

**Nemko Test Report:** 112099-3TRFWL

**Applicant:** Autostart Inc.  
5764 Rue Paré  
Mont-Royal, Québec  
Canada, H4P 2M2

**Apparatus:** 6212T

**FCC ID:** EZSDEI6212

**In Accordance With:** FCC Part 15 Subpart B, 15.107 and 15.109  
Unintentional Radiators  
FCC Part 15 Subpart C, 15.231  
Periodic operation in the band 40.66-40.70MHz and  
above 70 MHz.

**Authorized By:**

A blue ink signature of Jason Nixon, written in a cursive style.

Jason Nixon, Wireless/Telecom Specialist

**Date:** August 22, 2008

**Total Number of Pages:** 16

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## Section 1 : Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart B and Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003.

The assessment summary is as follows:

<b>Apparatus Assessed:</b>	6212T
<b>Specification:</b>	FCC Part 15 Subpart B, 15.107 and 15.109 FCC Part 15 Subpart C, 15.231
<b>Compliance Status:</b>	Complies
<b>Exclusions:</b>	None
<b>Non-compliances:</b>	None
<b>Report Release History:</b>	Original Release
<b>Test Locations:</b>	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
<b>FCC Test Site Reference No.:</b>	176392 (3m Semi-Anechoic Chamber)
<b>Tests Performed By:</b>	Andrey Adelberg EMC/Wireless Specialist
<b>Test Dates:</b>	August 18, 2008 to August 21, 2008

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. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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## Section 2 : Equipment Under Test

### 2.1 Identification of Equipment Under Test (EUT)

The following information identifies the EUT under test:

Type of Equipment:	Low Power Transceiver
Product Name:	Car Transceiver
Brand Name:	Autostart
Model Name or Number:	6212T
Serial Number:	Test Sample
Nemko Sample Number:	2
FCC ID:	EZSDEI6212
Date of Receipt:	August 18, 2008
Primary User Functions of EUT:	Remote Car Starter

### 2.2 Accessories

The following information identifies accessories used to exercise the EUT during testing:

Description:	Auto Security System Receiver
Brand Name:	Autostart
Model Name or Number:	N/A
Serial Number:	N/A
Nemko Sample Number:	3
Connection Port:	Proprietary 4 pin port
Cable Length and Type:	4 wire cable, 2 m

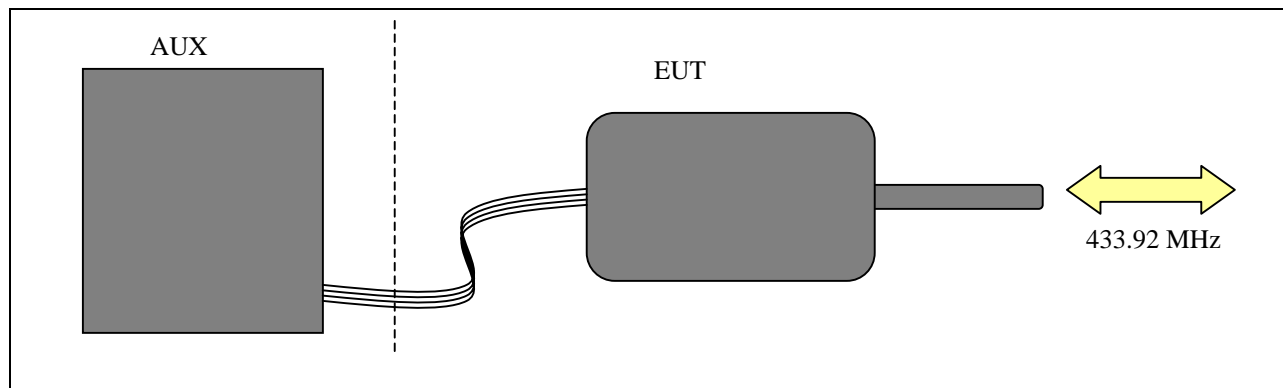
### 2.3 EUT Description

The 6216T IVU is used in a half duplex car starter/alarm system and operates at 433.92 MHz.

