21/2017
Lab: P
Tested By: Torey Oliver

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1816.80	--	H	73.98	--	Peak	--	--	No Emissions Found
1816.80	--	H	53.98	--	Avg	--	--	No Emissions Found
2725.20	--	H	73.98	--	Peak	--	--	No Emissions Found
2725.20	--	H	53.98	--	Avg	--	--	No Emissions Found
3633.60		H	73.98		Peak			No Emissions Found
3633.60		H	53.98		Avg			No Emissions Found
4542.00	47.12	H	73.98	-26.86	Peak	1.64	85	
4542.00	32.07	H	53.98	-21.91	Avg	1.64	85	
5450.40	--	H	73.98	--	Peak	--	--	No Emissions Found
5450.40	--	H	53.98	--	Avg	--	--	No Emissions Found
6358.80	--	H	73.98	--	Peak	--	--	No Emissions Found
6358.80	--	H	53.98	--	Avg	--	--	No Emissions Found
7267.20	--	H	73.98	--	Peak	--	--	No Emissions Found
7267.20	--	H	53.98	--	Avg	--	--	No Emissions Found
8175.60	--	H	73.98	--	Peak	--	--	No Emissions Found
8175.60	--	H	53.98	--	Avg	--	--	No Emissions Found
9084.00	--	H	73.98	--	Peak	--	--	No Emissions Found
9084.00	--	H	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS LOW CHANNEL VERTICAL X-AXIS

FCC 15.249

Company:	Nortek	Date:	5/21/2017
EUT:	2GIG Z-Wave-Zigbee	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	Torey Oliver

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1816.80	--	V	73.98	--	Peak	--	--	No Emissions Found
1816.80	--	V	53.98	--	Avg	--	--	No Emissions Found
2725.20	--	V	73.98	--	Peak	--	--	No Emissions Found
2725.20	--	V	53.98	--	Avg	--	--	No Emissions Found
3633.60	--	V	73.98	--	Peak	--	--	No Emissions Found
3633.60	--	V	53.98	--	Avg	--	--	No Emissions Found
4542.00	40.36	V	73.98	-33.62	Peak	2.90	301	
4542.00	27.16	V	53.98	-26.82	Avg	2.90	301	
5450.40	--	V	73.98	--	Peak	--	--	No Emissions Found
5450.40	--	V	53.98	--	Avg	--	--	No Emissions Found
6358.80	--	V	73.98	--	Peak	--	--	No Emissions Found
6358.80	--	V	53.98	--	Avg	--	--	No Emissions Found
7267.20	--	V	73.98	--	Peak	--	--	No Emissions Found
7267.20	--	V	53.98	--	Avg	--	--	No Emissions Found
8175.60	--	V	73.98	--	Peak	--	--	No Emissions Found
8175.60	--	V	53.98	--	Avg	--	--	No Emissions Found
9084.00	--	V	73.98	--	Peak	--	--	No Emissions Found
9084.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS LOW CHANNEL HORIZONTAL Y-AXIS

FCC 15.249

Company: Nortek
EUT: 2GIG Z-Wave-Zigbee
Model: 2GIG-ZWZB-500

Date: 5/21/2017
Lab: P
Tested By: Torey Oliver

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1816.80	--	H	73.98	--	Peak	--	--	No Emissions Found
1816.80	--	H	53.98	--	Avg	--	--	No Emissions Found
2725.20	--	H	73.98	--	Peak	--	--	No Emissions Found
2725.20	--	H	53.98	--	Avg	--	--	No Emissions Found
3633.60	--	H	73.98	--	Peak	--	--	No Emissions Found
3633.60	--	H	53.98	--	Avg	--	--	No Emissions Found
4542.00	51.02	H	73.98	-22.96	Peak	1.24	298	
4542.00	35.59	H	53.98	-18.39	Avg	1.24	298	
5450.40	--	H	73.98	--	Peak	--	--	No Emissions Found
5450.40	--	H	53.98	--	Avg	--	--	No Emissions Found
6358.80	--	H	73.98	--	Peak	--	--	No Emissions Found
6358.80	--	H	53.98	--	Avg	--	--	No Emissions Found
7267.20	--	H	73.98	--	Peak	--	--	No Emissions Found
7267.20	--	H	53.98	--	Avg	--	--	No Emissions Found
8175.60	--	H	73.98	--	Peak	--	--	No Emissions Found
8175.60	--	H	53.98	--	Avg	--	--	No Emissions Found
9084.00	--	H	73.98	--	Peak	--	--	No Emissions Found
9084.00	--	H	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS LOW CHANNEL VERTICAL Y-AXIS

