FCC PART 15 SUBPART B, SUBPART C SECTION 15.231,
RSS GEN, & RSS 210
TEST REPORT

for

FLOOD AND TEMP SENSOR
Model: 2GIG-FT1-345

Prepared for

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

Prepared by:____

MATT HARRISON

Reviewed by:_____

TOREY OLIVER

COMPATIBLE ELECTRONICS INC.
20621 PASCAL WAY
LAKE FOREST, CALIFORNIA 92630
(949) 587-0400

DATE: MARCH 11, 2016

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
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1	Plot Map And Layout of Test Site Below 1GHz
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GENERAL REPORT SUMMARY

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

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full with the written permission of Compatible Electronics.

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

Device Tested:	Flood and Temp Sensor Model: 2GIG-FT1-345 S/N: None
Product Description:	The Flood and Temperature sensor, 2GIG-FT1-345, is a fully supervised, tamper protected, one-way 345MHz peripheral that will monitor the ambient temperature and will detect a flood condition. The 2GIG-FT1-345 reports high or low temperature, the presences of water, tamper, low battery or failure of the flood sensor probe to the control panel.
Modifications:	The EUT was not modified in order to comply with specifications.
Manufacturer:	Nortek Security & Control 1950 Camino Vida Roble, Suite 150 Carlsbad, CA 92008
Test Dates:	March 10 & 11, 2016
Test Specifications:	EMI requirements CFR Title 47, Part 15 Subpart C Sections 15.205, 15.207, 15.209 and 15.231 RSS GEN & RSS 210
Test Procedure:	ANSI C63.4 & C63.10

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz.	The EUT is battery powered; therefore this test was deemed unnecessary and thus was not performed.
2	Radiated RF Emissions & Harmonics, 9 kHz – 3,450 MHz.	Complies with the limits of CFR Title 47, Part 15 Subpart C Section 15.209, 15.231, & RSS GEN.
3	-20 dB Occupied Bandwidth of the Emission	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.231 & RSS 210.
4	Peak Radiated EMI	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.231 & RSS 210.
5	Transmit Timeout	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.231 & RSS 210.

TABLE 1
SIX HIGHEST RADIATED EMISSIONS READINGS

	Reading Type (PK / QP / AV)	Polarization (Vert / Horz)	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Delta (dB)	Test Distance
1	AV	H	2760.00	50.98	53.98	-3.00	3-Meter
2	AV	H	345.00	72.83	77.26	-4.43	3-Meter
3	AV	H	3450.00	51.56	57.26	-5.70	3-Meter
4	AV	V	345.00	69.90	77.26	-7.36	3-Meter
5	AV	H	3105.00	48.58	57.26	-8.68	3-Meter
6	AV	V	2760.00	42.35	53.98	-11.63	3-Meter

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Flood and Temp Sensor Model: 2GIG-FT1-345. 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 (equipment under test) hereafter, are within the specification limits defined by the Code of Federal Regulations Title 47, Part 15 Subpart B section 15.109, Subpart C sections 15.205, 15.209. 15.231, RSS GEN, & RSS 210.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

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

2.2 Traceability Statement

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

2.3 Cognizant Personnel

Nortek

Verdin Orozco	Sr. Regulatory Compliance Engineer

Compatible Electronics, Inc.

Matt Harrison	Lab Manager
Torey Oliver	Test Technician

2.4 Date Test Sample was Received

The test sample was received on March 10th, 2016.

2.5 Disposition of the Test Sample

The test sample remains at Compatible Electronics, Inc. as of the date of this test report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
PCB	Printed Circuit Board
TX	Transmit
RX	Receive

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4 2014	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.
ANSI C63.10: 2013	American National Standard for Testing Unlicensed Wireless Devices
RSS GEN	General Requirements for Compliance of Radio Apparatus
RSS 210	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

4. DESCRIPTION OF TEST CONFIGURATION

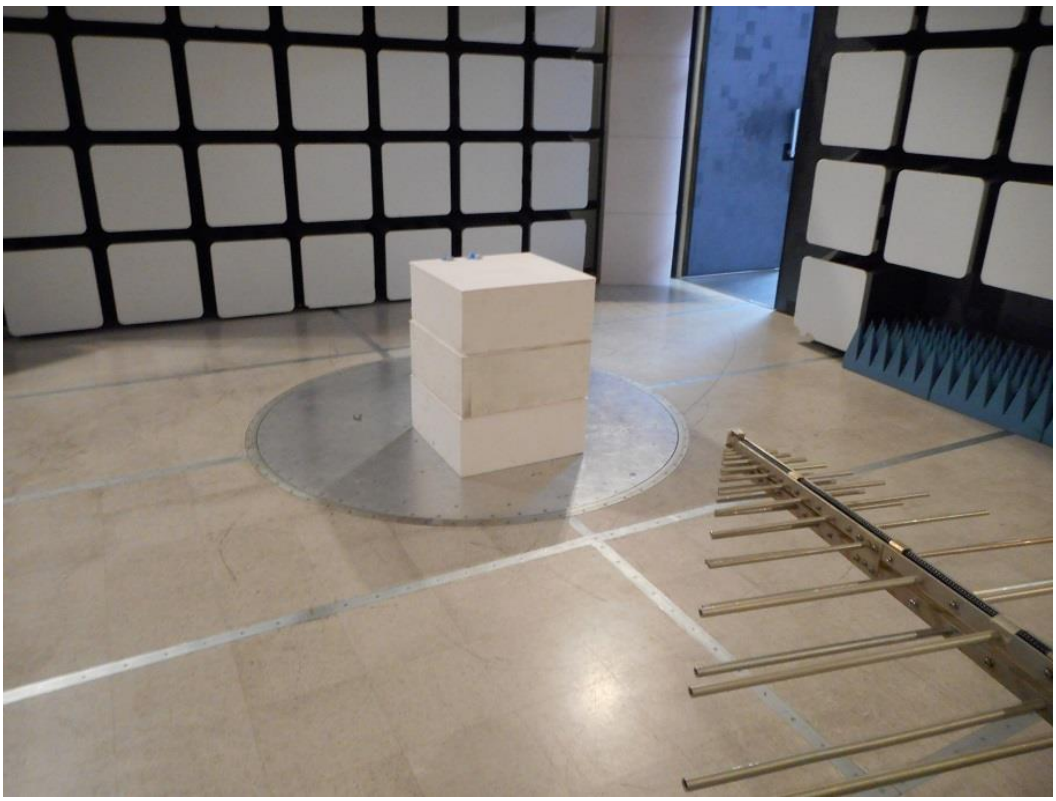
4.1 Description of Test Configuration

The Flood and Temp Sensor Model: 2GIG-FT1-345 (EUT) was setup in a tabletop configuration. It was connected to the physical sensor via hardwired connection. The EUT was checked all 3 axes. The worst case was found to be the X-Axis. The EUT was continuously transmitting during the tests.

The EUT was tested with a new battery.

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 Cable Construction and Termination

Cable 1:

This is a 1-meter, round, unshielded cable connecting the EUT to the physical sensor. It was hardwired into both ends 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	FLOOD AND TEMP SENSOR (EUT)	NORTEK	2GIG-FT1-345	NONE
2	PHYSICAL SENSOR	NORTEK	NONE	NONE
3	BATTERY	DURACELL	CR2	NONE

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	Compatible Electronics	NONE	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100172	09/22/2015	09/22/2016
MXE Receiver	Keysight	N9038A	MY51210150	12/29/2015	12/29/2016
Antenna, Loop	Com Power	AL-130	121049	12/06/2014	12/06/2016
Antenna, CombiLog	Com Power	AC-220	003	05/21/2014	05/21/2016
Antenna, Horn 1-18GHz	Com Power	AH-118	071225	07/01/2014	07/01/2016
Mast, Antenna Positioner	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Antenna Mast	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Turntable	Sunol Science Corporation	FM 2001	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Science Corporation	SC104V	020808-1	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and the figures in Appendix D of this report for test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted 1.0 meter high on a non-conductive surface, which was placed above the ground plane.

