

# Honeywell

## WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1

Report No. HONE0041

Report Prepared By



[www.nwemc.com](http://www.nwemc.com)  
1-888-EMI-CERT

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EMC Test Report

## Certificate of Test

Last Date of Test: March 04, 2009

Honeywell

Model: WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Spurious Radiated Emissions	FCC 15.247 (DTS):2008	ANSI C63.4:2003 KDB No. 558074	Pass

### Modifications made to the product

See the Modifications section of this report

### Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.  
41 Tesla Ave.  
Irvine, CA 92618

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834B-2).

Approved By:



Don Fecteau, IS Manager



NVLAP Lab Code: 200676-0

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

*Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.*

Revision Number	Description	Date	Page Number
00	None		

**FCC:** Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



**NVLAP:** Northwest EMC, Inc. is accredited under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



NVLAP LAB CODE 200629-0  
 NVLAP LAB CODE 200630-0  
 NVLAP LAB CODE 200676-0  
 NVLAP LAB CODE 200761-0

**Industry Canada:** Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS-Gen, Issue 2 and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2*)



**CAB:** Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.



**NEMKO:** Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



**Australia/New Zealand:** The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



**VCCI:** Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071, R-1025, C-2687, T-289, and R-2318, Irvine: R-1943, C-2766, and T-298, Sultan: R-871, C-1784, and T-294.*)



**BSMI:** Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017). License No.SL2-IN-E-1017.



**GOST:** Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



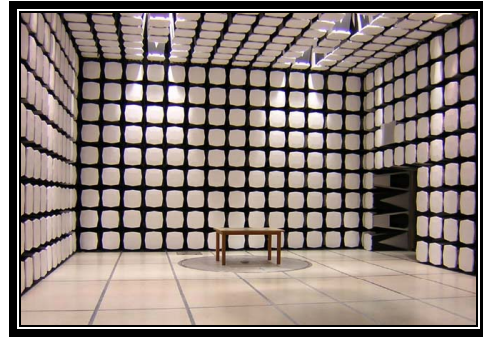
**KCC:** Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157*)



## SCOPE

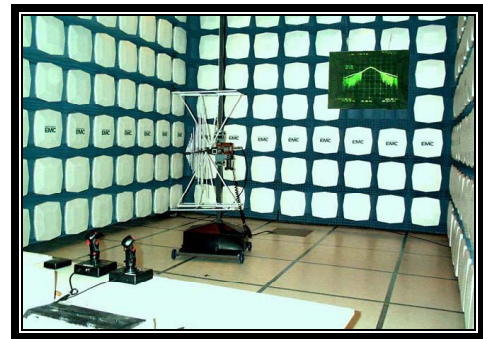
For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>



**California – Orange County Facility  
Labs OC01 – OC13**

41 Tesla Ave. Irvine, CA 92618  
(888) 364-2378 Fax: (503) 844-3826



**Oregon – Evergreen Facility  
Labs EV01 – EV11**

22975 NW Evergreen Pkwy. Suite 400 Hillsboro, OR 97124  
(503) 844-4066 Fax: (503) 844-3826



**Washington – Sultan Facility  
Labs SU01 – SU07**

14128 339<sup>th</sup> Ave. SE Sultan, WA 98294  
(888) 364-2378

**Party Requesting the Test**

<b>Company Name:</b>	Honeywell
<b>Address:</b>	2500 W. Union Hills Road
<b>City, State, Zip:</b>	Phoenix, AZ 85027
<b>Test Requested By:</b>	David Shipley
<b>Model:</b>	WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1
<b>First Date of Test:</b>	March 2, 2009
<b>Last Date of Test:</b>	March 4, 2009
<b>Receipt Date of Samples:</b>	March 2, 2009
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No Damage

**Information Provided by the Party Requesting the Test****Functional Description of the EUT (Equipment Under Test):**

The WCX1 uses a radio board that is in the XYR6000 product. The XYR6000 has already obtained the above approvals, through Northwest EMC:

- XYR6000 FCC limited modular approval (FCC ID: S5750025034)
- XYR6000 IC limited modular approval (IC: 573I-50025034)
- XYR6000 also has R&TTE Notified Body Opinion/Approval

The WCX1 will use a different/alternate housing, from the XYR6000 product; however, the antennas and output power levels will be the same as the XYR6000.

- The WCX1 does not have any signal or power cable that exit the housing.
- The WCX1 is battery powered.

**Testing Objective:**

It is seeking a Class II Permissive Change authorization for use in a new host device.

**CONFIGURATION 1 HONE0041****EUT**

Description	Manufacturer	Model/Part Number	Serial Number
WCX1 Valve Position Sensor,	Honeywell	Model # WCX1C1A0A-AA1	None

**Peripherals in test setup boundary**

Description	Manufacturer	Model/Part Number	Serial Number
-2dBi Low Gain Antenna	Honeywell	None	None
14dBi High Gain Antenna	Hyperlink Technologies	HG2414D	None

**Remote Equipment Outside of Test Setup Boundary**

Description	Manufacturer	Model/Part Number	Serial Number
Remote PC	Xplore	iX104C3 Plus	None

**Cables**

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial Cable	No	10m	No	PC	WCX1 Valve Position Sensor,
N-Cable	Yes	1m	No	WCX1 Valve Position Sensor,	14 dBI High Gain Antenna

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.



**Equipment modifications**

Item	Date	Test	Modification	Note	Disposition of EUT
1	3/2/2009 thru 3/4/2009	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was complete.

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**MODES OF OPERATION**

Transmitting at high channel 2475 MHz.  
Transmitting at mid channel 2440 MHz.  
Transmitting at low channel 2405 MHz.

**MODE USED FOR FINAL DATA**

Transmitting at high channel 2475 MHz.  
Transmitting at mid channel 2440 MHz.  
Transmitting at low channel 2405 MHz.

**AXIS INVESTIGATED**

X-Axis  
Y-Axis  
Z-Axis

**POWER SETTINGS INVESTIGATED**

7 VDC

**POWER SETTINGS USED FOR FINAL DATA**

7 VDC

**FREQUENCY RANGE INVESTIGATED**

Start Frequency	30 MHz	Stop Frequency	26000 MHz
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**CLOCKS AND OSCILLATORS**

2405 MHz, 2440 MHz, and 2475 MHz.

**SAMPLE CALCULATIONS**

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna, Biconilog	EMCO	3142	AXJ	2/25/2008	24
OC10 Cables	None	10kHz-1GHz RE Cables	OCH	3/2/2009	13
Pre-Amplifier	Miteq	AM-1616-1000	AOM	3/2/2009	13
Spectrum Analyzer	Agilent	E4446A	AAQ	12/20/2008	24
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOI	3/3/2008	13
Antenna, Horn	EMCO	3160-09	AHN	NCR	0
OC floating Cable	None	18-26GHz RE Cables	OCH	3/3/2008	13
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVP	11/6/2008	13
Antenna, Horn	EMCO	3160-08	AHK	NCR	0
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVL	2/8/2008	13
Antenna, Horn	ETS	3160-07	AHX	NCR	0
OC11 Cables	None	12-18GHz RE Cables	OCS	2/7/2008	13
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVJ	4/25/2008	13
Antenna, Horn	EMCO	3115	AHB	8/31/2007	24
OC11 Cables	None	1-8GHz RE Cables	OCR	2/7/2008	13
Spectrum Analyzer	Agilent	E4440A	AAX	12/16/2008	13

**MEASUREMENT BANDWIDTHS**

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

**MEASUREMENT UNCERTAINTY**

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

**TEST DESCRIPTION**

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

EUT: WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1		Work Order: HONE0041
Serial Number: None	Date: 03/02/09	
Customer: Honeywell	Temperature: 21.93	
Attendees: David Shipley	Humidity: 40%	
Project: None	Barometric Pres.: 30.06	
Tested by: Jaemi Suh	Power: 7 VDC	Job Site: OC11

<b>TEST SPECIFICATIONS</b>	Test Method
FCC 15.247(DTS):2009	ANSI C63.4:2003 KDB No. 558074

