

*FCC PART 15, SUBPART C 15.231  
TEST REPORT*

*for*

**SUPERVISED LONG RANGE CONVERTIBLE TRANSMITTER  
MODEL: DXS-600**

Prepared for

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

Prepared by: \_\_\_\_\_

**MATT HARRISON**

Approved by: \_\_\_\_\_

**JEFF KLINGER**

**COMPATIBLE ELECTRONICS INC.**  
20621 Pascal Way  
LAKE FOREST, CA 92630  
(949) 587-0400

DATE: MARCH 19, 2015

	REPORT BODY	APPENDICES				TOTAL
		A	B	C	D	
PAGES	16	2	2	13	14	47

This report shall not be reproduced except in full, without the written approval of Compatible Electronics.

## TABLE OF CONTENTS

Section / Title	PAGE
<b>GENERAL REPORT SUMMARY</b>	<b>4</b>
<b>SUMMARY OF TEST RESULTS</b>	<b>4</b>
<b>1. PURPOSE</b>	<b>5</b>
<b>2. ADMINISTRATIVE DATA</b>	<b>6</b>
2.1 Location of Testing	6
2.2 Traceability Statement	6
2.3 Cognizant Personnel	6
2.4 Date Test Sample was Received	6
2.5 Disposition of the Test Sample	6
2.6 Abbreviations and Acronyms	6
<b>3. APPLICABLE DOCUMENTS</b>	<b>7</b>
<b>4. DESCRIPTION OF TEST CONFIGURATION</b>	<b>8</b>
4.1 Description Of Test Configuration - EMI	8
4.1.1 Cable Construction and Termination	9
<b>5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT</b>	<b>10</b>
5.1 EUT and Accessory List	10
5.2 EMI Test Equipment	11
<b>6. TEST SITE DESCRIPTION</b>	<b>12</b>
6.1 Test Facility Description	12
6.2 EUT Mounting, Bonding and Grounding	12
<b>7. TEST PROCEDURES</b>	<b>13</b>
7.1 RF Emissions	13
7.1.1 Conducted Emissions Test	13
7.1.2 Radiated Emissions (Spurious and Harmonics) Test	14
7.1.3 Radiated Emissions (Spurious and Harmonics) Test (Continued)	15
7.1.4 Peak radiated EMI	15
7.1.5 Bandwidth of the Fundamental	16
<b>8. CONCLUSIONS</b>	<b>16</b>

**LIST OF APPENDICES**

<b>APPENDIX</b>	<b>TITLE</b>
A	Laboratory Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams, Charts, and Photos <ul style="list-style-type: none"><li>• Test Setup Diagrams</li><li>• Radiated Emissions Photos</li><li>• Antenna and Effective Gain Factors</li></ul>
E	Data Sheets

**LIST OF FIGURES**

<b>FIGURE</b>	<b>TITLE</b>
1	Radiated Emissions 3-Meter Semi-Anechoic Test Chamber Below 1GHz
2	Radiated Emissions 3-Meter Semi-Anechoic Test Chamber Above 1GHz

## 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: Supervised Long Range Transmitter  
Model: DXS-600  
SN: 11

Product Description: See Expository Statement

Modifications: The EUT was not modified.

Manufacturer: Nortek Security & Control, LLC.  
1950 Camino Vida Roble, Suite 150  
Carlsbad, CA 92008

Test Date: March 19, April 7, and May 7, 2015

Test Specifications: CFR Title 47, Part 15 Subpart C, Sections 15.205, 15.209 and 15.231

Test Procedure: ANSI C63.10

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 Supervised Long Range Transmitter Model: DXS-600. 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 March 19, 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.

<b>SPEC</b>	<b>TITLE</b>
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 Supervised Long Range Transmitter Model: DXS-600 (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 tests were 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**

<b>EQUIPMENT</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>FCC ID</b>
SUPERVISED LONG RANGE TRANSMITTER (EUT)	NORTEK SECURITY & CONTROL	DXS-600	11	EF400129
3.3V Battery	EVE	CR2032	NONE	N/A

## 5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
<b>GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS</b>					
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

$$\delta(\text{dB}) = 20 \log \left[ \frac{\sum (nt_1 + mt_2 + \dots + \xi t_x)}{T} \right]$$

where

$n$  is the number of pulses of duration  $t_1$

$m$  is the number of pulses of duration  $t_2$

$\xi$  is the number of pulses of duration  $t_x$

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

Pulse Type 1 =  $17 * 508.817635 \mu\text{S} = 8.649899846 \text{ mS}$

Total On Time = 8.649899846 mS

$100\text{ms} / 8.649899846 = 0.08649899846$

$20 \log (0.08649899846) = -21.26 \text{ dB}$  correction factor

Max Duty Cycle Correction Factor = -20.00 dB

#### 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 10 kHz and the VBW was set to 30 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 lies wholly within the 0.25% of the operating frequency centered on the fundamental frequency.

## 8. CONCLUSIONS

The Supervised Long Range Transmitter Model: DXS-600 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/](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>



Compatible Electronics IC listing can be found at:

<http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home>

**Brea Division**  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

**Agoura Division**  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

**Silverado Division**  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

**Lake Forest Division**  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400



**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

Supervised Long Range Transmitter  
Model: DXS-600  
S/N: 11

Client provided additional models not tested but covered by similarity are listed below.

According to the manufacturer, all models are electrically and mechanically identical. The only difference between the various models is the enclosure.