FCC 15.249

Company:	Nortek	Date:	5/21/2017
EUT:	2GIG Z-Wave-Zigbee	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	Torey Oliver

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1816.80	--	V	73.98	--	Peak	--	--	No Emissions Found
1816.80	--	V	53.98	--	Avg	--	--	No Emissions Found
2725.20	--	V	73.98	--	Peak	--	--	No Emissions Found
2725.20	--	V	53.98	--	Avg	--	--	No Emissions Found
3633.60	--	V	73.98	--	Peak	--	--	No Emissions Found
3633.60	--	V	53.98	--	Avg	--	--	No Emissions Found
4542.00	41.31	V	73.98	-32.67	Peak	2.68	360	
4542.00	28.08	V	53.98	-25.90	Avg	2.68	360	
5450.40	--	V	73.98	--	Peak	--	--	No Emissions Found
5450.40	--	V	53.98	--	Avg	--	--	No Emissions Found
6358.80	--	V	73.98	--	Peak	--	--	No Emissions Found
6358.80	--	V	53.98	--	Avg	--	--	No Emissions Found
7267.20	--	V	73.98	--	Peak	--	--	No Emissions Found
7267.20	--	V	53.98	--	Avg	--	--	No Emissions Found
8175.60	--	V	73.98	--	Peak	--	--	No Emissions Found
8175.60	--	V	53.98	--	Avg	--	--	No Emissions Found
9084.00	--	V	73.98	--	Peak	--	--	No Emissions Found
9084.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS LOW CHANNEL HORIZONTAL Z-AXIS

FCC 15.249

Company:	Nortek	Date:	5/21/2017
EUT:	2GIG Z-Wave-Zigbee	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	Torey Oliver

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1816.80	--	H	73.98	--	Peak	--	--	No Emissions Found
1816.80	--	H	53.98	--	Avg	--	--	No Emissions Found
2725.20	--	H	73.98	--	Peak	--	--	No Emissions Found
2725.20	--	H	53.98	--	Avg	--	--	No Emissions Found
3633.60	--	H	73.98	--	Peak	--	--	No Emissions Found
3633.60	--	H	53.98	--	Avg	--	--	No Emissions Found
4542.00	39.69	H	73.98	-34.29	Peak	1.41	265	
4542.00	27.15	H	53.98	-26.83	Avg	1.41	265	
5450.40	--	H	73.98	--	Peak	--	--	No Emissions Found
5450.40	--	H	53.98	--	Avg	--	--	No Emissions Found
6358.80	--	H	73.98	--	Peak	--	--	No Emissions Found
6358.80	--	H	53.98	--	Avg	--	--	No Emissions Found
7267.20	--	H	73.98	--	Peak	--	--	No Emissions Found
7267.20	--	H	53.98	--	Avg	--	--	No Emissions Found
8175.60	--	H	73.98	--	Peak	--	--	No Emissions Found
8175.60	--	H	53.98	--	Avg	--	--	No Emissions Found
9084.00	--	H	73.98	--	Peak	--	--	No Emissions Found
9084.00	--	H	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS LOW CHANNEL VERTICAL Z-AXIS

FCC 15.249

Company:	Nortek	Date:	5/21/2017
EUT:	2GIG Z-Wave-Zigbee	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	Torey Oliver

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1816.80	--	V	73.98	--	Peak	--	--	No Emissions Found
1816.80	--	V	53.98	--	Avg	--	--	No Emissions Found
2725.20	--	V	73.98	--	Peak	--	--	No Emissions Found
2725.20	--	V	53.98	--	Avg	--	--	No Emissions Found
3633.60	--	V	73.98	--	Peak	--	--	No Emissions Found
3633.60	--	V	53.98	--	Avg	--	--	No Emissions Found
4542.00	44.36	V	73.98	-29.62	Peak	1.09	360	
4542.00	30.11	V	53.98	-23.87	Avg	1.09	360	
5450.40	--	V	73.98	--	Peak	--	--	No Emissions Found
5450.40	--	V	53.98	--	Avg	--	--	No Emissions Found
6358.80	--	V	73.98	--	Peak	--	--	No Emissions Found
6358.80	--	V	53.98	--	Avg	--	--	No Emissions Found
7267.20	--	V	73.98	--	Peak	--	--	No Emissions Found
7267.20	--	V	53.98	--	Avg	--	--	No Emissions Found
8175.60	--	V	73.98	--	Peak	--	--	No Emissions Found
8175.60	--	V	53.98	--	Avg	--	--	No Emissions Found
9084.00	--	V	73.98	--	Peak	--	--	No Emissions Found
9084.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS HIGH CHANNEL HORIZONTAL X-AXIS