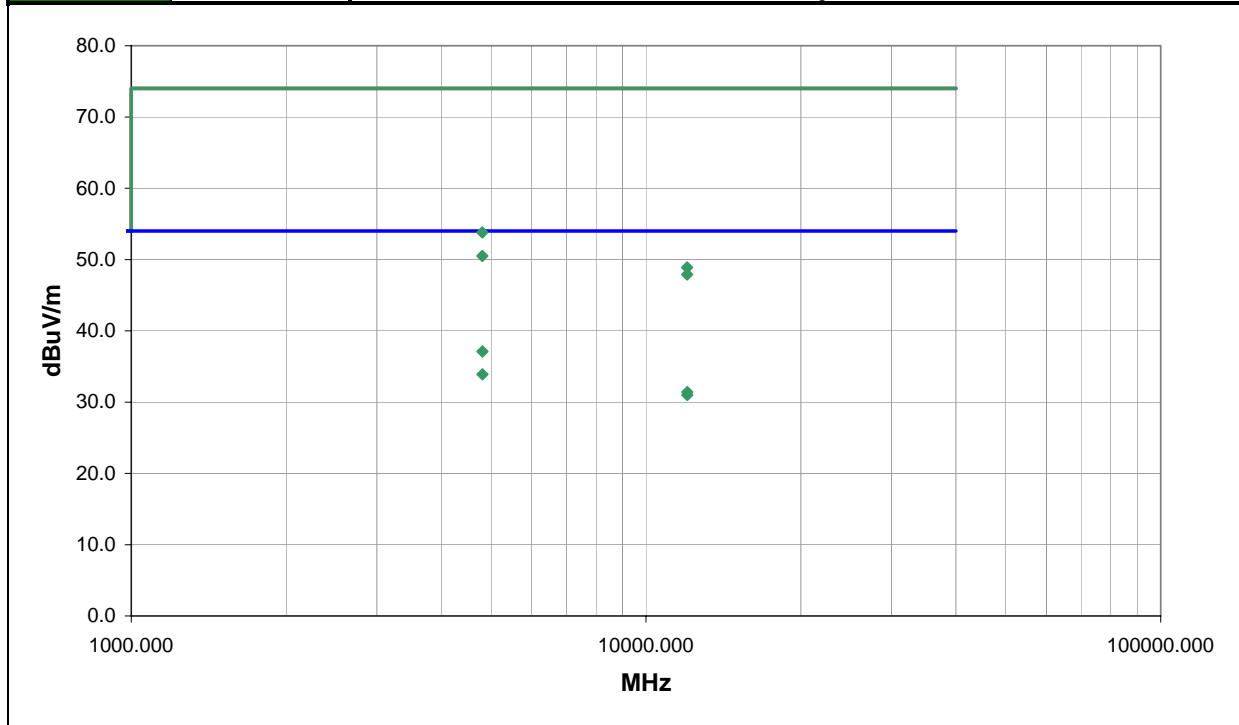
<b>TEST PARAMETERS</b>			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

**COMMENTS**  
Channel 5, Power Level = 255, All 1's. Y-Axis. Lowest Gain Antenna -2dBi. PC Power Level: 255 (20.6 dBm). CHIP PA Level = 0 dBm. Duty cycle correction factor is based on a 41msec dwell time. Duty cycle corr. =  $20 \log(41/100) = 7.7 \text{ dB}$ .

**EUT OPERATING MODES**  
Transmitting at low channel 2405 MHz.

**DEVIATIONS FROM TEST STANDARD**  
No deviations.

Run #	4	Signature 
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
4810.679	41.7	3.1	212.0	1.1	7.7	0.0	H-Horn	AV	0.0	37.1	54.0	-16.9
4810.675	38.5	3.1	348.0	1.4	7.7	0.0	V-Horn	AV	0.0	33.9	54.0	-20.1
4808.840	50.7	3.1	212.0	1.1	0.0	0.0	H-Horn	PK	0.0	53.8	74.0	-20.2
12026.890	50.1	-11.0	359.0	1.2	7.7	0.0	V-Horn	AV	0.0	31.4	54.0	-22.6
12026.930	49.7	-11.0	22.0	1.1	7.7	0.0	H-Horn	AV	0.0	31.0	54.0	-23.0
4808.680	47.4	3.1	348.0	1.4	0.0	0.0	V-Horn	PK	0.0	50.5	74.0	-23.5
12022.070	59.9	-11.0	359.0	1.2	0.0	0.0	V-Horn	PK	0.0	48.9	74.0	-25.1
12020.400	58.9	-11.0	22.0	1.1	0.0	0.0	H-Horn	PK	0.0	47.9	74.0	-26.1

EUT:	WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1	Work Order:	HONE0041
Serial Number:	None	Date:	03/02/09
Customer:	Honeywell	Temperature:	21.93
Attendees:	David Shipley	Humidity:	40%
Project:	None	Barometric Pres.:	30.06
Tested by:	Jaemi Suh	Power:	7 VDC
		Job Site:	OC11

TEST SPECIFICATIONS		Test Method
FCC 15.247(DTS):2009		ANSI C63.4:2003 KDB No. 558074

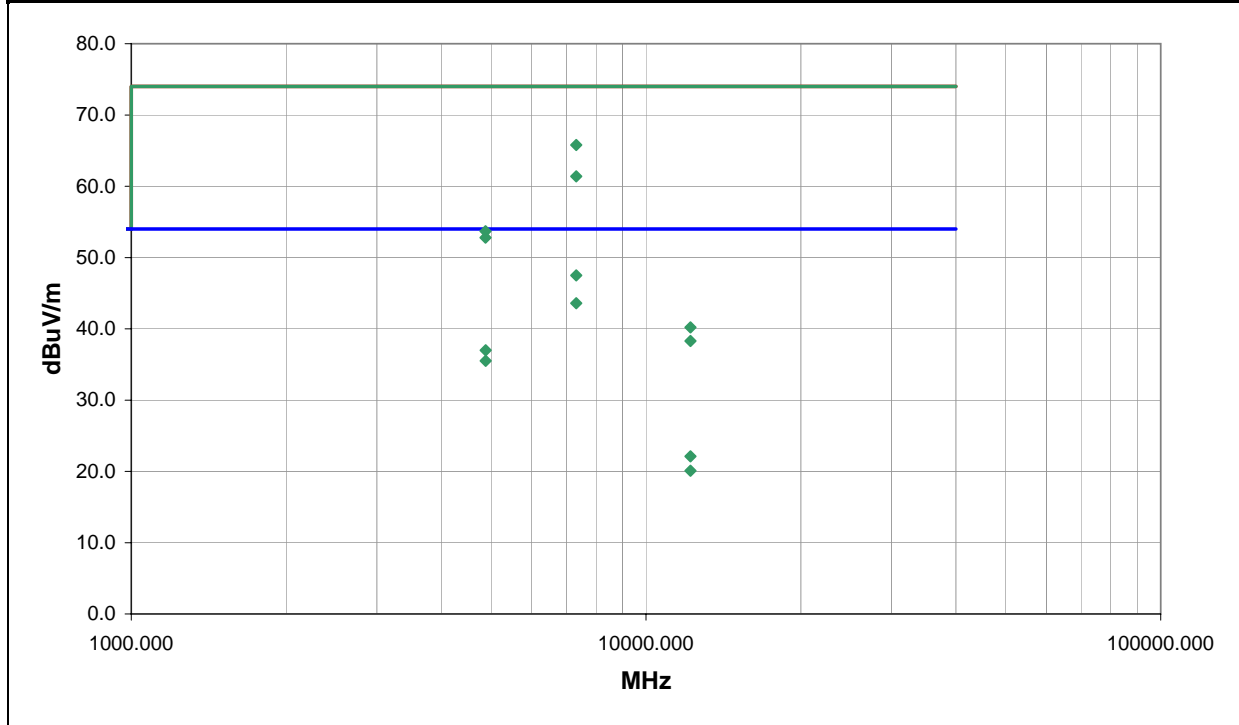
TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

**COMMENTS**  
Channel 40, Power Level = 255, All 1's. Y-Axis. Lowest Gain Antenna -2dBi. PC Power Level: 255 (20.6 dBm). CHIP PA Level = 0 dBm. Duty cycle correction factor is based on a 41msec dwell time. Duty cycle corr. = 20 log(41/100) = 7.7 dB.

