



**FCC CFR47 PART 15 SUBPART C  
CERTIFICATION  
TEST REPORT**

**FOR**

**MICROWAVE MOTION SENSOR**

**MODEL NUMBER: MRO8700**

**FCC ID: RG7MRO8700**

**REPORT NUMBER: 03U2211-1**

**ISSUE DATE: SEPTEMBER 08, 2003**

*Prepared for*  
**T & C INTERNATIONAL CORP.**  
**6 F, 48, KEELUNG RD., SEC. 2, TAIPEI**  
**TAIWAN**

*Prepared by*  
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## 1. TEST RESULT CERTIFICATION

**COMPANY NAME:** T & C INTERNATIONAL CORP.  
6 F, 48, KEELUNG RD., SEC. 2, TAIPEI  
TAIWAN

**EUT DESCRIPTION:** MICROWAVE MOTION SENSOR

**MODEL:** MRO8700

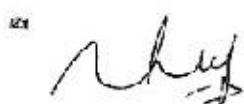
**DATE TESTED:** SEPTEMBER 02 – SEPTEMBER 05, 2003

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:



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THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

Tested By:



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VIEN TRAN  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. EUT DESCRIPTION

Microwave motion sensor is a 10.525 GHz device that is applying Doppler radar phenomenon to sense motion. It transmits a low power microwave and receives energy reflected by objects.

### **3. TEST METHODOLOGY**

The tests documented in this report were performed in accordance with ANSI C63.4:2001, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

### **4. FACILITIES AND ACCREDITATION**

#### **FACILITIES AND EQUIPMENT**

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

## TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	 1300
Japan	VCCI	CISPR 22 Two OATS and one conducted Site	 R-1014, R-619, C-640
Norway	NEMKO	EN50081-1, EN50081-2, EN50082-1, EN50082-2, IEC61000-6-1, IEC61000-6-2, EN50083-2, EN50091-2, EN50130-4, EN55011, EN55013, EN55014-1, EN55104, EN55015, EN61547, EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60945, EN61326-1	 ELA 117
Norway	NEMKO	EN60601-1-2 and IEC 60601-1-2, the Collateral Standards for Electro-Medical Products. MDD, 93/42/EEC, AIMD 90/385/EEC	 ELA-171
Taiwan	BSMI	CNS 13438	 SL2-IN-E-1012
Canada	Industry Canada	RSS210 Low Power Transmitter and Receiver	 IC2324 A,B,C, and F

## 5. CALIBRATION AND UNCERTAINTY

### 5.1 MEASURING INSTRUMENT CALIBRATION

The measurement instruments utilized to perform the tests documented in this report have been calibrated in accordance with the manufacturer's recommendations, and are traceable to national standards.

### 5.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

### 5.3 TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST AND MEASUREMENT EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due Date
Spectrum Analyzer	HP	8566B	3014A06685	6/1/04
Spectrum Display	HP	85662A	2152A03066	6/1/04
Quasi-Peak Detector	HP	85650A	3145A01654	6/1/04
Preamplifier	HP	8447D	2944A06833	8/22/04
Log Periodic Antenna	EMCO	3146	9107-3163	3/30/04
Biconical Antenna	Eaton	94455-1	1197	3/30/04
LISN	F.C.C.	LISN-50/250-25-2	2023	9/6/04
EMI Test Receiver	Rohde & Schwarz	ESHS 20	827129/006	4/17/04
Spectrum Analyzer	HP	8593EM	3710A00205	6/11/04
Preamplifier (1 - 26.5GHz)	HP	NSP2600-44	646456	4/26/04
Horn Antenna (1 - 18GHz)	EMCO	3115	6717	2/4/04
Horn Antenna (18 - 26.5 GHz)	ARA	MWH 1826/B	1013	2/4/04
Harmonic Mixer (26.5 - 40 GHz)	HP	11970A	3003A04190	10/14/05
Horn Antenna (26.5 - 40 GHz)	DICO	1149	2	N.C.R.
Harmonic Mixer (33 - 50 GHz)	HP	11970A	3003A03363	10/18/05
Horn Antenna (33 - 50 GHz)	ATM	22-442-6	7046005	N.C.R.
Harmonic Mixer (50 - 75 GHz)	HP	11970A	2521A01163	10/22/05
Horn Antenna (50 - 75 GHz)	ATM	15-442-6	7046105	N.C.R.

