



# Nemko



**Test Report:** 6W71020

**Applicant:** VTECH Engineering Canada  
200-7671 Alderbridge Way  
Richmond, B.C. V6X 1Z9  
Canada

**Apparatus:** ia 5823

**FCC ID:** EW780-5735-02

**In Accordance With:** FCC Part 15 Subpart C, 15.249  
Operation in the 902-928MHz, 2400 - 2483.5 MHz,  
5725-5850 MHz and 24.0-24.25 GHz

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

**Authorized By:**   
Jason Nixon, Telecom Specialist

**Date:** August 16, 2006

**Total Number of Pages:** 27

## 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:

<b>Apparatus Assessed:</b>	ia 5823
<b>Specification:</b>	FCC Part 15 Subpart C, 15.249
<b>Compliance Status:</b>	Complies
<b>Exclusions:</b>	None
<b>Non-compliances:</b>	None
<b>Report Release History:</b>	Original Release

Author: Roman Kuleba, EMC/Wireless 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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## TABLE OF CONTENTS

<b>Report Summary</b> .....	<b>2</b>
<b>Section 1 : Equipment Under Test</b> .....	<b>4</b>
1.1 Product Identification .....	4
1.2 Samples Submitted for Assessment.....	4
1.3 Theory of Operation .....	4
1.4 Technical Specifications of the EUT .....	5
1.5 Block Diagram of the EUT.....	5
<b>Section 2 : Test Conditions</b> .....	<b>6</b>
2.1 Specifications .....	6
2.2 Deviations From Laboratory Test Procedures .....	6
2.3 Test Environment .....	6
2.4 Test Equipment.....	6
<b>Section 3 : Observations</b> .....	<b>7</b>
3.1 Modifications Performed During Assessment .....	7
3.2 Record Of Technical Judgements .....	7
3.3 EUT Parameters Affecting Compliance .....	7
3.4 Test Deleted.....	7
3.5 Additional Observations .....	7
<b>Section 4 : Results Summary</b> .....	<b>8</b>
4.1 FCC Part 15 Subpart C : Test Results .....	9
<b>Appendix A : Test Results</b> .....	<b>10</b>
Clause 15.207(a) Powerline Conducted Emissions .....	10
Clause 15.209(a) Radiated Emissions within Restricted Bands .....	17
Clause 15.249(a) Radiated emissions not in Restricted Bands .....	18
Clause 15.249(d) Spurious emissions (except Harmonics).....	20
<b>Appendix B : Setup Photographs</b> .....	<b>25</b>
<b>Appendix C : Block Diagram of Test Setups</b> .....	<b>27</b>

## Section 1 : Equipment Under Test

### 1.1 Product Identification

The Equipment Under Test was identified as follows:

VTech ia5823 Base as a part of Basic 5.8GHz Analogue Cordless Phone with CID.

### 1.2 Samples Submitted for Assessment

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

Sample No.	Description	Serial No.
1	5.8 GHz Handset	S/N: PR06/05
2	ia5823 Base	5-8A G3 CR
3	117VAC/60Hz to 9VDC Class 2 Power Supply/Adaptor	M/N: U090020D1X
4	3.6V 600mAh Ni-Cd Battery Pack	P/N: 3301 (80-5071-00-00)

The first samples were received on: June 27, 2006

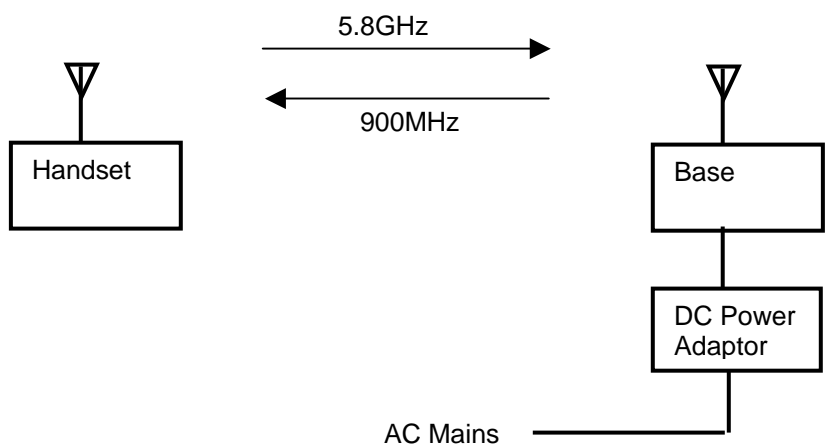
### 1.3 Theory of Operation

The ia5823 Base is part of an analogue cordless telephone with CID. The base and handset RF-module form a system that provides a full duplex wireless link between the handset and the base unit. The Base transmits to the Handset in the 902 – 928 MHz Band and receives from the Handset in 5.8 GHz band.