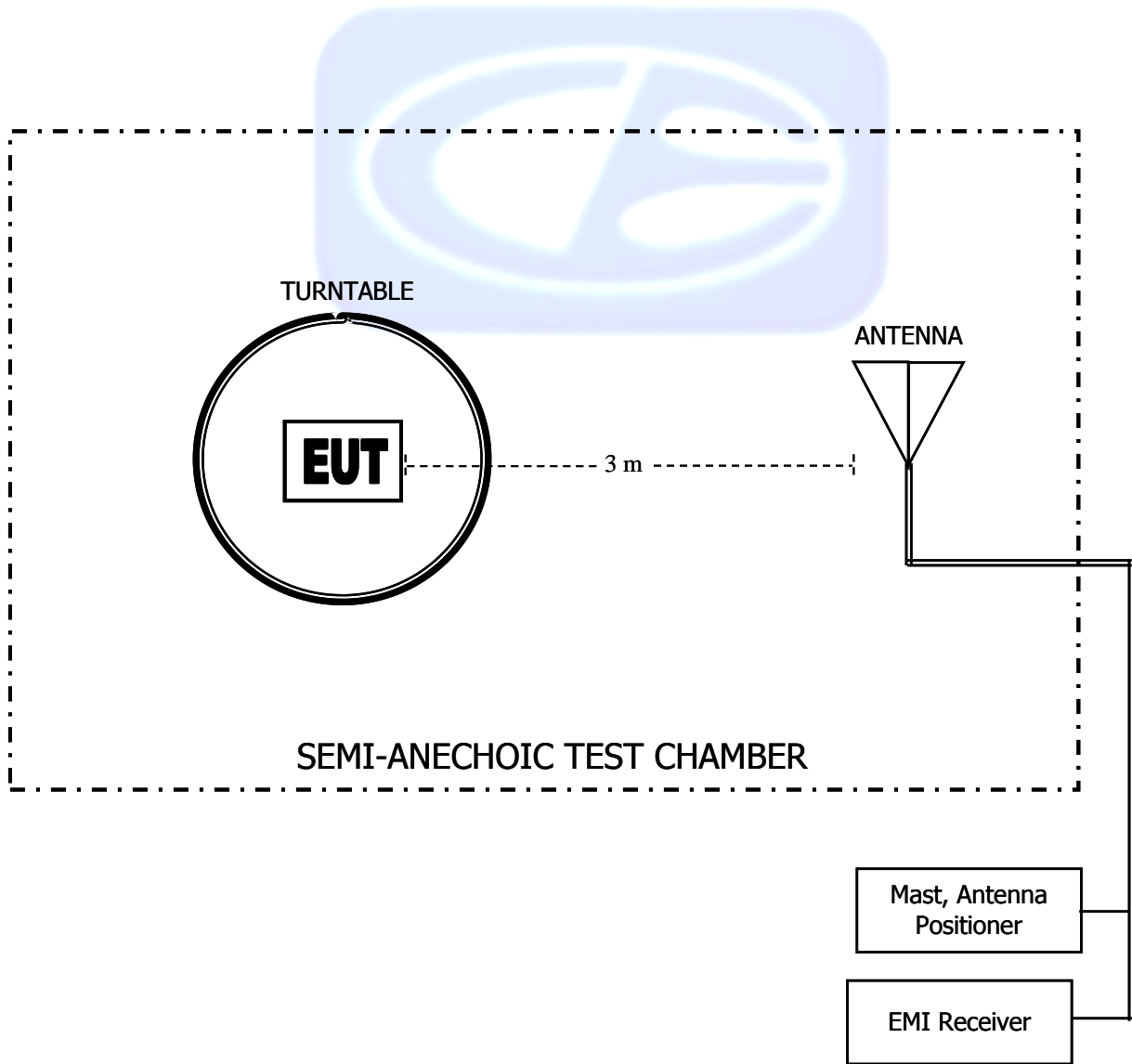
1. Supervised Long Range Pendant Transmitter, Model: DXS-700.