## 2.4 Technical Specifications of the EUT

<b>Operating Frequency:</b>	433.92 MHz
<b>Modulation:</b>	FSK
<b>Occupied Bandwidth:</b>	272 kHz
<b>Emission Designator:</b>	Q1D
<b>Antenna Data:</b>	Integrated
<b>Power Supply Requirements:</b>	12Vdc powered from AUX module connected to Fresh 12 Vdc car battery
<b>Receiver Type:</b>	Superheterodyne receiver

## 2.5 EUT Setup diagram



## 2.6 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

## Section 3 : Test Conditions

### 3.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart B, 15.107 and 15.109

Unintentional Radiators

FCC Part 15 Subpart C, 15.231

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

### 3.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

### 3.3 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

### 3.4 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95% and can be found in Nemko Canada document MU-003.

### 3.5 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Cal. Date	Next Cal.
Electro-Magnetic Interference Test Chamber	TDK	SAC-3	FA002047	May 06/08	May 06/09
Bilog	Sunol	JB3	FA002108	Jan. 21/08	Jan. 21/09
Flush Mount Turntable	Sunol	FM2022	FA002082	NCR	NCR
Controller	Sunol	SC104V	FA002060	NCR	NCR
Mast	Sunol	TLT2	FA002061	NCR	NCR
50 Coax cable	HUBER + SUHNER	None	FA002015	Sept. 19/07	Sept. 19/08
50 Coax cable	HUBER + SUHNER	None	FA002022	July 07/08	July 07/09
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 26	FA002043	Dec. 07/07	Dec. 07/08
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 40	FA002071	Nov. 15/07	Nov. 15/08
1 – 18 GHz Amplifier	JCA	JCA118-503	FA002091	Oct 2/07	Oct 2/08
Horn Antenna #2	EMCO	3115	FA000825	Jan. 15/08	Jan. 15/09

COU – Calibrate on Use

NCR – No Calibration Required

## Section 4 : Results Summary

This section contains the following:

FCC Part 15 Subpart B : Test Results

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 Report Summary)

### 4.1 FCC Part 15 Subpart B : Test Results

Part 15	Test Description	Required	Result
15.107(a) 15.109(a)	Conducted Emissions for Class B Radiated Emissions for Class B (Unintentional)	N Y	Pass

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

Part 15	Test Description	Required	Result
15.31(e)	Variation of Power source	N	
15.203	Antenna Requirement (Permanently attached antenna used with this device)	Y	Pass
15.207(a)	Powerline Conducted Emissions	N	
15.209(a)	Radiated Emissions within Restricted Bands	Y	Pass
15.231(a)(1)	Manually operated transmitter	N	
15.231(a)(2)	Automatically activated transmitter	Y	Pass
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 – Fundamental, Harmonics and Spurious	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	



## Appendix A : Part 15 Subpart B Test Results

### Clause 15.109(a) Radiated Emissions

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (microvoltsmeter)
30 - 88	100
88 - 216	150
216 - 960	200
Above 960	500

**Test Results:** Pass

#### Additional Observations:

- The Spectrum was searched from 30MHz to the 2000 MHz.
- The EUT was assessed at nominal installation position with vertical and horizontal receiving antenna. Only worst case was presented.
- Fresh batteries were used throughout all tests.
- Measurement equipment setup was 120kHz Quasi-peak detector for measurements below 1GHz and 1MHz RBW/VBW peak detector above 1GHz.
- All Measurements were performed at 3 meters.
- No emissions within 20 dB below the limit were found

## Appendix B : Part 15 Subpart C Test Results

### Clause 15.209(a) Radiated Emissions within Restricted Bands

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvoltsmeter)	Measurement Distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

