



**Test Report:** 6W58612.1 Issue 2


**Applicant:** Digital Security Controls,  
a division of Tyco Safety Products Canada Ltd.  
3301 Langstaff Road  
Concord, ON L4K 4I2  
Canada

**Apparatus:** Wireless 433MHz Pet Immune PIR  
M/N #WS4904 and WS4904P

**FCC ID:** F5306WS4904

**In Accordance With:** FCC Part 15 Subpart C, 15.231  
Periodic operation in the band 40.66-40.70MHz and  
above 70 MHz.

**Tested By:** Nemko Canada Inc.  
303 River Road  
Ottawa, Ontario  
K1V 1H2

**Authorized By:**   
Sim Jagpal, Resource Manager

**Date:** February 9, 2006

**Total Number of Pages:** 18

## Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

**Apparatus Assessed:** Wireless 433MHz Pet Immune PIR, M/N #WS4904 and WS4904P

**Specification:** FCC Part 15 Subpart C, 15.231

**Compliance Status:** Complies

**Exclusions:** None

**Non-compliances:** None

**Report Release History:** Issue 2 – Revised clause 15.231(a)

Author: Daniel Hynes, EMC Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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## **Section 1: Equipment Under Test**

### **1.1 Product Identification**

The Equipment Under Test was identified as follows:

Wireless 433MHz Pet Immune PIR, M/N #WS4904 and WS4904P

### **1.2 Samples Submitted for Assessment**

The following samples of the apparatus have been submitted for type assessment:

<b>Sample No.</b>	<b>Description</b>	<b>Serial No.</b>
1	Wireless 433MHz Pet Immune PIR (Normal Operation)	302137
2	Wireless 433MHz Pet Immune PIR (Constant Transmit)	None

The first samples were received on: December 23, 2005

### **1.3 Theory of Operation**

The WS4904 is a wireless passive infrared motion detector to be used with 433.92MHz DSC security systems.

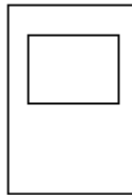
The WS4904 and WS4904P are identical except the WS4904P has a Pet Immune type of lens for the PIR motion detector; there is no difference in the RF circuitry.

## **1.4 Technical Specifications of the EUT**

<b>Manufacturer:</b>	Digital Security Controls, a division of Tyco Safety Products Canada Ltd.
<b>Operating Frequency:</b>	433.92MHz
<b>Emission Designator:</b>	103K3P1D
<b>Modulation:</b>	OOK (on/off key)
<b>Antenna Data:</b>	Integral
<b>Power Source:</b>	3.3VDC, CR123 single cell Lithium battery

## **1.5 Block Diagram of the EUT**

**EUT: WS4904**



## Section 2: Test Conditions

### 2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.231

Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

### 2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

### 2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 °C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

### 2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Hewlett-Packard	8564E	FA001367	Feb 22/05	Feb 22/06
Spectrum Analyzer	Hewlett-Packard	8565E	FA000981	March 10/05	March 10/06
Horn Antenna #4	EMCO	3115	FA001451	May 26/05	May 26/06
Bilog	Schaffner	CBL6112B	FA001503	Sept. 16/05	Sept. 16/06
1- 26.5 GHz Amplifier	Hewlett-Packard	HP 8449	FA001761	May 19/05	May 19/06

## **Section 3: Observations**

### **3.1 Modifications Performed During Assessment**

No modifications were performed during assessment.

### **3.2 Record Of Technical Judgements**

The WS4904 and WS4904P are identical except the WS4904P has a Pet Immune type of lens for the PIR motion detector; there is no difference in the RF circuitry.

### **3.3 EUT Parameters Affecting Compliance**

The user of the apparatus could not alter parameters that would affect compliance.

### **3.4 Test Deleted**

No Tests were deleted from this assessment.

### **3.5 Additional Observations**

There were no additional observations made during this assessment.

## **Section 4: Results Summary**

This section contains the following:

### **FCC Part 15 Subpart C: Test Results**

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

- N      No: not applicable / not relevant.
- Y      Yes: Mandatory i.e. the apparatus shall conform to these tests.
- N/T    Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.