**APPENDIX D**

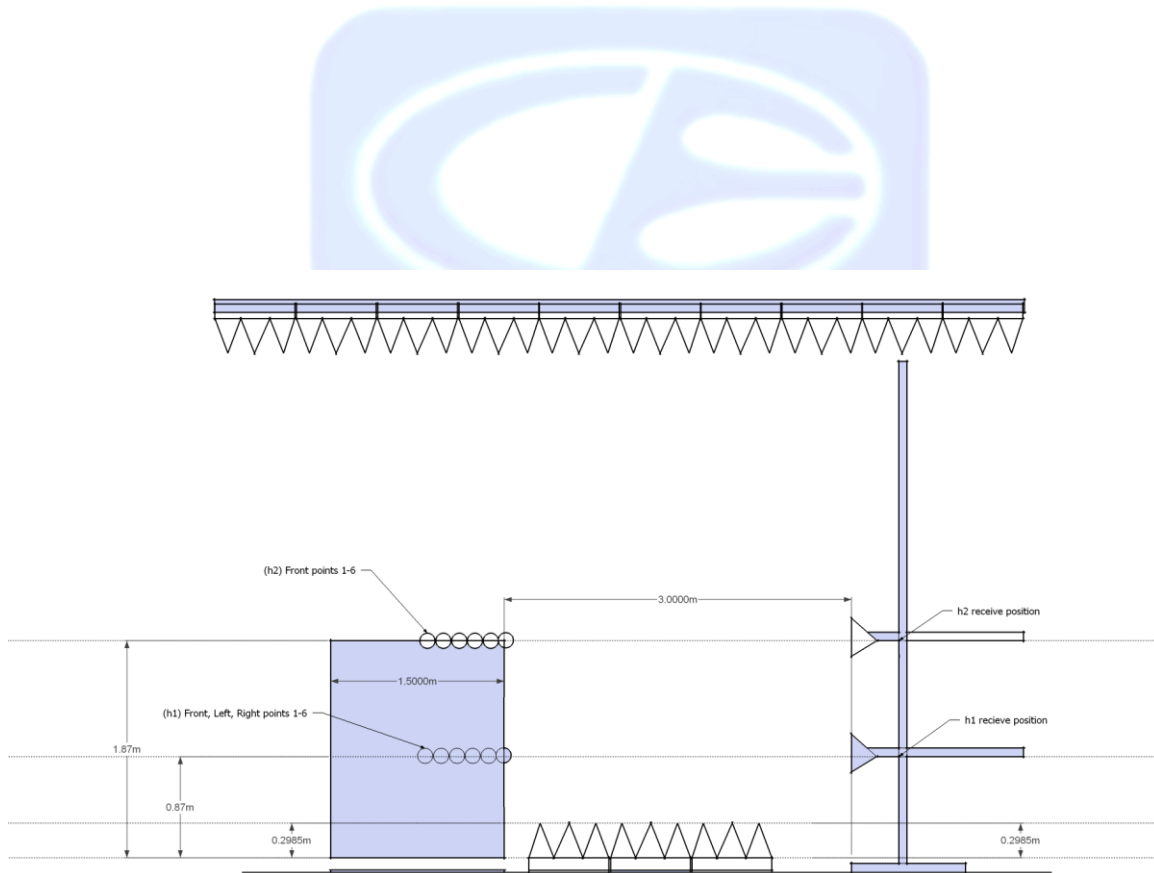
***DIAGRAMS, CHARTS, AND PHOTOS***

**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**

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

**COM-POWER AH-118****HORN ANTENNA**

S/N: 071250

**CALIBRATION DUE: JULY 1, 2016**

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

**COM-POWER PAM-118****1-18GHz - PREAMPLIFIER**

S/N: 443013

CALIBRATION DUE: APRIL 24, 2015

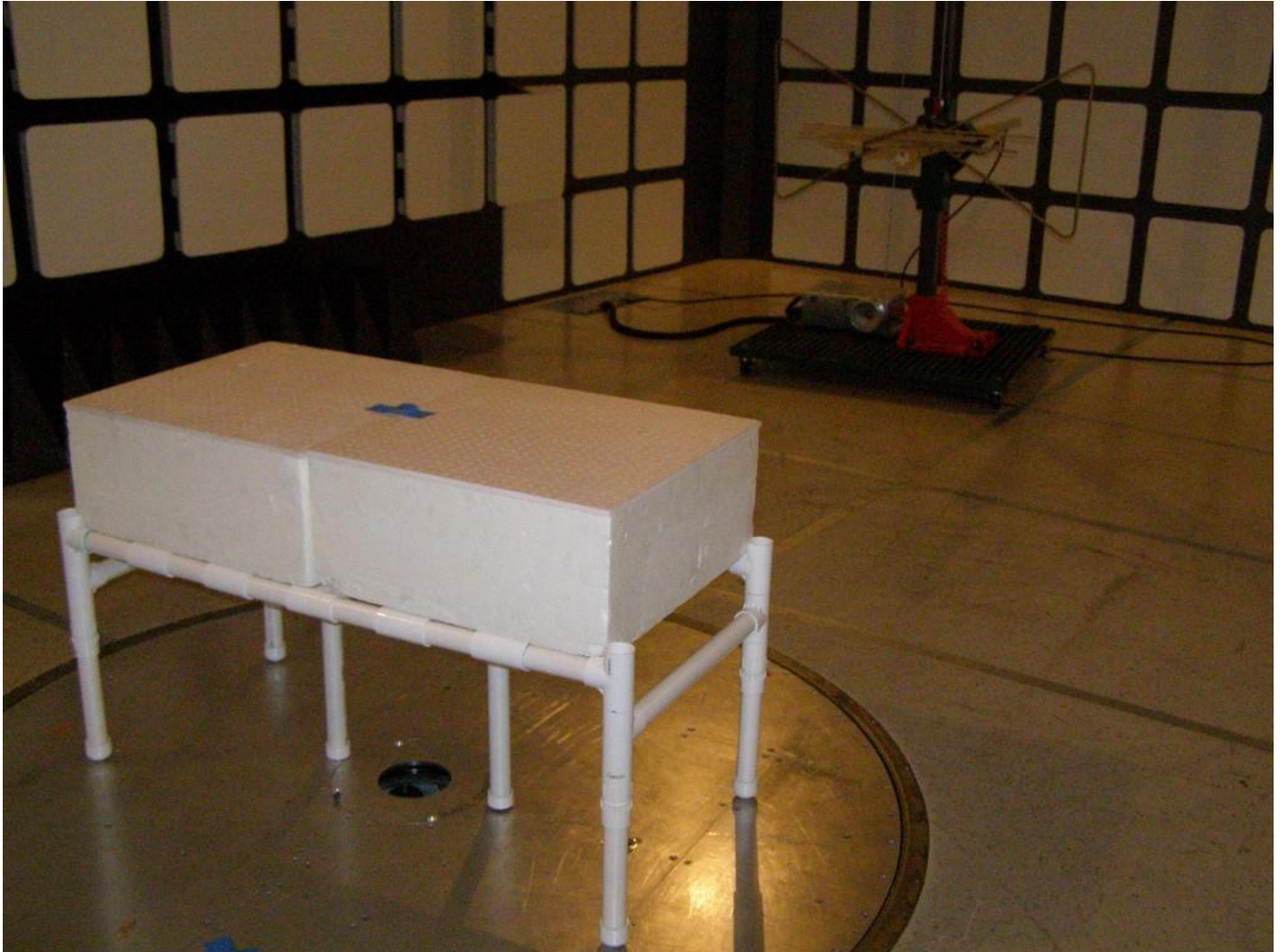
<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
500	26.2	5500	25.3
1000	25.6	6000	25.0
1100	25.9	6500	24.7
1200	25.9	7000	23.6
1300	26.3	7500	23.3
1400	26.5	8000	23.7
1500	26.3	8500	24.0
1600	26.1	9000	24.3
1700	26.2	9500	24.1
1800	26.3	10000	23.7
1900	25.8	11000	24.2
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  
SUPERVISED LONG RANGE TRANSMITTER  
MODEL: DXS-600  
FCC SUBPART B AND C – RADIATED SPURIOUS EMISSIONS BELOW 1GHz