**Test Results:** Pass

#### Additional Observations:

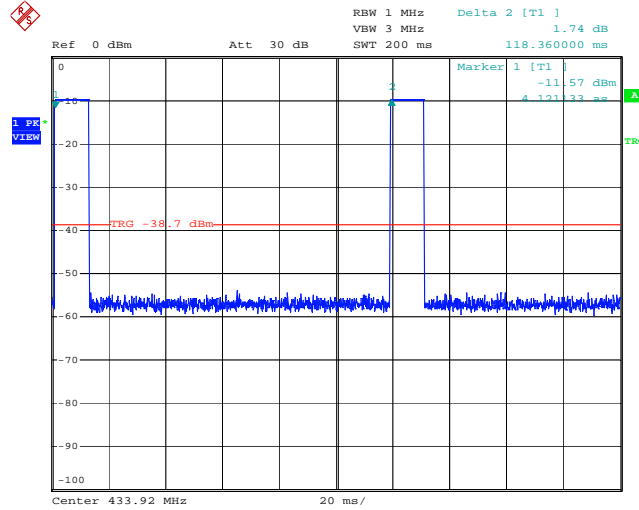
- The Spectrum was searched from 30MHz to the 10<sup>th</sup> Harmonic.
- These results apply to emissions found in the Restricted bands defined in FCC Part 15 Subpart C, 15.205.
- The EUT was assessed at nominal installation position with vertical and horizontal receiving antenna. Only worst case was presented.
- Fresh batteries were used throughout all tests.
- All measurements were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

Frequency (MHz)	Ant.	Polarity	RCVD Signal (dBμV/m)	Corr. Factor (dB)	Duty Cycle Corr.	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1301.906	Horn	H	63.1	7.2	18.42	63.10	74.00	10.90	Peak
						44.68	54.00	9.32	Average

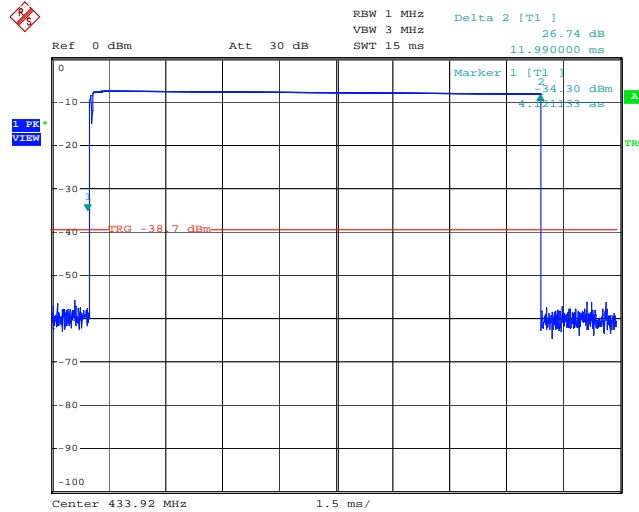
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole

Note 2: RCVD Signal includes Correction factor of Antenna factor, cable loss and amplifier gain where applicable.

**Duty Cycle within 100ms:**



**Pulse Transmission:**



Due to FSK modulation Duty cycle within 1 pulse is 100%.

Duty cycle correction factor calculation:

$$Duty\ Cycle = 20\log\left(\frac{Pulsetime}{100ms}\right) = 20\log\left(\frac{11.99}{100}\right) = -18.42dB$$

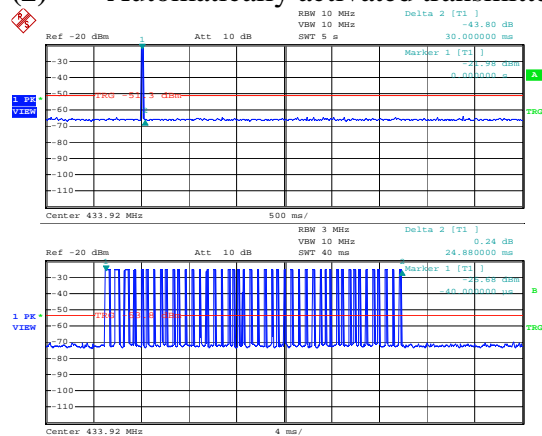
**Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation**

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 Results:** Pass

- (1) No manual operation
- (2) Automatically activated transmitter, deactivates within 5 seconds after activation:



- (3) There are no periodic transmissions at regular predetermined intervals implemented.
- (4) Not intended for radio control purposes during emergencies.
- (5) Not intended for security applications.