**EUT OPERATING MODES**  
Transmitting at mid channel 2440 MHz.

**DEVIATIONS FROM TEST STANDARD**  
No deviations.

Run #	6	Signature 
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
7320.998	46.8	8.4	328.0	1.2	7.7	0.0	H-Horn	AV	0.0	47.5	54.0	-6.5
7318.189	57.4	8.4	328.0	1.2	0.0	0.0	H-Horn	PK	0.0	65.8	74.0	-8.2
7320.952	42.9	8.4	188.0	1.2	7.7	0.0	V-Horn	AV	0.0	43.6	54.0	-10.4
7321.038	53.0	8.4	188.0	1.2	0.0	0.0	V-Horn	PK	0.0	61.4	74.0	-12.6
4880.687	41.4	3.3	333.0	1.3	7.7	0.0	H-Horn	AV	0.0	37.0	54.0	-17.0
4880.692	39.9	3.3	357.0	1.4	7.7	0.0	V-Horn	AV	0.0	35.5	54.0	-18.5
4879.036	50.4	3.3	333.0	1.3	0.0	0.0	H-Horn	PK	0.0	53.7	74.0	-20.3
4878.679	49.5	3.3	357.0	1.4	0.0	0.0	V-Horn	PK	0.0	52.8	74.0	-21.2
12201.830	40.2	-10.4	315.0	1.0	7.7	0.0	H-Horn	AV	0.0	22.1	54.0	-31.9
12202.060	50.6	-10.4	315.0	1.0	0.0	0.0	H-Horn	PK	0.0	40.2	74.0	-33.8
12201.820	38.2	-10.4	236.0	1.0	7.7	0.0	V-Horn	AV	0.0	20.1	54.0	-33.9
12201.480	48.7	-10.4	236.0	1.0	0.0	0.0	V-Horn	PK	0.0	38.3	74.0	-35.7

EUT: WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1		Work Order: HONE0041
Serial Number: None	Date: 03/02/09	
Customer: Honeywell	Temperature: 21.93	
Attendees: David Shipley	Humidity: 40%	
Project: None	Barometric Pres.: 30.06	
Tested by: Jaemi Suh	Power: 7 VDC	Job Site: OC11

<b>TEST SPECIFICATIONS</b>	Test Method
FCC 15.247(DTS):2009	ANSI C63.4:2003 KDB No. 558074

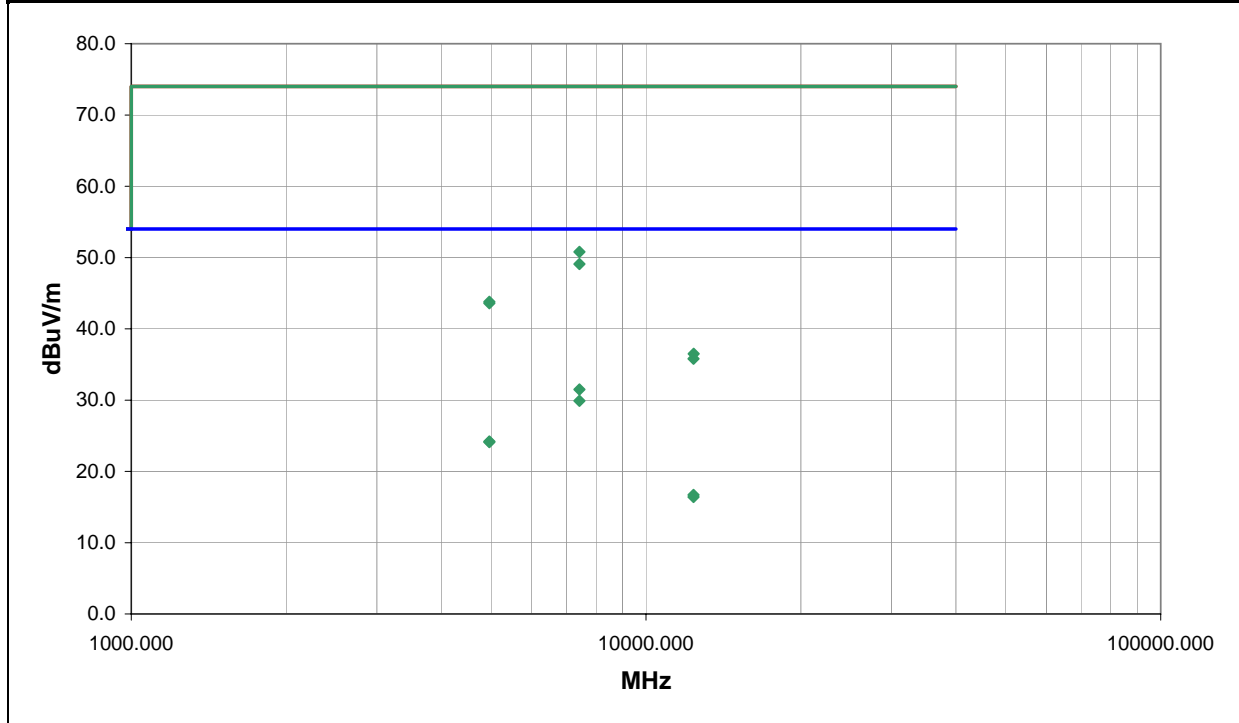
<b>TEST PARAMETERS</b>			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

**COMMENTS**  
Channel 75, Power Level = 255, All 1's. Y-Axis. Lowest Gain Antenna -2dBi. PC Power Level: 255 (20.6 dBm). CHIP PA Level = 0 dBm. Duty cycle correction factor is based on a 41msec dwell time. Duty cycle corr. = 20 log(41/100) = 7.7 dB.

**EUT OPERATING MODES**  
Transmitting at high channel 2475 MHz.

**DEVIATIONS FROM TEST STANDARD**  
No deviations.

Run #	8	Signature 
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
7426.123	30.5	8.7	359.0	2.3	7.7	0.0	V-Horn	AV	0.0	31.5	54.0	-22.5
7422.995	42.1	8.7	359.0	2.3	0.0	0.0	V-Horn	PK	0.0	50.8	74.0	-23.2
7423.035	28.9	8.7	360.0	2.0	7.7	0.0	H-Horn	AV	0.0	29.9	54.0	-24.1
7426.314	40.4	8.7	360.0	2.0	0.0	0.0	H-Horn	PK	0.0	49.1	74.0	-24.9
4963.586	28.3	3.6	3.0	1.0	7.7	0.0	V-Horn	AV	0.0	24.2	54.0	-29.8
4961.340	28.2	3.6	69.0	1.2	7.7	0.0	H-Horn	AV	0.0	24.1	54.0	-29.9
4961.411	40.2	3.6	3.0	1.0	0.0	0.0	V-Horn	PK	0.0	43.8	74.0	-30.2
4960.584	40.0	3.6	69.0	1.2	0.0	0.0	H-Horn	PK	0.0	43.6	74.0	-30.4
12371.790	34.2	-9.8	299.0	1.0	7.7	0.0	H-Horn	AV	0.0	16.7	54.0	-37.3
12377.400	46.3	-9.8	299.0	1.0	0.0	0.0	H-Horn	PK	0.0	36.5	74.0	-37.5
12372.200	33.9	-9.8	241.0	1.0	7.7	0.0	V-Horn	AV	0.0	16.4	54.0	-37.6
12372.540	45.6	-9.8	241.0	1.0	0.0	0.0	V-Horn	PK	0.0	35.8	74.0	-38.2

EUT: WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1		Work Order: HONE0041
Serial Number: None	Date: 03/03/09	
Customer: Honeywell	Temperature: 21.93	
Attendees: David Shipley	Humidity: 40%	
Project: None	Barometric Pres.: 30.06	
Tested by: Jaemi Suh	Power: 7 VDC	Job Site: OC11

TEST SPECIFICATIONS		Test Method
FCC 15.247(DTS):2009		ANSI C63.4:2003 KDB No. 558074