**4.1 FCC Part 15 Subpart C: Test Results**

Part 15	Test Description	Required	Result
15.207(a)	Powerline Conducted Emissions	N	—
15.209(a)	Radiated Emissions within Restricted Bands	N	—
15.231(a)(1)	Manually operated transmitter	Y	PASS
15.231(a)(2)	Automatically activated transmitter	N	—
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	N	—
15.231(a)(4)	Radiators used in cases of emergency	N	—
15.231(a)(5)	Set-up information for security systems	N	—
15.231(b)	Radiated Emissions	Y	PASS
15.231(c)	20dB Bandwidth	Y	PASS
15.231(d)	Devices operating within the frequency band 40.66-40.70 MHz	N	—
15.231(e)	Radiated emissions for Periodic radiators	N	—

Notes:

15.231(d) was not performed because the EUT does not transmit between 40.66 and 40.70MHz.

## Appendix A: Test Results

### Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.
- (4) Intentional radiators, which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.
- (5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

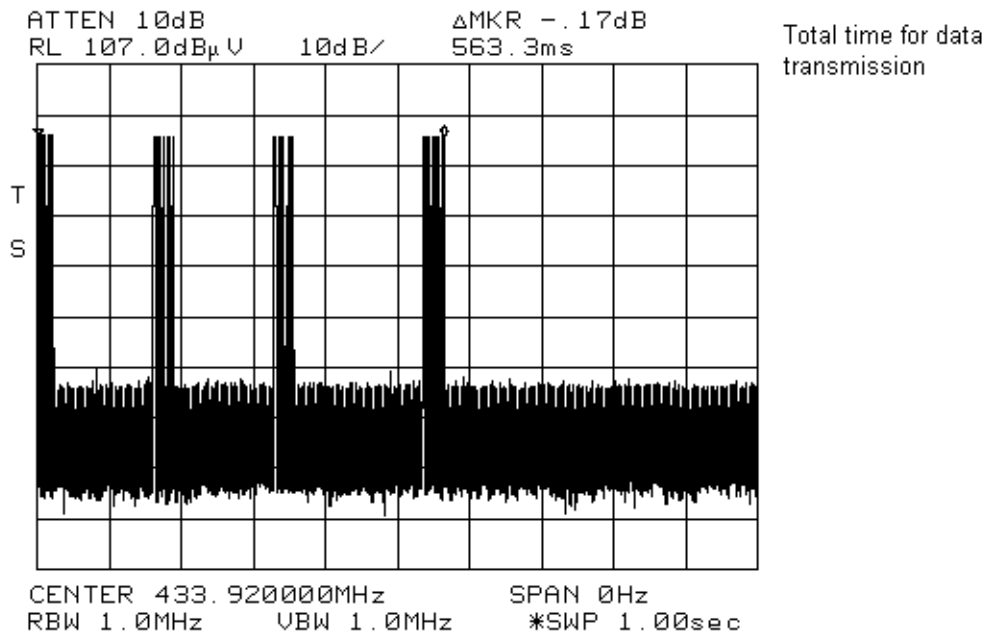
### Test Conditions:

<b>Sample Number:</b>	1	<b>Temperature:</b>	21
<b>Date:</b>	January 10, 2006	<b>Humidity:</b>	20
<b>Modification State:</b>	0	<b>Tester:</b>	Daniel Hynes
		<b>Laboratory:</b>	Ottawa

### Test Results:

- (1) The apparatus is not a manually activated transmitter.

(2)



- (3) The apparatus transmits a supervisory signal at intervals of 64 minutes and the duration is 24.5msec.
- (4) When activated by an alarm the transmitter follows the same pattern of transmission as seen in (2).
- (5) The apparatus does not exceed the requirements of (a)(1) or (a)(2).

**Clause 15.231(b) Radiated Emissions**

In addition to the provisions of 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750	125 to 375
174-260	3,750	375
260-470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250

**Test Conditions:**

<b>Sample Number:</b>	2	<b>Temperature:</b>	20
<b>Date:</b>	January 6, 2006	<b>Humidity:</b>	30
<b>Modification State:</b>	0	<b>Tester:</b>	Daniel Hynes
		<b>Laboratory:</b>	Almonte

**Test Results:**

See Attached Table for Results

**Additional Observations:**

The Spectrum was searched from 30MHz to the 10<sup>th</sup> Harmonic.

