

**ELECTROMAGNETIC COMPATIBILITY**  
**CLASS I PERMISSIVE CHANGE TEST REPORT TO**  
**CFR 47 FCC Part 2, Subpart J, Section 2.1043**  
**CFR 47 FCC Part 15, Subpart C, Section 15.249**  
**Industry Canada RSS 210, Issue 8**  
**Industry Canada RSS-Gen, Issue 3**  
**Industry Canada RSP-100 Issue 9**  
**ETSI EN 301 489-1 V1.8.1**

**CHANGES IN CERTIFIED EQUIPMENT FOR LICENCE-EXEMPT RADIO**  
**APPARATUS & INTENTIONAL RADIATORS OPERATING WITHIN THE BAND**  
**2400-2483.5 MHz**

**Report Number:** E10457-1301  
**Issue:** Revision 0.1  
**Date of Issue:** March 19<sup>th</sup>, 2013  
**Number of Pages:** 29



**Testing Laboratory:** Quality Auditing Institute  
**Address:** #16 – 211 Schoolhouse Street, Coquitlam, BC, V3K 4X9, Canada

**ISO 17025 Accreditation:**



**Standard Council of Canada: Accredited Laboratory No. 743**  
**International Accreditation Service Inc.: Accredited Laboratory No. TL-239**

This report has been completed in accordance with the requirements of ISO/IEC 17025. Test results contained in this report are within QAI Laboratories ISO/IEC 17025 accreditation. QAI Laboratories authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for the use by the company's employees only.

<b>Applicant's Name:</b>	Nyce Control Inc.
<b>Address:</b>	#103 – 8525 Baxter Place, Burnaby, BC, V5A 4V7, Canada.
<b>Phone:</b>	(604) 473-9800 x250
<b>Fax:</b>	
<b>Primary Contact:</b>	Michael Vogel
<b>E-mail:</b>	mvogel@nycecontrol.com
<b>Test Specifications</b>	
<b>Standards:</b>	CFR 47 FCC Part 2, Subpart J, Section 2.1043 CFR 47 FCC Part 15, Subpart C, Section 15.249 Industry Canada RSS 210, Issue 8 Industry Canada RSS-Gen, Issue 3 Industry Canada RSP-100 Issue 9 ETSI EN 301 489-1 V1.8.1
<b>Procedures:</b>	ANSI C63.4:2009 & ANSI C63.10:2009
<b>Non-Standard Test Methods:</b>	NA
<b>Test Item Description:</b>	Garage Door Sensor and Asset Sensor
<b>Trade Mark:</b>	
 	
<b>Manufacturer:</b>	Nyce Control Inc.
<b>Model Numbers:</b>	NCZ-3031
<b>FCC ID #</b>	<b>Y8R-Z30111</b>
<b>IC ID #</b>	<b>9488A-Z30111</b>



## Table of Contents

Section I:	EMC Test Description .....	5
	Testing Location.....	5
	EUT Receiving Details .....	5
	Environmental Test Conditions: Indoors .....	5
	EMC Test Summary.....	6
	Revision History .....	8
	Measurement Uncertainty .....	9
	Test Equipment List .....	9
	Semi-Anechoic Chamber Equipment List.....	9
	Measurement Software List .....	9
Section II:	Equipment Under Test Information.....	10
	EUT Testing Information .....	10
	Auxiliary Equipment .....	11
	EUT Cabling Configuration.....	11
	Product Description.....	11
	EUT Testing Configuration .....	11
Section III:	Requirements for the Canadian Market – Industry Canada & Emission Requirements for the CE Mark.....	12
	Digital Circuits Radiated Emission Testing .....	13
	Radiated Peak Power of the Fundamental and Harmonics .....	14
	Spurious Radiated Emissions Testing .....	15
Section IV:	Requirements for the US Market - FCC.....	16
	Digital Circuits Radiated Emission Testing .....	17
	Radiated Peak Power of the Fundamental and Harmonics .....	18
	Spurious Radiated Emissions and Bandedge Testing.....	19
Appendix A:	Report of Measurement Data and Plots.....	20
	Radiated Emissions: 30 MHz – 1 GHz.....	20
	NCZ-3031 Low Channel.....	20



NCZ-3031 Mid Channel .....	21
NCZ-3031 High Channel.....	22
Radiated Emissions: 1 GHz – 18 GHz.....	23
NCZ-3031 Low Channel.....	23
NCZ-3031 Mid Channel .....	23
NCZ-3031 High Channel.....	24
Bandwidth and Bandedge Plots.....	25
NCZ-3031 Low Channel Bandedge .....	26
NCZ-3031 High Channel Bandedge .....	27
Appendix B: EUT Photos During EMC Testing .....	28



## Section I: EMC Test Description

### Testing Location

**Testing Laboratory:** Quality Auditing Institute  
**Laboratory Address:** #16 – 211 Schoolhouse Street, Coquitlam, BC, V3K 4X9, Canada  
**Associated EMC Laboratory:** Quality Auditing Institute: Pitt Meadows & Maple Ridge Locations  
**Testing Location & Address:** 19473 Fraser Way, Pitt Meadows, BC, V3Y 2V4, Canada  
**Phone Number:** (604) 527-8378

**FCC Test Site Registration Number: 10 Meter Open Air Test Site and 3 Meter Semi-Anechoic Chamber:**  
226383

**Industry Canada Site Registration Number: 3 Meter SAC:** 9543B-1

**Industry Canada Test Site Registration Number: 10 Meter OATS:** 9543C-1

### EUT Receiving Details

**Model Numbers:** NCZ-3031  
**Company:** Nyce Control Inc.  
**Received Date:** January 18<sup>th</sup>, 2013  
**Received By:** Simon Howkins  
**Test Sample Log:** QAI Product Control Log: QM 1301 -Test Sample Inventory

### Environmental Test Conditions: Indoors

Day 1: January 18 <sup>th</sup> , 2013 25%	Temperature: 22°C R.H.:
Day 2: January 21 <sup>st</sup> , 2013 24%	Temperature: 22°C R.H.:
Day 3: January 22 <sup>nd</sup> , 2013 23%	Temperature: 22°C R.H.:
Day 4: January 23 <sup>rd</sup> , 2013 30%	Temperature: 23°C R.H.:
Day 5: January 24 <sup>th</sup> , 2013 33%	Temperature: 22°C R.H.:



## EMC Test Summary

The following tests demonstrate testimony to apply the FCC & IC Identification numbers and Marks as well as the CE mark for the intentional transmitters **NCZ-3031** manufactured by **Nyce Control Inc.** under the FCC and IC permissive change rules to model **NCZ-3011** manufactured by **Nyce Control Inc.**