## 6. SETUP OF EQUIPMENT UNDER TEST

### SETUP INFORMATION FOR TESTS

#### SUPPORT EQUIPMENT

TEST PERIPHERALS				
Device Type	Manufacturer	Model Number	Serial Number	FCC ID
DC POWER SUPPLY	HP	33610A	KR24104150	DOC

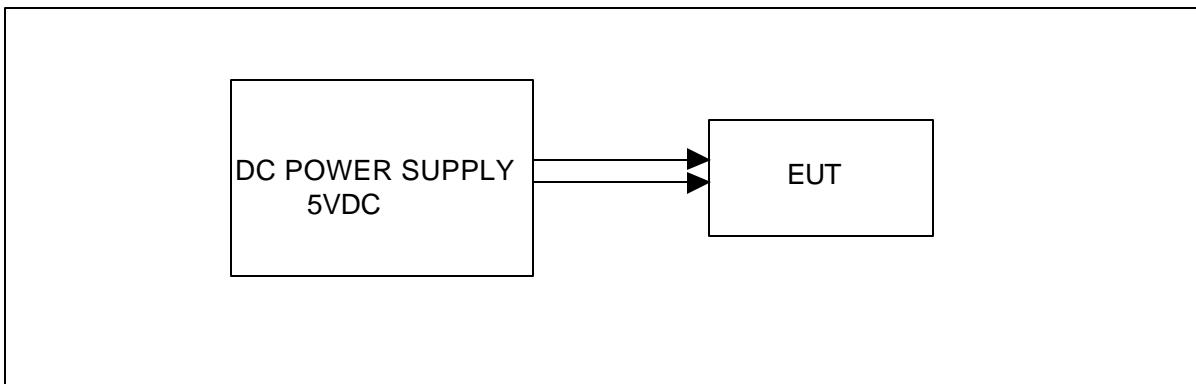
#### I/O CABLES

N/A

#### TEST SETUP

The EUT was operated by 5vdc.

**SETUP DIAGRAM FOR TESTS**



EUT WAS OPERATED BY 5VDC POWER SUPPLY

## 7. APPLICABLE LIMITS AND TEST RESULTS

### 7.1 EQUIPMENT TYPE

#### LIMIT

§15.245 (a) Operation under the provisions of this Section is limited to intentional radiators used as field disturbance sensors, excluding perimeter protection systems.

#### RESULTS

No non-compliance noted. The EUT is a field disturbance sensor used for collecting and delivering traffic statistics.

## 7.2 FIELD STRENGTH

### 7.2.1 APPLICABLE RULES

§15.245 (b) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (millivolts/meter)
902 – 928	500	1.6
2435 – 2465	500	1.6
5785 – 5815	500	1.6
10500 – 10550	2500	25.0
24075 – 24175	2500	25.0

(1) Regardless of the limits shown in the above table, harmonic emissions in the restricted bands below 17.7 GHz, as specified in § 15.205, shall not exceed the field strength limits shown in § 15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz shall not exceed the following field strength limits:

(i) For field disturbance sensors designed for use only within a building or to open building doors, 25.0 mV/m.

(2) Field strength limits are specified at a distance of 3 meters.

(3) 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 Section 15.209, whichever is the lesser attenuation.

(4) The emission limits shown in the above table are based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41	322 - 335.4		

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) 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 (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

### 7.2.2 LIMITS

Frequency Range	Average Limit (mV/m at 3 m)	Average Limit (dBuV/m at 3 m)	Peak Limit (dBuV/m at 3 m)
Fundamental 10.500 to 10.550 GHz	2500	128	148
Harmonics at 21.050, 31.575, 42.100 and 52.625 GHz	25	88	108
Emissions from 30 to 960 MHz		§ 15.209 (or -50 dBc)	§ 15.209 (or -50 dBc)
Other Emissions from 0.96 to 53.0 GHz		54 (or -50 dBc)	74 (or -50 dBc)

### 7.2.3

### SETUP AND PROCEDURE

#### TEST SETUP

The EUT is placed on the 0.8 m high non-conducting tabletop. The EUT is continuously transmitting.

#### TEST PROCEDURE

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 53 GHz is investigated.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The frequency span is set small enough to easily differentiate between broadcast stations, intermittent ambient signals and EUT emissions. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the signal. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

For measurements below 26.5 GHz a measurement distance of 3 m is used.

For measurements above 26.5 GHz, the maximum distance from the EUT that yields a minimum system noise floor at least 6 dB below the 15.209 limit is calculated for each separate harmonic mixer band. This distance is shown in the noise floor calculations below. The antenna is scanned around the entire perimeter surface of the EUT, in both horizontal and vertical polarizations. During this perimeter scan, the antenna is kept no further from the EUT than the maximum distance calculated for each mixer band.