**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
<b>260-470</b>	<b>3,750 to 12,500</b>	<b>375 to 1,250</b>
Above 470	12,500	1,250

**Test Results:** Pass

**Additional Observations:**

- The Spectrum was searched from 30MHz to the 10<sup>th</sup> Harmonic.
- The EUT was assessed at nominal installation position with vertical and horizontal receiving antenna. Only worst case was presented.
- Fresh batteries were used throughout all tests.
- All measurements were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV/m)	Corr. Factor (dB)	Duty Cycle Corr. (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)
<b>Fundamental</b>											
433.92	BL	H	97.86	20.9	18.42	97.86	100.83	2.97	79.44	80.83	1.39
<b>Harmonics</b>											
867.81	BL	H	52.25	28.5	18.42	52.25	80.83	28.58	33.83	60.83	27.00
1735.58	Horn	V	67.77	8.8	18.42	67.77	80.83	13.06	49.35	60.83	11.48
2169.47	Horn	V	69.44	10.9	18.42	69.44	80.83	11.39	51.02	60.83	9.81
2604.32	Horn	V	55.26	11.5	18.42	55.26	80.83	25.57	36.84	60.83	23.99
<p>Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole            Note 2: RCVD Signal includes Correction factor of Antenna factor, cable loss and amplifier gain where applicable.</p>											



Nemko Canada Inc.

Report Number: 112099-3TRFWL

Specification: FCC Part 15 Subpart C, 15.231

Clause 15.231(c) 20dB Bandwidth

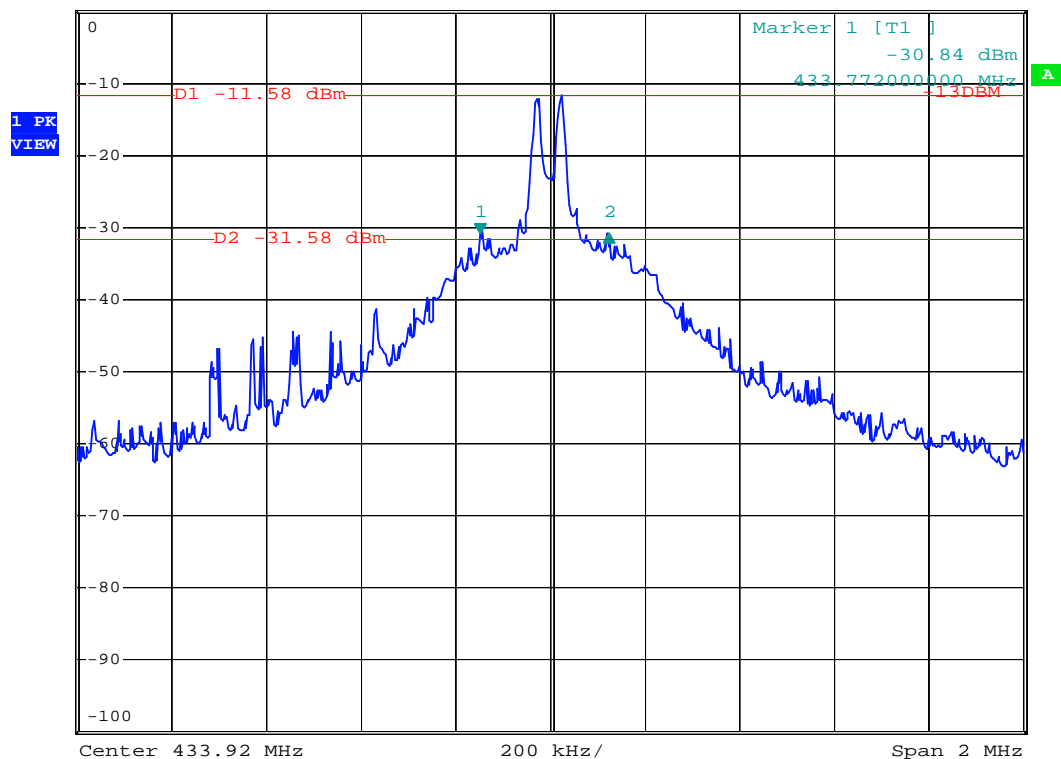
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated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