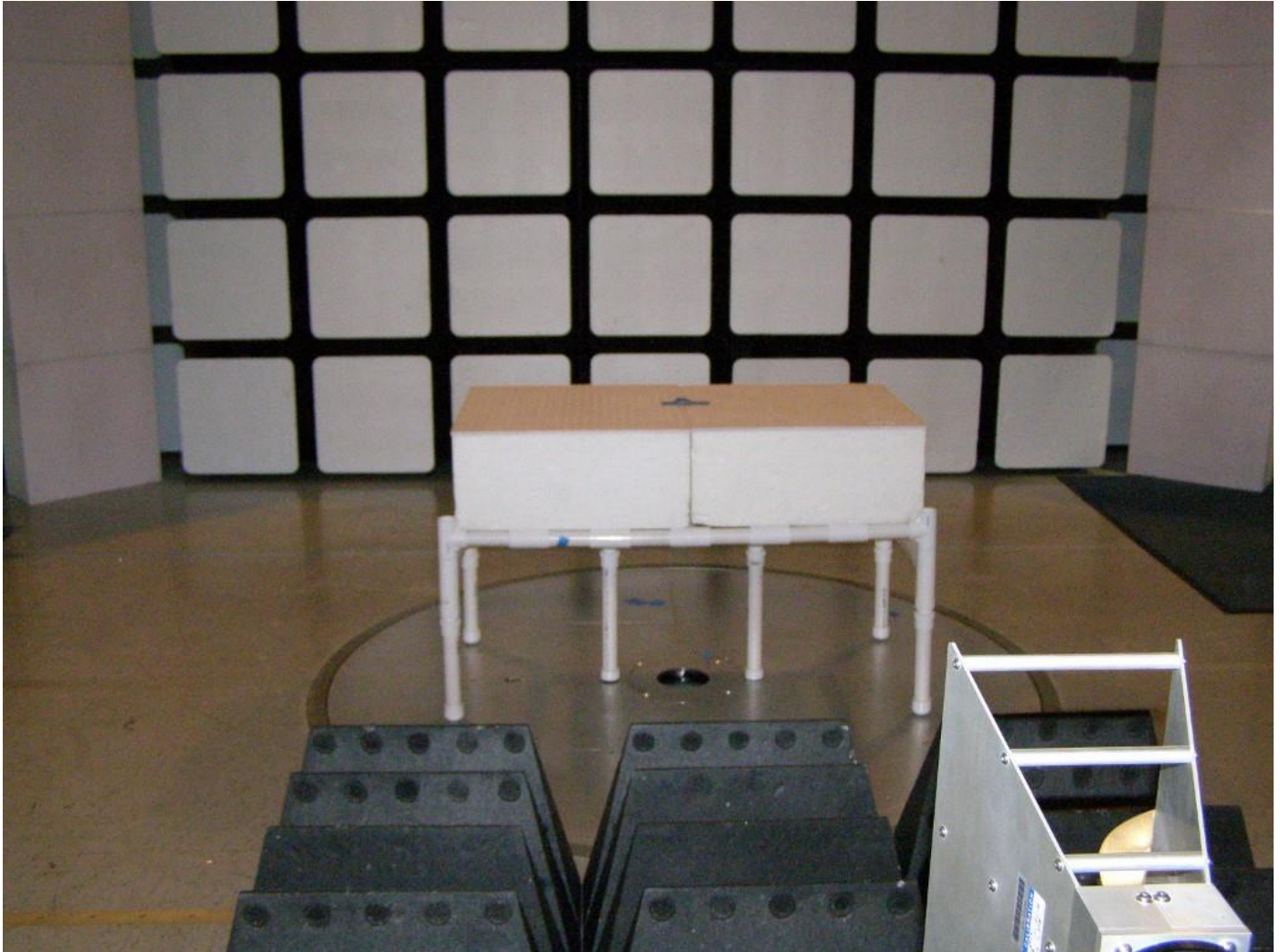
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**



**VIEW 2  
(X-AXIS)**

**NORTEK SECURITY & CONTROL  
SUPERVISED LONG RANGE TRANSMITTER  
MODEL: DXS-600  
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  
SUPERVISED LONG RANGE TRANSMITTER  
MODEL: DXS-600  
FCC SUBPART B AND C – RADIATED SPURIOUS EMISSIONS ABOVE 1GHz**

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

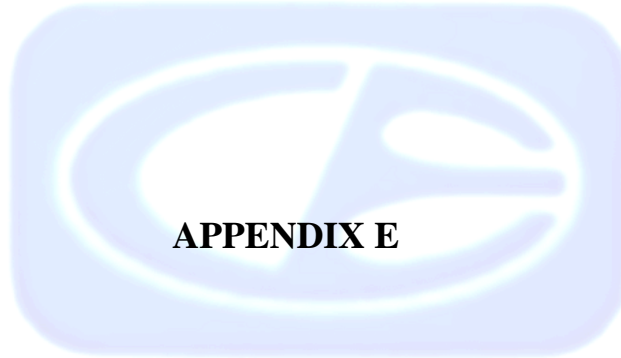




**VIEW 2  
(X-AXIS)**

**NORTEK SECURITY & CONTROL  
SUPERVISED LONG RANGE TRANSMITTER  
MODEL: DXS-600  
FCC SUBPART B AND C – RADIATED SPURIOUS EMISSIONS ABOVE 1GHz**