**SYSTEM NOISE FLOOR FROM 26.5 TO 75 GHz**

09/02/03 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site															
<p>Test Engr: VIEN TRAN  Project #: 03T2211-1  Company: T &amp; C INTERNATIONAL CORP.  EUT Descrip.: MICROWAVE MOTION SENSOR  EUT M/N: ADC1011  Test Target: INT. RADIATOR @ 15.245 (10500 - 10550MHz)  Mode Oper: NORMAL MODE _ HARMONIC &amp; SPUR (26.5 TO 53GHz)</p>															
<b>Test Equipment:</b>															
IMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Agilent 8564E Analyzer	Horn > 18GHz	Limit										
<input type="button" value=""/>	<input type="button" value=""/>	<input type="button" value=""/>	<input type="button" value=""/>	<input type="button" value=""/>	<input type="button" value=""/>										
<p>Hi Frequency Cables</p> <p><input type="checkbox"/> (2 ft) <input type="checkbox"/> (2~3 ft) <input type="checkbox"/> (4~6 ft) <input type="checkbox"/> (12 ft)</p>															
<p><b>Peak Measurements:</b> 1 MHz Resolution Bandwidth  1 MHz Video Bandwidth</p> <p><b>Average Measurements:</b> 1 MHz Resolution Bandwidth  10Hz Video Bandwidth</p>															
<b>f</b> GHz	<b>Dist</b> feet	<b>Read Pk</b> dBuV	<b>Read Avg</b> dBuV	<b>AF</b> dB/m	<b>CL</b> dB	<b>Amp</b> dB	<b>D Corr</b> dB	<b>HPF</b>	<b>Peak</b> dBuV/m	<b>Avg</b> dBuV/m	<b>Pk Lim</b> dBuV/m	<b>Avg Lim</b> dBuV/m	<b>Pk Mar</b> dB	<b>Avg Mar</b> dB	<b>Notes</b>
<b>26.5 to 40GHz MIXER</b>															
26.500	0.10	44.3	35.0	43.0	0.0	0.0	-39.9	0.0	47.4	38.1	74.0	54.0	26.6	-15.9	V
40.000	0.10	40.2	28.0	43.0	0.0	0.0	-39.9	0.0	43.3	31.1	74.0	54.0	30.7	-22.9	H
<b>33 TO 50GHz MIXER</b>															
33.000	0.1	42.3	29.9	41.6	0.0	0.0	-39.9	0.0	44.0	31.6	74.0	54.0	30.0	-22.4	V
50.000	0.1	36.3	25.9	41.6	0.0	0.0	-39.9	0.0	38.0	27.6	74.0	54.0	36.0	-26.4	H
<b>50 TO 75GHz MIXER</b>															
50.000	0.03	50.5	37.9	44.2	0.0	0.0	-40.0	0.0	54.7	42.1	74.0	54.0	19.3	-11.9	V
75.000	0.03	49.0	36.0	47.7	0.0	0.0	-40.0	0.0	56.7	43.7	74.0	54.0	-17.3	-10.3	H
<p><b>f</b> Measurement Frequency  <b>Dist</b> Distance to Antenna  <b>Read</b> Analyzer Reading  <b>AF</b> Antenna Factor  <b>CL</b> Cable Loss</p> <p><b>Amp</b> Preamp Gain  <b>D Corr</b> Distance Correct to 3 meters  <b>Avg</b> Average Field Strength @ 3 m  <b>Peak</b> Calculated Peak Field Strength  <b>HPF</b> High Pass Filter</p> <p><b>Avg Lim</b> Average Field Strength Limit  <b>Pk Lim</b> Peak Field Strength Limit  <b>Avg Mar</b> Margin vs. Average Limit  <b>Pk Mar</b> Margin vs. Peak Limit</p>															

## 7.2.4 TEST RESULTS

### FIELD STRENGTH OF FUNDAMENTAL EMISSION

09/02/03 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site																																																																														
Test Engr: VIEN TRAN Project #: 03T2211-1 Compan: T & C INTERNATIONAL CORP. EUT Descrip.: MICROWAVE MOTION SENSOR EUT M/N: MDC1011 Test Target: INT. RADIATOR @ 15.245 (10500 - 10550MHz) Mode Oper: NORMAL MODE _ FUNDAMENTAL																																																																														
Test Equipment:																																																																														
EMCO Horn 1.18GHz	Pre-amplifier 1.26GHz	Spectrum Analyzer	Horn > 18GHz				Limit																																																																							
T60; S/N: 2238 @3m		Agilent E4446A Analyzer					FCC 15.245																																																																							
H Frequency Cables <input type="checkbox"/> (1 ft) <input checked="" type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)																																																																														
Peak Measurements: 1 MHz Resolution Bandwidth 1MHz Video Bandwidth																																																																														
Average Measurements: 1 MHz Resolution Bandwidth 10Hz Video Bandwidth																																																																														
<table border="1"><thead><tr><th>f</th><th>Dist</th><th>Read Pk</th><th>Read Avg.</th><th>AF</th><th>CL</th><th>Amp</th><th>D Corr</th><th>HPF</th><th>Peak</th><th>Avg</th><th>Pk Lim</th><th>Avg Lim</th><th>Pk Mar</th><th>Avg Mar</th><th>Notes</th></tr><tr><th>GHz</th><th>feet</th><th>dBuV</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>dB</th><th></th><th>dBuV/m</th><th>dBuV/m</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dB</th><th></th></tr></thead><tbody><tr><td>10.525</td><td>9.8</td><td>50.2</td><td>48.2</td><td>38.2</td><td>3.6</td><td>0.0</td><td>0.0</td><td>1.0</td><td>92.9</td><td>91.0</td><td>148.0</td><td>128.0</td><td>-55.1</td><td>-37.0</td><td>V</td></tr><tr><td>10.525</td><td>9.8</td><td>44.2</td><td>36.8</td><td>38.2</td><td>3.6</td><td>0.0</td><td>0.0</td><td>1.0</td><td>87.0</td><td>79.6</td><td>143.0</td><td>128.0</td><td>-61.0</td><td>-48.4</td><td>H</td></tr></tbody></table>															f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	HPF	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes	GHz	feet	dBuV	dBuV	dB/m	dB	dB	dB		dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB		10.525	9.8	50.2	48.2	38.2	3.6	0.0	0.0	1.0	92.9	91.0	148.0	128.0	-55.1	-37.0	V	10.525	9.8	44.2	36.8	38.2	3.6	0.0	0.0	1.0	87.0	79.6	143.0	128.0	-61.0	-48.4	H
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Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit																																																																									
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**FIELD STRENGTH OF HARMONIC AND SPURIOUS EMISSIONS FROM 1 TO 26.5 GHz**