Test / Requirement Description	Deviations from:		Pass / Fail	Applicable FCC Rule Parts	Applicable CE & Industry Canada Rule Parts
	Base Standard	Test Basis			
Radiated Emissions, 30 MHz to 1000 MHz	No	No	Pass	FCC Subpart C 15.209 & 15.249 & 2.1043	RSS-Gen Issue 3 7.2.5 & 7.1.4 RSS-210 Issue 8 Annex A2.9(b) ETSI EN 301 489-1 V1.8.1 §7.1
Field Strength of Fundamental & Spurious Emissions 1 GHz – 18 GHz	No	No	Pass	FCC Subpart C 15.209 & 15.249 & 2.1043	RSS-Gen Issue 3 7.2.5 & RSS-210 Issue 8 Annex A2.9(a)(b) ETSI EN 301 489-1 V1.8.1 §7.1
Occupied Bandwidth (99% emissions bandwidth)	No	No	NA	N/A	RSS-Gen Issue 3 4.6.1
Band Edge Measurement	No	No	Pass	FCC Subpart C 15.249 (d)	RSS-Gen Issue 3 7.2.5 & 7.1.4 RSS-210 Issue 8 Annex A8.5 ETSI EN 301 489-1 V1.8.1 §7.1
Electrostatic Discharge	No	No	Pass	N/A	ETSI EN 301 489-1 V1.8.1 ETSI EN 301 489-17 V2.1.1
Radiated RF Immunity	No	No	Pass	N/A	ETSI EN 301 489-1 V1.8.1 ETSI EN 301 489-17 V2.1.1



X

---

Tested By & Report Written By  
Simon Howkins, EMC Engineer

X

---

Reviewed By  
David Johanson RF/ EMC Test Engineer

Tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with CFR 47 FCC Part 2 Subpart J Section 2.1043, Industry Canada RSS 210 Issue 8, Industry Canada RSS-Gen Issue 3, Industry Canada RSP-100 Issue 9 & ETSI EN 301-489-1 V1.8.1: Changes in Certified Equipment For Licence-Exempt Radio Apparatus & Intentional Radiators Operating within the Band 2400-2483.5 MHz. The manufacturer is responsible for the tested product configuration, continued product compliance with these standards listed, and for the appropriate auditing of subsequent products as required.



## **Revision History**

<b>Date</b>	<b>Report Number</b>	<b>Rev. #</b>	<b>Details</b>	<b>Author</b>
Jan. 23 <sup>rd</sup> , 2013	E10456-1301	0.0	Draft Test Report	Simon Howkins
Mar. 19 <sup>th</sup> , 2013	E10457-1301	0.1	Draft Test Report	Andrei Moldavanov

**All previous versions of this Report have been superseded by the latest dated Revision as listed in the above table. Please dispose of all previous electronic and paper printed revisions accordingly.**





## **Measurement Uncertainty**

Radio Frequency:	$\pm 1.5 \times 10^{-5}$
Total RF Power: Conducted:	$\pm 1$ dB
RF Power Density: Conducted	$\pm 2.75$ dB
Spurious Emissions: Conducted	$\pm 3$ dB
All Emissions: Radiated	$\pm 3.5$ dB
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5$ %
DC and Low Frequency Voltages	$\pm 3$ %

## **Test Equipment List**

### **Semi-Anechoic Chamber Equipment List**

Manufacturer	Model	Description	Serial No.	Last Cal	Cal Due Date
ETS Lindgren	2165	Turntable	00043677	N/A	N/A
ETS Lindgren	2125	Mast	00077487	N/A	N/A
Sunol Sciences	JB3	Antenna	A042004	31-Oct-2012	31-Oct-2014
Rohde & Schwarz	ESU40	EMI Receiver	100011	26-June-2012	26-June-2015
ETS Lindgren	S201	5 meter Semi-Anechoic Chamber	1030	N/A	N/A
A.H. Systems	PAM-0118	Preamplifier	189	13-Dec-2006	N/A
A.H. Systems	PAM-0118	Preamplifier	189	Verified: 11-Sept-2011	
COM-POWER	AHA-118	Pre-Amp & Dual Ridge Horn Antenna	711040	11-Mar-2011	11-Mar-2014
Mini-Circuits	VHF-5500+	High Pass Filter	10550	Verified: 24-Sept-2013	

### **Measurement Software List**

Manufacturer	Model	Version	Description
Rhode & Schwarz	EMC 32	6.20.0	Emissions Pre-scan Test Software
VI Automation	Via EMC Immunity Executive	1.0.308	Radiated and Conducted Immunity Test Program



## Section II: Equipment Under Test Information

### EUT Testing Information



**NCZ-3031**

**Note:** Wires coming off the devices are for DC power and for EMC testing only. These devices are battery powered.

<b>Manufacturer</b>	Nyce Control Inc.
<b>EUT Descriptions</b>	Garage Door Sensor and Asset Sensor
<b>EUT Names</b>	Garage Door Sensor and Asset Sensor
<b>Model Number</b>	NCZ-3031
<b>Product Software/Firmware Revision</b>	???
<b>Serial Number</b>	EMC Test Unit
<b>FCC Classification</b>	FCC Part 15 Subpart C Section 15.249 &



	FCC Part 2 Subpart J Section 2.1043
<b>IC Classification</b>	RSS-210 Issue 8 & RSS-Gen Issue 3
<b>CE Classification</b>	EN 301 489-1 V1.8.1 & EN 301 489-17
<b>Antenna</b>	PCB Antenna
<b>Modulation</b>	ZigBee OQPSK
<b>Power Ratings</b>	3.0VDC Lithium, 50 mA. CR2032 Type.
<b>EUT Size (L x W x H) (cm)</b>	3.2 x 2.9 x 1.1
<b>EUT Weight</b>	11 grams with battery
<b>Channels/Frequency Range</b>	16 / 2.405 – 2.480 GHz

### **Auxiliary Equipment**

<b>Description</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>
DC Power Supply	Xantrex	XT 30-2	47665
Laptop	Compact	HSTNN-170C	CNU9512Y98
Laptop Power Supply	HP	PA-1400-18HB	0Y12021303 HB REV:A02
Ethernet Switch	Netgear	FS728TP	1PG279410006B
Ethernet to InSight Port Converter	Ember	EM-ISA-01	00:0D:6F:00:13:5D

### **EUT Cabling Configuration**

<b>Description</b>	<b>Number of Lines</b>	<b>Length (m)</b>	<b>Connection Type</b>	<b>Load or Termination</b>	<b>Shielded</b>	<b>Ferrites</b>
DC Power Supply to EUT	2	10	Solder	Yes	No	At chamber Interface.