For above 1GHz the EUT was mounted on a 1.5 meter high non-conductive tabletop, which was placed on the ground plane.

The EUT was not grounded.

6.3 Facility Environmental Characteristics

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

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Number and Frequencies

The EUT has one operating channel and the EUT has OOK modulation. The EUT has a fixed output power.

1 == 345 MHz

7.2 Antenna

The antenna is made up of a wire soldered to the PCB.

8. TEST PROCEDURES

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

8.1 RF Emissions

8.1.1 Conducted Emissions Test

Test Results: *The EUT is battery operated; therefore, this test was deemed unnecessary and thus was not performed.*

The EMI receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. The LISN output was measured using the EMI receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The EUT received its power through the LISN, which was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI 63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the computer software.

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.

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

For the Fundamental & Harmonic emissions a duty cycle average was used.

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

FREQUENCY RANGE (MHz)	TRANSDUCER	EFFECTIVE MEASUREMENT BANDWIDTH
.009 to .150	Active Loop Antenna	200 Hz
.150 to 30	Active Loop Antenna	9 kHz
30 to 1000	Combilog Antenna	100 kHz (120kHz for QP Measurements)
1000 to 3450	Horn Antenna	1 MHz

The TDK FAC-3 shielded test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.4 & ANSI C63.10. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters in both vertical and horizontal polarizations (for E field radiated field strength).

Test Results:

The EUT complies with the limits of CFR Title 47 Part 15 Subpart B section 15.109, Subpart C sections 15.205, 15.209, 15.231, RSS GEN & RSS 210. The six highest emissions are listed in table 1.

8.1.3 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 = 44 * 150.701403 µS = 6630.862 µS

Pulse Type 2 = 10 * 287.274549 µS = 2872.745 µS

2872.745 µS + 6630.862 = 9.503607 mS

Total On Time = 9.503607 mS

Pulse train greater than 100 mS; therefore 100mS was used

9.503607 / 100mS = 0.095

20 log (0.095) = -20.44 dB correction factor

Max Duty Cycle Correction Factor = -20dB

Test Results:

The EUT complies with Part 15, Subpart C, section 15.231 & RSS 210.

8.1.4 Bandwidth of the Fundamental

The -20 dB bandwidth was checked using the MXE 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 1-5% of the occupied bandwidth and the VBW was set to approximately three times the RBW. The span was to between two and five times the occupied bandwidth. 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.

8.1.5 Occupied Bandwidth

The occupied bandwidth was checked using the 99% Bandwidth function on the MXE Receiver. The RBW was set to 1-5% of the occupied bandwidth and the VBW was set to approximately three times the RBW. The span was to between two and five times the occupied bandwidth. A Plot of the Occupied Bandwidth is located in Appendix E.

Test Results:

The EUT complies with the requirements of RSS GEN 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.

8.1.6 Transmit Timeout

The Transmit timeout test was performed using the EMI Receiver to make sure the transmission coming from the transmitter would cease within 5 seconds after the activation. A Plot of the transmission duration 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) & RSS 210 for Transmit Timeout less than 5 seconds.

9. TEST PROCEDURE DEVIATIONS

The test procedures were not deviated from throughout all tests.

10. CONCLUSIONS

The Flood and Temp Sensor Model: 2GIG-FT1-345 meets all of the relevant specification requirements defined in the Code of Federal Regulations Title 47, Part 15 Subpart B section 15.109, Subpart C sections 15.205, 15.207, 15.209, 15.231, RSS GEN, & RSS 210.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

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

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

NVLAP listing links

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

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

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

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

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

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

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

Industry Canada Industrie Canada

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

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

There were no modifications were made during testing.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	FLOOD AND TEMP SENSOR Model: 2GIG-FT1-345 S/N: None

No additional models were tested.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

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

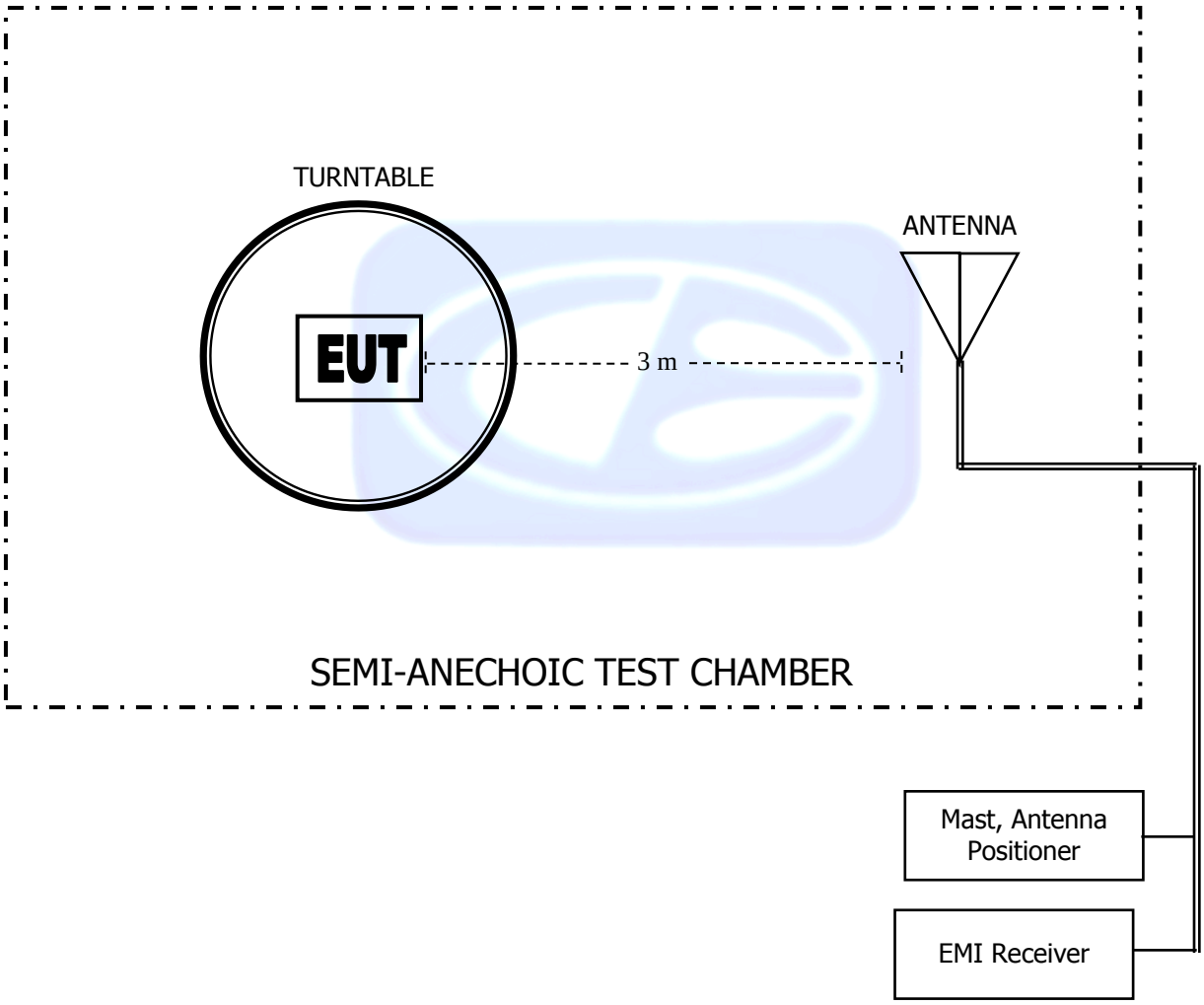
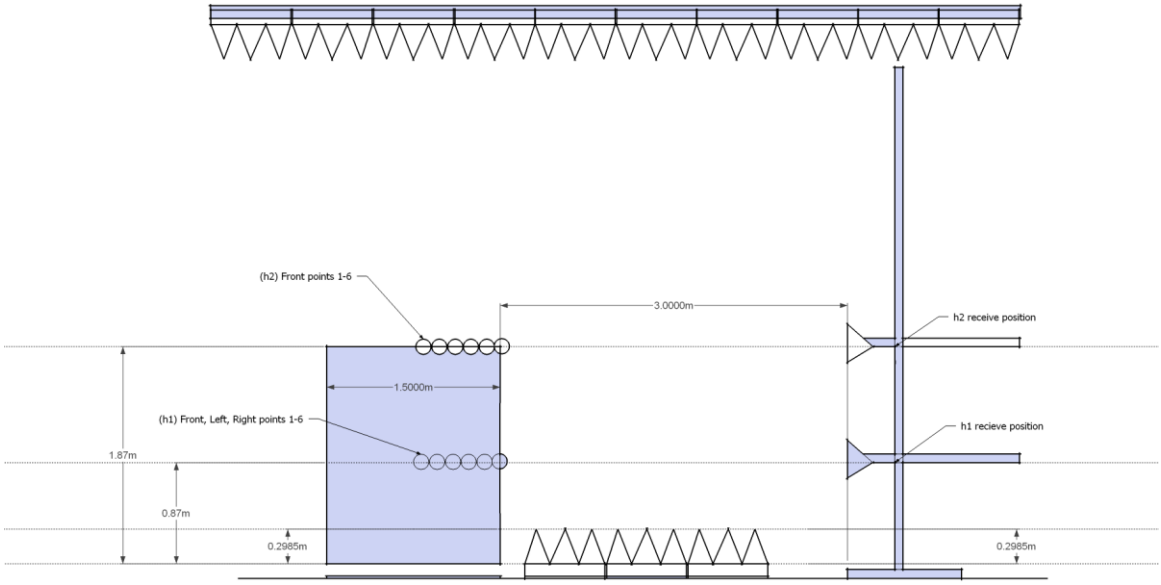