09/02/03 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site															
Test Engr: VIEN TRAN Project #: 03T2211-1 Company: T & C INTERNATIONAL CORP. EUT Descrip.: MICROWAVE MOTION SENSOR EUT M/N: MDC1011 Test Target: INT. RADIATOR @ 15.245 (10500 - 10550MHz) Mode Oper: NORMAL MODE _ HARMONIC & SPUR (2nd harmonic_21.05GHz)															
Test Equipment:															
EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz				Limit								
	T63 Miteq 646456	Agilent E4446A Analyzer	T87; ARA 18-26GHz; S/N:1049				FCC 15.245								
H Frequency Cables <input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 - 3 ft) <input checked="" type="checkbox"/> (4 - 6 ft) <input checked="" type="checkbox"/> (12 ft)															
Peak Measurements: Average Measurements: 1 MHz Resolution Bandwidth 1 MHz Resolution Bandwidth 1 MHz Video Bandwidth 10Hz Video Bandwidth															
f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
21.050	9.8	57.4	32.4	33.8	7.9	-38.2	0.0	1.0	61.9	36.9	108.0	88.0	-46.1	-51.1	V
21.050	9.8	52.3	28.7	33.8	7.9	-38.2	0.0	1.0	56.8	33.2	108.0	88.0	-51.2	-54.8	H
NO OTHER EMISSION DETECTED ABOVE NOISE FLOOR															
f Measurement Frequency Dist Distance to Antenna Read Analyzer Reading AF Antenna Factor CL Cable Loss					Amp Presamp Gain D Corr Distance Correct to 3 meters Avg Average Field Strength @ 3 m Peak Calculated Peak Field Strength HPF High Pass Filter					Avg Lim Average Field Strength Limit Pk Lim Peak Field Strength Limit Avg Mar Margin vs. Average Limit Pk Mar Margin vs. Peak Limit					

**FIELD STRENGTH OF HARMONIC AND SPURIOUS EMISSIONS FROM 26.5 TO 53 GHz**

09-02-03 High Frequency Measurement  
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: VIEN TRAN  
Project #: 03T2211-1  
Company: T & C INTERNATIONAL CORP.  
EUT Descrip.: MICROWAVE MOTION SENSOR  
EUT M/N: MDC1011  
Test Target: INT. RADIATOR @ 15.245 (10500 - 10550MHz)  
Mode Oper: NORMAL MODE \_ HARMONIC & SPUR (3rd and up)

**Test Equipment:**

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
Agilent 8564E Analyzer				FCC 15.245

Hi Frequency Cables  
 (2 ft)  (2 ~ 3 ft)  (4 ~ 6 ft)  (12 ft)

