FCC PART 15, SUBPART C 15.231
TEST REPORT

for

WIRELESS DOOR/WINDOW CONTACT WITH LOCAL BYPASS

MODEL: 2GIG-DW40-345

Prepared for

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

Prepared by:_____

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Approved by:_____

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DATE: FEBRUARY 20, 2015

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Device Tested:	Wireless Door/Window Contact with Local Bypass Model: 2GIG-DW40-345 SN: 11
Product Description:	The 2GIG-DW40-345 Wireless Door/Window Contact has a local bypass feature. This means that the contact allows opening of a protected door or window without sending a signal to the control panel.
Modifications:	The EUT was not modified.
Manufacturer:	Nortek Security & Control 1950 Camino Vida Roble, Suite 150 Carlsbad, CA 92008
Test Date:	February 20 & 24, 2015
Test Specifications:	CFR Title 47, Part 15 Subpart C, Sections 15.205, 15.209 and 15.231
Test Procedure:	ANSI C63.10: 2009
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Radiated RF Emissions, 0.01 - 4000 MHz	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.205 & 15.209
2	-20 dB Occupied Bandwidth of the Emission	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.231.
3	Peak Radiated EMI	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.231.
4	Transmit Timeout	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.231.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Wireless Door/Window Contact With Local Bypass Model: 2GIG-DW40-345. 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 hereafter, are within the specification limits defined by CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209,15.231.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

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

2.2 Traceability Statement

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

2.3 Cognizant Personnel

Nortek Security & Control

Josh Hansen	Regulatory Engineer

Compatible Electronics, Inc.

Matt Harrison	Test Technician
Jeff Klinger	Director of Engineering

2.4 Date Test Sample was Received

The test sample was received on February 20, 2015.

2.5 Disposition of the Test Sample

The sample remains at Compatible Electronics 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
CLA	Cigar Lighter Adaptor
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
CFR Title 47, Part 2	Frequency Allocations And Radio Treaty Matters; General Rules And Regulations
ANSI C63.10 2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description Of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The Wireless Door/Window Contact With Local Bypass Model: 2GIG-DW40-345 (EUT) was set up in a table top configuration. The transmit antenna of the EUT is a PCB trace on the PCB, which is contained inside the plastic housing. The EUT was explored in 3 orthogonal axes (X-axis, Y-axis and Z-axis).

The final test was performed in the worse case emission configuration.

The EUT was continuously transmitting throughout the tests.

The final data was taken in the mode described above in the X-axis configuration. Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

There were no interconnecting cables.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
WIRELESS DOOR/WINDOW CONTACT WITH LOCAL BYPASS (EUT)	NORTEK SECURITY & CONTROL	2GIG-DW40-345	NONE	WDQ-DW40345
3V Battery	RADIO SHACK	N/A	N/A	N/A

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
Computer	Compatible Electronics	N/A	N/A	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100219	9/5/2014	9/5/2015
Combilog Antenna	Com-Power	AC-220	25857	5/21/2014	5/21/2015
Loop Antenna	Com-Power	AL-130	121049	12/6/2013	12/6/2015
Horn Antenna	Com-Power	AH-118	071250	7/1/2014	7/1/2016
Pre Amplifier	Com-Power	PAM-118	443013	4/24/2014	4/24/2015
Antenna Mast	Sunol Sciences Corporation	TWR 95-4	081309-3	N/A	N/A
Turntable	Sunol Sciences Corporation	FM2011VS	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Sciences Corporation	SC104V	081309-1	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 EMI test location.

6.2 EUT Mounting, Bonding and Grounding

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

The EUT was placed in the center of the table, in accordance with ANSI C63.10. The test site receive antenna distance was measured from the closest periphery of the EUT setup.

The EUT was not grounded.

7. TEST PROCEDURES

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

7.1 RF Emissions

7.1.1 Conducted Emissions Test

(This test was not performed.)

The EMI Receiver was used as a measuring meter. A 10 dB attenuation pad was used for the protection of the EMI Receiver input stage. All factors associated with attenuator and cables were recorded into the EMI Software Program accordingly to display the actual corrected measured level. The LISN output was connected to the input of the EMI Receiver. The output of the second LISN was terminated with 50-ohm termination. The effective measurement bandwidth used for the conducted emissions 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 FCC 15.207. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The initial test data was taken in manual mode while scanning the frequency ranges of 0.15 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

Test Results:

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

7.1.2 Radiated Emissions (Spurious and Harmonics) Test

The 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.

The spurious emission frequencies above 1 GHz were investigated with the built-in average detector.

The harmonic emissions frequencies were investigated with the duty cycle correction factor.

The measurement bandwidths and transducers used for the radiated emissions (Spurious) tests were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 1 GHz	100 kHz	CombiLog Antenna
1 GHz to 4 GHz	1 MHz	Horn Antenna

The Semi-Anechoic test site of Compatible Electronics, Inc, Lab R (Lake Forest), was used for all tests. This test sites are set up according to 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. Final data was collected in the worst case 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 loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

7.1.3 Radiated Emissions (Spurious and Harmonics) Test (Continued)

The EUT was continuously transmitting during the test. The EUT was tested at a 3-meter test distance to obtain the final test data. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209 and 15.231. There were no emissions found below 30MHz.

7.1.4 Peak radiated EMI

The EUT was tested at a 3-meter test distance to obtain the final test data. The final qualification data sheets are located in Appendix E. This data also shows compliance at the band edges.

Duty Cycle Correction Factor = -20.00dB

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

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 Type 1 = 40 * 150.701403 µS = 6.028056 mS

Pulse Type 2 = 12 * 283.967936 µS = 3.407615 mS

Total On Time = 6.028056 mS + 3.407615 mS = 9.435671 mS

100ms / 9.435671 = 0.09435671

20 log (0.09435671) = -20.50 dB correction factor

Max Duty Cycle Correction Factor = -20.00dB

Test Results:

The EUT complies with Part 15, Subpart C, section 15.231.

7.1.5 Bandwidth of the Fundamental

The -20 dB bandwidth was checked using the EMI Receiver to see that the emissions were wholly within the 0.25% of the operating frequency centered on the fundamental frequency. The RBW was set to 500 Hz and the VBW was set to 3 kHz. A Plot of the -20 dB bandwidth is located in Appendix E.

Test Results:

The EUT complies with the requirements of CFR Title 47, Part 15, Subpart C, section 15.231 (c) for the -20 dB bandwidth of the fundamental. The EUT has a -20 dB bandwidth that is lies wholly within the 0.25% of the operating frequency centered on the fundamental frequency.

8. CONCLUSIONS

The wireless door/window contact with local bypass Model: 2GIG-DW40-345 meets all of the specification limits defined in CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.209, and 15.231 for the transmitter portion.

APPENDIX A

LABORATORY RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

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

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

NVLAP listing links
Agoura Division / Brea Division / Silverado/Lake Forest Division

.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."