**Note:** Laptop, Ethernet switch and Ember unit were used to set the channel, continuous mode and modulation settings and were not present during the testing.

### **Product Description**

The NCZ-3031 wireless Asset Sensor combines the features of a vibration sensor and ZigBee (802.15.4) radio in a single tiny device. Packed with intelligent features, the Asset Sensor expands your network's possibilities reporting when objects are on the move without wires.

### **EUT Testing Configuration**

For the purpose of compliance testing, the EUT was powered using an auxiliary 3 VDC power supply since the battery would not have enough power to complete the testing. The EUT was programmed to transmit the maximum output power at the low, mid and high channels of the ZigBee band (2405, 2440 and 2480 MHz respectively) in a continuous transmission mode, with modulation. Programming was done by using an Ember programming module that was connected to a PC via POE Ethernet. The programming module was disconnected after programming and all auxiliary equipment was removed from the test area.



### **Section III: Requirements for the Canadian Market – Industry Canada & Emission Requirements for the CE Mark**

#### **Summary for RSS-Gen Issue 3, RSS-210 Issue 8 & RSP-100 Issue 9 Class I Permission Change Requirements**

Testing was performed pursuant to Industry Canada standards. For the purpose of verifying compliance for a Class I Permissive Change the radiated emissions were verified to ensure compliance. It was noted that there has been a sensor change compared to the previous version of this product. There was no change to the radio circuitry.

<b>Test</b>	<b>Standard</b>	<b>Description</b>	<b>Result</b>
Digital Circuits Radiated Emissions	RSS-Gen (7.1.4) ICES-003	The radiated emissions are measured in the 30-1000MHz range	Complies
Radiated Peak Power and Harmonics	RSS-210 (A2.9)(a)	Peak Power and Harmonics shall be measured at 3meters	Complies
Spurious Emissions outside of the band	RSS-210 (A2.9)(b)	Radiated Spurious emissions shall be 50dBc or 54dBuV in accordance with table 2, whichever is less stringent 30-18000MHz	Complies



## **Digital Circuits Radiated Emission Testing**

DATE: January 18<sup>th</sup>, 2013

TEST STANDARD: ICES-003 Issue 5

TEST METHOD: RSS-Gen (7.1.4)

TEST VOLTAGE: 3 VDC

MINIMUM STANDARD: Class B Limit:

Frequency (MHz)	Maximum Field Strength (calculated) dB $\mu$ V/m at 3 m	Maximum Field Strength dB $\mu$ V/m at 10 m
30 - 230	40.45	30.0
230 - 1000	47.45	37.0
Note 1. The lower limit shall apply at the transition frequency Note 2. Additional provisions may be required for cases where interference occurs Note 3. The 3meter calculation is done for measurements performed at 3meters.		

METHOD OF MEASUREMENT: The equipment was set up in 3m Semi Anechoic Chamber for preliminary and final measurements; Radiated Emissions were performed at 3 meters for this unit. A typical application was tested.

Emissions in both horizontal and vertical polarizations were measured while rotating the EUT on a turntable to maximize the emissions signal strength.

The EUT was investigated in 3 orthogonal planes and the worst case data and plots were taken.

The transmitter was set to continuous mode of transmission and modulation on for this test. The transmitter was tested in its low, mid, and high channels within the band.

MODIFICATIONS: The EUT did not require any modifications.

MEASUREMENT DATA: The plots and data are contained in Appendix A.

PERFORMANCE: Complies.



## **Radiated Peak Power of the Fundamental and Harmonics**

DATE: January 22<sup>nd</sup>, 2013 & January 23<sup>rd</sup>, 2013

TEST STANDARD: RSS-210 Annex 2 Section (A2.9)(a)

TEST VOLTAGE: 3 VDC

MINIMUM STANDARD: (a) The field strengths measured at 3 meters shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength (millivolts/m)	
	Fundamental	Harmonics
2400-2483.5	50 (94 dBuV)	0.5 (54 dBuV)

TEST SETUP: The EUT was tested in our 3meter SAC and was positioned on the center of the Turntable and connected to a 3 VDC power supply. The Transmitter was set for Continuous transmission. The lowest, middle and highest channels in the 2400-2483.5MHz band were measured for all radiated emissions 9kHz to 18 GHz in three orthogonal planes

MEASUREMENT METHOD: Measurements were made using an EMI Receiver with a 1 MHz RBW and average detector above 1 GHz as required and using the appropriate antennas, amplifiers and filters. The EUT was investigated in 3 orthogonal planes and the worst case data and plots were taken.

DEVICE DESCRIPTIONS: As described in the above EUT description and setup Section.

EMISSIONS DATA: See data in Appendix A.

OBSERVATIONS: The EUT performed as expected.

PERFORMANCE: Complies.



## **Spurious Radiated Emissions Testing**

DATE: January 22<sup>nd</sup>, 2013 & January 23<sup>rd</sup>, 2013

TEST STANDARD: RSS-210 Annex 2 Section (A2.9)(b)

RSS-Gen Section (7.2.5)

TEST VOLTAGE: 3 VDC

MINIMUM STANDARD: (b) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general field strength limits listed in RSS-Gen, whichever is less stringent.

### **General Field Strength Limits for Transmitters at Frequencies above 30 MHz**

Frequency (MHz)	Field Strength	
	uV/m @ 3-m	Calculated dB $\mu$ V/m at 3m
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
960 +	500	54.0

TEST SETUP: The EUT was tested in a 3 meter semi-anechoic chamber and was positioned in the center of the turntable and connected to a 3 VDC power supply. The transmitter was set for continuous transmission. The lowest, middle and highest channels in the 2400-2483.5MHz band were measured for all radiated emissions 30 MHz to 18 GHz.

MEASUREMENT METHOD: Measurements were made using an EMI Receiver with a 120 kHz RBW and a quasi-peak detector below 1 GHz and with a 1 MHz RBW and average detector above 1 GHz as required and using the appropriate antennas, amplifiers and filters. The EUT was investigated in 3 orthogonal planes and the worst case data and plots were taken.

DEVICE DESCRIPTIONS: As described in the above EUT description and setup Section.

EMISSIONS DATA: See data in Appendix A

OBSERVATIONS: The EUT performed as expected.

PERFORMANCE: Complies.