### 1.4 Technical Specifications of the EUT

<b>Manufacturer:</b>	VTECH Engineering Canada
<b>Operating Frequency:</b>	Transmitter: 912.75 to 917.1 MHz Receiver: 5863.80 to 5872.50 MHz
<b>Emission Designator</b>	F3E, F1D
<b>Modulation:</b>	Voice: FM (Nominal Deviation: 30 kHz) Data: FSK at 1000 bps
<b>Antenna Data:</b>	Integrated Monopole for 5.8GHz Receiver Integrated Wire for 900 MHz Transmitter
<b>Antenna Connector:</b>	There is no antenna connectors on the device to be used with external antenna.
<b>Power Source:</b>	117VAC/60Hz to 9VDC Class 2 Power Supply/Adaptor

### 1.5 Block Diagram of the EUT



## Section 2 : Test Conditions

### 2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.249

Operation in the 902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz  
and 24.0-24.25 GHz bands

### 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.	Next Cal.
Spectrum Analyzer	Rohde & Schwarz	FSP	FA001920	March 17/07
LISN	EMCO	4825/2	FA001545	Jan. 30/07
Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 16/07
Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 16/07
International Power Supply	California Inst.	1001WP	FA000995	Jan. 11/07
Receiver	Rohde & Schwarz	ESHS 10	FA001918	Feb. 17/07
Transient Limiter	Hewlett-Packard	1194 7A	FA000975	May 18/07
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	Aug. 2/07
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	Aug. 2/07
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	Aug. 2/07
5.0 – 18.0 GHz Amplifier	NARDA	DWT-186N23U40	FA001409	COU
1.7 GHz High-pass Filter	K & L	3DH1-2000 T8000-O/O	FA001434	COU
Biconical (1) Antenna	EMCO	3109	FA000805	May 3, 2007
Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Aug. 29/06
Horn Antenna #1	EMCO	3115	FA000649	Jan. 12/07
Horn Antenna #2	EMCO	3115	FA000825	Dec. 16/06

COU – Cal On Use

## **Section 3 : Observations**

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

No modifications were performed during assessment.

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

No technical judgements were made during the assessment.

### **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	Y	PASS
15.209(a)	Radiated Emissions within Restricted Bands	Y	PASS
15.249(a)	Radiated emissions not in Restricted Bands	Y	PASS
15.249(b)	Fixed Point-to-Point operation in the 24.0-24.25 GHz Band	N	N/A
15.249(d)	Spurious emissions (except Harmonics)	Y	PASS

Notes:

## Appendix A : Test Results

### Clause 15.207(a) Powerline Conducted Emissions

Frequency of Conducted limit (dB $\mu$ V)		
Emission (MHz)	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 Conditions:

<b>Sample Number:</b>	2	<b>Temperature:</b>	23°C
<b>Date:</b>	August 10, 2006	<b>Humidity:</b>	45 %
<b>Modification State:</b>	0	<b>Tester:</b>	Roman Kuleba
		<b>Laboratory:</b>	Ottawa