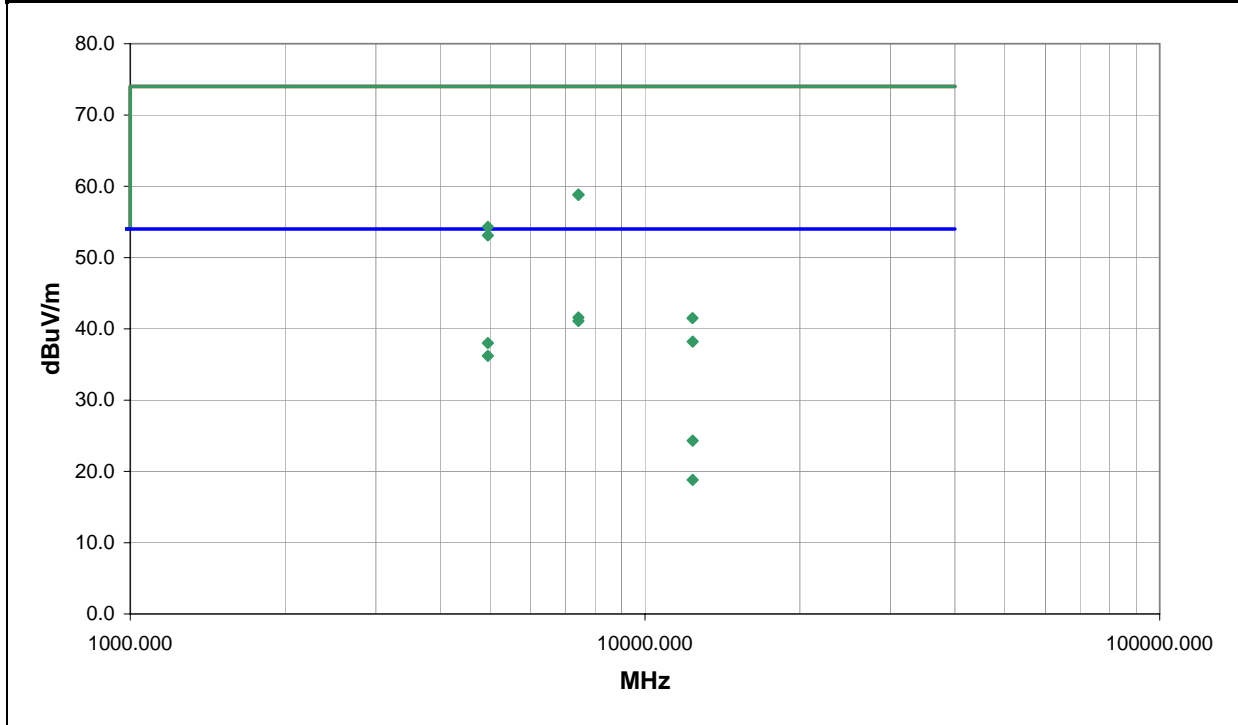
TEST PARAMETERS		
Antenna Height(s) (m)	1 - 4	Test Distance (m)
		3

**COMMENTS**  
Channel 75, Power Level = 168, All 1's. Y-Axis. Highest Gain Antenna 14dBi. PC Power Level: 168 (20.6 dBm). CHIP PA Level = 0 dBm. Duty cycle correction factor is based on a 41msec dwell time. Duty cycle corr. = 20 log(41/100) = 7.7 dB.

**EUT OPERATING MODES**  
Transmitting at high channel 2475 MHz.

**DEVIATIONS FROM TEST STANDARD**  
No deviations.

Run #	10	 Signature
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
7425.951	40.6	8.7	136.0	1.0	7.7	0.0	V-Horn	AV	0.0	41.6	54.0	-12.4
7425.977	40.1	8.7	332.0	1.0	7.7	0.0	H-Horn	AV	0.0	41.1	54.0	-12.9
7423.109	50.1	8.7	136.0	1.0	0.0	0.0	V-Horn	PK	0.0	58.8	74.0	-15.2
7423.293	50.1	8.7	332.0	1.0	0.0	0.0	H-Horn	PK	0.0	58.8	74.0	-15.2
4950.713	42.1	3.6	25.0	1.0	7.7	0.0	V-Horn	AV	0.0	38.0	54.0	-16.0
4950.736	40.3	3.6	156.0	1.1	7.7	0.0	H-Horn	AV	0.0	36.2	54.0	-17.8
4950.897	50.7	3.6	25.0	1.0	0.0	0.0	V-Horn	PK	0.0	54.3	74.0	-19.7
4950.658	49.5	3.6	156.0	1.1	0.0	0.0	H-Horn	PK	0.0	53.1	74.0	-20.9
12376.860	41.8	-9.8	359.0	1.0	7.7	0.0	H-Horn	AV	0.0	24.3	54.0	-29.7
12372.000	51.3	-9.8	359.0	1.0	0.0	0.0	H-Horn	PK	0.0	41.5	74.0	-32.5
12376.820	36.3	-9.8	359.0	1.3	7.7	0.0	V-Horn	AV	0.0	18.8	54.0	-35.2
12376.930	48.0	-9.8	359.0	1.3	0.0	0.0	V-Horn	PK	0.0	38.2	74.0	-35.8

<b>EUT:</b> WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1		<b>Work Order:</b> HONE0041
<b>Serial Number:</b> None		<b>Date:</b> 03/03/09
<b>Customer:</b> Honeywell		<b>Temperature:</b> 21.93
<b>Attendees:</b> David Shipley		<b>Humidity:</b> 40%
<b>Project:</b> None		<b>Barometric Pres.:</b> 30.06
<b>Tested by:</b> Jaemi Suh	<b>Power:</b> 7 VDC	<b>Job Site:</b> OC11

<b>TEST SPECIFICATIONS</b>	<b>Test Method</b>
FCC 15.247(DTS):2009	ANSI C63.4:2003 KDB No. 558074

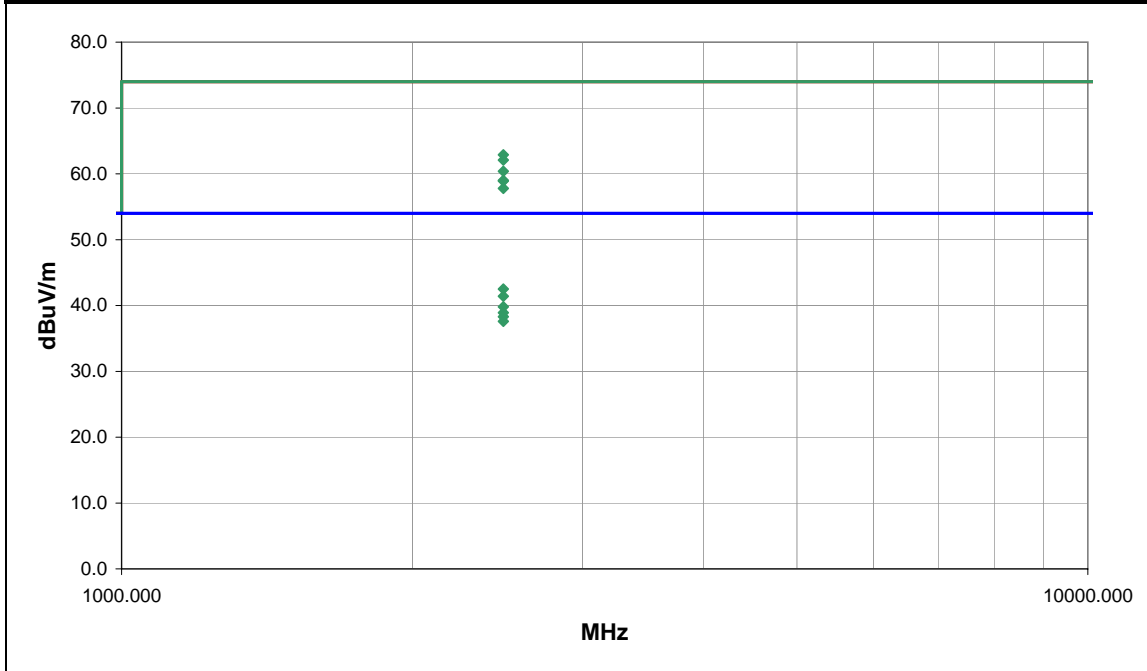
<b>TEST PARAMETERS</b>			
<b>Antenna Height(s) (m)</b>	1 - 4	<b>Test Distance (m)</b>	3

**COMMENTS**  
Channel 75, Power Level = 168, All 1's. Y-Axis. Highest Gain Antenna 14dBi. PC Power Level: 168 (20.6 dBm). CHIP PA Level = 0 dBm. Duty cycle correction factor is based on a 41msec dwell time. Duty cycle corr. = 20 log(41/100) = 7.7 dB.