FIGURE 2: PLOT MAP AND LAYOUT OF TEST SITE ABOVE 1GHZ



COM-POWER AL-130

LOOP ANTENNA

S/N: 121049

CALIBRATION DUE: DECEMBER 6, 2016

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

COM-POWER AC-220

LAB P - COMBILOG ANTENNA

S/N: 003

CALIBRATION DUE: MAY 21, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	22.90	**160**	15.20
35	22.80	**180**	14.40
40	23.50	**200**	14.10
45	21.90	**250**	15.90
50	22.00	**300**	18.20
60	18.10	**400**	19.40
70	12.80	**500**	21.50
80	12.10	**600**	22.00
90	12.70	**700**	23.90
100	13.00	**800**	25.80
120	15.50	**900**	27.00
140	14.40	**1000**	27.90

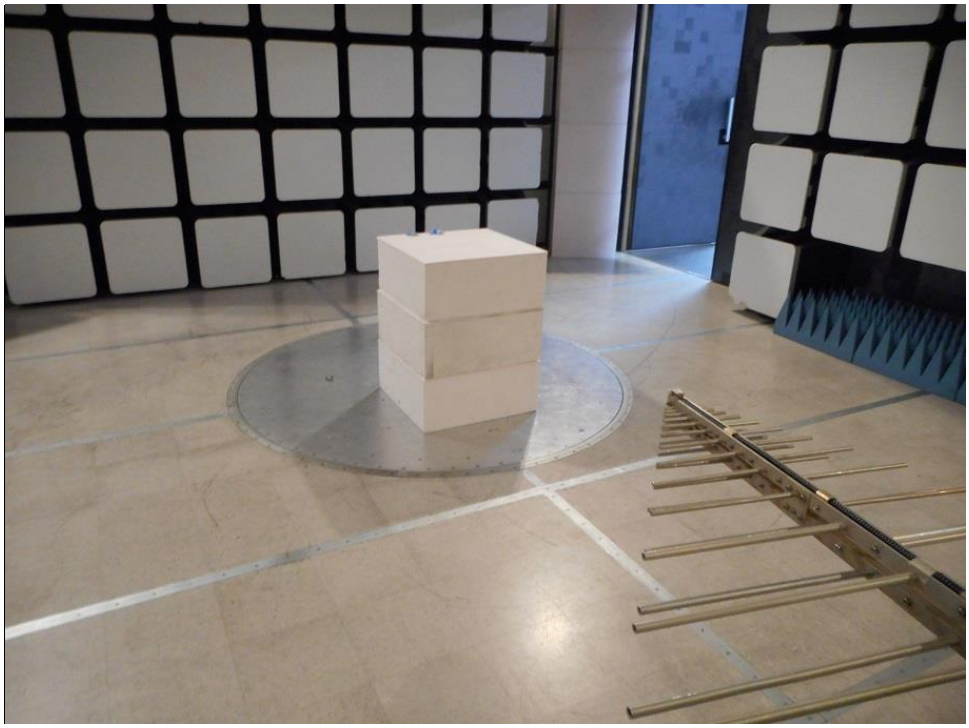
COM-POWER AH-118

HORN ANTENNA

S/N: 071225

CALIBRATION DUE: JULY 1, 2016

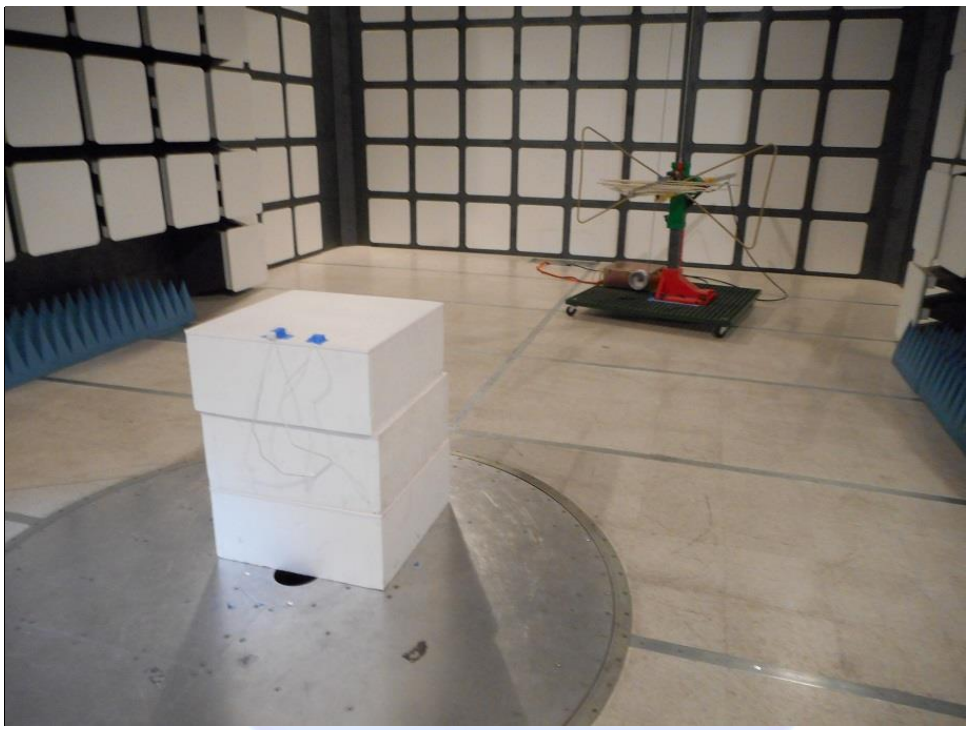
FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	30.2	**9500**	43.86
1500	29.46	**10000**	43.85
2000	31.81	**10500**	43.54
2500	35.95	**11000**	45.28
3000	33.6	**11500**	45.18
3500	36.43	**12000**	45.03
4000	35.85	**12500**	44.33
4500	36.32	**13000**	45.71
5000	40.11	**13500**	46.89
5500	38.7	**14000**	46.88
6000	39.33	**14500**	45.89
6500	40.08	**15000**	49.59
7000	41.17	**15500**	46.49
7500	43.58	**16000**	45.01
8000	41.55	**16500**	44.57
8500	42.63	**17000**	48.28
9000	43.5	**17500**	49.88
		18000	49.94