## Section IV: Requirements for the US Market - FCC

For the purpose of verifying compliance for a Class II Permissive Change the radiated emissions were verified to ensure compliance. It was noted that there has been a sensor change compared to the previous version of this product. There was no change to the radio circuitry.

Tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC CFR 47 Part 15 Subpart C – Intentional Radiators

### Summary for FCC CFR 47, Part 15 Subpart C Section 15.249

Test	Standard	Description	Result
Digital Circuits Radiated Emissions	15.249(d)	The radiated emissions are measured in the 30-18000MHz range	Complies
Radiated Fundamental and Harmonics Emissions	15.249(a)	Peak Fundamental and Harmonics shall be measured at 3meters	Complies
Spurious Emissions outside of the band and Bandedge	15.249(d) and (e)	Radiated Spurious emissions shall be 50dBc or the levels in 15.209	Complies





## **Digital Circuits Radiated Emission Testing**

DATE: January 18<sup>th</sup>, 2013

TEST STANDARD: FCC Part 15 Subpart C Section 15.249(d)

TEST VOLTAGE: 3 VDC

MINIMUM STANDARD: Class B Limit:

Frequency (MHz)	Field Strength	
	uV/m @ 3-m	dB $\mu$ V/m at 3m
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
960 - 1000	500	54.0

METHOD OF MEASUREMENT: The equipment was set up in 3m Semi Anechoic Chamber for preliminary and final measurements; Radiated Emissions were performed at 3 meters for this unit. A typical application was tested.

Emissions in both horizontal and vertical polarizations were measured while rotating the EUT on a turntable to maximize the emissions signal strength.

The EUT was investigated in 3 orthogonal planes and the worst case data and plots were taken.

The transmitter was set to continuous mode of transmission and modulation on for this test. The transmitter was tested in its low, mid, and high channels within the band.

MODIFICATIONS: The EUT did not require any modifications.

MEASUREMENT DATA: See Appendix A for emissions plots and corresponding data

PERFORMANCE: Complies.



## **Radiated Peak Power of the Fundamental and Harmonics**

DATE: January 22<sup>nd</sup>, 2013 & January 23<sup>rd</sup>, 2013

TEST STANDARD: CFR 47 FCC Part 15 Subpart C Section 15.249(a)

TEST VOLTAGE: 3 VDC

MINIMUM STANDARD: (a) The field strengths measured at 3 meters shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength (millivolts/m)	
	Fundamental	Harmonics
2400-2483.5	50 (94 dBuV)	0.5 (54 dBuV)

TEST SETUP: The EUT was tested in our 3meter SAC and was positioned on the center of the Turntable and connected to a 3 VDC power supply. The Transmitter was set for Continuous transmission. The lowest, middle and highest channels in the 2400-2483.5MHz band were measured for all radiated emissions 9kHz to 18 GHz in three orthogonal planes

MEASUREMENT METHOD: Measurements were made using an EMI Receiver with a 1 MHz RBW and average detector above 1 GHz as required and using the appropriate antennas, amplifiers and filters. The EUT was investigated in 3 orthogonal planes and the worst case data and plots were taken.

DEVICE DESCRIPTIONS: As described in the above EUT description and setup Section.

EMISSIONS DATA: See data in Appendix A.

OBSERVATIONS: The EUT performed as expected.

PERFORMANCE: Complies.



## Spurious Radiated Emissions and Bandedge Testing

DATE: January 22<sup>nd</sup>, 2013 & January 23<sup>rd</sup>, 2013

TEST STANDARD: FCC Part 15.249(d) & (e).

TEST VOLTAGE: 3 VDC

MINIMUM STANDARD: (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.  
(e) As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

### 15.209 General Field Strength Limits

Frequency (MHz)	Field Strength	
	uV/m @ 3-m	Calculated dBµV/m at 3m
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
960 +	500	54.0

TEST SETUP: The EUT was tested in a 3 meter semi-anechoic chamber and was positioned in the center of the turntable and connected to a 3 VDC power supply. The transmitter was set for continuous transmission. The lowest, middle and highest channels in the 2400-2483.5MHz band were measured for all radiated emissions 30 MHz to 18 GHz.

MEASUREMENT METHOD: Measurements were made using an EMI Receiver with a 120 kHz RBW and a quasi-peak detector below 1 GHz and with a 1 MHz RBW and average detector above 1 GHz as required and using the appropriate antennas, amplifiers and filters. The EUT was investigated in 3 orthogonal planes and the worst case data and plots were taken.

DEVICE DESCRIPTIONS: As described in the above EUT description and setup section.

EMISSIONS DATA: See data in Appendix A

OBSERVATIONS: The EUT performed as expected.

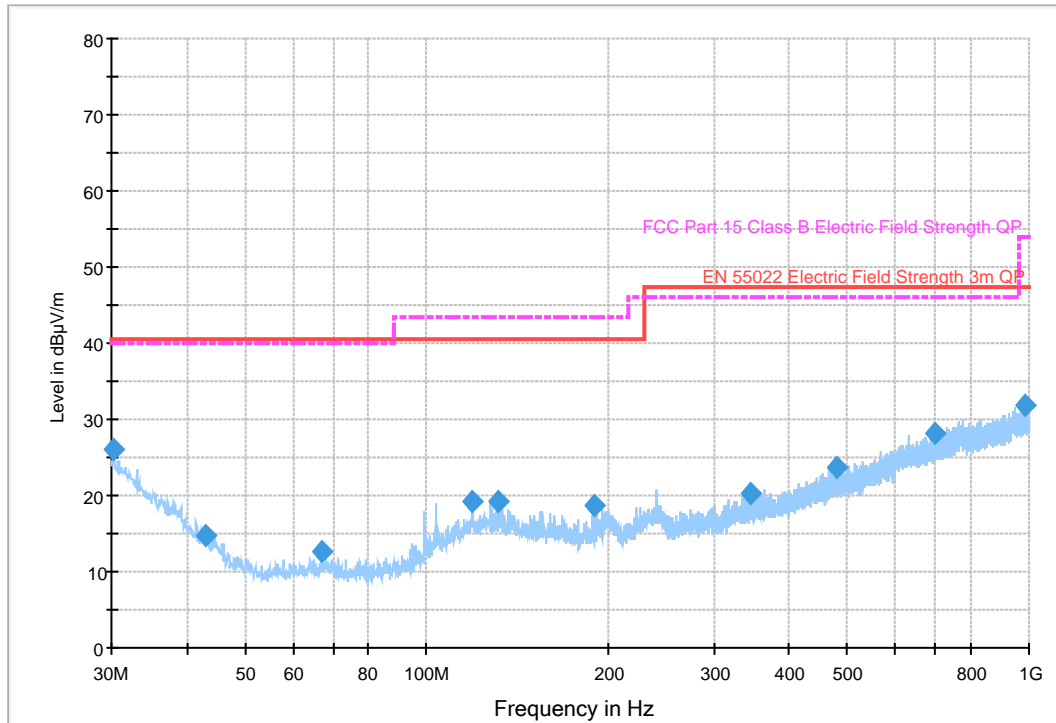
PERFORMANCE: Complies.