**Test Results:** See Attached Plots.

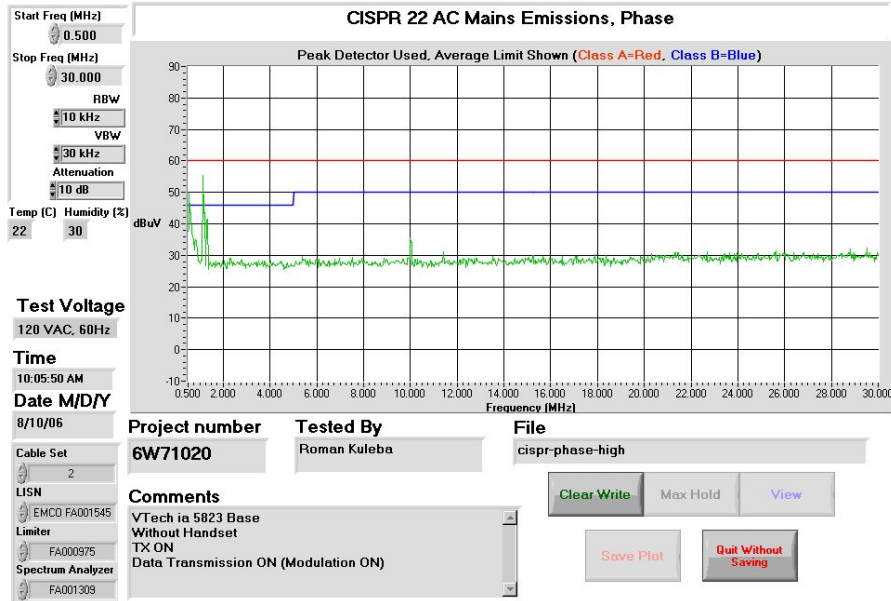
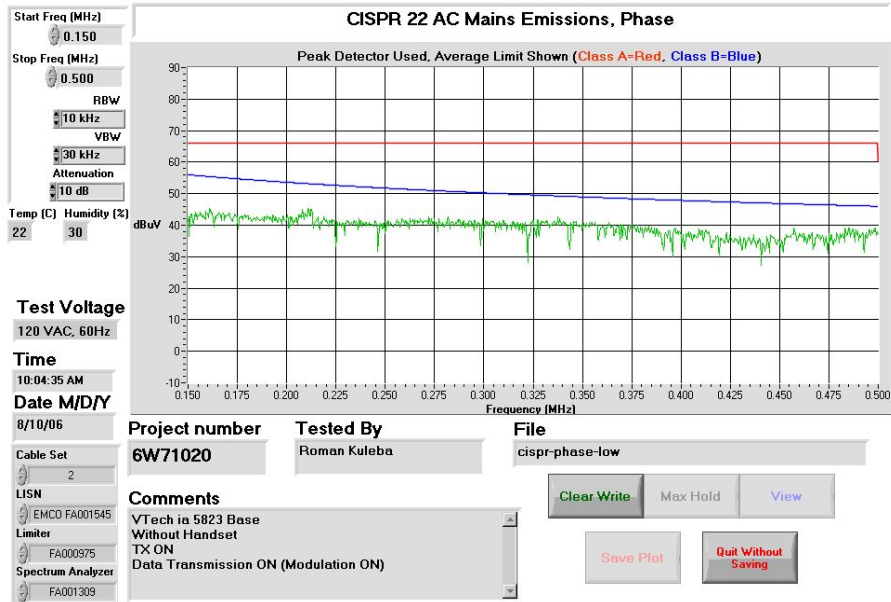
### Additional Observations:

All plots were generated with a peak detector.  
 Spectral plots have been corrected with cable, LISN, and attenuator losses to show compliance with the average limit.  
 Peak measurements with 3dB or less margin of the average limit line have been measured with a test receiver.