ANSI listing CETCB

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

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).
APEC MRA list NIST MRA site

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

VCCI Support member: Please visit http://www.vcci.jp/vcci_e/

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

Industry Canada Industrie Canada

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

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

No modifications were made to the EUT.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	WIRELESS DOOR/WINDOW CONTACT WITH LOCAL BYPASS Model: 2GIG-DW40-345 S/N: 11

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

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

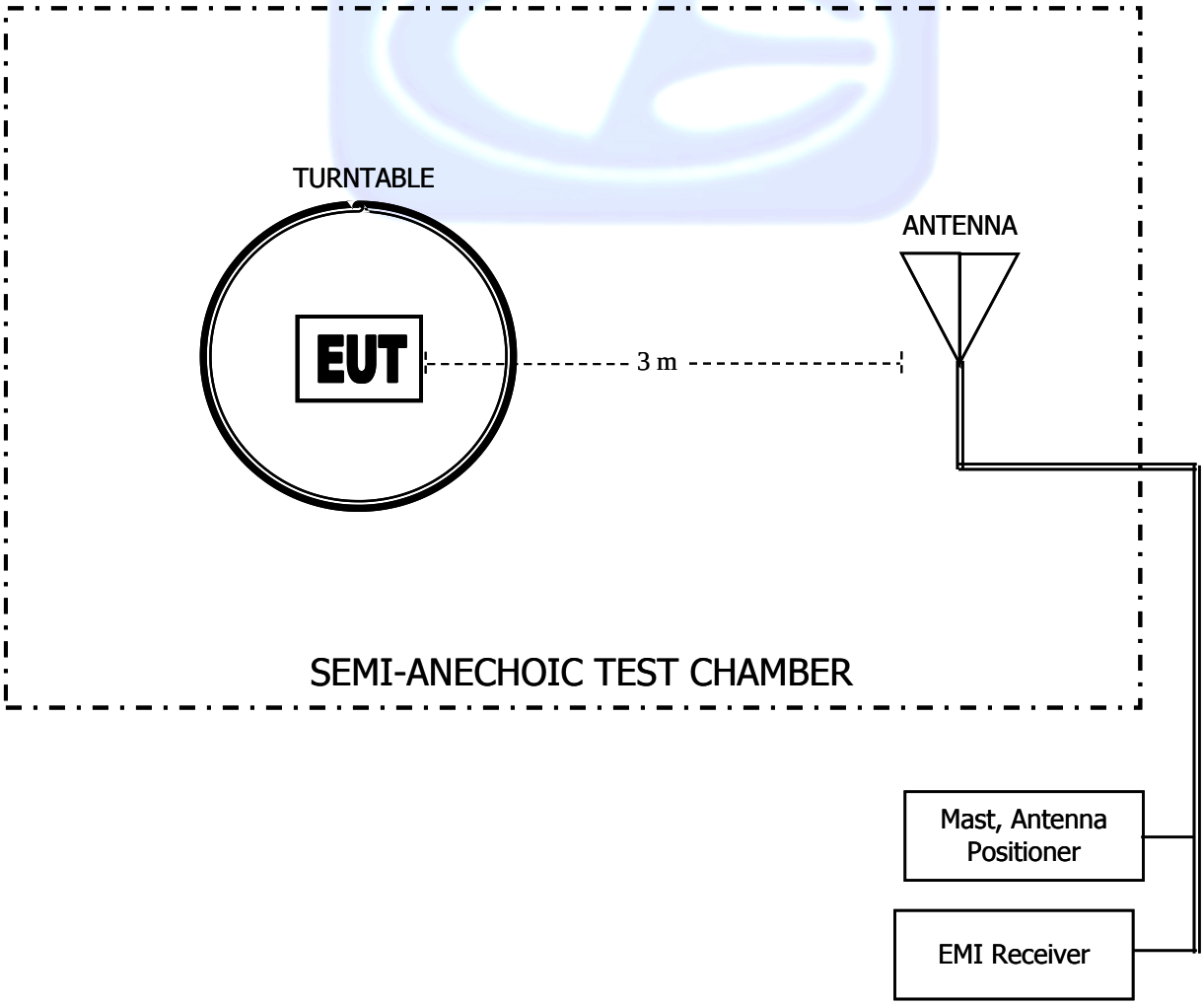
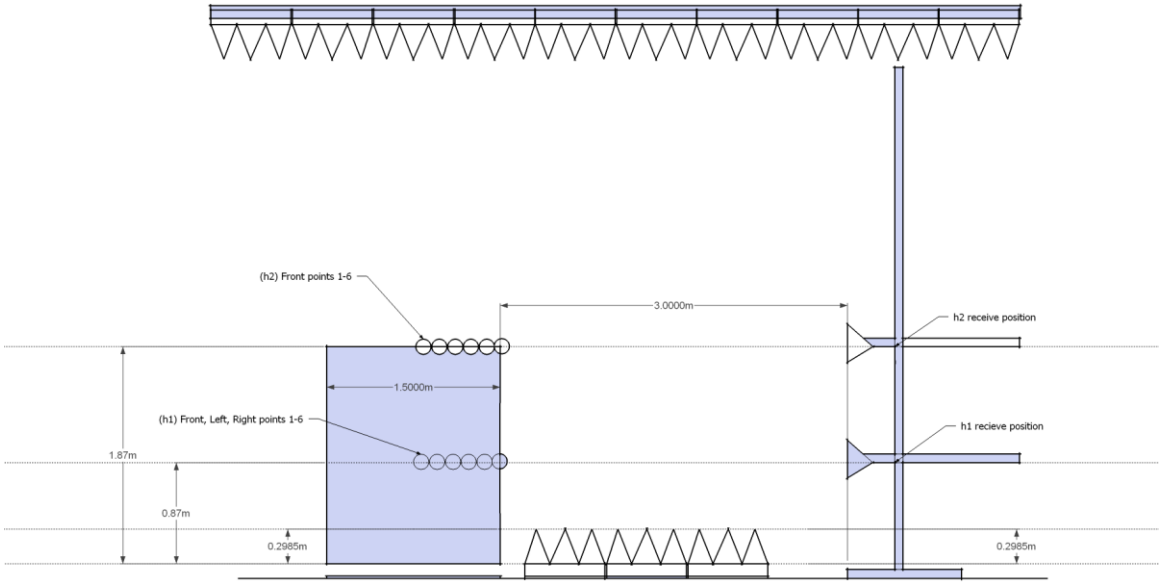