## Appendix A: Report of Measurement Data and Plots

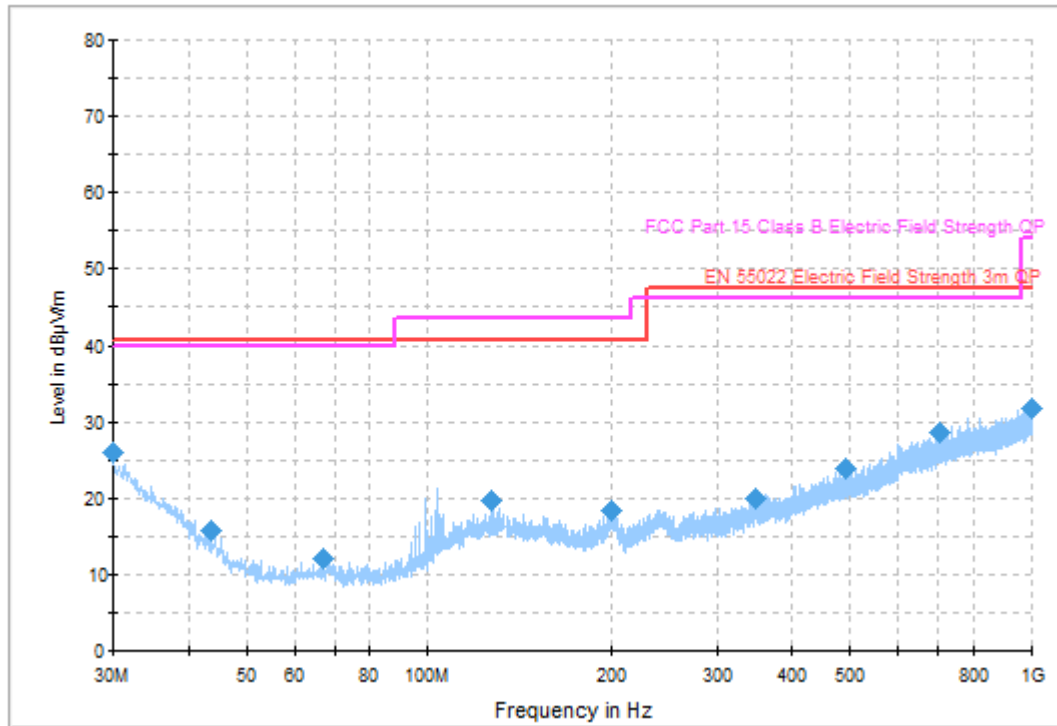
### Radiated Emissions: 30 MHz – 1 GHz

#### NCZ-3031 Low Channel



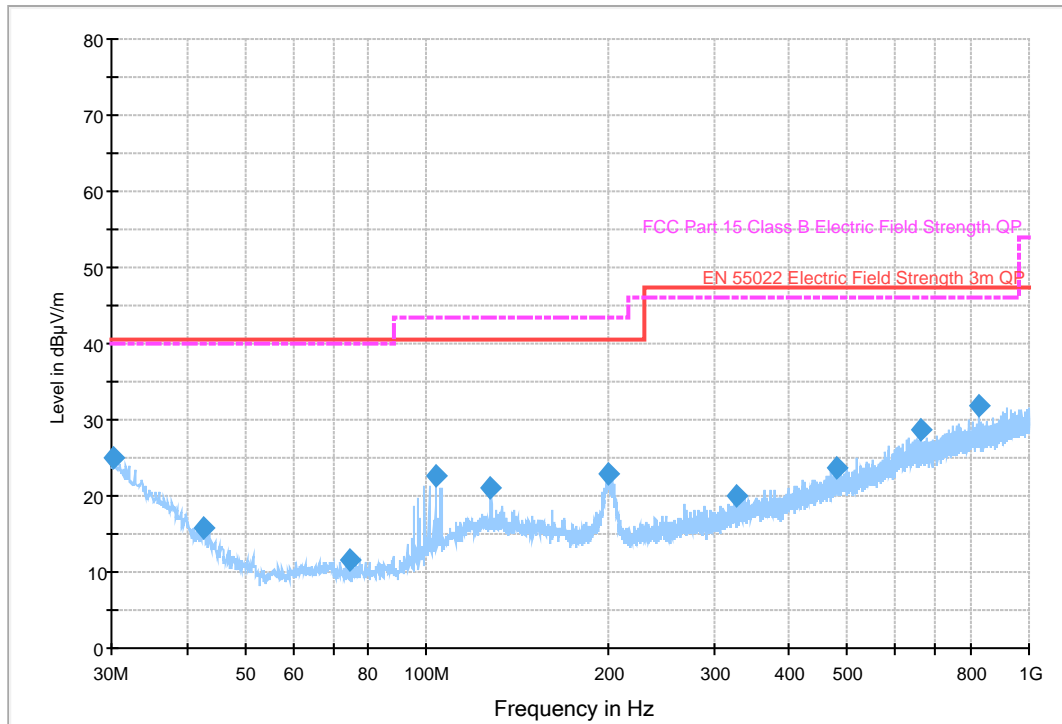


## NCZ-3031 Mid Channel





## NCZ-3031 High Channel





## **Radiated Emissions: 1 GHz – 18 GHz**

### **NCZ-3031 Low Channel**

Frequency (MHz)	Average (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2.404474	88.8	1000.000	134	V	10	30.1	5.2	94.0
4.810918	42.4	1000.000	134	V	12	16.1	11.6	54.0
7.213302	36.9	1000.000	100	H	306	8.6	17.1	54.0
9.621835	41.2	1000.000	160	H	30	21.0	12.8	54.0
12.025	NM	NA	NA	NA	NA	NA	NA	NA

Frequency (MHz)	Peak (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2.404474	94.5	1000.000	134	V	10	30.1	19.5	114.0
4.810918	53.3	1000.000	134	V	12	16.1	20.7	74.0
7.213302	47.3	1000.000	100	H	306	8.6	26.7	74.0
9.621835	54.0	1000.000	160	H	30	21.0	20.0	74.0
12.025	NM	NA	NA	NA	NA	NA	NA	NA