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**



***DATA SHEETS***

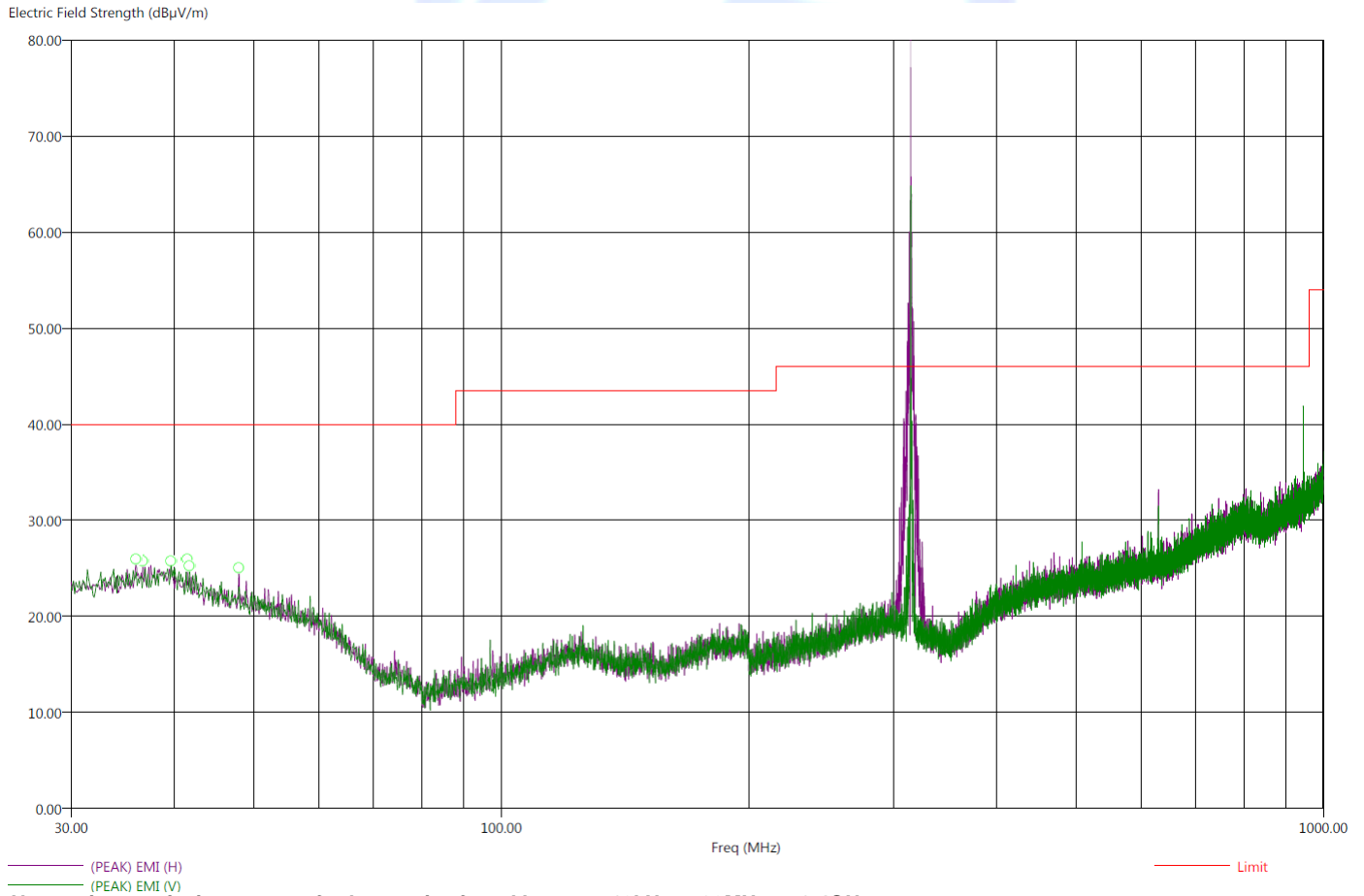


***RADIATED EMISSIONS  
SPURIOUS AND HARMONICS  
DATA SHEETS***

Title: FCC 15.209  
File: Radiated Pre-Scan 30-1000Mhz.set  
Operator: Matt Harrison  
EUT Type: DXS-600.  
EUT Condition: Transmitting 315 MHz.  
Comments: X-Axis  
Temp: 68f  
Hum: 43%  
Battery Powered

4/7/2015 8:27:28 AM  
Sequence: Preliminary Scan

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  
File: Radiated Final 30-1000Mhz.set  
Operator: Matt Harrison  
EUT Type: DXS-600.  
EUT Condition: Transmitting 315 MHz.  
Comments: X-Axis  
Temp: 68f  
Hum: 43%  
Battery Powered

4/7/2015 8:38:36 AM  
Sequence: Final Measurements

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

Freq (MHz)	(QP)Margin (dB)	(QP)EMI (dB $\mu$ V/m)	(PEAK)EMI (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable (dB)
36.00	-20.36	19.64	25.18	40.00	H	179.50	332.05	22.61	1.08
36.70	-20.35	19.65	24.59	40.00	H	103.25	377.55	22.67	1.11
39.70	-19.80	20.20	25.41	40.00	H	292.00	315.64	22.97	1.28
41.50	-20.32	19.68	25.68	40.00	H	147.50	388.17	22.50	1.09
41.80	-20.45	19.55	24.82	40.00	V	337.75	291.22	22.41	1.05
48.00	-21.99	18.01	23.22	40.00	H	241.00	145.25	21.38	0.32

*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  
 Supervised Long Range  
 EUT: Convertible Transmitter  
 Model: DXS-600  
 Duty Cycle Correction Factor: -20.00

Date: 4/7/2015  
 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
630.00	37.66	H	75.62	-37.96	Peak	1.17	44	
630.00	17.66	H	55.62	-37.96	Avg	1.17	44	
945.00	40.36	H	75.62	-35.26	Peak	1.78	275	
945.00	20.36	H	55.62	-35.26	Avg	1.78	275	
1260.00	53.37	H	75.62	-22.25	Peak	1.07	334	
1260.00	33.37	H	55.62	-22.25	Avg	1.07	334	
1575.00	49.61	H	73.98	-24.37	Peak	1.40	201	
1575.00	29.61	H	53.98	-24.37	Avg	1.40	201	
1890.00	46.40	H	75.62	-29.22	Peak	1.94	335	
1890.00	26.40	H	55.62	-29.22	Avg	1.94	335	
2205.00	63.70	H	73.98	-10.28	Peak	1.1	150	
2205.00	43.70	H	53.98	-10.28	Avg	1.1	150	
2520.00	56.29	H	75.62	-19.33	Peak	1.16	121	
2520.00	36.29	H	55.62	-19.33	Avg	1.16	121	
2835.00	56.97	H	73.98	-17.01	Peak	1.27	195	
2835.00	36.97	H	53.98	-17.01	Avg	1.27	195	
3150.00	54.35	H	75.62	-21.27	Peak	1.16	133	
3150.00	34.35	H	55.62	-21.27	Avg	1.16	133	

Test distance  
 3 meter

## HARMONICS - VERTICAL

**FCC 15.231**

Company: Nortek  
 Supervised Long Range  
 EUT: Convertible Transmitter  
 Model: DXS-600  
 Duty Cycle Correction Factor: -20.00

Date: 4/7/2015  
 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
630.00	35.50	V	75.62	-40.12	Peak	1.02	117	
630.00	15.50	V	55.62	-40.12	Avg	1.02	117	
945.00	44.92	V	75.62	-30.70	Peak	1.07	142	
945.00	24.92	V	55.62	-30.70	Avg	1.07	142	
1260.00	52.97	V	75.62	-22.65	Peak	2.42	289	
1260.00	32.97	V	55.62	-22.65	Avg	2.42	289	
1575.00	52.28	V	73.98	-21.70	Peak	1.08	161	
1575.00	32.28	V	53.98	-21.70	Avg	1.08	161	
1890.00	45.02	V	75.62	-30.60	Peak	1.14	0	
1890.00	25.02	V	55.62	-30.60	Avg	1.14	0	
2205.00	53.78	V	73.98	-20.20	Peak	1.16	121	
2205.00	33.78	V	53.98	-20.20	Avg	1.16	121	
2520.00	47.19	V	75.62	-28.43	Peak	2.09	220	
2520.00	27.19	V	55.62	-28.43	Avg	2.09	220	
2835.00	48.26	V	73.98	-25.72	Peak	1.48	277	
2835.00	28.26	V	53.98	-25.72	Avg	1.48	277	
3150.00	54.35	V	75.62	-21.27	Peak	1.16	131	
3150.00	34.35	V	55.62	-21.27	Avg	1.16	131	