FCC 15.249

Company:	Nortek	Date:	5/19/2017
EUT:	Zwave/Zigbee Transceiver	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	M. Harrison

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1832.00	--	H	73.98	--	Peak	--	--	No Emissions Found
1832.00	--	H	53.98	--	Avg	--	--	No Emissions Found
2748.00	--	H	73.98	--	Peak	--	--	No Emissions Found
2748.00	--	H	53.98	--	Avg	--	--	No Emissions Found
3664.00	--	H	73.98	--	Peak	--	--	No Emissions Found
3664.00	--	H	53.98	--	Avg	--	--	No Emissions Found
4580.00	46.80	H	73.98	-27.18	Peak	1.66	89	
4580.00	29.34	H	53.98	-24.64	Avg	1.66	89	
5496.00	--	H	73.98	--	Peak	--	--	No Emissions Found
5496.00	--	H	53.98	--	Avg	--	--	No Emissions Found
6412.00	--	H	73.98	--	Peak	--	--	No Emissions Found
6412.00	--	H	53.98	--	Avg	--	--	No Emissions Found
7328.00	--	H	73.98	--	Peak	--	--	No Emissions Found
7328.00	--	H	53.98	--	Avg	--	--	No Emissions Found
8244.00	--	H	73.98	--	Peak	--	--	No Emissions Found
8244.00	--	H	53.98	--	Avg	--	--	No Emissions Found
9160.00	--	H	73.98	--	Peak	--	--	No Emissions Found
9160.00	--	H	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS HIGH CHANNEL VERTICAL X-AXIS

FCC 15.249

Company:	Nortek	Date:	5/19/2017
EUT:	Zwave/Zigbee Transceiver	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	M. Harrison

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1832.00	--	V	73.98	--	Peak	--	--	No Emissions Found
1832.00	--	V	53.98	--	Avg	--	--	No Emissions Found
2748.00	--	V	73.98	--	Peak	--	--	No Emissions Found
2748.00	--	V	53.98	--	Avg	--	--	No Emissions Found
3664.00	--	V	73.98	--	Peak	--	--	No Emissions Found
3664.00	--	V	53.98	--	Avg	--	--	No Emissions Found
4580.00	47.49	V	73.98	-26.49	Peak	1.27	303	
4580.00	29.66	V	53.98	-24.32	Avg	1.27	303	
5496.00	--	V	73.98	--	Peak	--	--	No Emissions Found
5496.00	--	V	53.98	--	Avg	--	--	No Emissions Found
6412.00	--	V	73.98	--	Peak	--	--	No Emissions Found
6412.00	--	V	53.98	--	Avg	--	--	No Emissions Found
7328.00	--	V	73.98	--	Peak	--	--	No Emissions Found
7328.00	--	V	53.98	--	Avg	--	--	No Emissions Found
8244.00	--	V	73.98	--	Peak	--	--	No Emissions Found
8244.00	--	V	53.98	--	Avg	--	--	No Emissions Found
9160.00	--	V	73.98	--	Peak	--	--	No Emissions Found
9160.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS HIGH CHANNEL HORIZONTAL Y-AXIS

FCC 15.249

Company:	Nortek	Date:	5/19/2017
EUT:	Zwave/Zigbee Transceiver	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	M. Harrison

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1832.00	--	H	73.98	--	Peak	--	--	No Emissions Found
1832.00	--	H	53.98	--	Avg	--	--	No Emissions Found
2748.00	--	H	73.98	--	Peak	--	--	No Emissions Found
2748.00	--	H	53.98	--	Avg	--	--	No Emissions Found
3664.00	--	H	73.98	--	Peak	--	--	No Emissions Found
3664.00	--	H	53.98	--	Avg	--	--	No Emissions Found
4580.00	39.74	H	73.98	-34.24	Peak	2.11	108	
4580.00	27.24	H	53.98	-26.74	Avg	2.11	108	
5496.00	--	H	73.98	--	Peak	--	--	No Emissions Found
5496.00	--	H	53.98	--	Avg	--	--	No Emissions Found
6412.00	--	H	73.98	--	Peak	--	--	No Emissions Found
6412.00	--	H	53.98	--	Avg	--	--	No Emissions Found
7328.00	--	H	73.98	--	Peak	--	--	No Emissions Found
7328.00	--	H	53.98	--	Avg	--	--	No Emissions Found
8244.00	--	H	73.98	--	Peak	--	--	No Emissions Found
8244.00	--	H	53.98	--	Avg	--	--	No Emissions Found
9160.00	--	H	73.98	--	Peak	--	--	No Emissions Found
9160.00	--	H	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS HIGH CHANNEL VERTICAL Y-AXIS