FRONT VIEW

NORTEK
FLOOD AND TEMP SENSOR
Model: 2GIG-FT1-345
FCC SUBPART C - RADIATED EMISSIONS < 1GHz

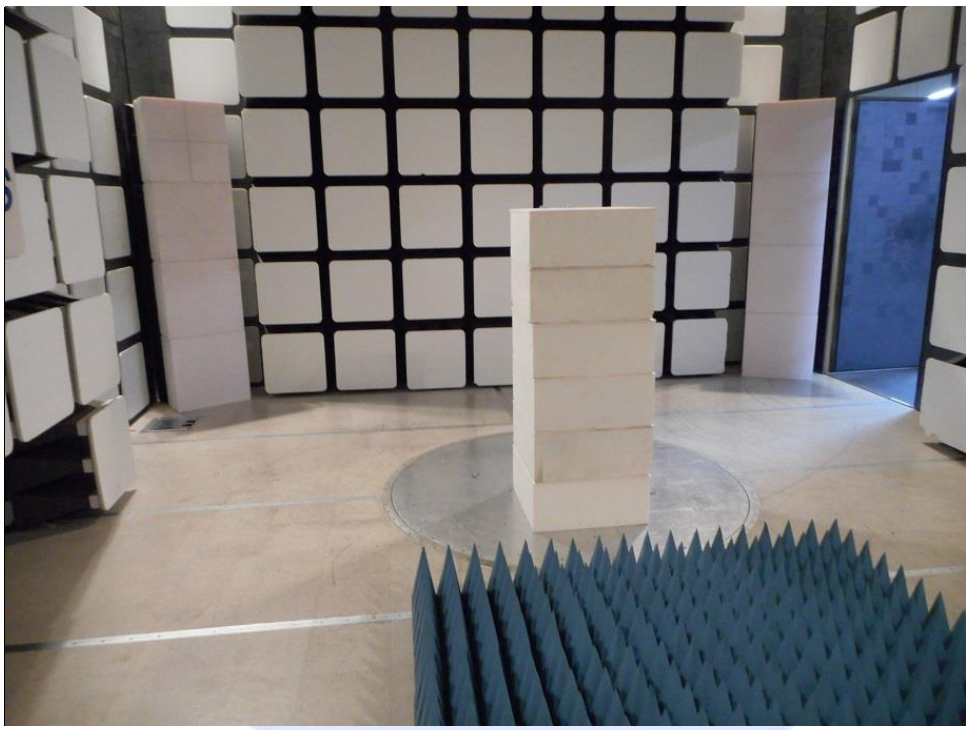
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

NORTEK
FLOOD AND TEMP SENSOR
Model: 2GIG-FT1-345
FCC SUBPART C - RADIATED EMISSIONS < 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

NORTEK
FLOOD AND TEMP SENSOR
Model: 2GIG-FT1-345
FCC SUBPART C - RADIATED EMISSIONS > 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

NORTEK
FLOOD AND TEMP SENSOR
Model: 2GIG-FT1-345
FCC SUBPART C - RADIATED EMISSIONS > 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