*FIGURE 2: RADIATED EMISSIONS 3-METER SEMI-*ANECHOIC *TEST CHAMBER ABOVE 1 GHz*



COM-POWER AL-130

LOOP ANTENNA

S/N: 121049

CALIBRATION DUE: DECEMBER 6, 2015

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

COM-POWER AC-220

LAB R - COMBILOG ANTENNA

S/N: 25857

CALIBRATION DUE: MAY 21, 2015

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

COM-POWER AH-118

HORN ANTENNA

S/N: 071250

CALIBRATION DUE: JULY 1, 2016

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

COM-POWER PAM-118

1-18GHz - PREAMPLIFIER

S/N: 443013

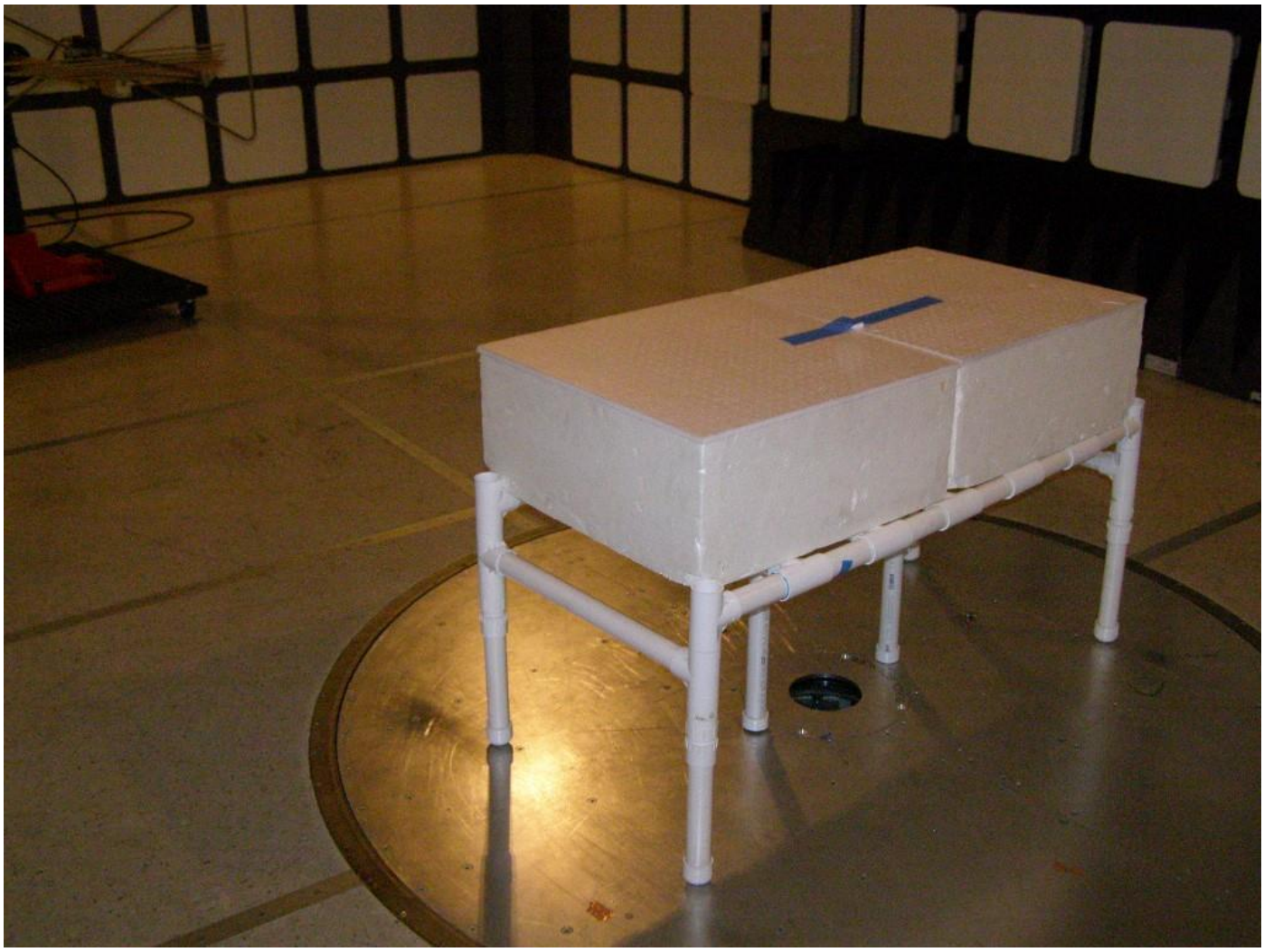
CALIBRATION DUE: APRIL 24, 2015

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
500	26.2	**5500**	25.3
1000	25.6	**6000**	25.0
1100	25.9	**6500**	24.7
1200	25.9	**7000**	23.6
1300	26.3	**7500**	23.3
1400	26.5	**8000**	23.7
1500	26.3	**8500**	24.0
1600	26.1	**9000**	24.3
1700	26.2	**9500**	24.1
1800	26.3	**10000**	23.7
1900	25.8	**11000**	24.2
2000	26.0	**12000**	23.2
2500	26.0	**13000**	22.8
3000	25.8	**14000**	22.6
3500	25.9	**15000**	22.9
4000	26.4	**16000**	22.3
4500	26.0	**17000**	22.6
5000	25.6	**18000**	23.9

VIEW 1
(X-AXIS)

NORTEK SECURITY & CONTROL
WIRELESS DOOR/WINDOW CONTACT WITH LOCAL BYPASS
MODEL: 2GIG-DW40-345
FCC SUBPART B AND C – RADIATED SPURIOUS EMISSIONS BELOW 1GHz

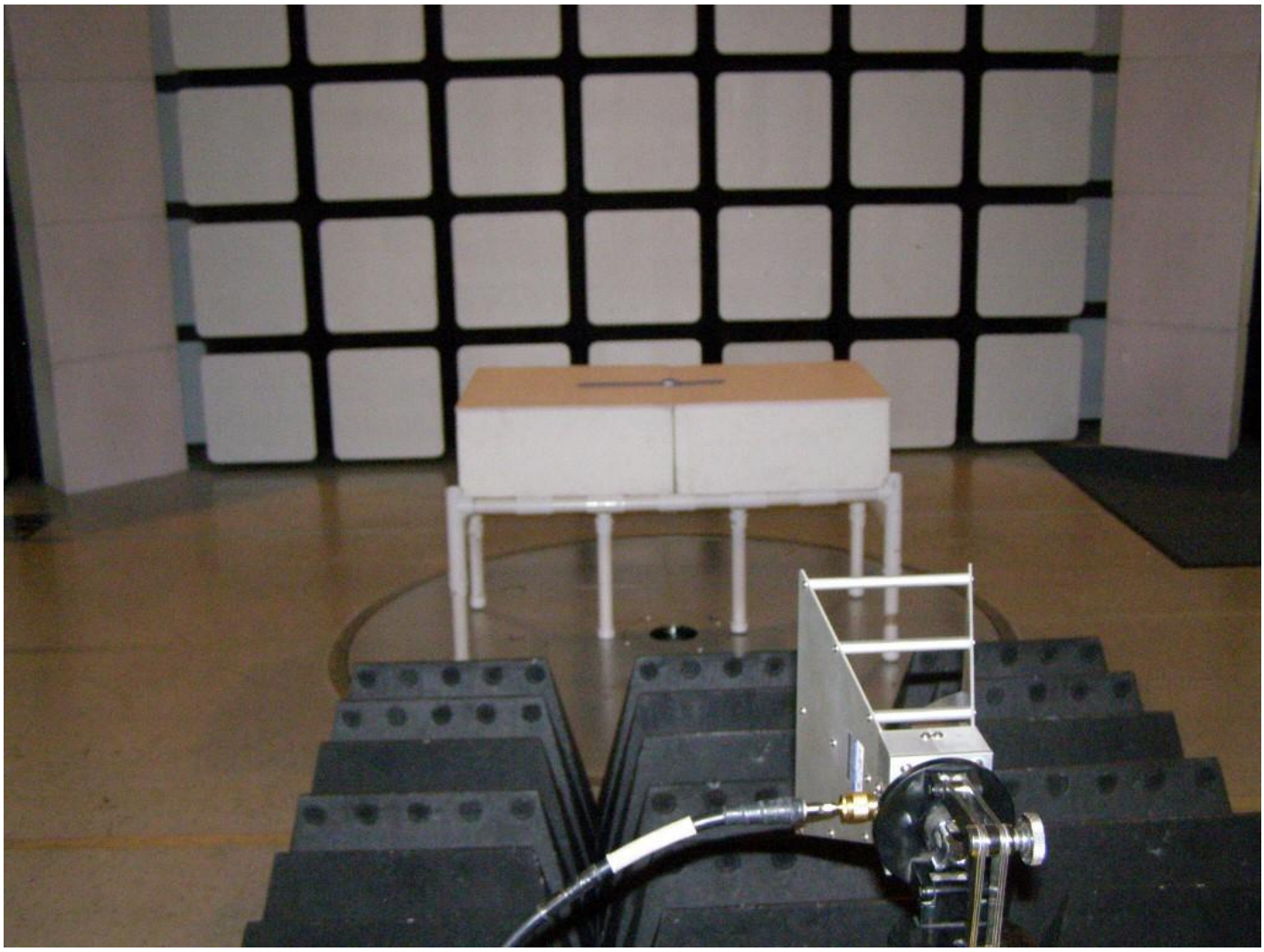
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