Test Results: Pass

20dB Bandwidth:



Ref 0 dBm Att 30 dB \*RBW 10 kHz Delta 2 [T1] VBW 30 kHz 0.01 dB SWT 20 ms 272.00000000 kHz

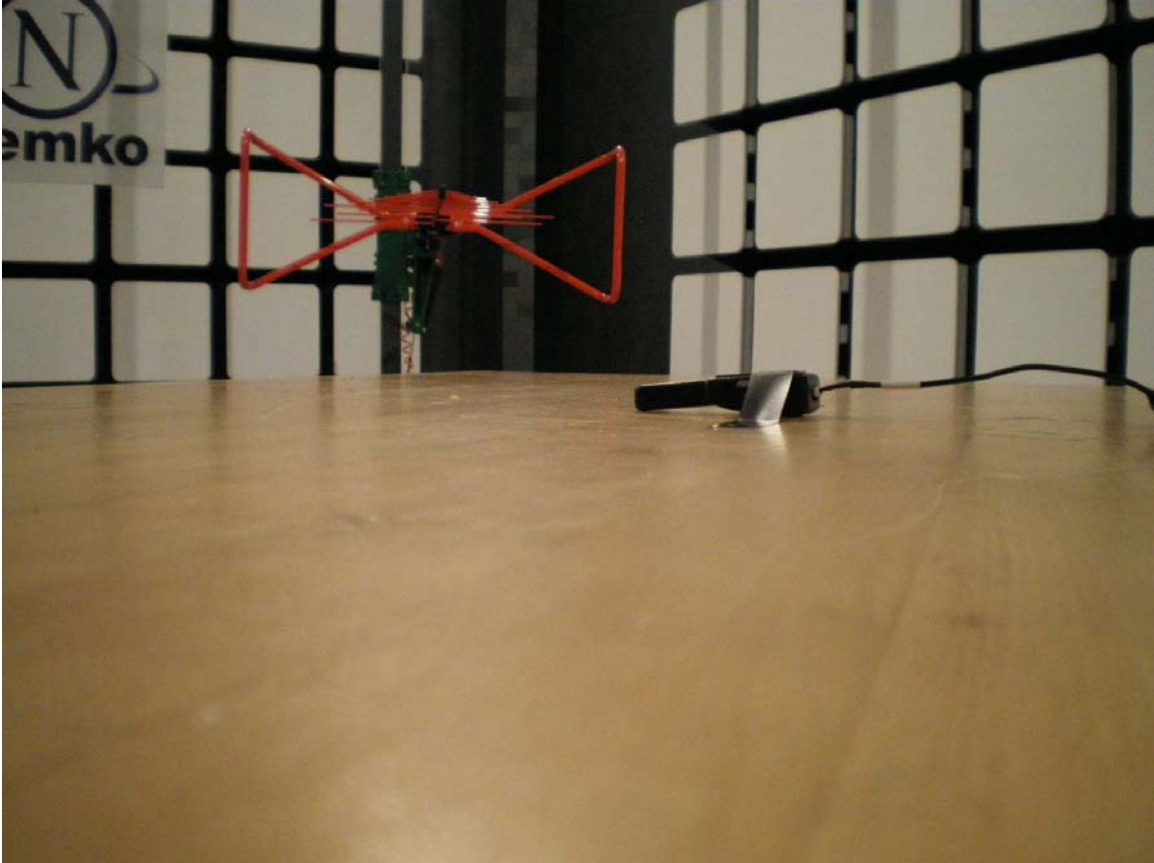


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Frequency, MHz	20dB BW, kHz	Limit, kHz	Margin, kHz
433.92	272	1084.8	812.8

## Appendix C : Setup Photographs

### Spurious Emissions Setup:



## Appendix D : Block Diagram of Test Setups

### Radiated Emissions above 30MHz Test Site