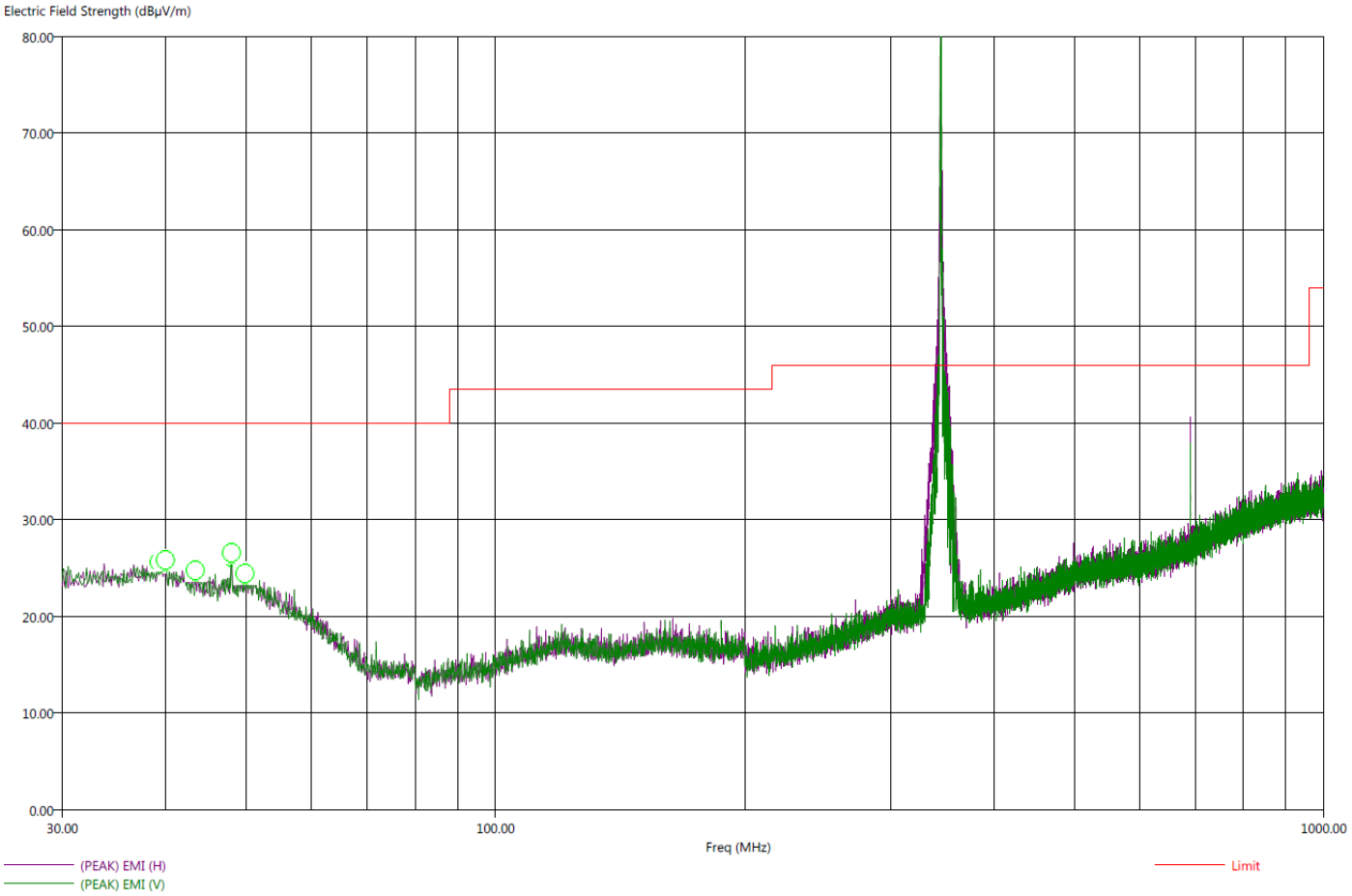
APPENDIX E

RADIATED EMISSIONS DATA SHEETS

Title: FCC 15.209 & 15.109 Class B
File: Radiated Pre-Scan 30-1000Mhz
Operator: Matt Harrison
EUT Type: 2GIG-FT1-345.
EUT Condition: Constantly Transmitting @ 345MHz.
Comments: Connected to sensor.
Temp: 75f
Hum: 46%
Battery Powered

3/10/2016 4:24:48 PM
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 the worst case mode.

Title: FCC 15.209 & 15.109 Class B 3/10/2016 4:54:17 PM
File: Radiated Final 30-1000Mhz Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: 2GIG-FT1-345.
EUT Condition: Constantly Transmitting @ 345MHz.
Comments: Connected to sensor.
Temp: 75f
Hum: 46%
Battery Powered

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)
39.30	-19.94	20.06	25.89	40.00	H	291.25	364.64	23.39	0.50
40.00	-19.84	20.16	25.99	40.00	V	64.00	170.41	23.50	0.50
43.50	-20.87	19.13	25.05	40.00	V	0.25	241.88	22.35	0.55
48.00	-16.55	23.45	27.92	40.00	H	358.50	194.11	21.96	0.61
48.00	-16.80	23.20	27.38	40.00	V	18.75	294.41	21.96	0.61
49.90	-20.93	19.07	24.37	40.00	V	198.25	138.88	22.00	0.63

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

FUNDAMENTAL & HARMONICS

DATA SHEETS

FUNDAMENTAL FIELD STRENGTH

FCC 15.231

Company: Nortek
EUT: Flood and Temp Sensor
Model: 2GIG-FT1-345
Duty Cycle Correction Factor: -20.00

Date: 3/10/2016
Lab: P
Tested By: Matt H.

Compatible Electronics, Inc. FAC-3

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table	Tower	Comments
345.00	92.83	H	97.26	-4.43	Peak	270.00	1.08	
345.00	72.83	H	77.26	-4.43	Avg	270.00	1.08	
345.00	89.90	V	97.26	-7.36	Peak	20.00	1.00	
345.00	69.90	V	77.26	-7.36	Avg	20.00	1.00	

Test distance
3 meter

HARMONICS HORIZONTAL

FCC 15.231

Company: Nortek
EUT: Flood & Temperature Sensor
Model: 2GIG-FT1-345
Duty Cycle Correction Factor: -20.00

Date: 3/11/2016
Lab: P
Tested By: Matt H.

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
690.00	46.63	H	77.26	-30.63	Peak	1.30	80	
690.00	26.63	H	57.26	-30.63	Avg	1.30	80	
1035.00	51.74	H	73.98	-22.24	Peak	1.27	75	
1035.00	31.74	H	53.98	-22.24	Avg	1.27	75	
1380.00	49.25	H	73.98	-24.73	Peak	1.21	157	
1380.00	29.25	H	53.98	-24.73	Avg	1.21	157	
1725.00	61.42	H	77.26	-15.84	Peak	1.26	270	
1725.00	41.42	H	57.26	-15.84	Avg	1.26	270	
2070.00	62.97	H	77.26	-14.29	Peak	1.09	247	
2070.00	42.97	H	57.26	-14.29	Avg	1.09	247	
2415.00	60.83	H	77.26	-16.43	Peak	1.12	163	
2415.00	40.83	H	57.26	-16.43	Avg	1.12	163	
2760.00	70.98	H	73.98	-3.00	Peak	1.52	91	
2760.00	50.98	H	53.98	-3.00	Avg	1.52	91	
3105.00	68.58	H	77.26	-8.68	Peak	1	83	
3105.00	48.58	H	57.26	-8.68	Avg	1	83	
3450.00	71.56	H	77.26	-5.70	Peak	1.84	283	
3450.00	51.56	H	57.26	-5.70	Avg	1.84	283	

Test distance
3 meter

HARMONICS VERTICAL

FCC 15.231

Company: Nortek
EUT: Flood & Temperature Sensor
Model: 2GIG-FT1-345
Duty Cycle Correction Factor: -20.00

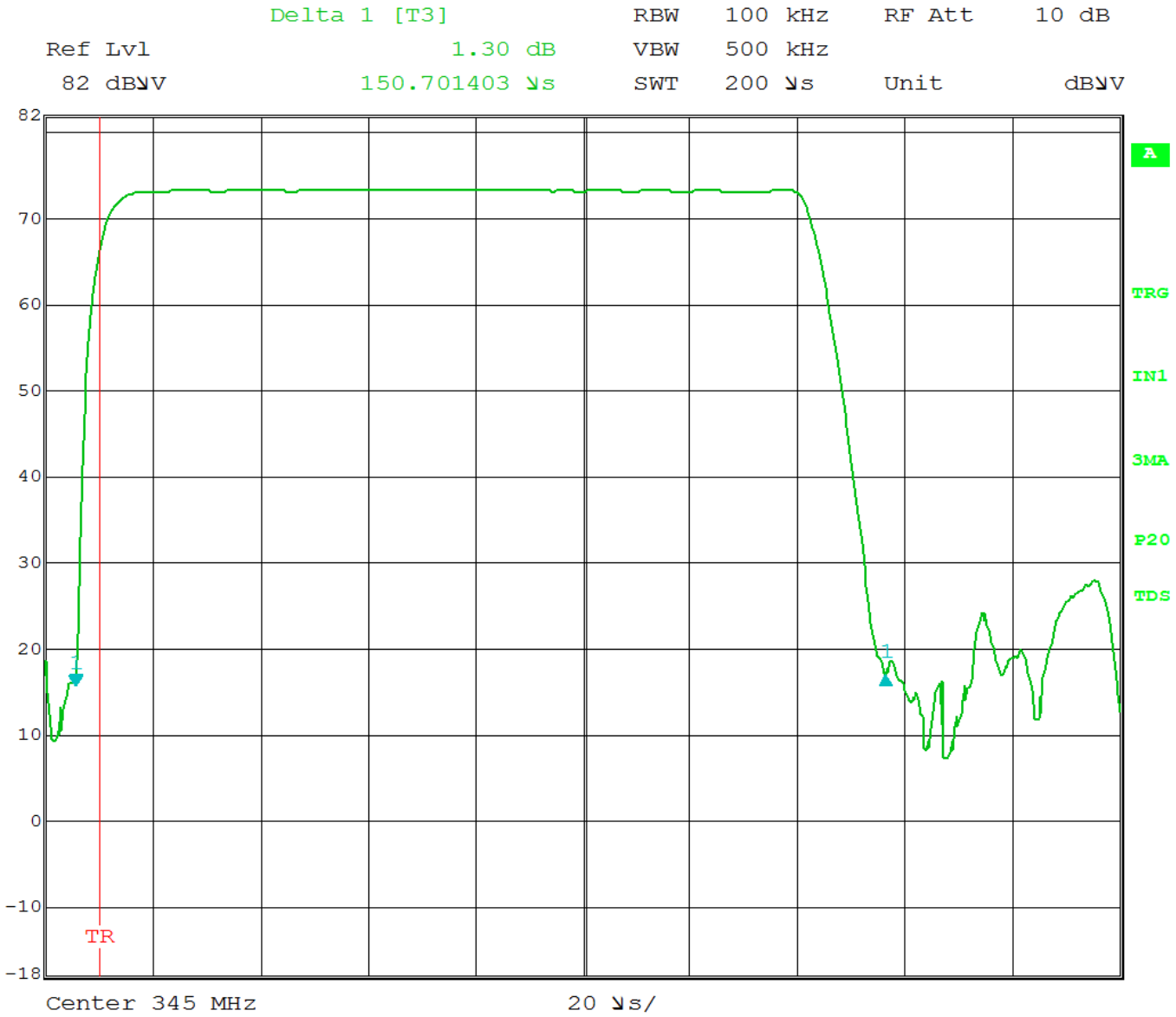
Date: 3/11/2016
Lab: P
Tested By: Matt H.