FCC 15.249

Company:	Nortek	Date:	5/19/2017
EUT:	Zwave/Zigbee Transceiver	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	M. Harrison

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1832.00	--	V	73.98	--	Peak	--	--	No Emissions Found
1832.00	--	V	53.98	--	Avg	--	--	No Emissions Found
2748.00	--	V	73.98	--	Peak	--	--	No Emissions Found
2748.00	--	V	53.98	--	Avg	--	--	No Emissions Found
3664.00	--	V	73.98	--	Peak	--	--	No Emissions Found
3664.00	--	V	53.98	--	Avg	--	--	No Emissions Found
4580.00	44.35	V	73.98	-29.63	Peak	1.48	88	
4580.00	28.01	V	53.98	-25.97	Avg	1.48	88	
5496.00	--	V	73.98	--	Peak	--	--	No Emissions Found
5496.00	--	V	53.98	--	Avg	--	--	No Emissions Found
6412.00	--	V	73.98	--	Peak	--	--	No Emissions Found
6412.00	--	V	53.98	--	Avg	--	--	No Emissions Found
7328.00	--	V	73.98	--	Peak	--	--	No Emissions Found
7328.00	--	V	53.98	--	Avg	--	--	No Emissions Found
8244.00	--	V	73.98	--	Peak	--	--	No Emissions Found
8244.00	--	V	53.98	--	Avg	--	--	No Emissions Found
9160.00	--	V	73.98	--	Peak	--	--	No Emissions Found
9160.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

HARMONICS HIGH CHANNEL HORIZONTAL Z-AXIS

FCC 15.249

Company:	Nortek	Date:	5/19/2017
EUT:	Zwave/Zigbee Transceiver	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	M. Harrison

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1832.00	--	H	73.98	--	Peak	--	--	No Emissions Found
1832.00	--	H	53.98	--	Avg	--	--	No Emissions Found
2748.00	--	H	73.98	--	Peak	--	--	No Emissions Found
2748.00	--	H	53.98	--	Avg	--	--	No Emissions Found
3664.00	--	H	73.98	--	Peak	--	--	No Emissions Found
3664.00	--	H	53.98	--	Avg	--	--	No Emissions Found
4580.00	40.45	H	73.98	-33.53	Peak	1.22	98	
4580.00	27.39	H	53.98	-26.59	Avg	1.22	98	
5496.00	--	H	73.98	--	Peak	--	--	No Emissions Found
5496.00	--	H	53.98	--	Avg	--	--	No Emissions Found
6412.00	--	H	73.98	--	Peak	--	--	No Emissions Found
6412.00	--	H	53.98	--	Avg	--	--	No Emissions Found
7328.00	--	H	73.98	--	Peak	--	--	No Emissions Found
7328.00	--	H	53.98	--	Avg	--	--	No Emissions Found
8244.00	--	H	73.98	--	Peak	--	--	No Emissions Found
8244.00	--	H	53.98	--	Avg	--	--	No Emissions Found
9160.00	--	H	73.98	--	Peak	--	--	No Emissions Found
9160.00	--	H	53.98	--	Avg	--	--	No Emissions Found

Test distance

HARMONICS HIGH CHANNEL VERTICAL Z-AXIS

FCC 15.249

Company:	Nortek	Date:	5/19/2017
EUT:	Zwave/Zigbee Transceiver	Lab:	P
Model:	2GIG-ZWZB-500	Tested By:	M. Harrison