**EUT OPERATING MODES**  
Transmitting at high channel 2475 MHz.

**DEVIATIONS FROM TEST STANDARD**  
No deviations.

<b>Run #</b>	11	 Signature
<b>Configuration #</b>	1	
<b>Results</b>	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2483.500	47.7	-4.8	0.0	2.0	0.0	20.0	H-Horn	PK	0.0	62.9	74.0	-11.1	X-Axis
2483.500	35.0	-4.8	0.0	2.0	7.7	20.0	H-Horn	AV	0.0	42.5	54.0	-11.5	X-Axis
2483.500	46.9	-4.8	1.0	1.7	0.0	20.0	H-Horn	PK	0.0	62.1	74.0	-11.9	Z-Axis
2483.499	33.9	-4.8	1.0	1.7	7.7	20.0	H-Horn	AV	0.0	41.4	54.0	-12.6	Z-Axis
2483.500	45.2	-4.8	265.0	1.0	0.0	20.0	H-Horn	PK	0.0	60.4	74.0	-13.6	Y-Axis
2483.500	32.3	-4.8	265.0	1.0	7.7	20.0	H-Horn	AV	0.0	39.8	54.0	-14.2	Y-Axis
2483.500	43.8	-4.8	251.0	1.0	0.0	20.0	V-Horn	PK	0.0	59.0	74.0	-15.0	Y-Axis
2483.500	43.7	-4.8	311.0	1.4	0.0	20.0	V-Horn	PK	0.0	58.9	74.0	-15.1	Z-Axis
2483.500	31.4	-4.8	251.0	1.0	7.7	20.0	V-Horn	AV	0.0	38.9	54.0	-15.1	Y-Axis
2483.500	30.8	-4.8	311.0	1.4	7.7	20.0	V-Horn	AV	0.0	38.3	54.0	-15.7	Z-Axis
2483.500	42.6	-4.8	1.0	1.4	0.0	20.0	V-Horn	PK	0.0	57.8	74.0	-16.2	X-Axis
2483.500	30.1	-4.8	1.0	1.4	7.7	20.0	V-Horn	AV	0.0	37.6	54.0	-16.4	X-Axis

EUT: WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1		Work Order: HONE0041
Serial Number: None		Date: 03/03/09
Customer: Honeywell		Temperature: 21.93
Attendees: David Shipley		Humidity: 40%
Project: None		Barometric Pres.: 30.06
Tested by: Jaemi Suh	Power: 7 VDC	Job Site: OC11

<b>TEST SPECIFICATIONS</b>	Test Method
FCC 15.247(DTS):2009	ANSI C63.4:2003 KDB No. 558074

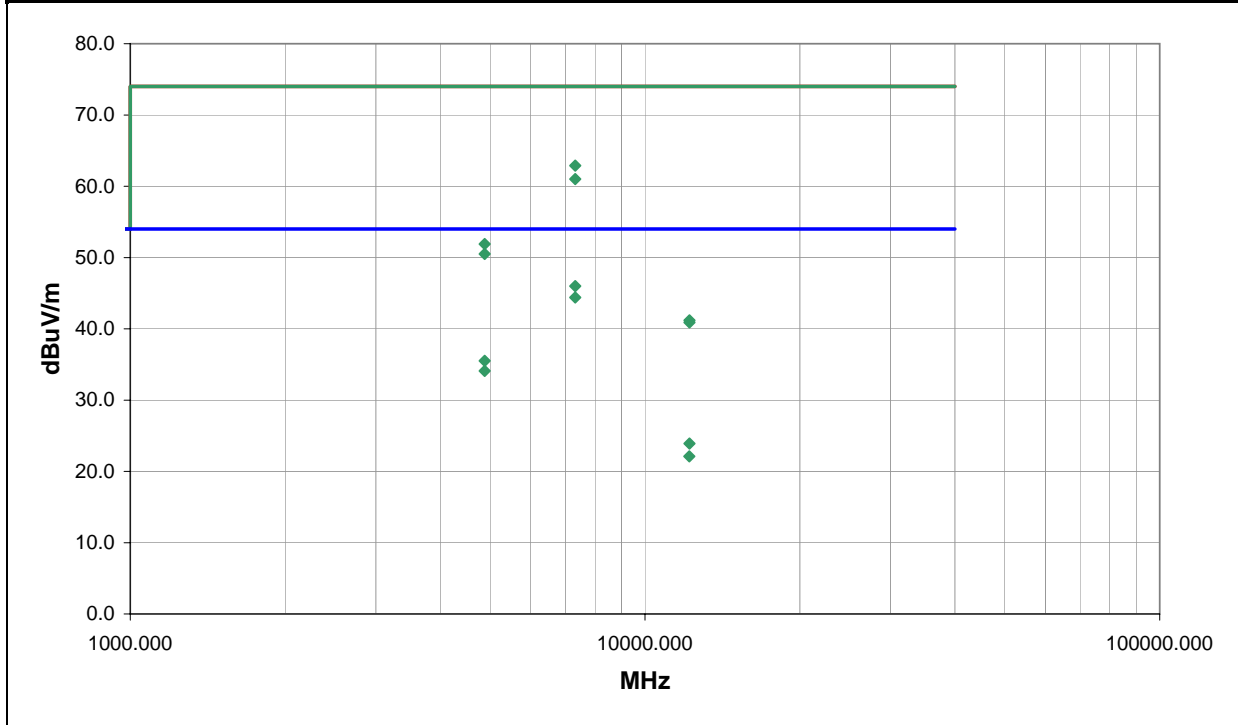
<b>TEST PARAMETERS</b>		
Antenna Height(s) (m)	1 - 4	Test Distance (m)
		3

**COMMENTS**  
Channel 40, Power Level = 168, All 1's. Y-Axis. Highest Gain Antenna 14dBi. PC Power Level: 168 (20.6 dBm). CHIP PA Level = 0 dBm. Duty cycle correction factor is based on a 41msec dwell time. Duty cycle corr. = 20 log(41/100) = 7.7 dB.

**EUT OPERATING MODES**  
Transmitting at mid channel 2440 MHz.

**DEVIATIONS FROM TEST STANDARD**  
No deviations.

Run #	13	Signature 
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
7321.075	45.3	8.4	346.0	1.0	7.7	0.0	V-Horn	AV	0.0	46.0	54.0	-8.0
7321.009	43.7	8.4	30.0	1.0	7.7	0.0	H-Horn	AV	0.0	44.4	54.0	-9.6
7320.857	54.5	8.4	346.0	1.0	0.0	0.0	V-Horn	PK	0.0	62.9	74.0	-11.1
7318.371	52.6	8.4	30.0	1.0	0.0	0.0	H-Horn	PK	0.0	61.0	74.0	-13.0
4880.705	39.9	3.3	324.0	1.0	7.7	0.0	H-Horn	AV	0.0	35.5	54.0	-18.5
4880.729	38.5	3.3	231.0	1.0	7.7	0.0	V-Horn	AV	0.0	34.1	54.0	-19.9
4880.522	48.6	3.3	324.0	1.0	0.0	0.0	H-Horn	PK	0.0	51.9	74.0	-22.1
4880.618	47.2	3.3	231.0	1.0	0.0	0.0	V-Horn	PK	0.0	50.5	74.0	-23.5
12201.880	42.0	-10.4	285.0	1.0	7.7	0.0	H-Horn	AV	0.0	23.9	54.0	-30.1
12197.000	40.2	-10.4	181.0	1.0	7.7	0.0	V-Horn	AV	0.0	22.1	54.0	-31.9
12201.870	51.6	-10.4	285.0	1.0	0.0	0.0	H-Horn	PK	0.0	41.2	74.0	-32.8
12201.720	51.3	-10.4	181.0	1.0	0.0	0.0	V-Horn	PK	0.0	40.9	74.0	-33.1



EUT:	WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1	Work Order:	HONE0041
Serial Number:	None	Date:	03/03/09
Customer:	Honeywell	Temperature:	21.93
Attendees:	David Shipley	Humidity:	40%
Project:	None	Barometric Pres.:	30.06
Tested by:	Jaemi Suh	Power:	7 VDC
		Job Site:	OC11

TEST SPECIFICATIONS		Test Method
FCC 15.247(DTS):2009		ANSI C63.4:2003 KDB No. 558074