VIEW 2
(X-AXIS)

NORTEK SECURITY & CONTROL
WIRELESS DOOR/WINDOW CONTACT WITH LOCAL BYPASS
MODEL: 2GIG-DW40-345
FCC SUBPART B AND C – RADIATED SPURIOUS EMISSIONS BELOW 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



VIEW 1
(X-AXIS)

NORTEK SECURITY & CONTROL
WIRELESS DOOR/WINDOW CONTACT WITH LOCAL BYPASS
MODEL: 2GIG-DW40-345
FCC SUBPART B AND C – RADIATED SPURIOUS EMISSIONS ABOVE 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

VIEW 2
(X-AXIS)

NORTEK SECURITY & CONTROL
WIRELESS DOOR/WINDOW CONTACT WITH LOCAL BYPASS
MODEL: 2GIG-DW40-345
FCC SUBPART B AND C – RADIATED SPURIOUS EMISSIONS ABOVE 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

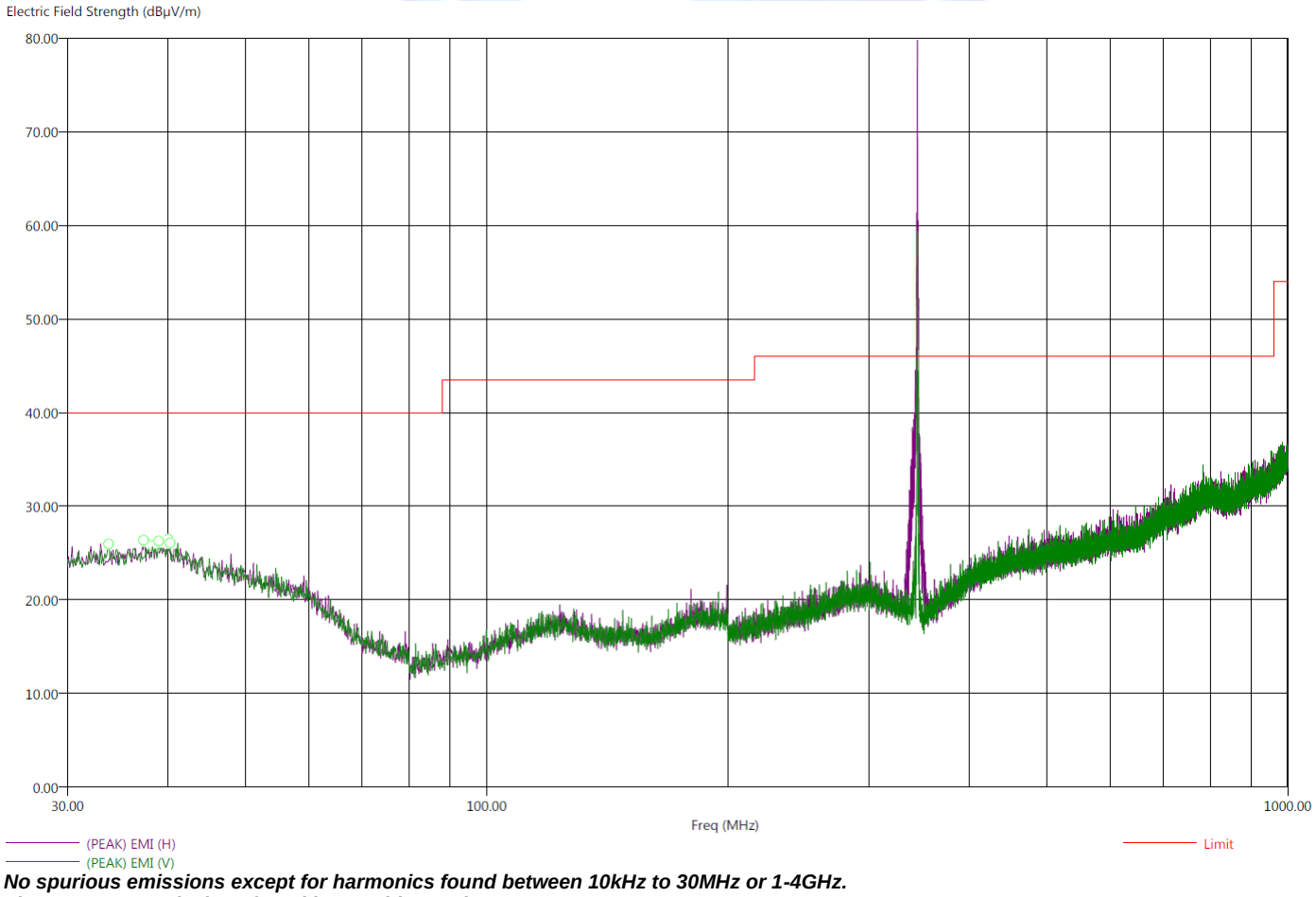
APPENDIX E

DATA SHEETS

RADIATED EMISSIONS
SPURIOUS AND HARMONICS
DATA SHEETS

Title: FCC 15.209 2/20/2015 2:47:03 PM
File: Radiated Pre-Scan 30-1000Mhz.set Sequence: Preliminary Scan
Operator: Matt Harrison
EUT Type: 2GIG-DW40-345.
EUT Condition: Transmitting 345 MHz.
Comments: X-Axis
Temp: 68f
Hum: 43%
Battery Powered

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



No spurious emissions except for harmonics found between 10kHz to 30MHz or 1-4GHz.
There were no emissions found in stand-by mode

Title: FCC 15.209 2/20/2015 3:10:27 PM
File: Radiated Final 30-1000Mhz.set Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: 2GIG-DW40-345.
EUT Condition: Transmitting 345 MHz.
Comments: X-Axis
Temp: 68f
Hum: 43%
Battery Powered

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

Freq (MHz)	(QP)Margin (dB)	(QP)EMI (dBµV/m)	(PEAK)EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable (dB)
33.80	-20.26	19.74	24.47	40.00	V	231.50	146.38	22.50	0.94
37.40	-19.64	20.36	25.66	40.00	H	319.50	210.08	22.75	1.16
38.40	-19.50	20.50	25.76	40.00	H	103.50	125.61	22.84	1.21
39.00	-19.32	20.68	26.76	40.00	V	54.00	288.65	22.91	1.25
40.10	-19.15	20.85	25.87	40.00	H	283.75	158.56	22.98	1.29
40.30	-19.19	20.81	25.95	40.00	V	170.50	400.00	22.91	1.26

No spurious emissions except for harmonics found between 10kHz to 30MHz or 1-4GHz.
There were no emissions found in stand-by mode