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV/m)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1832.00	--	V	73.98	--	Peak	--	--	No Emissions Found
1832.00	--	V	53.98	--	Avg	--	--	No Emissions Found
2748.00	--	V	73.98	--	Peak	--	--	No Emissions Found
2748.00	--	V	53.98	--	Avg	--	--	No Emissions Found
3664.00	--	V	73.98	--	Peak	--	--	No Emissions Found
3664.00	--	V	53.98	--	Avg	--	--	No Emissions Found
4580.00	39.62	V	73.98	-34.36	Peak	1.23	118	
4580.00	27.18	V	53.98	-26.80	Avg	1.23	118	
5496.00	--	V	73.98	--	Peak	--	--	No Emissions Found
5496.00	--	V	53.98	--	Avg	--	--	No Emissions Found
6412.00	--	V	73.98	--	Peak	--	--	No Emissions Found
6412.00	--	V	53.98	--	Avg	--	--	No Emissions Found
7328.00	--	V	73.98	--	Peak	--	--	No Emissions Found
7328.00	--	V	53.98	--	Avg	--	--	No Emissions Found
8244.00	--	V	73.98	--	Peak	--	--	No Emissions Found
8244.00	--	V	53.98	--	Avg	--	--	No Emissions Found
9160.00	--	V	73.98	--	Peak	--	--	No Emissions Found
9160.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
3 meter

EMISSIONS RADIATED OUTSIDE OF THE FUNDAMENTAL FREQUENCY BAND

DATA SHEETS

BAND EDGES LOW CHANNEL

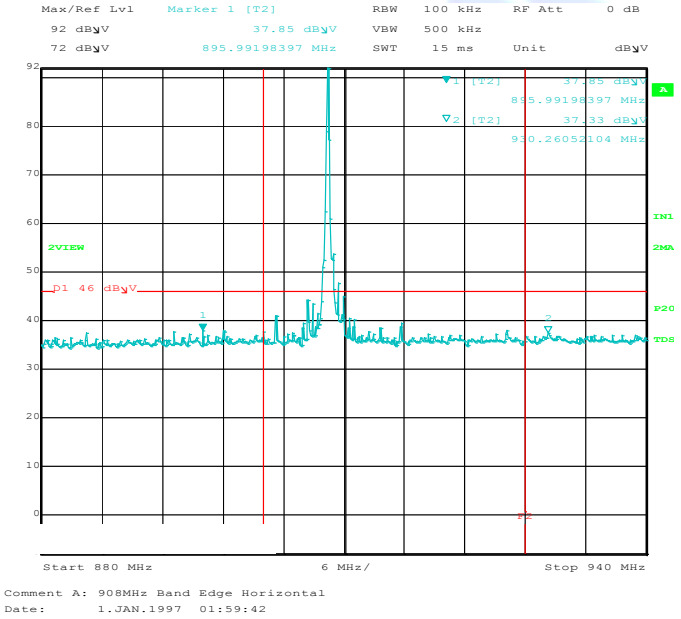
FCC 15.249

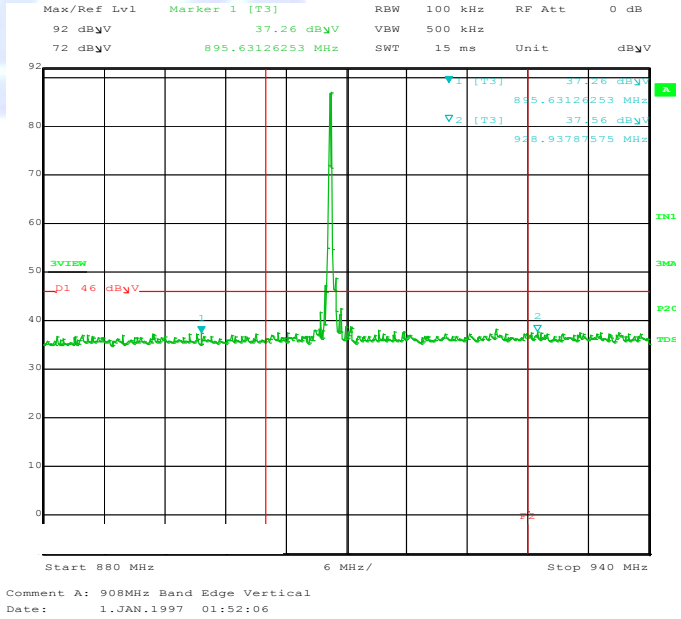
Company:	Nortek	Date:	5/21/2017
EUT:	2GIG Z-Wave-Zigbee	Lab:	P
Model:	2GIG-ZWZB-500	Test ENG:	Torey Oliver