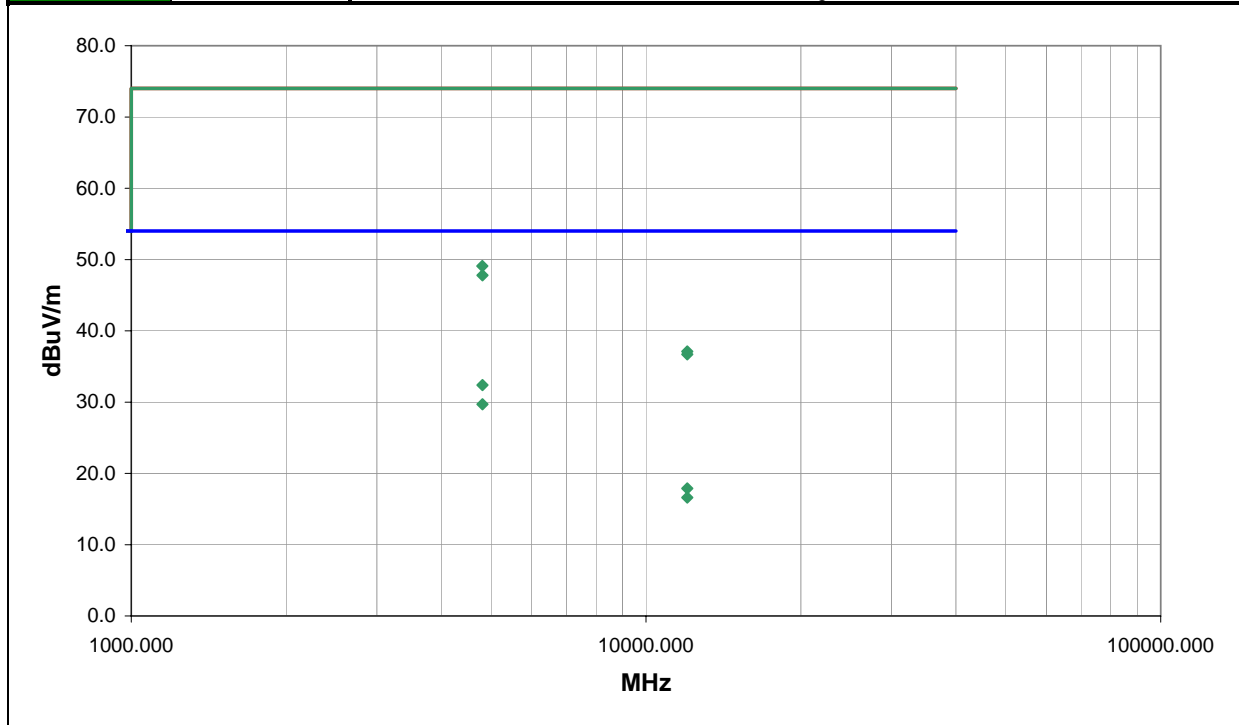
TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

**COMMENTS**  
Channel 5, Power Level = 168, All 1's. X-Axis. Highest Gain Antenna 14dBi. PC Power Level: 168 (20.6 dBm). CHIP PA Level = 0 dBm. Duty cycle correction factor is based on a 41msec dwell time. Duty cycle corr. = 20 log(41/100) = 7.7 dB.

**EUT OPERATING MODES**  
Transmitting at low channel 2405 MHz.

**DEVIATIONS FROM TEST STANDARD**  
No deviations.

Run #	16	Signature 
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Spec. (dB)	Compared to Spec. (dB)
4810.732	37.0	3.1	4.0	1.0	7.7	0.0	H-Horn	AV	0.0	32.4	54.0	-21.6	
4810.714	34.3	3.1	48.0	1.0	7.7	0.0	V-Horn	AV	0.0	29.7	54.0	-24.3	
4808.753	46.0	3.1	4.0	1.0	0.0	0.0	H-Horn	PK	0.0	49.1	74.0	-24.9	
4810.576	44.7	3.1	48.0	1.0	0.0	0.0	V-Horn	PK	0.0	47.8	74.0	-26.2	
12026.820	36.6	-11.0	296.0	1.0	7.7	0.0	H-Horn	AV	0.0	17.9	54.0	-36.1	
12026.620	48.1	-11.0	296.0	1.0	0.0	0.0	H-Horn	PK	0.0	37.1	74.0	-36.9	
12025.250	47.7	-11.0	170.0	1.5	0.0	0.0	V-Horn	PK	0.0	36.7	74.0	-37.3	
12026.780	35.3	-11.0	170.0	1.5	7.7	0.0	V-Horn	AV	0.0	16.6	54.0	-37.4	

EUT: WCX1 Valve Position Sensor, Model # WCX1C1A0A-AA1	Work Order: HONE0041
Serial Number: None	Date: 03/04/09
Customer: Honeywell	Temperature: 21.93
Attendees: David Shipley	Humidity: 40%
Project: None	Barometric Pres.: 30.06
Tested by: Jaemi Suh	Power: 7 VDC
	Job Site: OC11

TEST SPECIFICATIONS	Test Method
FCC 15.247(DTS):2009	ANSI C63.4:2003 KDB No. 558074

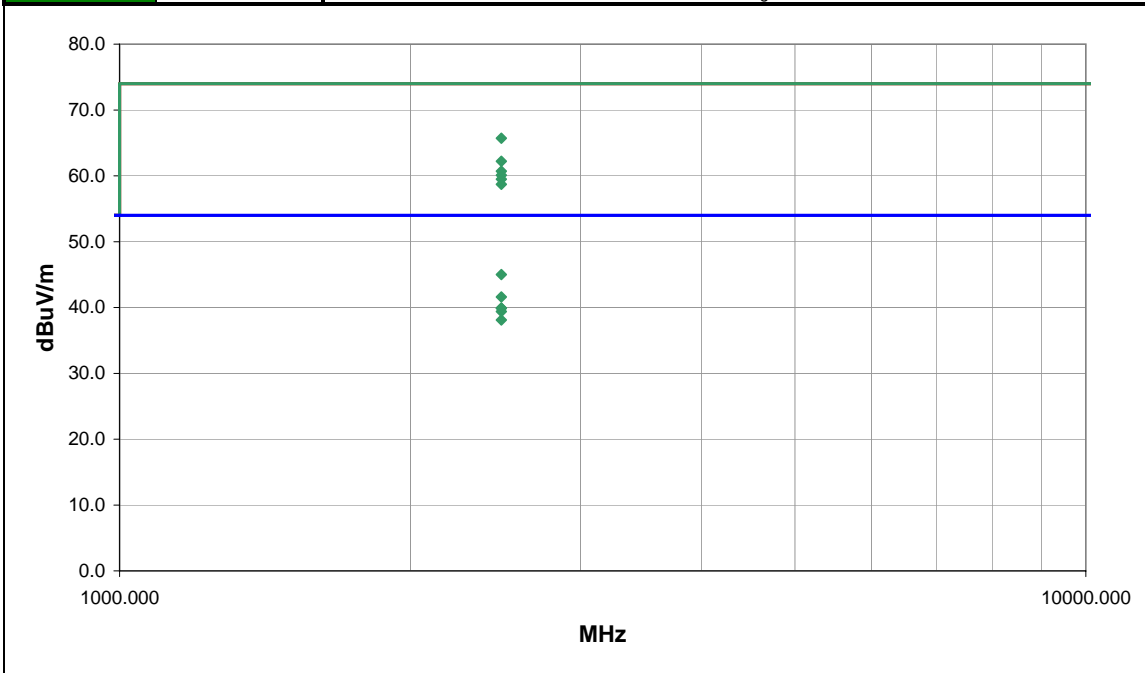
TEST PARAMETERS
Antenna Height(s) (m)   1 - 4   Test Distance (m)   3

COMMENTS  
Channel 75, Power Level = 255, All 1's. Y-Axis. Lowest Gain Antenna -2dBi. PC Power Level: 255 (20.6 dBm). CHIP PA Level = 0 dBm. Duty cycle correction factor is based on a 41msec dwell time. Duty cycle corr. = 20 log(41/100) = 7.7 dB.