### **NCZ-3031 Mid Channel**

Frequency (MHz)	Average (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2.440394	84.3	1000.000	130	V	7	30.1	9.7	94.0
4.880925	33.1	1000.000	130	H	0	16.1	20.9	54.0
7.318301	32.8	1000.000	100	V	266	8.6	21.2	54.0
9.76	NM	NA	NA	NA	NA	NA	NA	NA
12.2	NM	NA	NA	NA	NA	NA	NA	NA

Frequency (MHz)	Peak (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2.440394	90.1	1000.000	130	V	7	30.1	23.9	114.0
4.880925	46.8	1000.000	130	H	0	16.1	27.2	74.0
7.318301	45.1	1000.000	100	V	266	8.6	28.9	74.0
9.76	NM	NA	NA	NA	NA	NA	NA	NA



12.2	NM	NA	NA	NA	NA	NA	NA	NA
------	----	----	----	----	----	----	----	----

### NCZ-3031 High Channel

Frequency (MHz)	Average (dBμV/m)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2.479467	83.3	1000.000	102	V	336	30.1	10.7	94.0
4.960915	46.3	1000.000	113	H	27	16.1	7.7	54.0
7.438605	29.5	1000.000	100	V	275	8.6	24.5	54.0
9.92	NM	NA	NA	NA	NA	NA	NA	NA
12.4	NM	NA	NA	NA	NA	NA	NA	NA

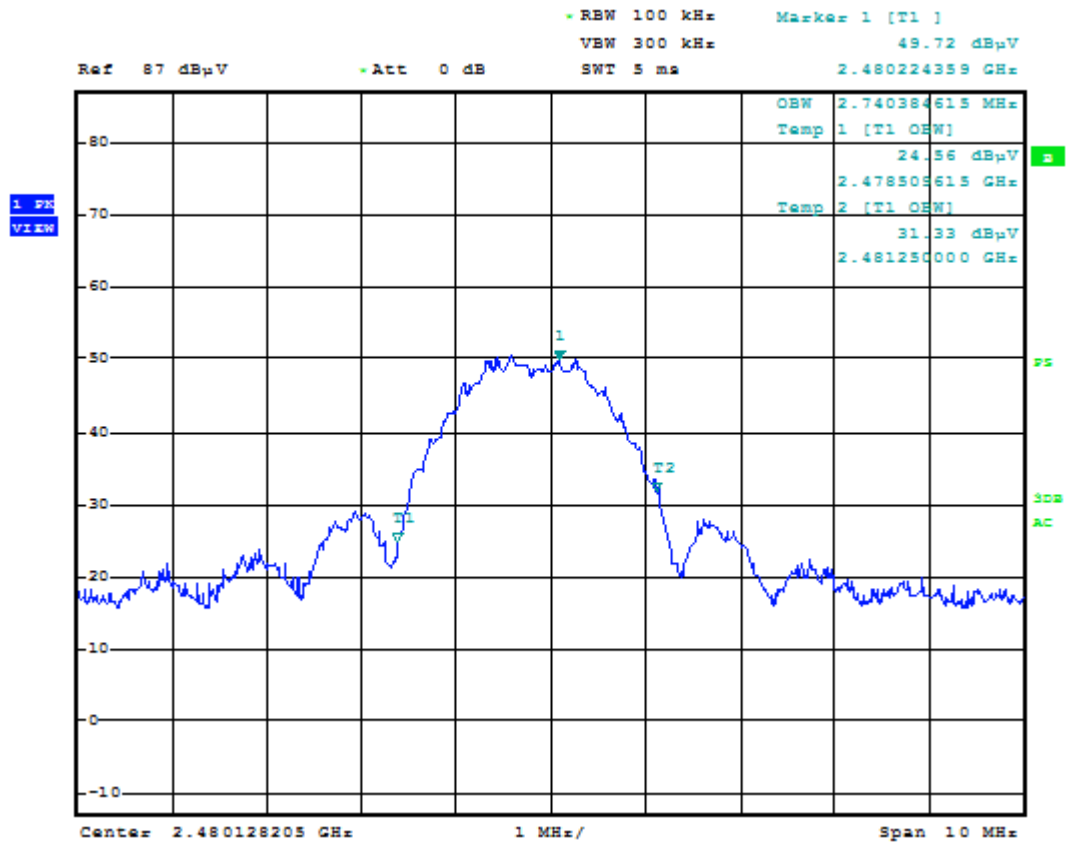
Frequency (MHz)	Peak (dBμV/m)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2.479467	89.1	1000.000	102	V	336	30.1	24.9	114.0
4.960915	55.3	1000.000	113	H	27	16.1	18.7	74.0
7.438605	42.6	1000.000	100	V	275	8.6	31.4	74.0
9.92	NM	NA	NA	NA	NA	NA	NA	NA
12.4	NM	NA	NA	NA	NA	NA	NA	NA