HARMONICS - HORIZONTAL

FCC 15.231

Company: Nortek
EUT: Door/Window Sensor
Model: 2GIG-DW40-345
Duty Cycle Correction Factor: -20.00

Date: 2/20/2015
Lab: R
Tested By: Matt Harrison

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
690.00	--	H	--	--	Peak	--	--	No Emissions Found
690.00	--	H	--	--	Avg	--	--	No Emissions Found
1035.00	38.22	H	73.98	-35.76	Peak	1.18	139	In Restricted Band
1035.00	18.22	H	53.98	-35.76	Avg	1.18	139	
1380.00	--	H	73.98	--	Peak	--	--	In Restricted Band
1380.00	--	H	53.98	--	Avg	--	--	No Emissions Found
1725.00	50.01	H	77.26	-27.25	Peak	1.08	128	
1725.00	30.01	H	57.26	-27.25	Avg	1.08	128	
2070.00	55.91	H	77.26	-21.35	Peak	3.58	315	
2070.00	35.91	H	57.26	-21.35	Avg	3.58	315	
2415.00	58.79	H	77.26	-18.47	Peak	1.38	289	
2415.00	38.79	H	57.26	-18.47	Avg	1.38	289	
2760.00	56.50	H	73.98	-17.48	Peak	2.17	31	In Restricted Band
2760.00	36.50	H	53.98	-17.48	Avg	2.17	31	
3105.00	63.49	H	77.26	-13.77	Peak	1.14	156	
3105.00	43.49	H	57.26	-13.77	Avg	1.14	156	
3450.00	59.29	H	77.26	-17.97	Peak	1.79	37	
3450.00	39.29	H	57.26	-17.97	Avg	1.79	37	

Test distance
3 meter

HARMONICS - VERTICAL

FCC 15.231

Company: Nortek
EUT: Door/Window Sensor
Model: 2GIG-DW40-345
Duty Cycle Correction Factor: -20.00

Date: 2/20/2015
Lab: R
Tested By: Matt Harrison

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
690.00	--	V	--	--	Peak	--	--	No Emissions Found
690.00	--	V	--	--	Avg	--	--	No Emissions Found
1035.00	41.54	V	73.98	-32.44	Peak	1.19	2	In Restricted Band
1035.00	21.54	V	53.98	-32.44	Avg	1.19	2	
1380.00	--	V	73.98	--	Peak	--	--	In Restricted Band
1380.00	--	V	53.98	--	Avg	--	--	No Emissions Found
1725.00	50.01	V	77.26	-27.25	Peak	1.08	128	
1725.00	30.01	V	57.26	-27.25	Avg	1.08	128	
2070.00	51.57	V	77.26	-25.69	Peak	2.92	48	
2070.00	31.57	V	57.26	-25.69	Avg	2.92	48	
2415.00	49.74	V	77.26	-27.52	Peak	1.25	56	
2415.00	29.74	V	57.26	-27.52	Avg	1.25	56	
2760.00	55.98	V	73.98	-18.00	Peak	2.17	31	In Restricted Band
2760.00	35.98	V	53.98	-18.00	Avg	2.17	31	
3105.00	62.54	V	77.26	-14.72	Peak	1.20	66	
3105.00	42.54	V	57.26	-14.72	Avg	1.20	66	
3450.00	55.07	V	77.26	-22.19	Peak	1.38	329	
3450.00	35.07	V	57.26	-22.19	Avg	1.38	329	

Test distance
3 meter

-20 dB BANDWIDTH

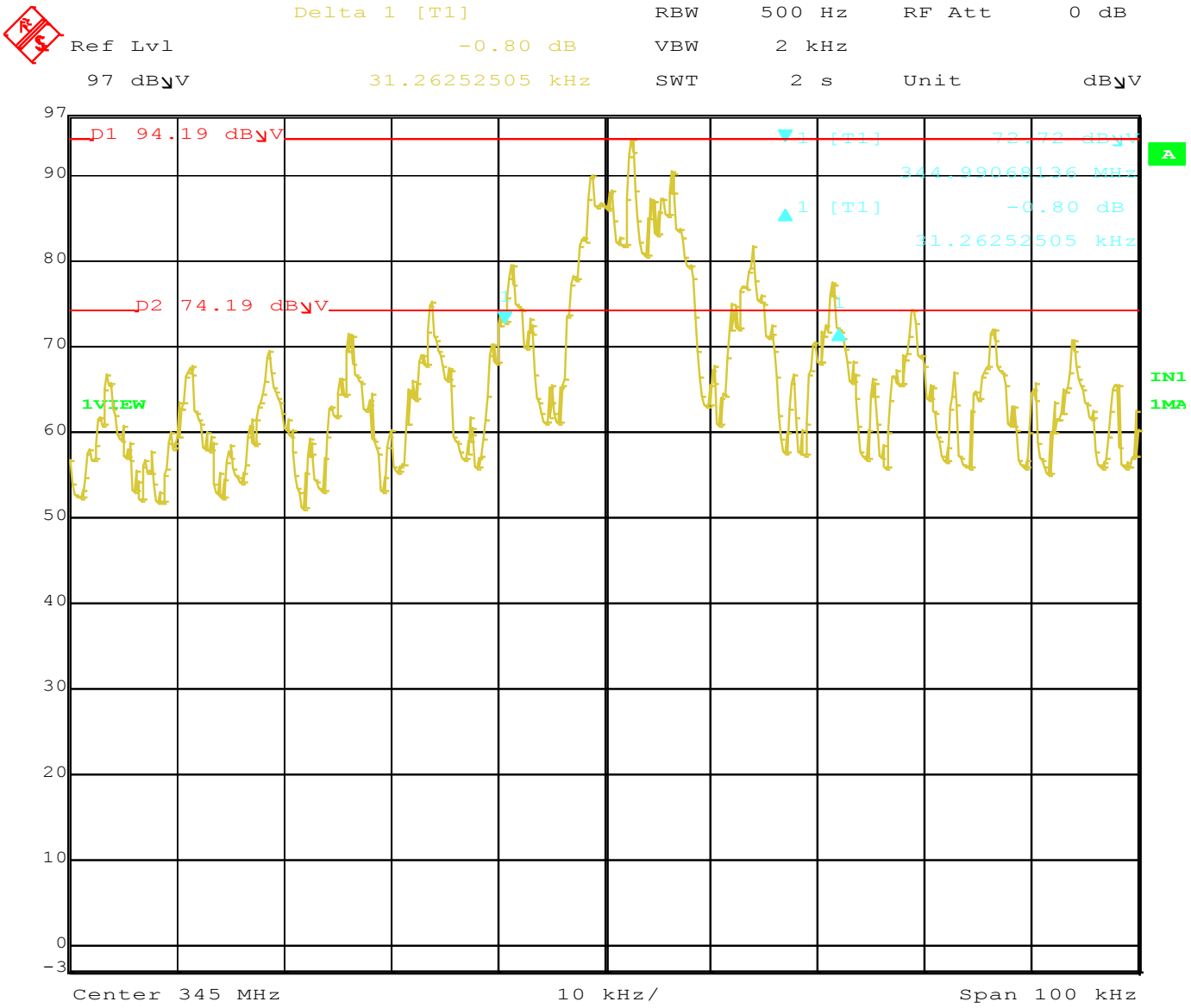
DATA SHEETS

Title: FCC 15.231 2/24/2014 13:12:33 PM
File: 2GIG-DW40-345 -20dB occupied Bandwidth
Operator: Matt Harrison
EUT Type: 2GIG-DW40-345
EUT Condition: Continuously Transmitting
Temp: 68f
Hum: 43%