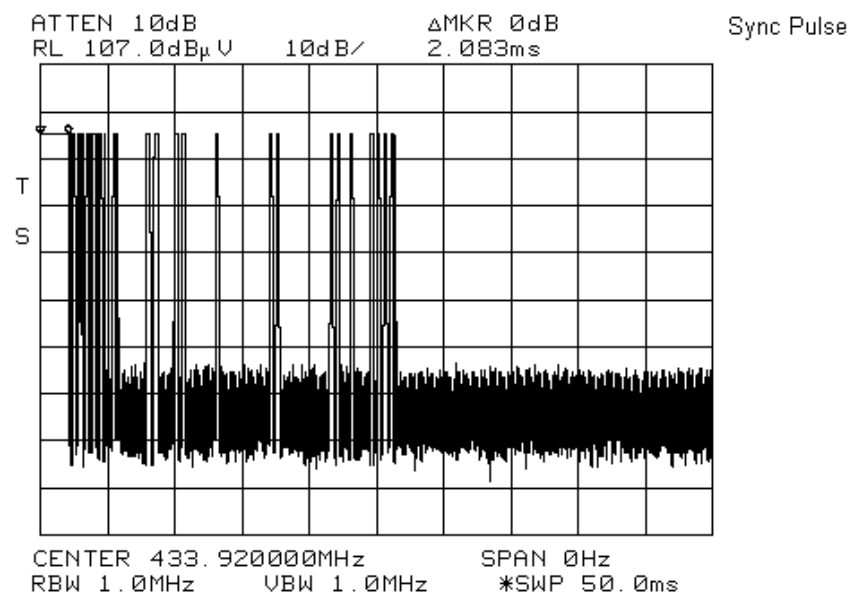
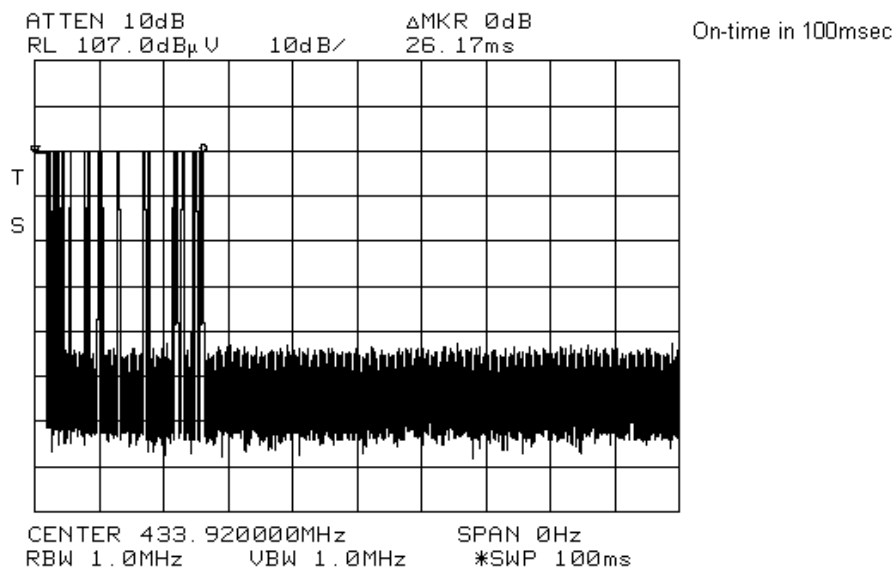
The EUT was measured on three orthogonal axis.

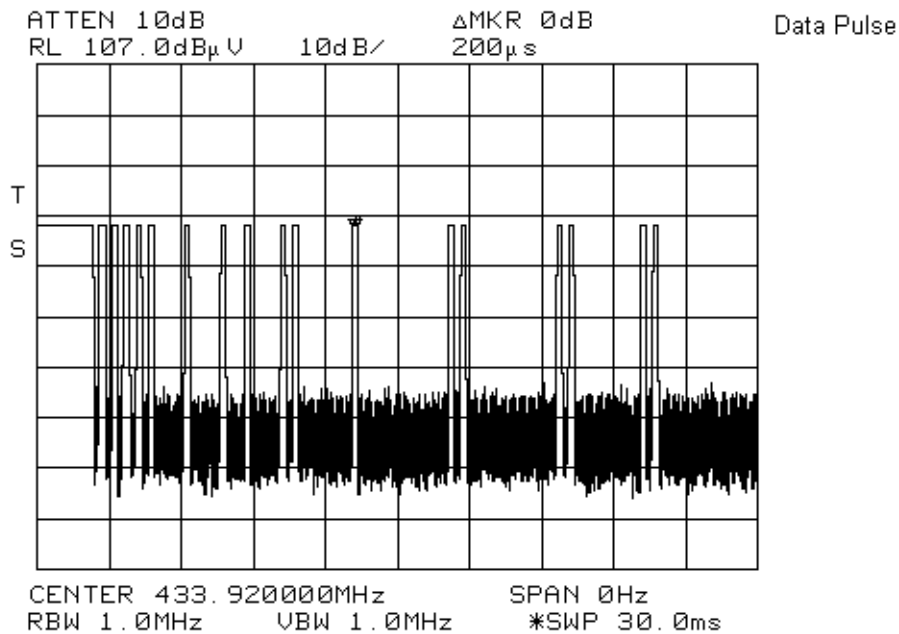
All measurements were performed using a Peak Detector with 100kHz RBW below 1GHz and a 1MHz RBW above 1GHz at a distance of 3 meters.