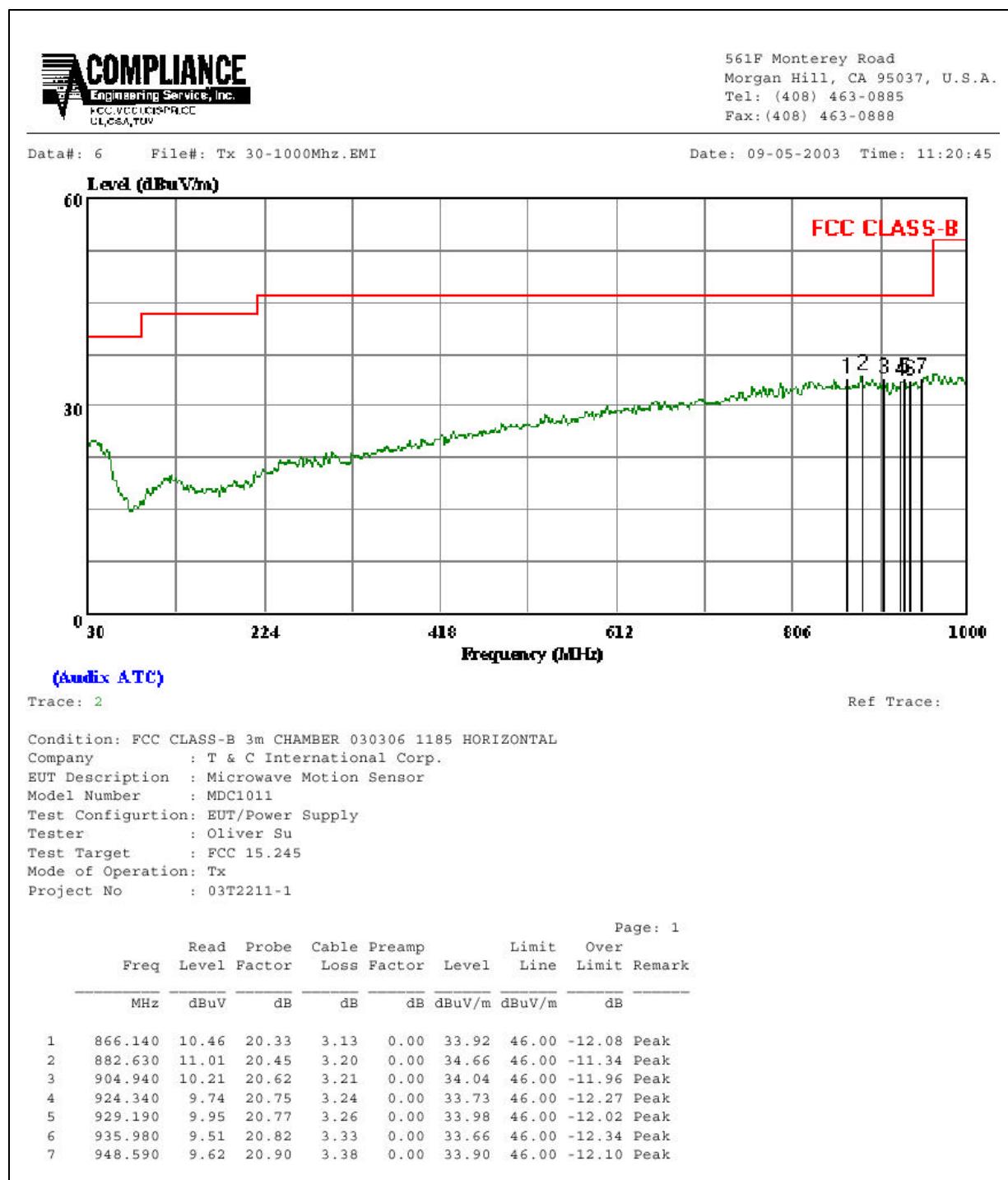
**Peak Measurements:** 1 MHz Resolution Bandwidth  
1MHz Video Bandwidth  
**Average Measurements:** 1 MHz Resolution Bandwidth  
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF	CL	Amp dB	D Corr dB	HPF dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
31.575	0.1	76.6	73.5	35.2	0.0	0.0	-39.9	0.0	71.9	68.8	108.0	88.0	-36.1	-19.2	V
31.575	0.1	69.7	68.1	35.2	0.0	0.0	-39.9	0.0	65.1	63.4	108.0	88.0	-42.9	-24.6	H
42.100	0.1	67.4	60.8	37.7	0.0	0.0	-39.9	0.0	60.3	58.6	108.0	88.0	-47.7	-29.4	V
42.100	0.1	55.3	53.8	37.7	0.0	0.0	-39.9	0.0	53.1	51.6	108.0	88.0	-54.9	-36.4	H