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

Freq (MHz)	BW (kHz)	Limit (kHz)	Margin (kHz)
345.00	31.26	862.50	-831.24

-20 dB Occupied Bandwidth Plot



Title: 2GIG-DW40-345
Comment A: 20dB Bandwidth.
Date: 24.FEB.2015 13:12:33

PEAK TRANSMIT EMI

DATA SHEETS

FCC 15.231

Company: Nortek
EUT: Door/Window Sensor
Model: 2GIG-DW40-345
Duty Cycle Correction Factor: -20.00

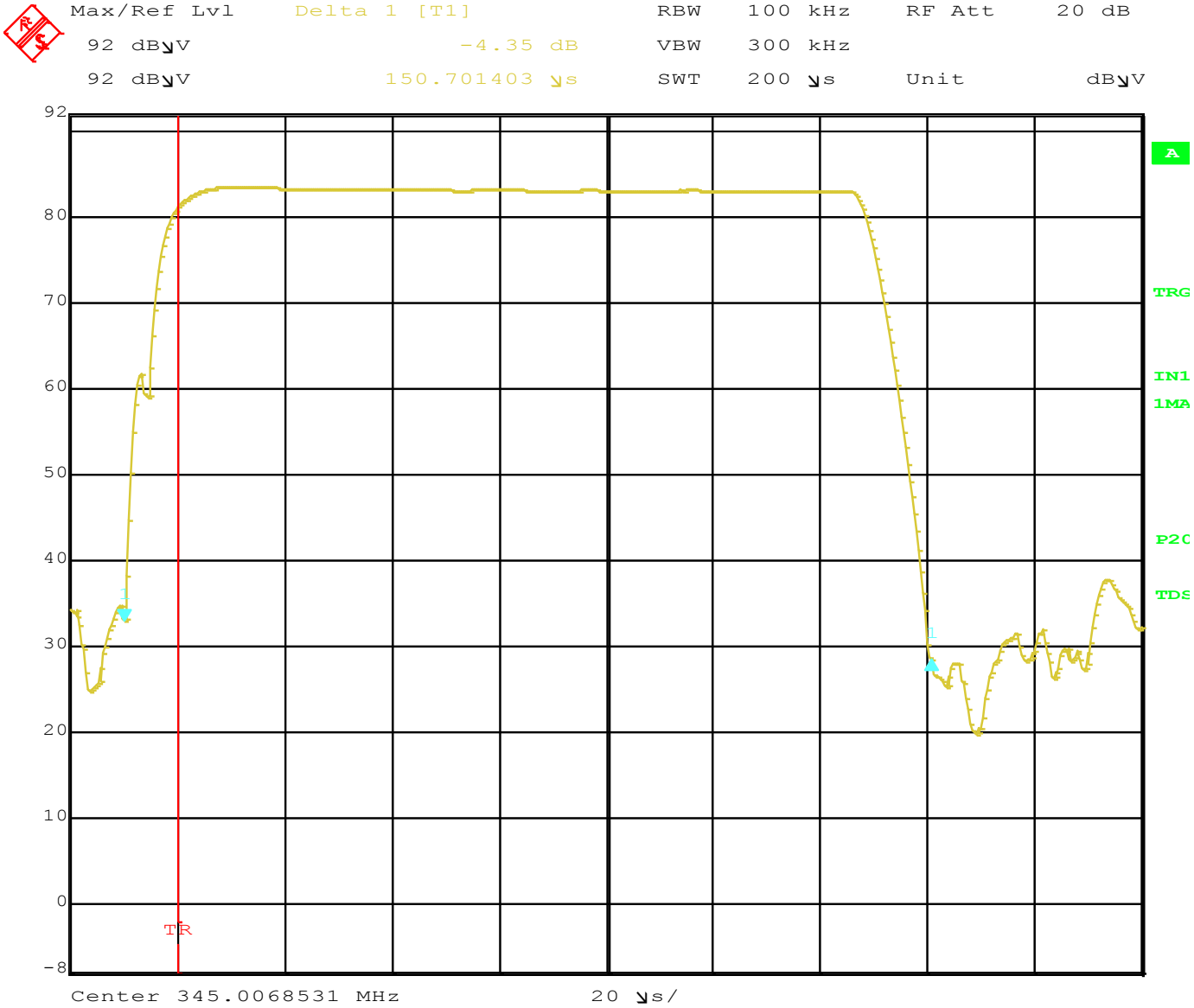
Date: 2/20/2015
Lab: R
Tested By: Matt Harrison

Compatible Electronics, Inc. FAC-3

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table	Tower	Comments
345.00	83.70	H	97.26	-13.56	Peak	240.00	1.00	X-Axis
345.00	63.70	H	77.26	-13.56	Avg	240.00	1.00	X-Axis
345.00	68.87	V	97.26	-28.39	Peak	345.00	1.40	X-Axis
345.00	48.87	V	77.26	-28.39	Avg	345.00	1.40	X-Axis