Test distance  
 3 meter



***-20 dB BANDWIDTH***

***DATA SHEETS***



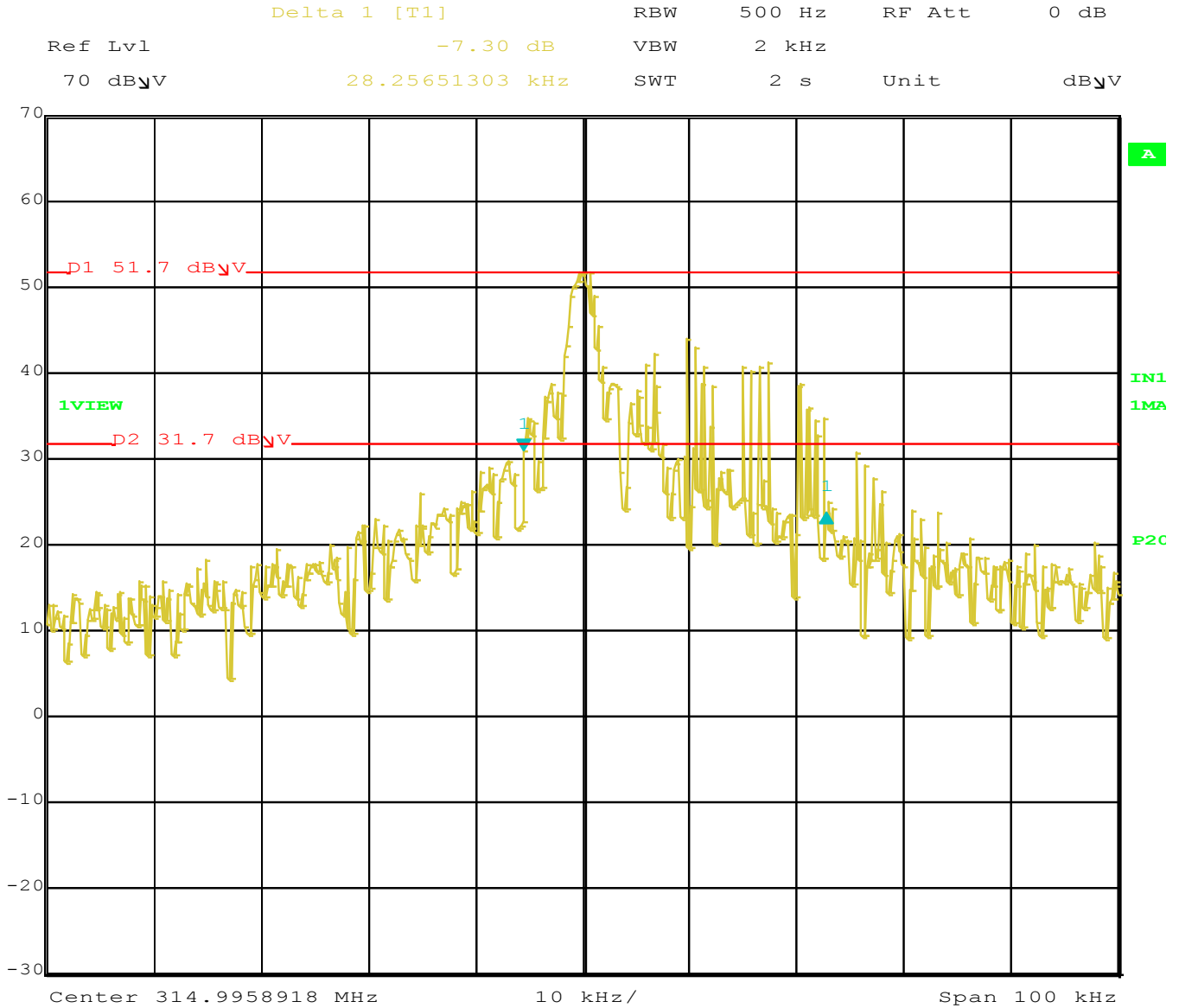
Title: FCC 15.231  
File: DXS-600 -20dB occupied Bandwidth  
Operator: Matt Harrison  
EUT Type: DXS-600  
EUT Condition: Continuously Transmitting  
Temp: 68f  
Hum: 43%

5/7/2015 19:35:17 PM

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

<b>Freq (MHz)</b>	<b>BW (kHz)</b>	<b>Limit (kHz)</b>	<b>Margin (kHz)</b>
315.00	28.26	787.50	-759.24

**-20 dB Occupied Bandwidth Plot**



Title: DXS-600  
 Comment A: BANDWIDTH  
 Date: 7.MAY.2015 19:35:17



***PEAK TRANSMIT EMI***

***DATA SHEETS***

**FCC 15.231**Company: Nortek  
Supervised Long Range  
EUT: Convertible Transmitter  
Model: DXS-600  
Duty Cycle Correction Factor: -20.00