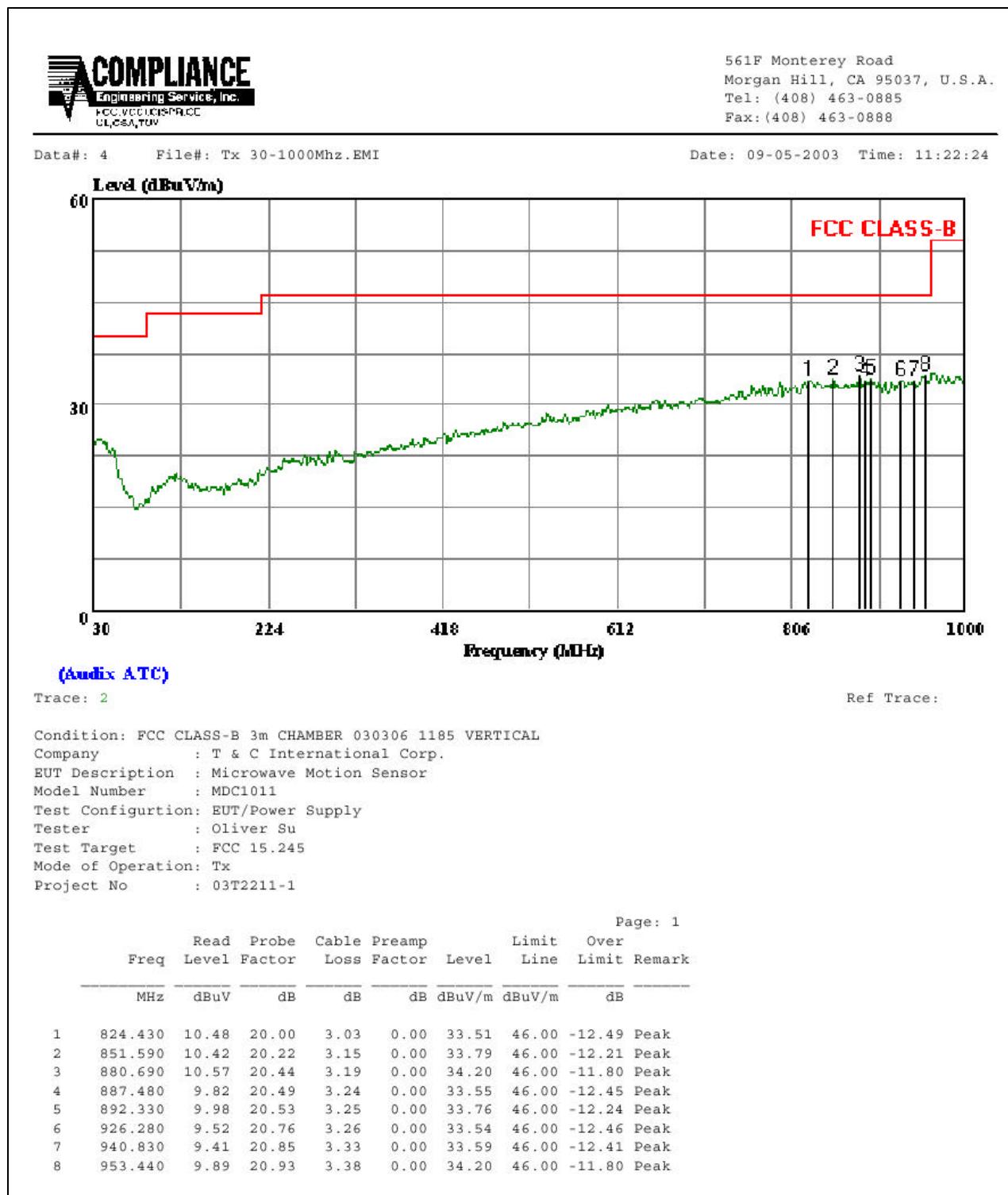
NO OTHER EMISSION DETECTED ABOVE NOISE FLOOR

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

**FIELD STRENGTH OF SPURIOUS EMISSIONS FROM 30 MHz TO 1 GHz**  
**HORIZONTAL**



VERTICAL



### 7.3 RECEIVER SPURIOUS EMISSIONS

#### LIMIT

Frequency Range	Average Limit (dBuV/m at 3 m)	Peak Limit (dBuV/m at 3 m)
30 to 960 MHz	§ 15.209	§ 15.209
0.96 to 53.0 GHz	54	74

#### RESULTS

Not applicable. The EUT operates on the same principle as a radar. The transmitter and receiver operate simultaneously, thus there is no receive only mode.

## 7.4 POWERLINE CONDUCTED EMISSIONS

### LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

### TEST PROCEDURE

The EUT is placed on a wooden table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane on the floor.

The EUT is continuously transmitting, and data traffic is continuously maintained on the RS232 serial port.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