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
690.00	45.07	V	77.26	-32.19	Peak	1.00	180	
690.00	25.07	V	57.26	-32.19	Avg	1.00	180	
1035.00	51.14	V	73.98	-22.84	Peak	1.04	338	
1035.00	31.14	V	53.98	-22.84	Avg	1.04	338	
1380.00	50.45	V	73.98	-23.53	Peak	1.04	194	
1380.00	30.45	V	53.98	-23.53	Avg	1.04	194	
1725.00	60.07	V	77.26	-17.19	Peak	2.47	316	
1725.00	40.07	V	57.26	-17.19	Avg	2.47	316	
2070.00	61.60	V	77.26	-15.66	Peak	1.92	297	
2070.00	41.60	V	57.26	-15.66	Avg	1.92	297	
2415.00	60.34	V	77.26	-16.92	Peak	1.9	346	
2415.00	40.34	V	57.26	-16.92	Avg	1.9	346	
2760.00	62.35	V	73.98	-11.63	Peak	2.46	165	
2760.00	42.35	V	53.98	-11.63	Avg	2.46	165	
3105.00	62.88	V	77.26	-14.38	Peak	1.79	206	
3105.00	42.88	V	57.26	-14.38	Avg	1.79	206	
3450.00	62.73	V	77.26	-14.53	Peak	1.63	107	
3450.00	42.73	V	57.26	-14.53	Avg	1.63	107	

Test distance
3 meter

DUTY CYCLE PLOTS

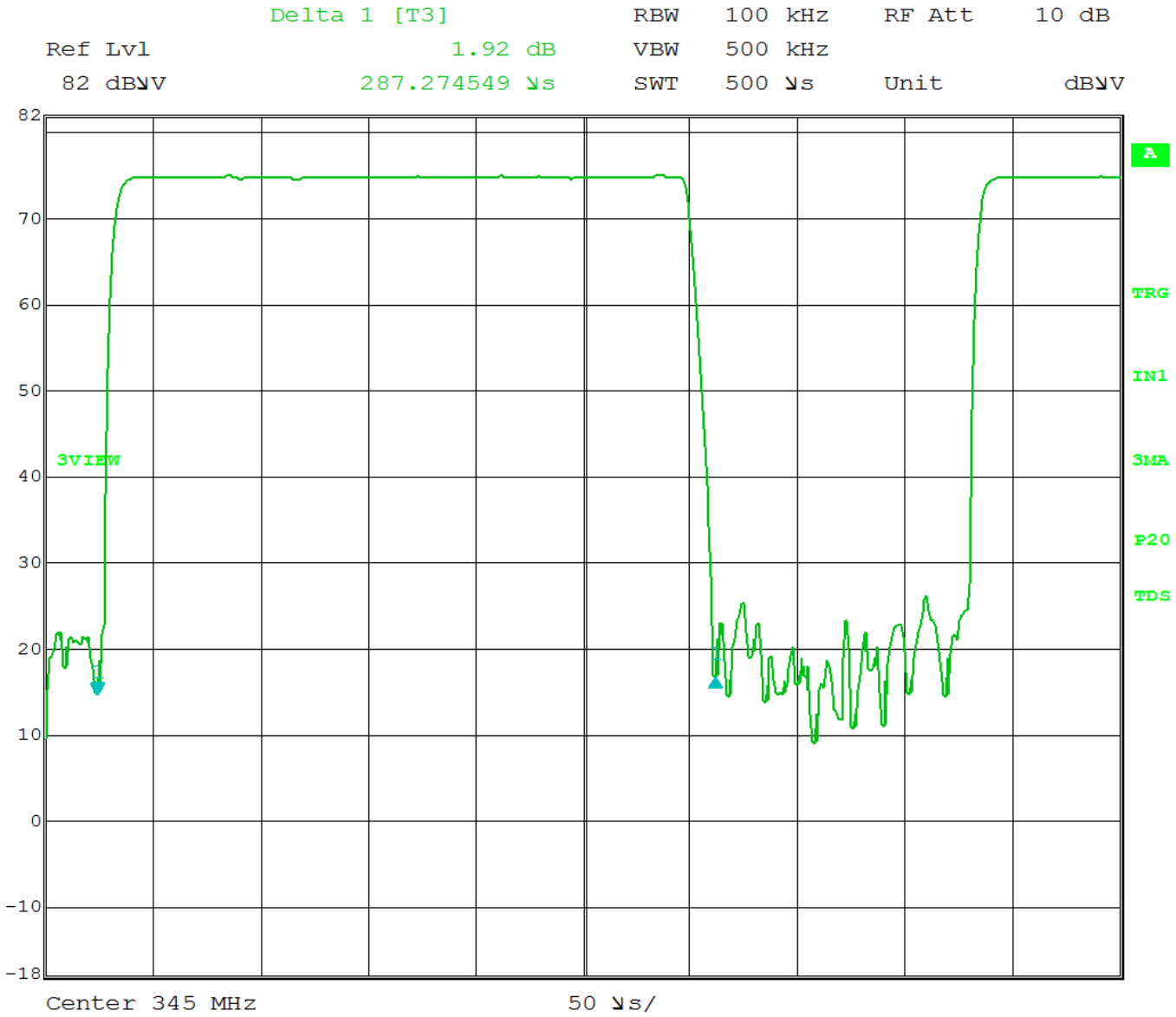
DUTY CYCLE



Date:

Time of Pulse Type 1 = 150.701403 µS

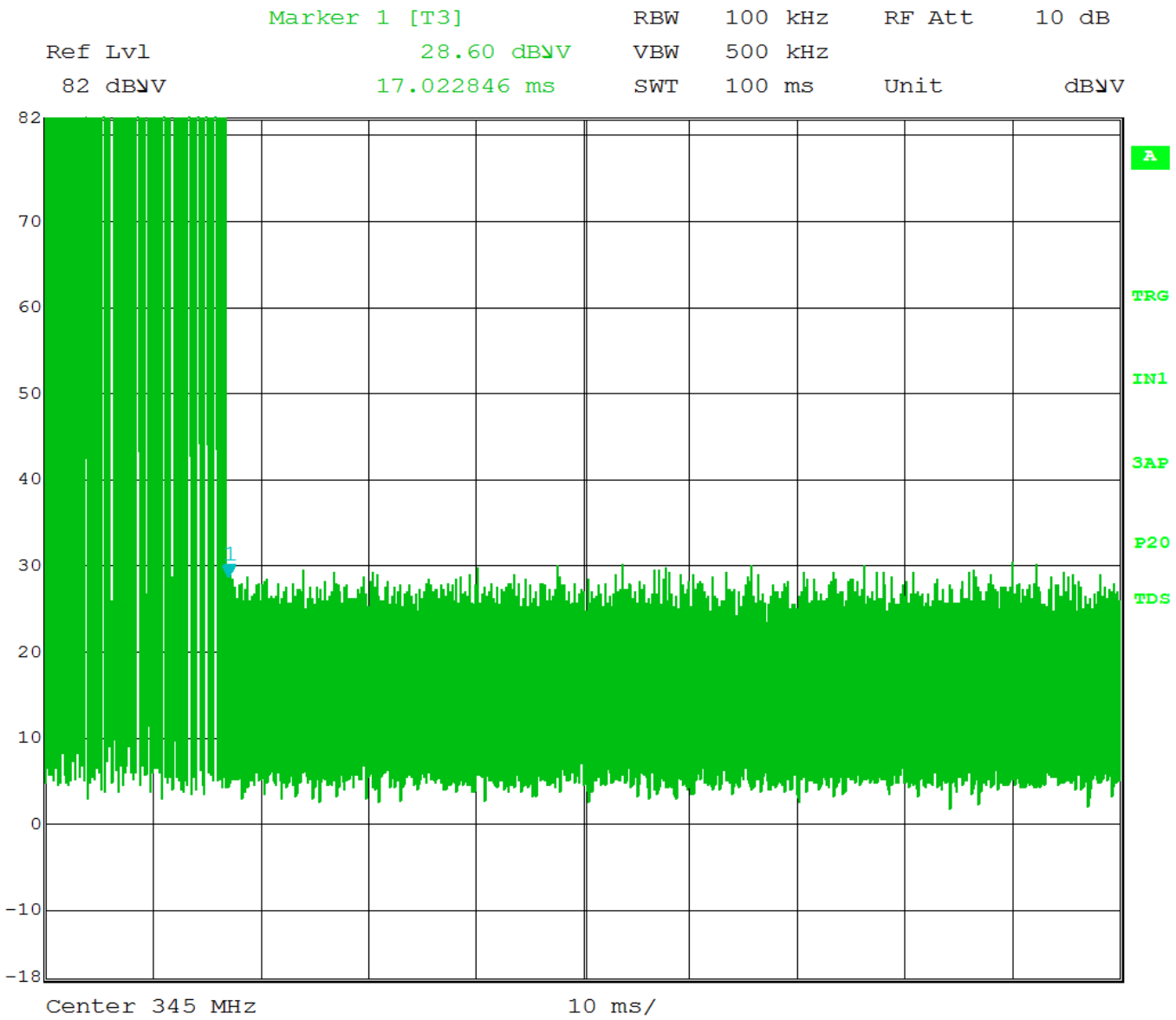
DUTY CYCLE



Date:

Time of Pulse Type 2 = 287.274549 µS

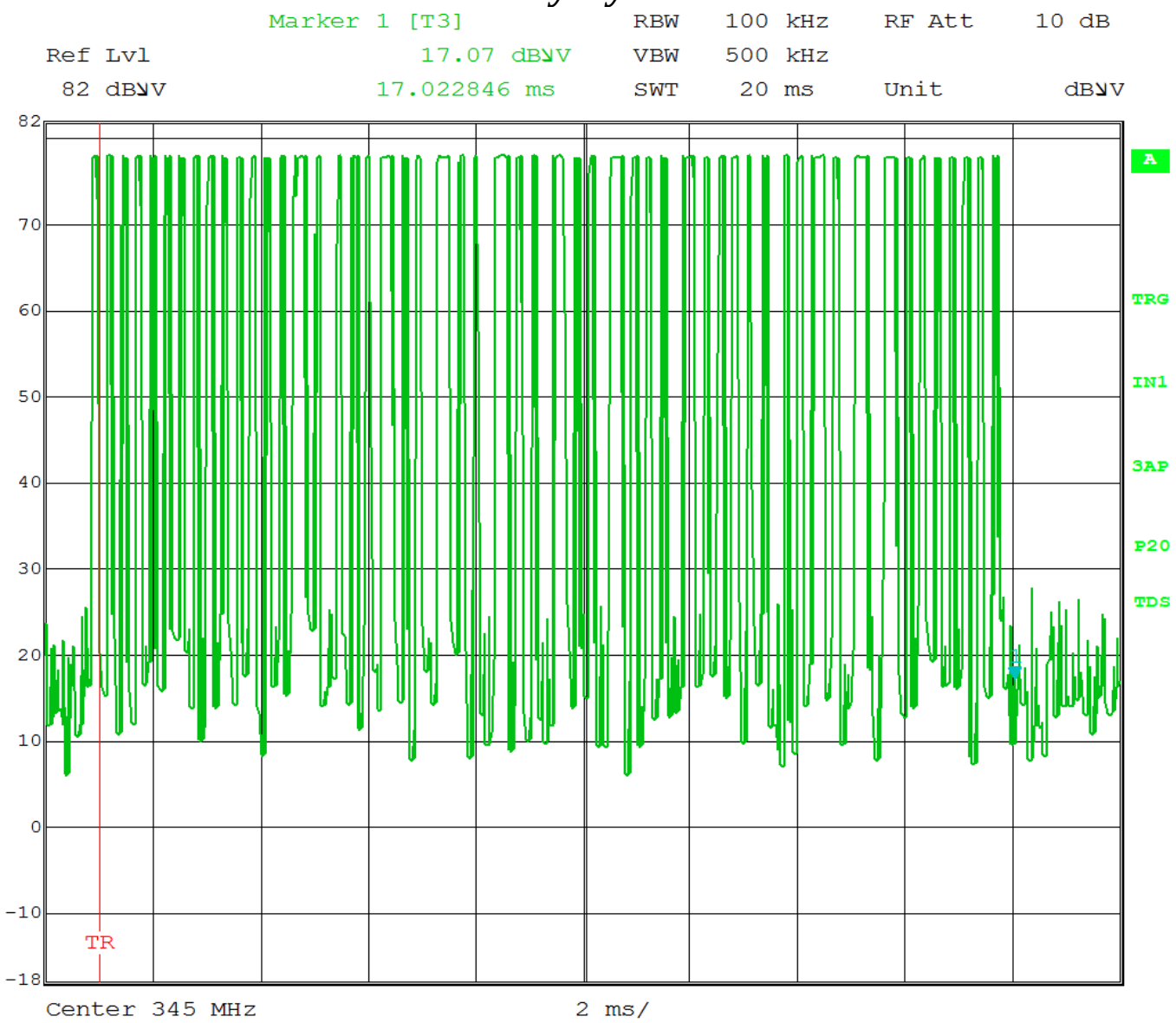
DUTY CYCLE



Date:

Total On Time in a 100ms Span = 9.503607 mS

Duty Cycle



Date:

Number of Pulses in Worst Case 100 mS = 54

Pulse Type 1 On Time = 150.701403 µS *44 = 6630.862 µS
Pulse Type 2 On Time = 287.274549 µS *10 = 0.4018036 µS
287.274549 µS + 150.701403µS = 9.503607 mS
Duty Cycle = 9.503607 mS / 100 mS = 0.095
The Peak to Average Duty Cycle Correction = -20.805dB
Max Duty Cycle Correction Factor = -20.00dB