Date: 4/7/2015

Lab: R  
Tested By: Matt Harrison**Compatible Electronics, Inc. FAC-3**

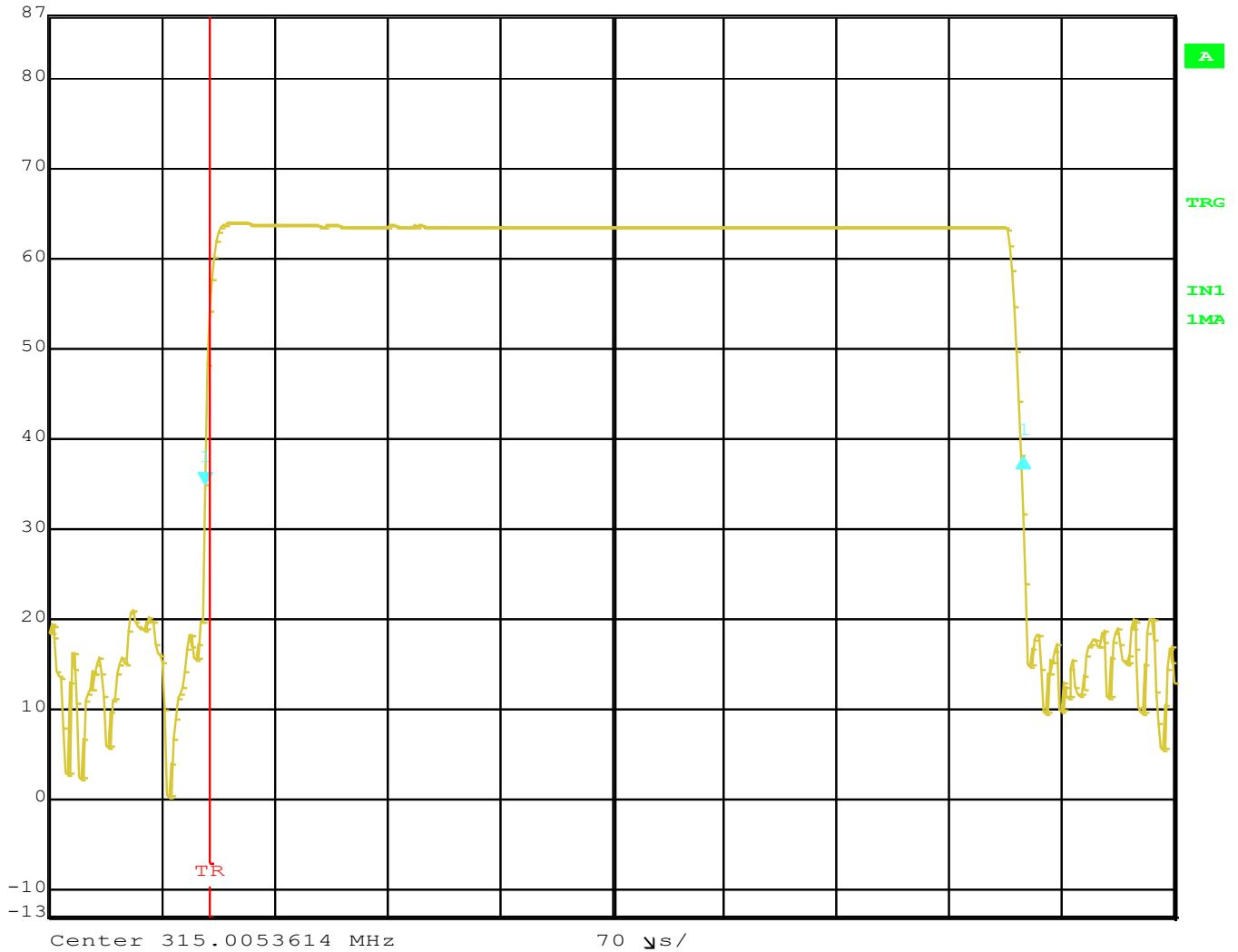
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table	Tower	Comments
315.00	92.45	H	95.62	-3.17	Peak	260.00	1.00	X-Axis
315.00	72.45	H	75.62	-3.17	Avg	260.00	1.00	X-Axis
315.00	73.09	V	95.62	-22.53	Peak	175.00	1.00	X-Axis
315.00	53.09	V	75.62	-22.53	Avg	175.00	1.00	X-Axis

Test distance  
3 meter

**DUTY CYCLE**



Delta 1 [T1] RBW 100 kHz RF Att 10 dB  
 Ref Lvl 3.08 dB VBW 300 kHz  
 87 dB $\mu$ V 508.817635  $\mu$ s SWT 700  $\mu$ s Unit dB $\mu$ V



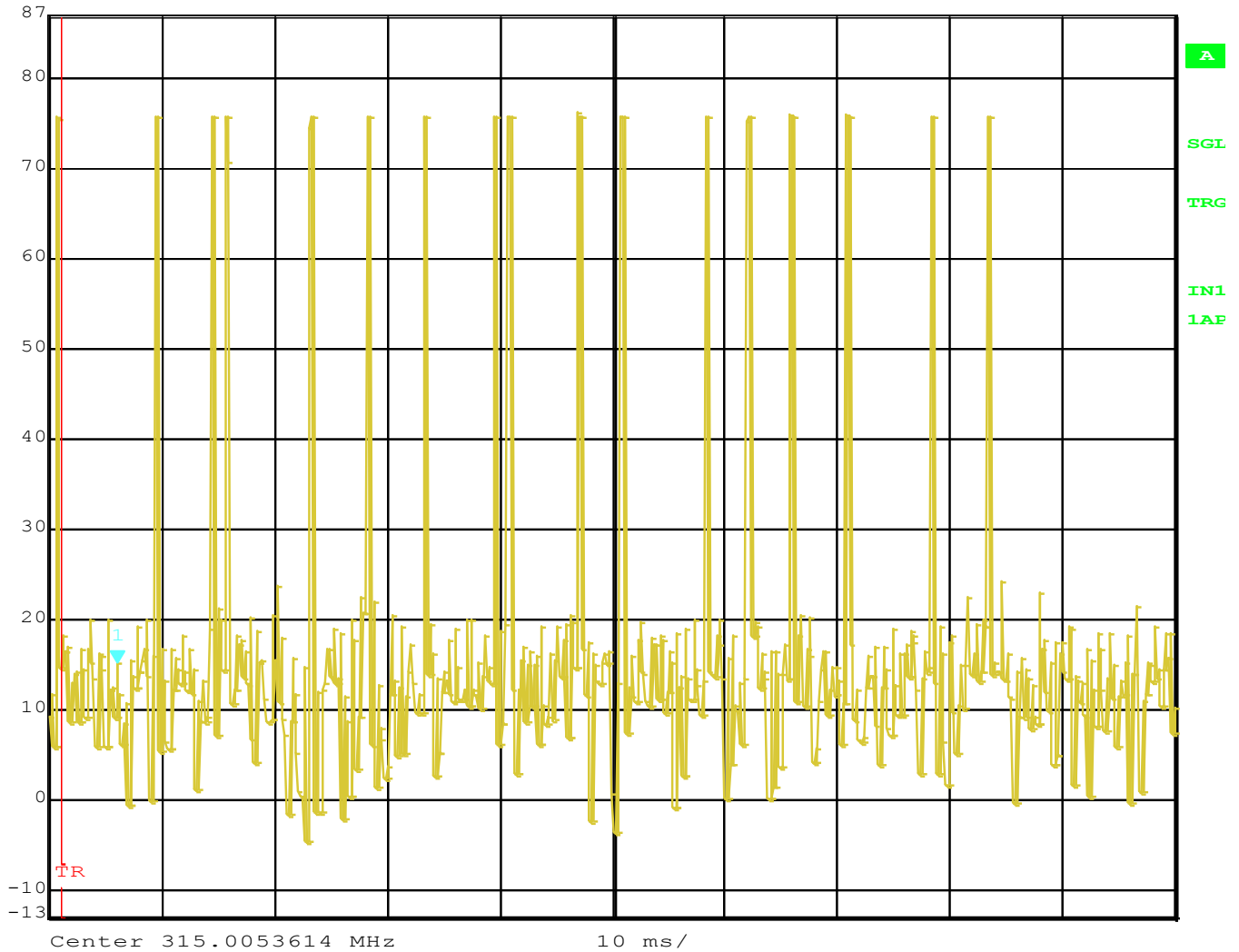
Comment A: Duty Cycle.  
 Date: 19.MAR.2015 07:19:22