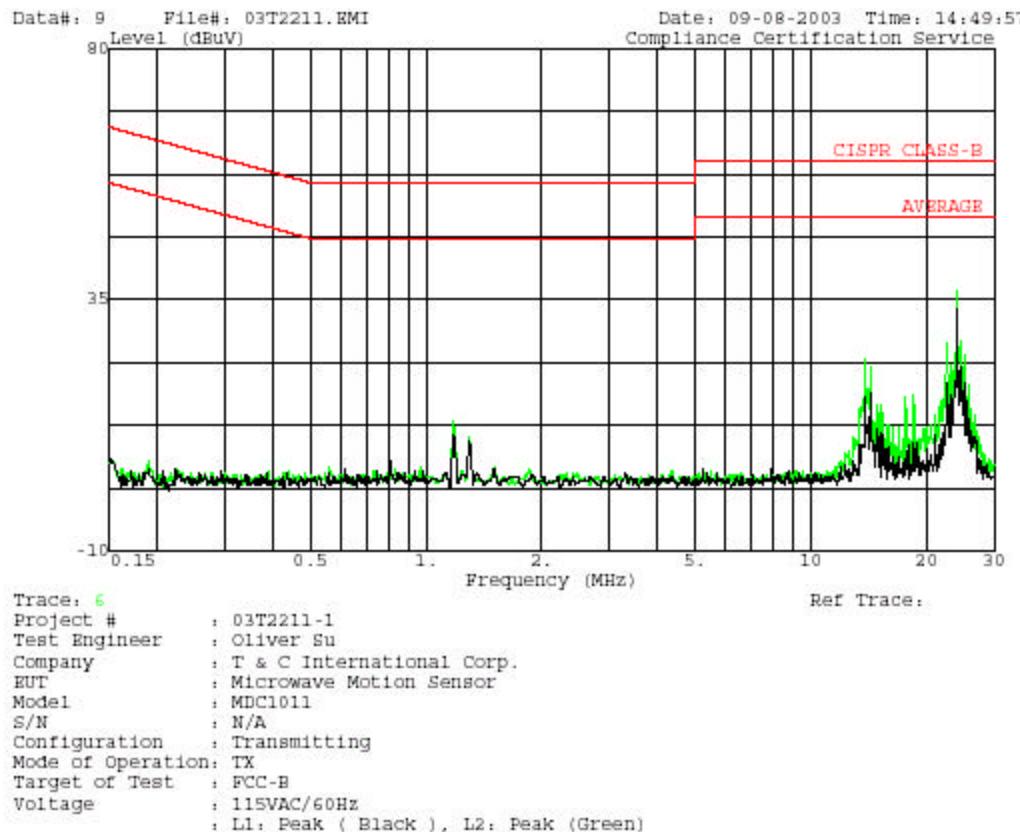
**RESULTS**

No non-compliance noted:

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq. (MHz)	Reading			Closs (dB)	Limit	EN_B	Margin		Remark
	PK (dBuV)	QP (dBuV)	AV (dBuV)				QP (dB)	AV (dB)	
24.40	36.12	--	--	0.00	60.00	50.00	-23.88	-13.88	L1
13.91	24.32	--	--	0.00	60.00	50.00	-35.68	-25.68	L1
1.18	13.13	--	--	0.00	56.00	46.00	-42.87	-32.87	L1
24.40	33.24	--	--	0.00	60.00	50.00	-26.76	-16.76	L2
14.36	18.25	--	--	0.00	60.00	50.00	-41.75	-31.75	L2
13.84	17.50	--	--	0.00	60.00	50.00	-42.50	-32.50	L2
6 Worst Data									



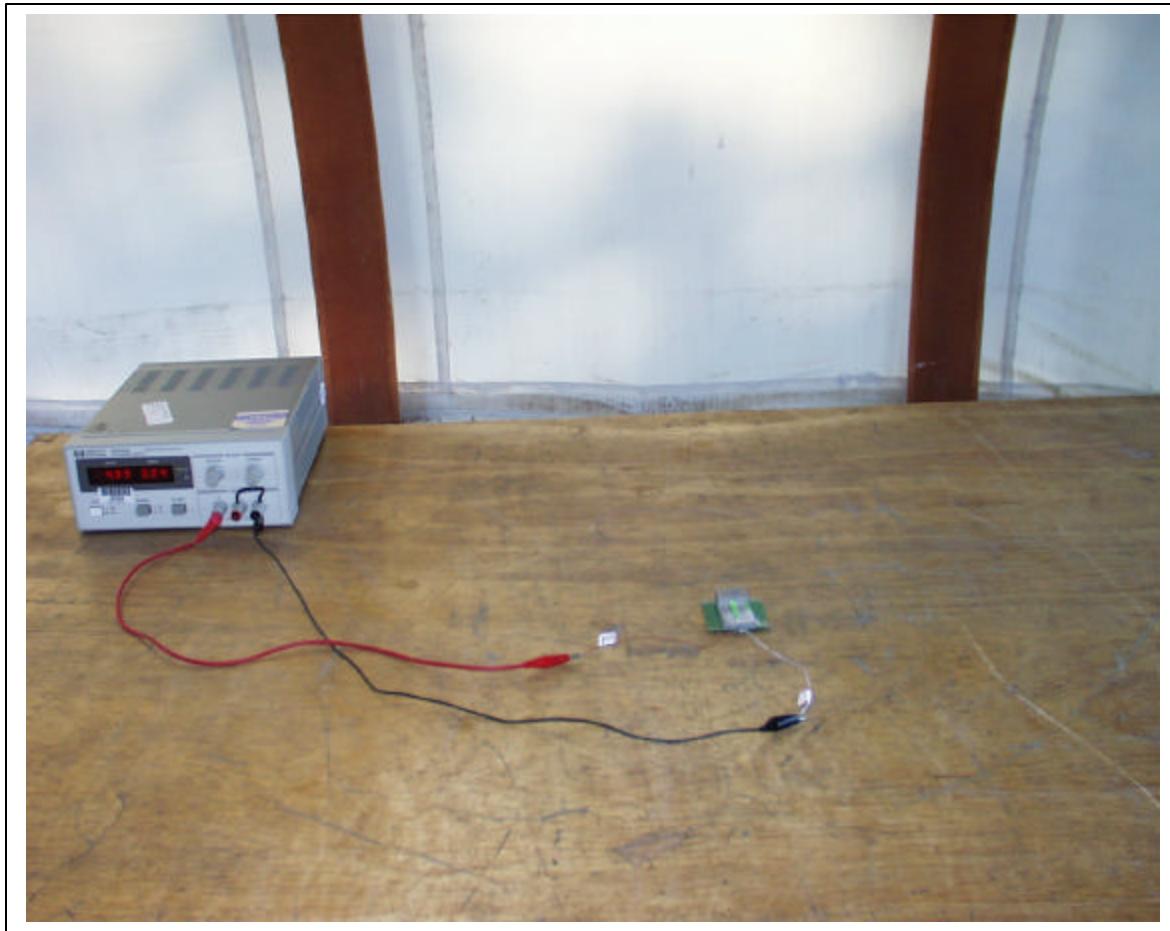
561F Monterey Road,  
San Jose, CA 95037 USA  
Tel: (408) 463-0885  
Fax: (408) 463-0888