All testing was performed using fresh new batteries. Only results within 20dB below the limit have been included.

Freq. (MHz)	Ant	Pol. V/H	RCVD Signal (dBμV)	Ant. Factor (dB)	Amp. Gain (dB)	Duty Cycle Corr. (dB)	Cable Loss (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)
433.9200	BL	V	80.7	17.0	N/A	24.3	2.9	76.3	80.8	4.5
433.9200	BL	H	71.5	17.2	N/A	24.3	2.9	67.3	80.8	13.5
433.9200	BL	V	80.7	17.0	N/A	N/A	2.9	100.6	100.8	0.2
433.9200	BL	H	71.5	17.2	N/A	N/A	2.9	91.6	100.8	9.2
867.8400	BL	V	44.2	20.8	N/A	24.3	4.4	45.1	61.9	16.9
867.8400	BL	H	44.5	21.6	N/A	24.3	4.4	46.2	61.9	15.7
867.8400	BL	V	44.2	20.8	N/A	N/A	4.4	69.4	81.9	12.5
867.8400	BL	H	44.5	21.6	N/A	N/A	4.4	70.5	81.9	11.4
1301.7600	Horn4	V	73.7	24.8	37.7	24.3	5.6	42.1	54	19.9
1301.7600	Horn4	H	68.0	24.9	37.7	24.3	5.6	36.5	54	25.5
1301.7600	Horn4	V	73.7	24.8	37.7	N/A	5.6	66.4	74	7.6
1301.7600	Horn4	H	68.0	24.9	37.7	N/A	5.6	60.8	74	13.2
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole										

# Duty Cycle:



**Duty Cycle, continued:****Duty Cycle Calculation:**

Data Pulse Time On:

20 pulses X 200us (per data pulse) = 4ms

Total Time On:

4ms (data pulse) + 2.083ms (sync pulse) = 6.083ms

Duty Cycle Correction:

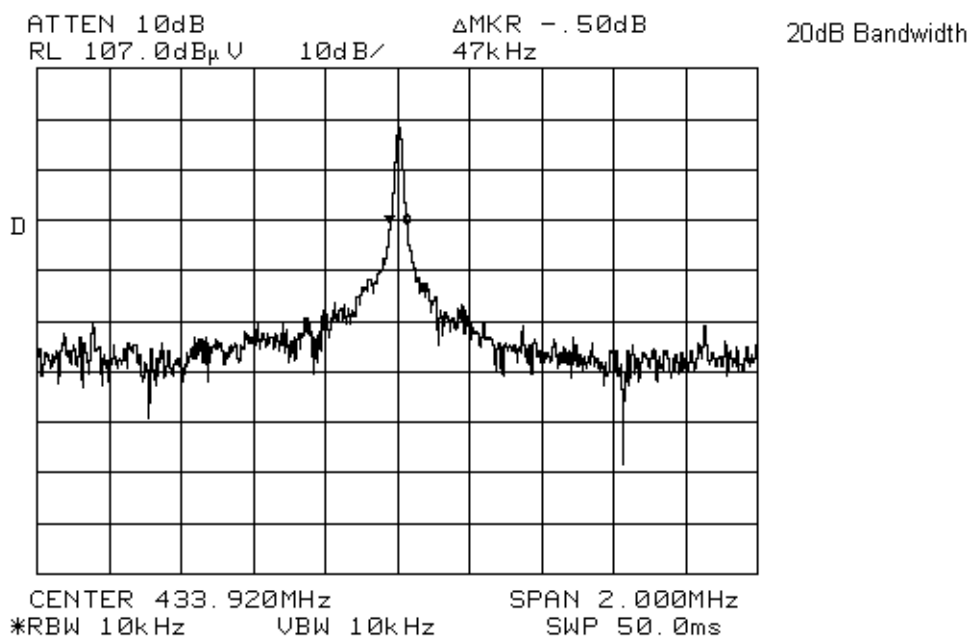
20 Log (Total Time On / 100ms) = 20 Log (6.083ms/100ms) = -24.31