## Bandwidth and Bandedge Plots

### NCZ-3031 99% Occupied Bandwidth

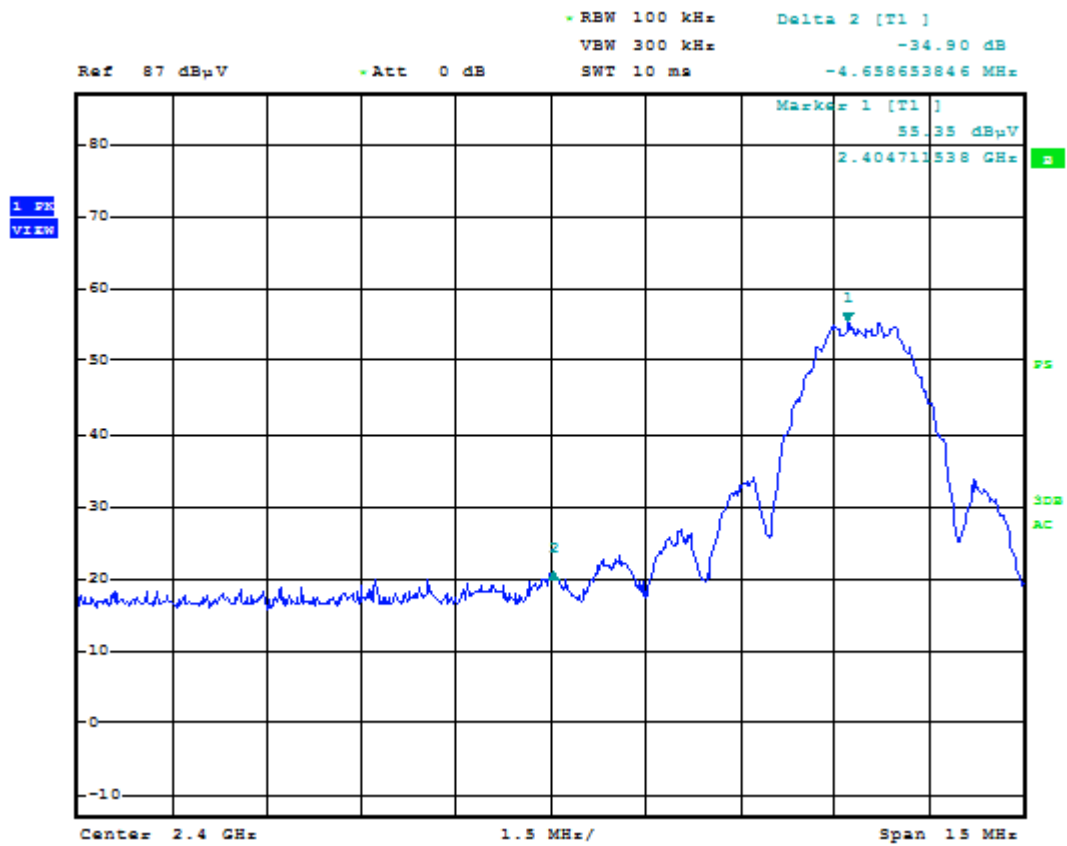


Note: Correction factors have not been applied to this plot.

99% Occupied Bandwidth = 2.740384 MHz



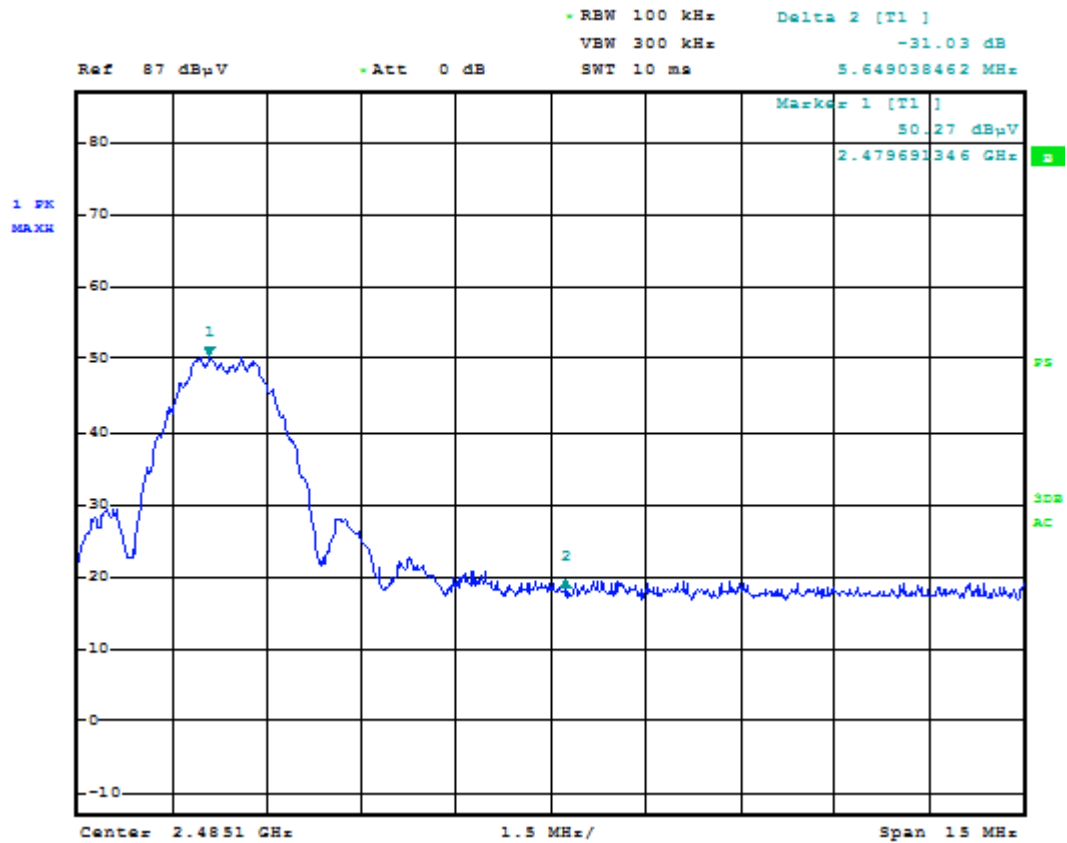
## NCZ-3031 Low Channel Bandedge



Note: Correction factor not applied to this plot.