## 8. SETUP PHOTOS

RADIATED EMISSIONS MEASUREMENT SETUP ABOVE 1GHz

FUNDAMENTAL, HARMONIC AND SPUR



FRONT



**BACK**

**RADIATED EMISSIONS MEASUREMENT SETUP BELOW 1GHz**

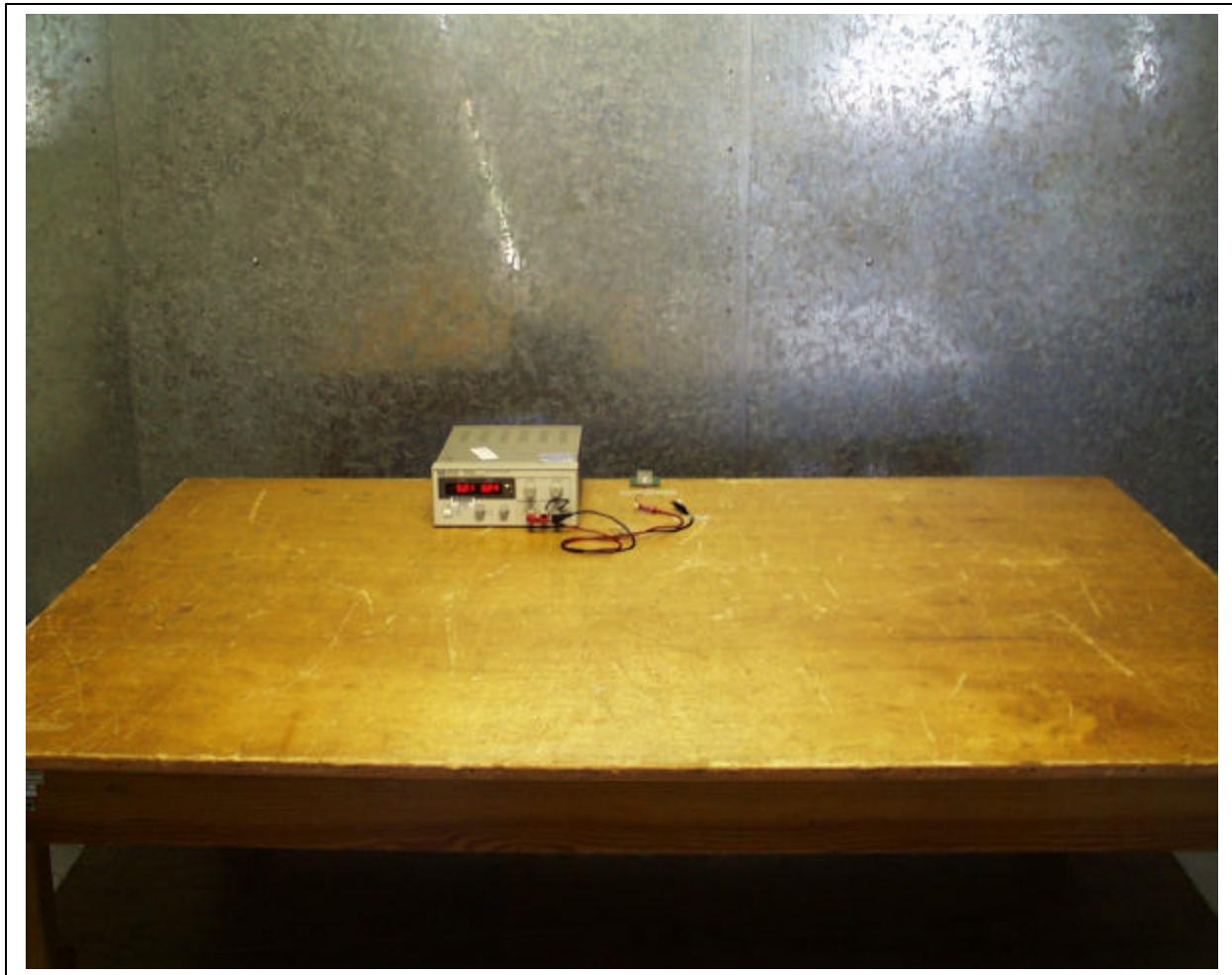


**FRONT**



**BACK**

**CONDUCTED EMISSIONS MEASUREMENT SETUP**



**FRONT**



**BACK**

**END OF REPORT**