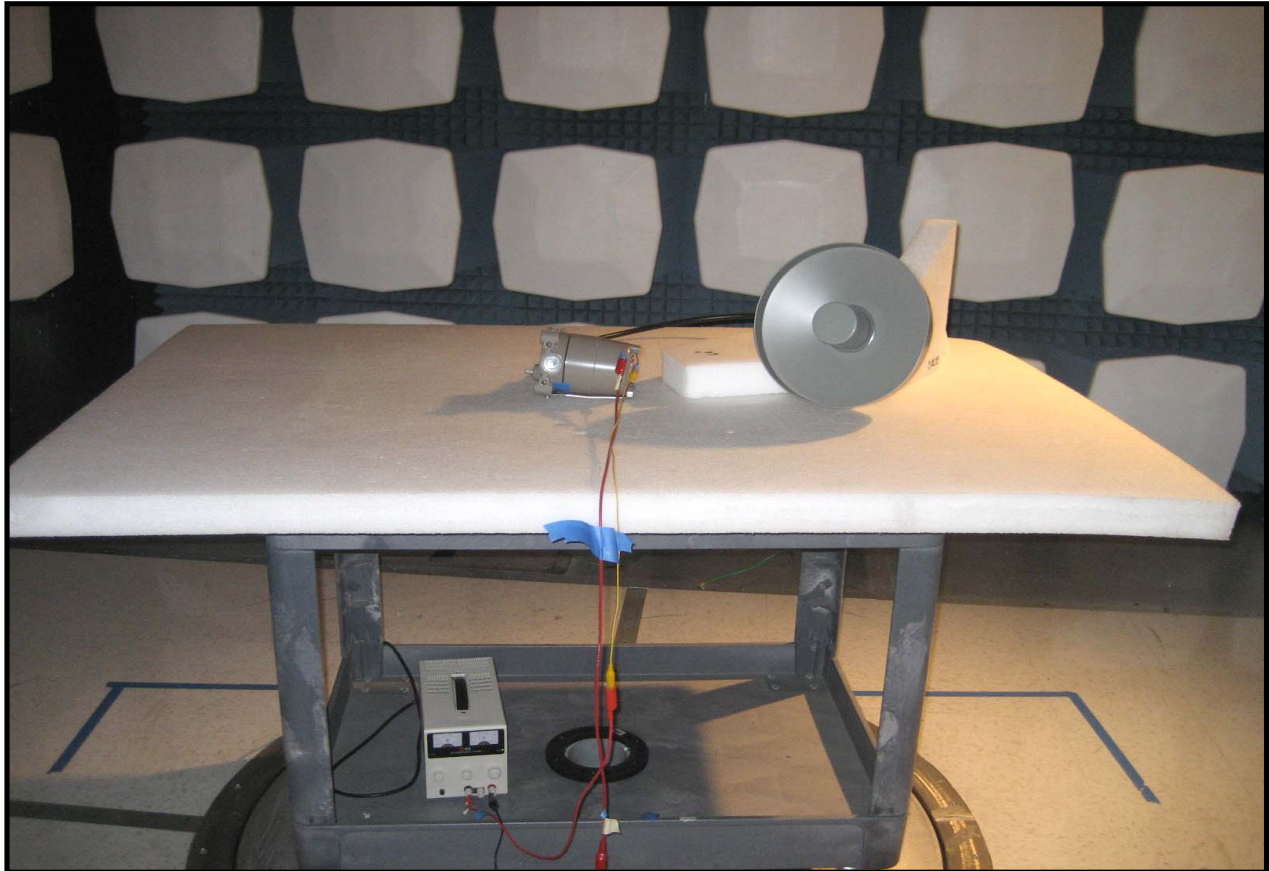
EUT OPERATING MODES  
Transmitting at high channel 2475 MHz.

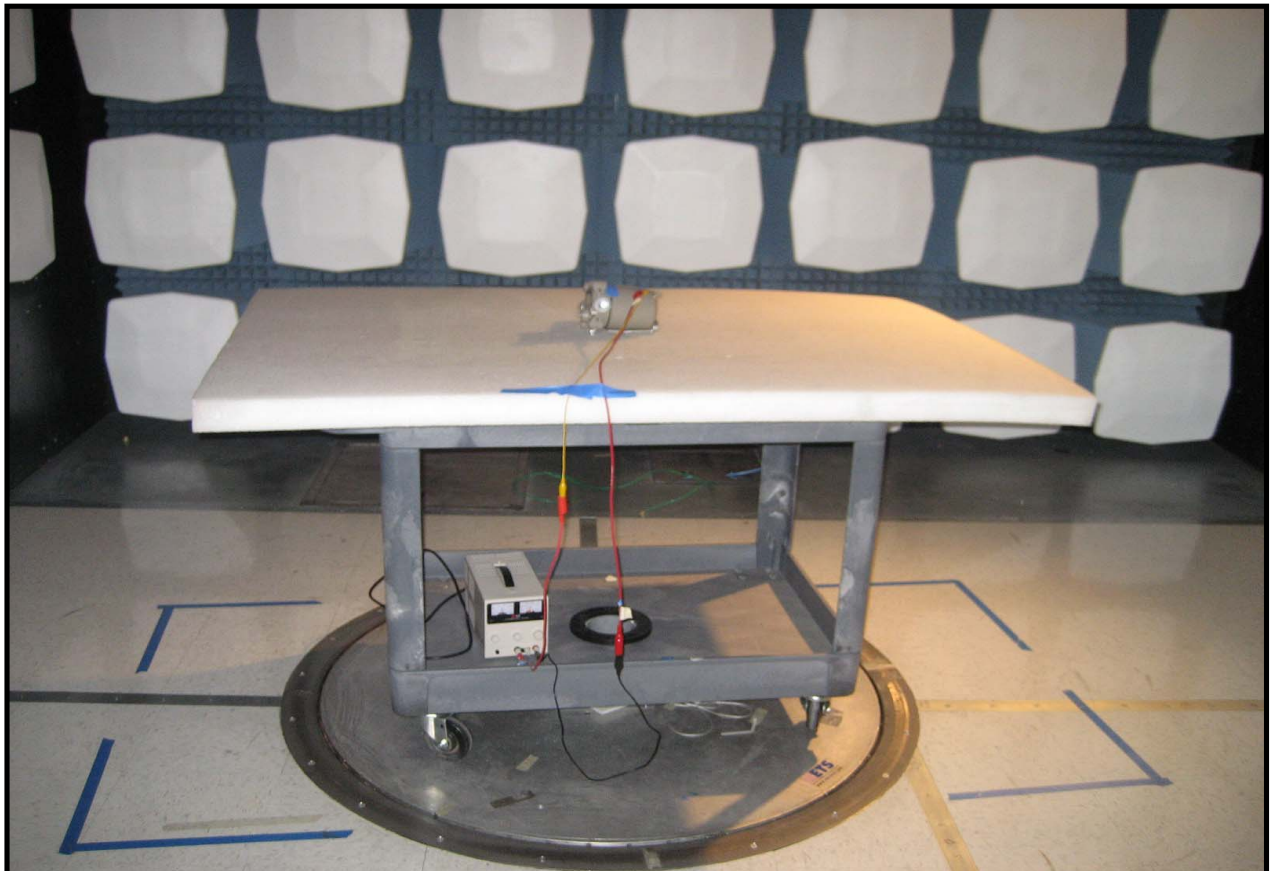
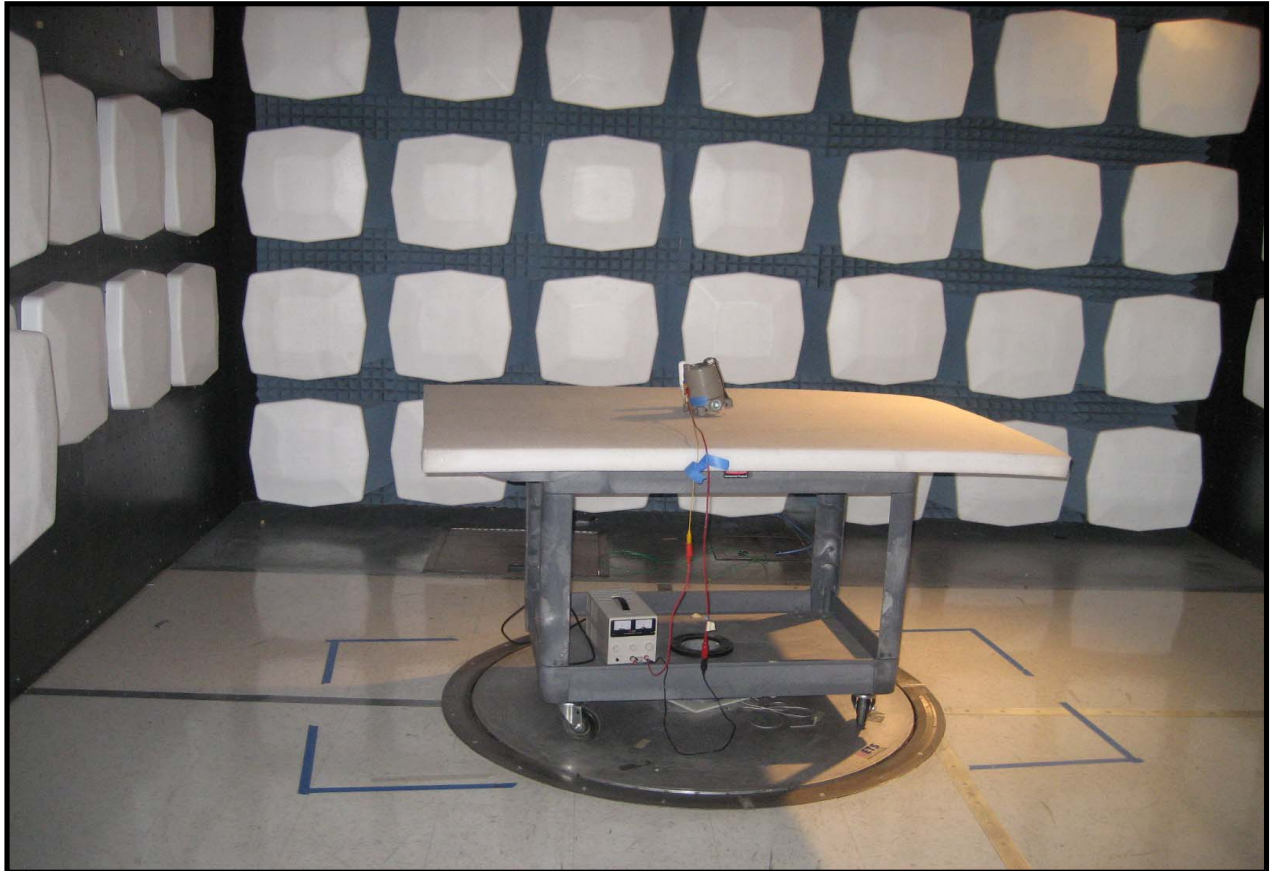
DEVIATIONS FROM TEST STANDARD  
No deviations.