**Clause 15.231(c) 20dB Bandwidth**

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

**Test Conditions:**

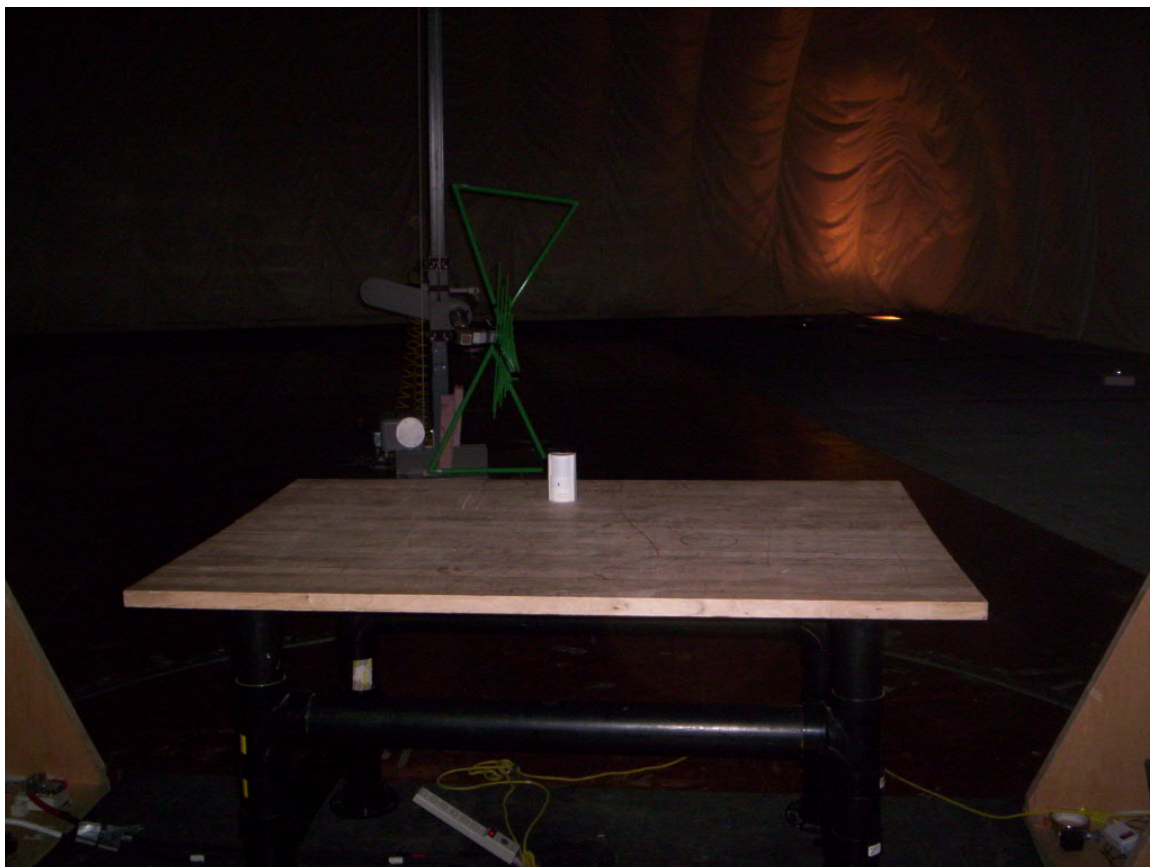
<b>Sample Number:</b>	1	<b>Temperature:</b>	21
<b>Date:</b>	January 10, 2006	<b>Humidity:</b>	20
<b>Modification State:</b>	0	<b>Tester:</b>	Daniel Hynes
		<b>Laboratory:</b>	Ottawa

**Test Results:****20dB Bandwidth:**



## **Appendix B: Setup Photographs**

### **Spurious Emissions Setup:**



## Appendix C: Block Diagram of Test Setups

### Test Site For Radiated Emissions