Test distance
3 meter

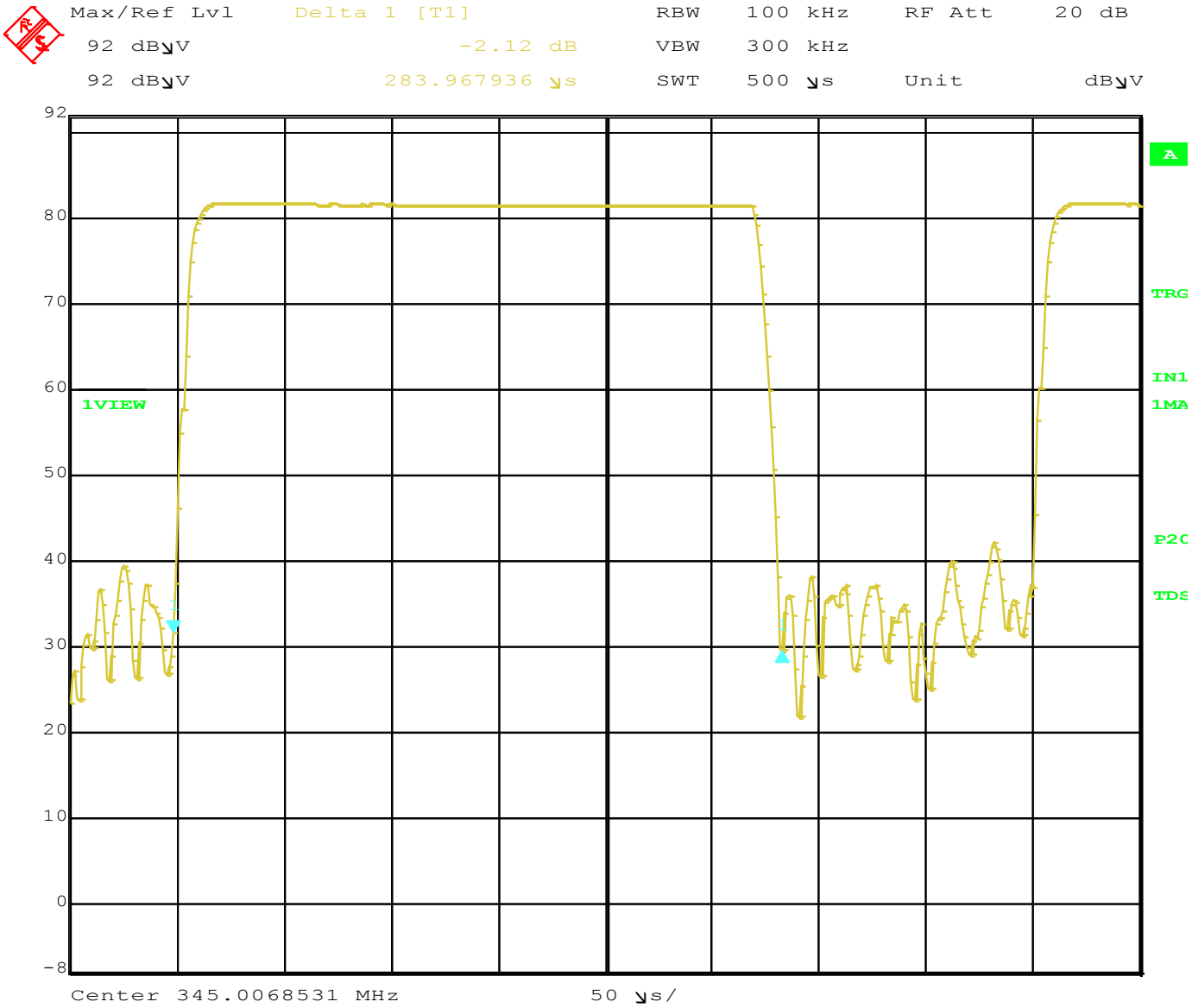
DUTY CYCLE



Title: 2GIG-DW40-345.
Comment A: Duty Cycle.
Date: 20.FEB.2015 13:46:00

Time of Pulse 1 = 150.701403 µS

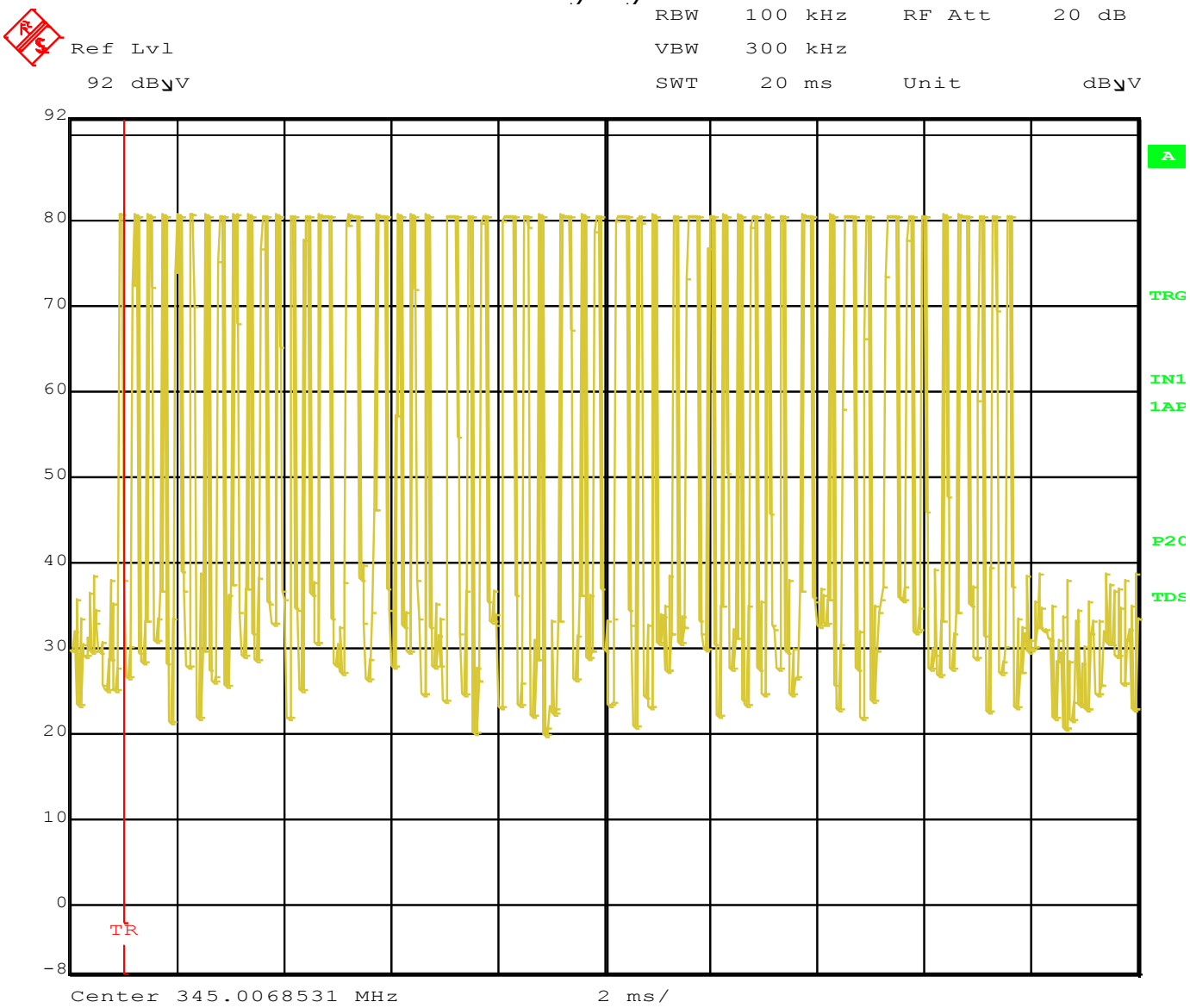
DUTY CYCLE



Title: 2GIG-DW40-345.
Comment A: Duty Cycle.
Date: 20.FEB.2015 13:49:22

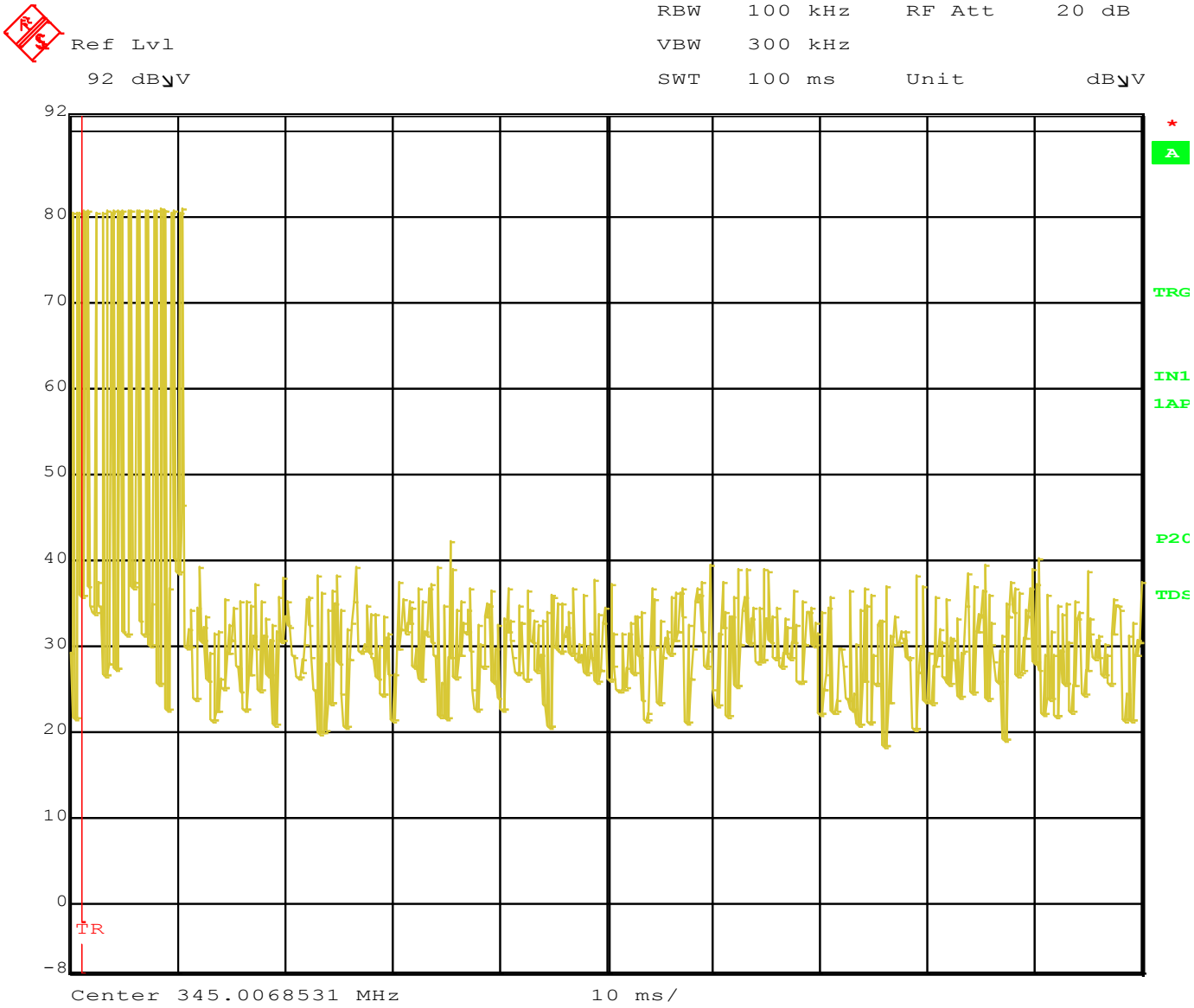
Time of Pulse 2 = 283.967936 µS

Duty Cycle



Title: 2GIG-DW40-345.
Comment A: Duty Cycle.
Date: 20.FEB.2015 13:42:44

Duty Cycle



Title: 2GIG-DW40-345.
Comment A: Duty Cycle.
Date: 20.FEB.2015 13:41:31

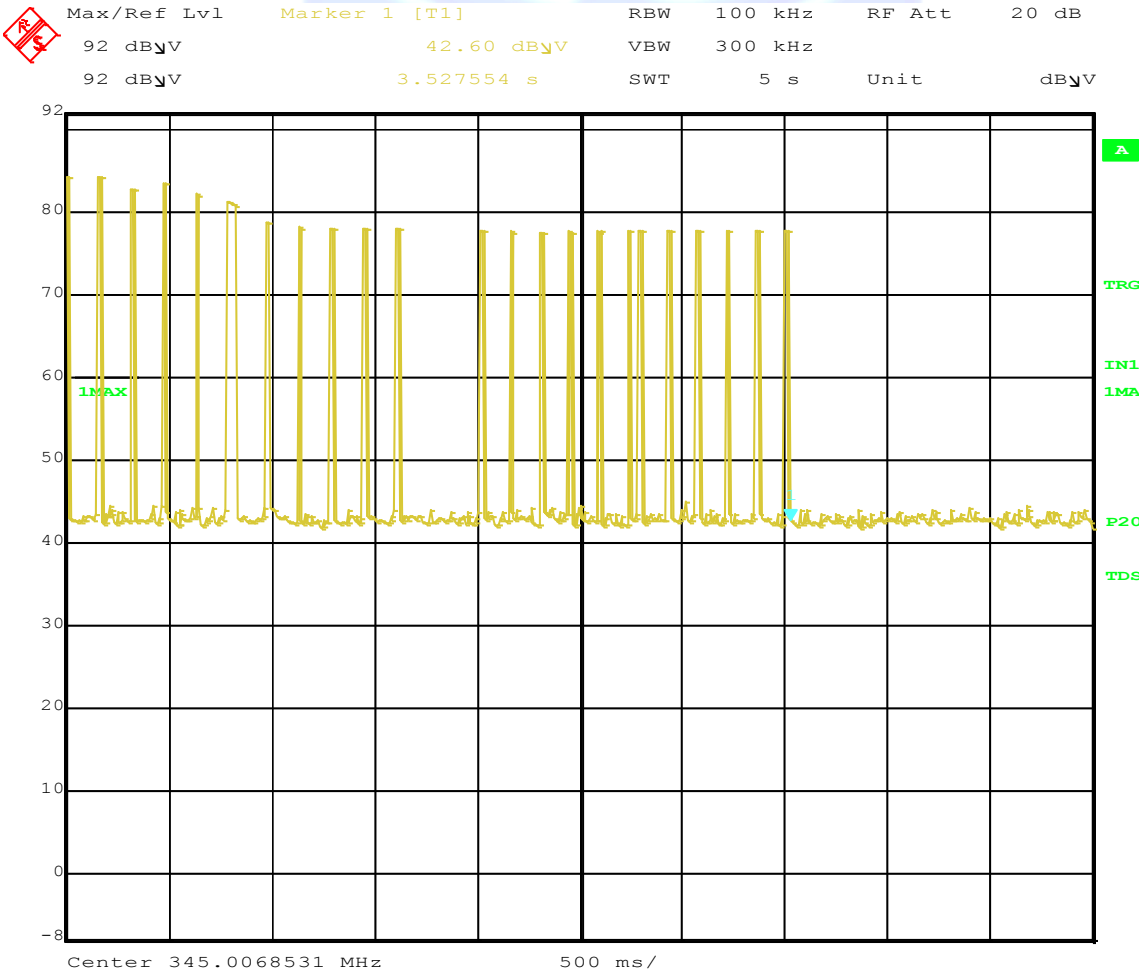
Number of Pulse Type 1 Pulses in Worst Case 100 mS = 40
Number of Pulse Type 2 Pulses in Worst Case 100 mS = 12
Pulse Type 1 On Time = 150.701403 µS*40 = 6.028056 mS
Pulse Type 2 On Time = 283.967936 µS*12 = 3.407615 mS
Duty Cycle = 6.028056 + 3.407615 = 9.435671 mS / 100 mS = 0.09435671
The Peak to Average Duty Cycle Correction = -20.50dB
Max Duty Cycle Correction Factor = -20.00dB

DURATION TIME

FCC 15.231

Company:	Nortek	Date: 2/20/2015
EUT:	Door/Window Sensor	Lab: R
Model:	2GIG-DW40-345	Tested By: Matt Harrison

Freq. (MHz)	Time (S)	Limit (S)	Margin	Comments
345.00	3.527554	5	-1.472446	



Title: 2GIG-DW40-345.
Comment A: Transmit Timeout.
Date: 20.FEB.2015 14:02:29

Supervisory signal on time = 9.435671 mS * 23 = 217.020433 mS in a 60 minute period.