Time of Pulse 1 = 508.817635  $\mu$ S

### Duty Cycle



Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
 Ref Lvl 15.10 dB $\mu$ V VBW 300 kHz  
 87 dB $\mu$ V 5.000000 ms SWT 100 ms Unit dB $\mu$ V



Comment A: Duty Cycle.

Date: 19.MAR.2015 07:06:49


Number of Pulse Type 1 Pulses in Worst Case 100 mS = 17  
 Pulse Type 1 On Time = 508.817635  $\mu$ S\*17 = 8.649899795 mS  
 Duty Cycle = 8.649899795 / 100 mS = 0.08649899795  
 The Peak to Average Duty Cycle Correction = -21.26 dB  
**Max Duty Cycle Correction Factor = -20.00 dB**

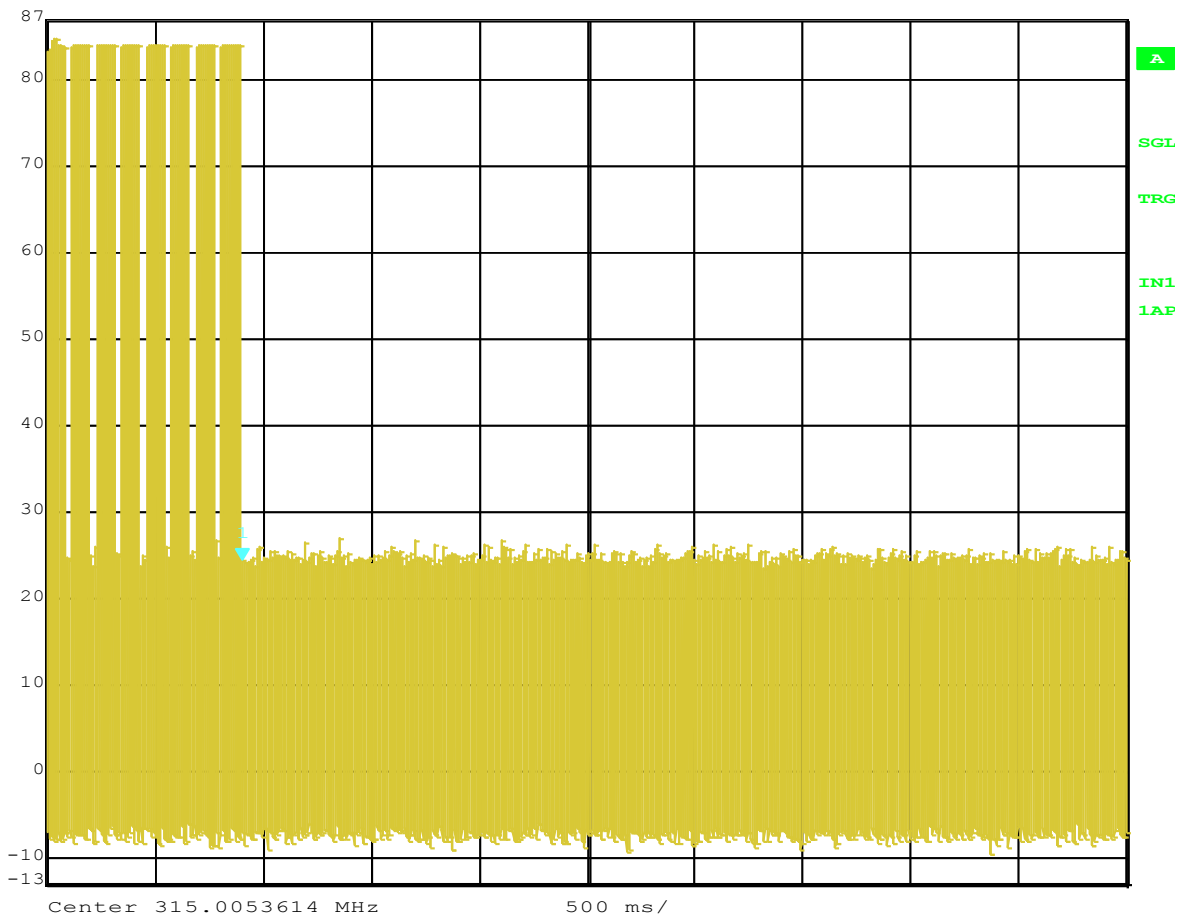
## DURATION TIME

**FCC 15.231**

Company: Nortek Date: 3/19/2015  
 Supervised Long Range  
 EUT: Convertible Transmitter Lab: R  
 Model: DXS-600 Tested By: Matt Harrison

Freq. (MHz)	Time (S)	Limit (S)	Margin	Comments
315.00	0.90	5.00	-4.10	

 Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
 Ref Lvl 24.44 dB $\mu$ V VBW 300 kHz  
 87 dB $\mu$ V 901.803607 ms SWT 5 s Unit dB $\mu$ V



Comment A: Transmit Timeout.  
 Date: 19.MAR.2015 07:28:13