Run #	21	Signature 
Configuration #	1	
Results	Pass	

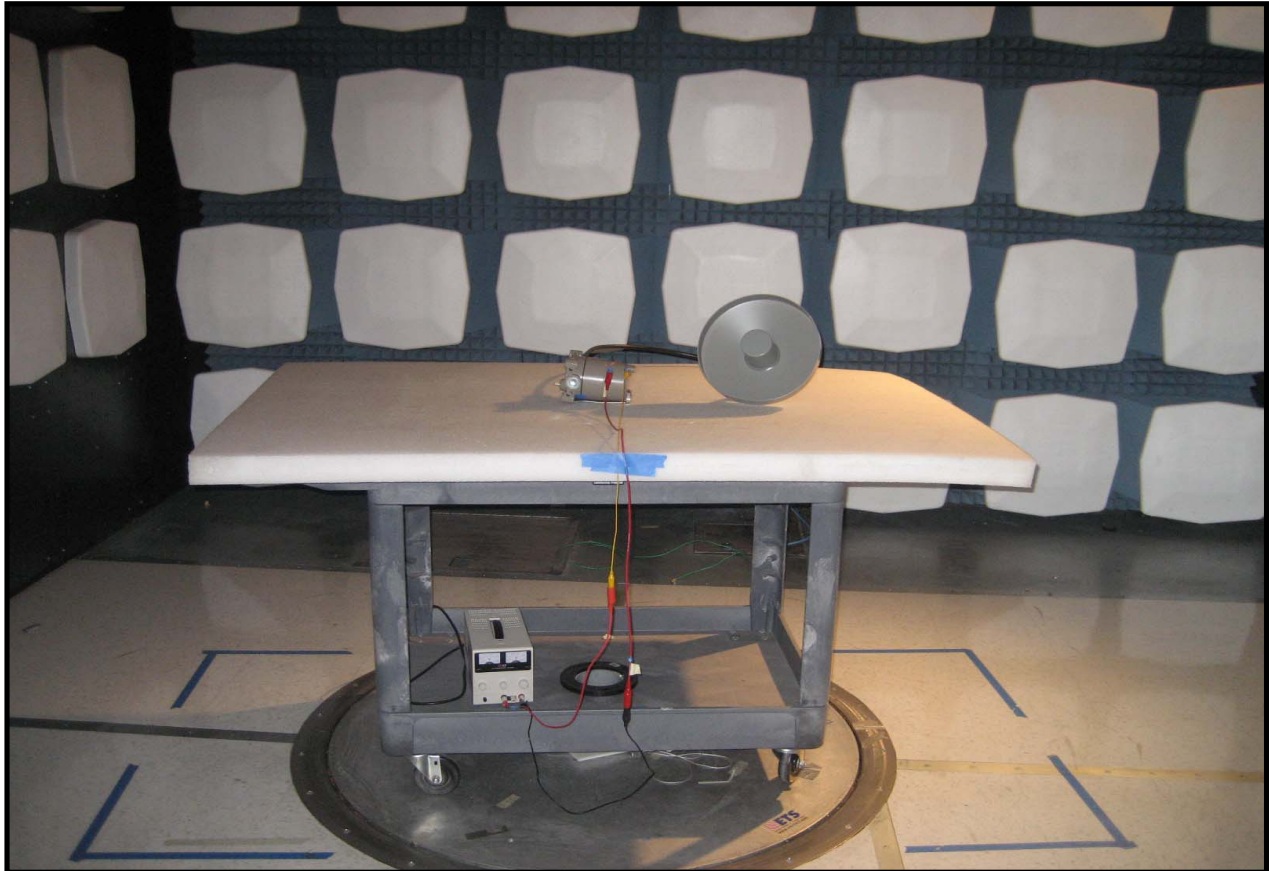


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2483.500	50.5	-4.8	123.0	1.1	0.0	20.0	H-Horn	PK	0.0	65.7	74.0	-8.3	Z-Axis
2483.500	37.5	-4.8	123.0	1.1	7.7	20.0	H-Horn	AV	0.0	45.0	54.0	-9.0	Z-Axis
2483.500	47.0	-4.8	251.0	1.2	0.0	20.0	H-Horn	PK	0.0	62.2	74.0	-11.8	Y-Axis
2483.500	34.1	-4.8	251.0	1.2	7.7	20.0	H-Horn	AV	0.0	41.6	54.0	-12.4	Y-Axis
2483.500	45.5	-4.8	19.0	1.0	0.0	20.0	V-Horn	PK	0.0	60.7	74.0	-13.3	Z-Axis
2483.500	44.9	-4.8	20.0	1.0	0.0	20.0	V-Horn	PK	0.0	60.1	74.0	-13.9	Y-Axis
2483.500	32.4	-4.8	19.0	1.0	7.7	20.0	V-Horn	AV	0.0	39.9	54.0	-14.1	Z-Axis
2483.500	32.4	-4.8	20.0	1.0	7.7	20.0	V-Horn	AV	0.0	39.9	54.0	-14.1	Y-Axis
2483.500	44.3	-4.8	11.0	1.0	0.0	20.0	V-Horn	PK	0.0	59.5	74.0	-14.5	X-Axis
2483.500	31.9	-4.8	11.0	1.0	7.7	20.0	V-Horn	AV	0.0	39.4	54.0	-14.6	X-Axis
2483.500	43.5	-4.8	186.0	1.3	0.0	20.0	H-Horn	PK	0.0	58.7	74.0	-15.3	X-Axis
2483.500	30.6	-4.8	186.0	1.3	7.7	20.0	H-Horn	AV	0.0	38.1	54.0	-15.9	X-Axis









# Spurious Radiated Emissions