## NCZ-3031 High Channel Bandedge



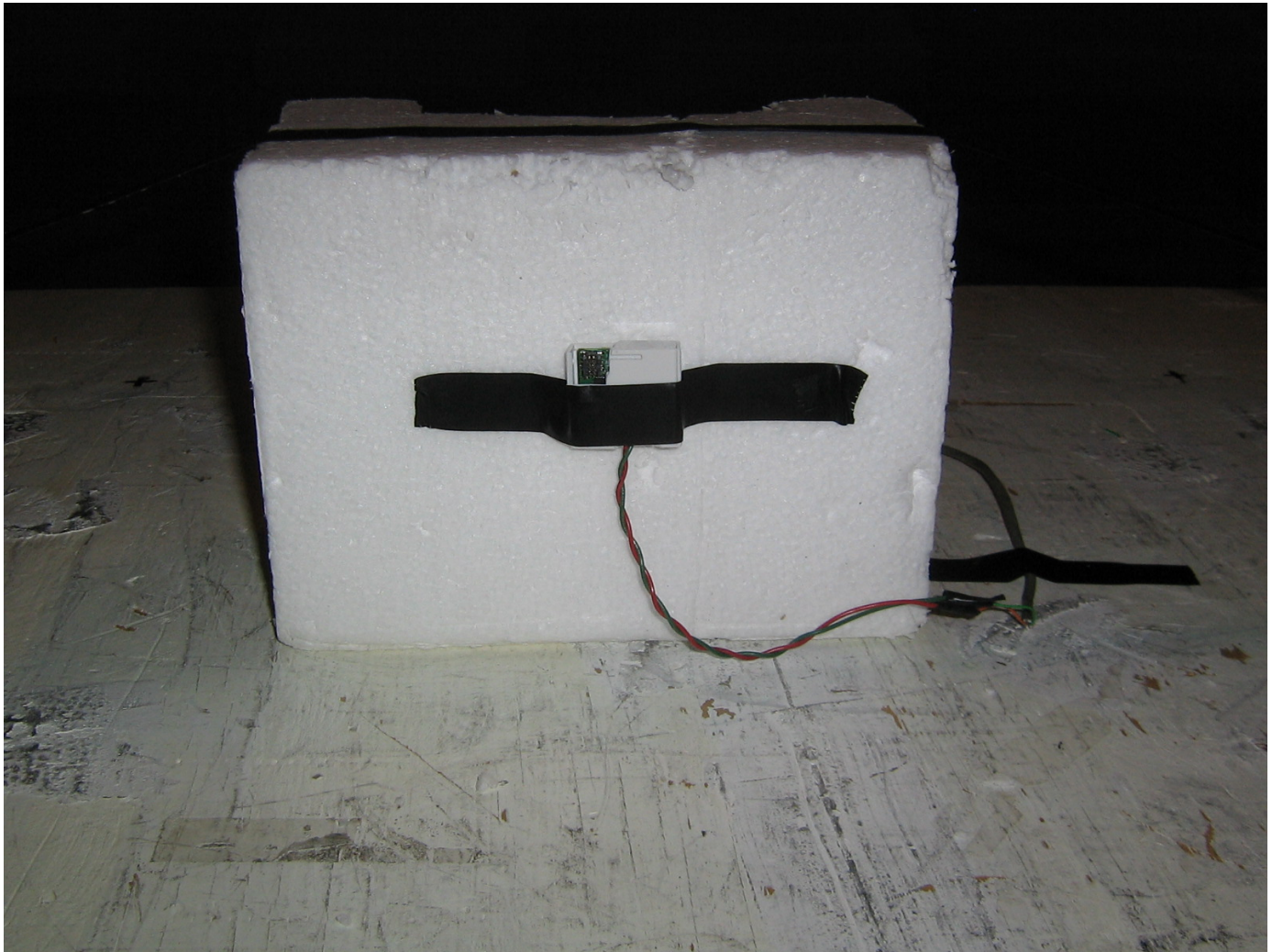
Note: Correction factor not applied to this plot.



## Appendix B: EUT Photos During EMC Testing



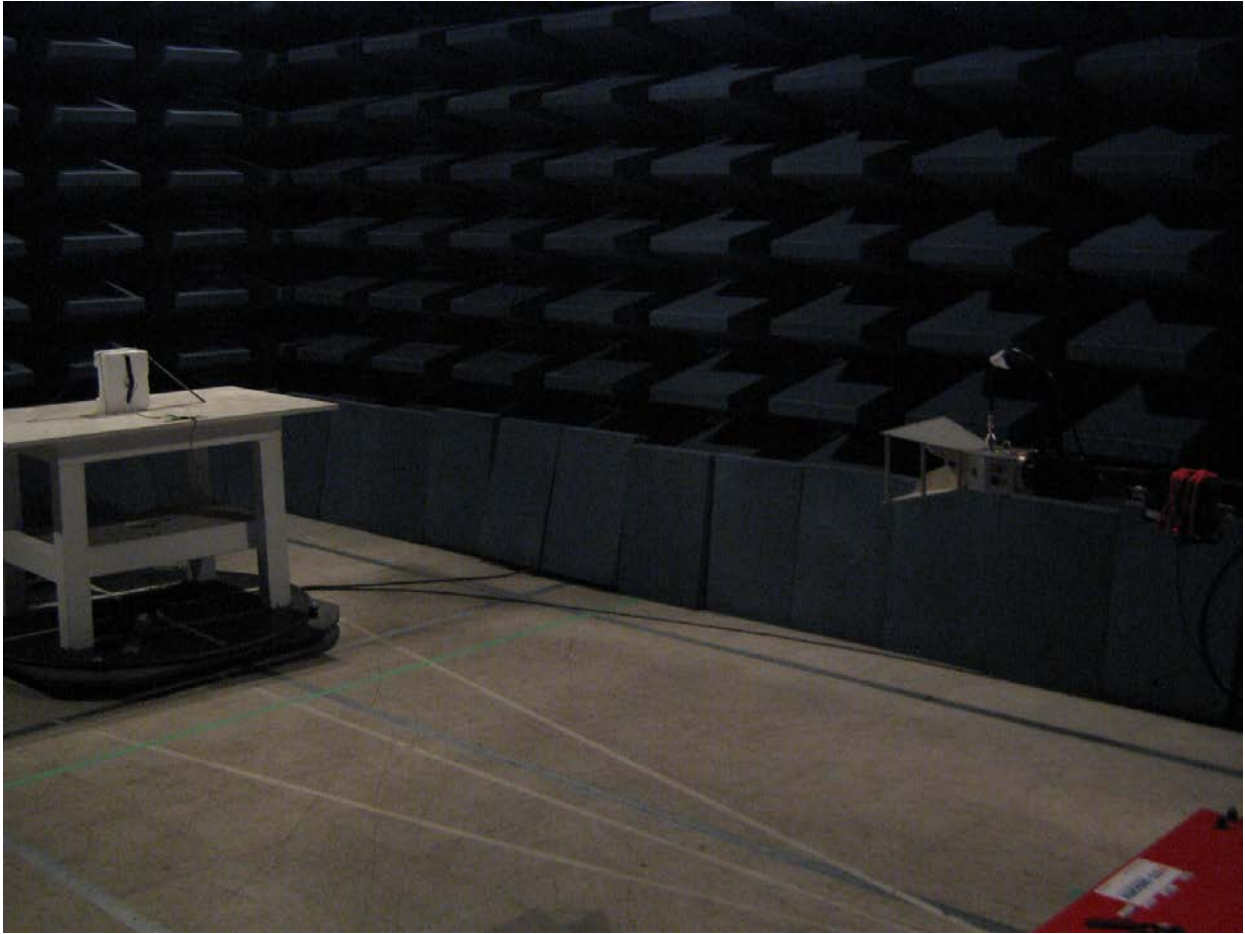
Radiated Emission Test Setup in the Semi-Anechoic Chamber: NCZ-3031



Radiated Emissions Test Set-Up in the Semi-Anechoic Chamber: NCZ-3031

**Note: Picture does not show worst case orientation of EUT. EUT should be rotated 90 degrees.**





Radiated Emission Test Setup in the Semi-Anechoic Chamber: NCZ-3031