TRANSMIT TIMEOUT DATA

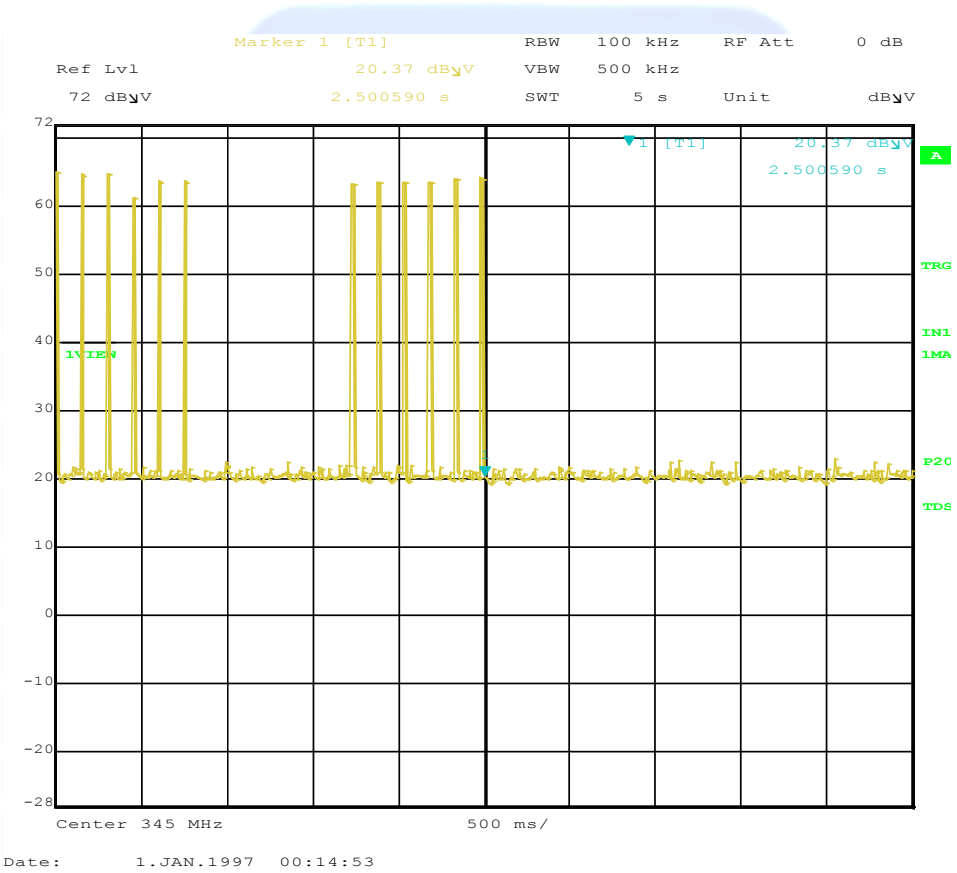
TRANSMIT TIMEOUT

DURATION TIME

FCC 15.231

Company:	Nortek	Date:	3/11/2016
EUT:	Flood and Temp Sensor	Lab:	P
Model:	2GIG-FT1-345	Tested By:	Matt H.

Freq. (MHz)	Time (S)	Limit (S)	Margin	Comments
345.00	2.50	5.00	-2.50	

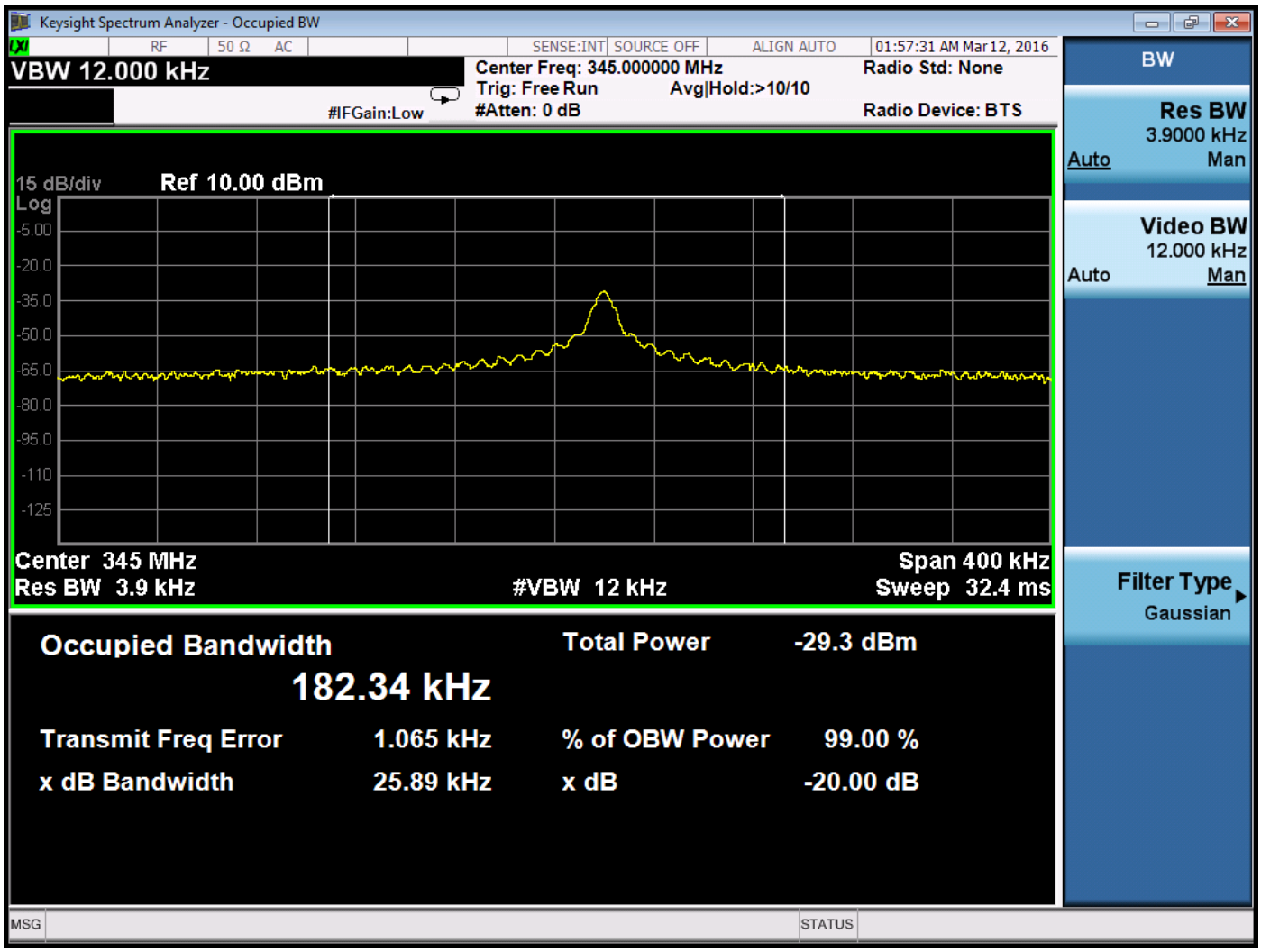


15.231 -20 dB Bandwidth & RSS210 Occupied Bandwidth DATA

-20dB and Occupied Bandwidth

FCC 15.231

Company:	Nortek	Date:	1/21/2016
EUT:	Flood and Temp Sensor	Lab:	P
Model:	2GIG-FT1-345	Tested By:	Matt H.

Compatible Electronics, Inc. FAC-3

Freq. (MHz)	20dB Bandwidth	Limit (kHz)	Margin (kHz)	Occupied Bandwidth
345.00	25.89	862.50	-836.61	182.34kHz