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

Freq. (MHz)	Level (dBµV/m)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
895.99	37.85	H	46.00	-8.15	Peak	1.53	52.00	No Marker Delta
895.63	37.26	V	46.00	-8.74	Peak	1.14	69.00	Method Used
930.26	37.33	H	46.00	-8.67	Peak	1.53	52.00	No Marker Delta
928.94	37.56	V	46.00	-8.44	Peak	1.14	69.00	Method Used

Test distance
3 meter





BAND EDGES HIGH CHANNEL

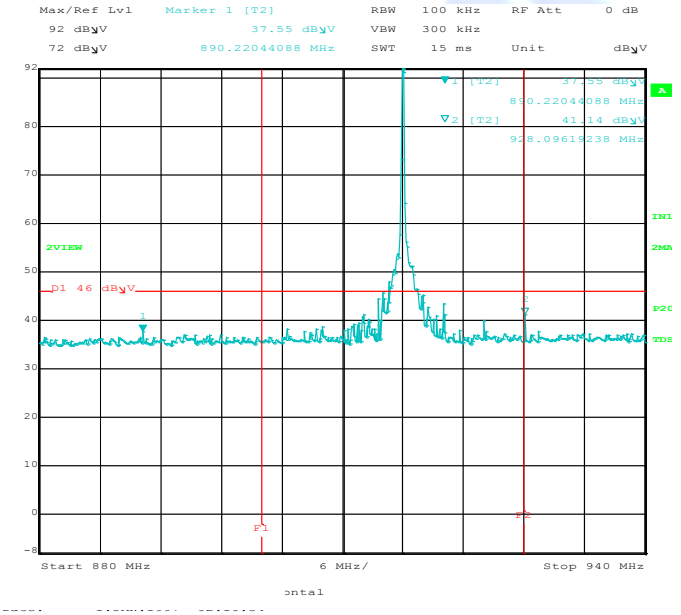
FCC 15.249

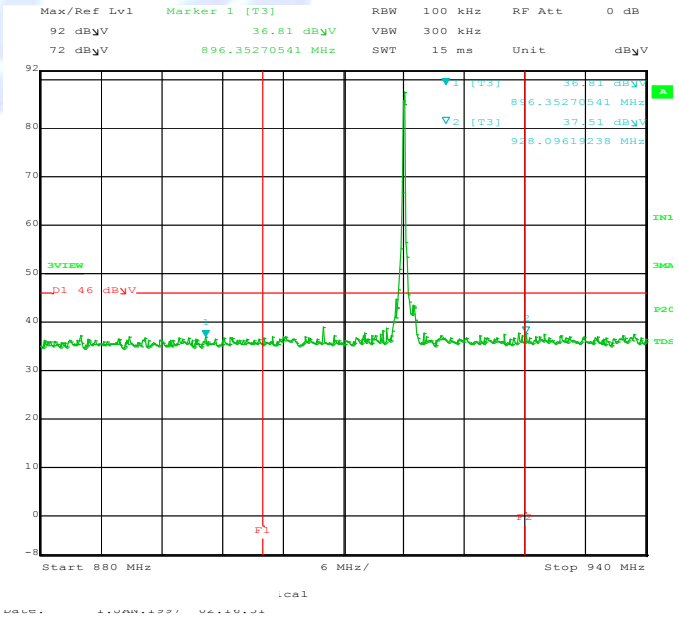
Company:	Nortek	Date:	5/21/2017
EUT:	Zwave/Zigbee Transceiver	Lab:	P
Model:	2GIG-ZWZB-500	Test ENG:	Torey Oliver

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

Freq. (MHz)	Level (dBµV/m)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
890.22	37.55	H	46.00	-8.45	Peak	1.44	337.00	No Marker Delta
896.35	36.81	V	46.00	-9.19	Peak	1.00	247.00	Method Used
928.10	41.14	H	46.00	-4.86	Peak	1.44	337.00	No Marker Delta
928.10	37.51	V	46.00	-8.49	Peak	1.00	247.00	Method Used

Test distance
3 meter





OCCUPIED BANDWIDTH

IC BANDWIDTH

RSS GEN

Company:	Nortek	Date:	5/27/2017
EUT:	2GIG Z-Wave-Zigbee Module	Lab:	R
Model:	2GIG-ZWZB-500	Test ENG:	Torey Oliver

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

Freq. (MHz)	Measured BW (kHz)	Comments
908.40	94.19	99%
916.00	112.22	99%