AC Powerline Conducted Emissions, continued

Without Handset, TX-ON

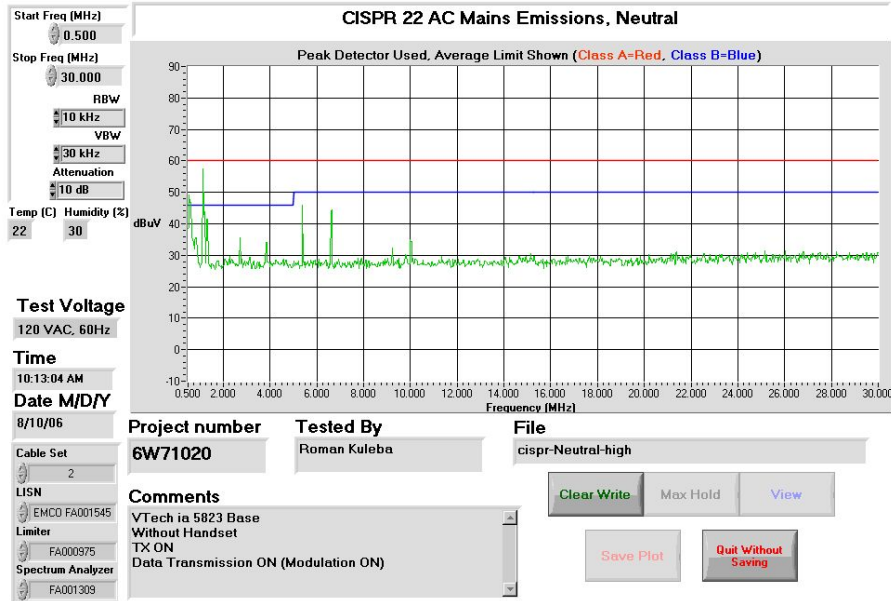
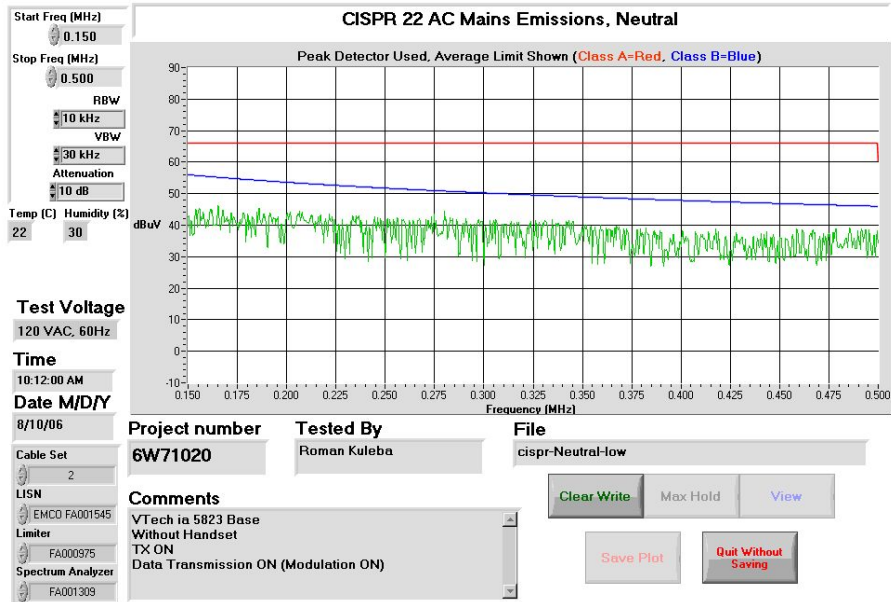
Spectral Plots



AC Powerline Conducted Emissions, continued

Without Handset, TX-ON

Spectral Plots



AC Powerline Conducted Emissions, continued

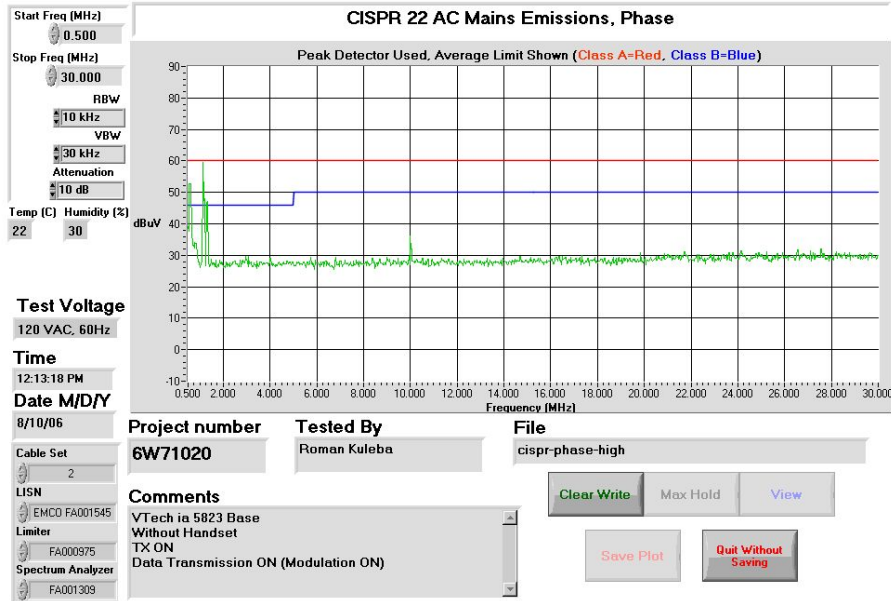
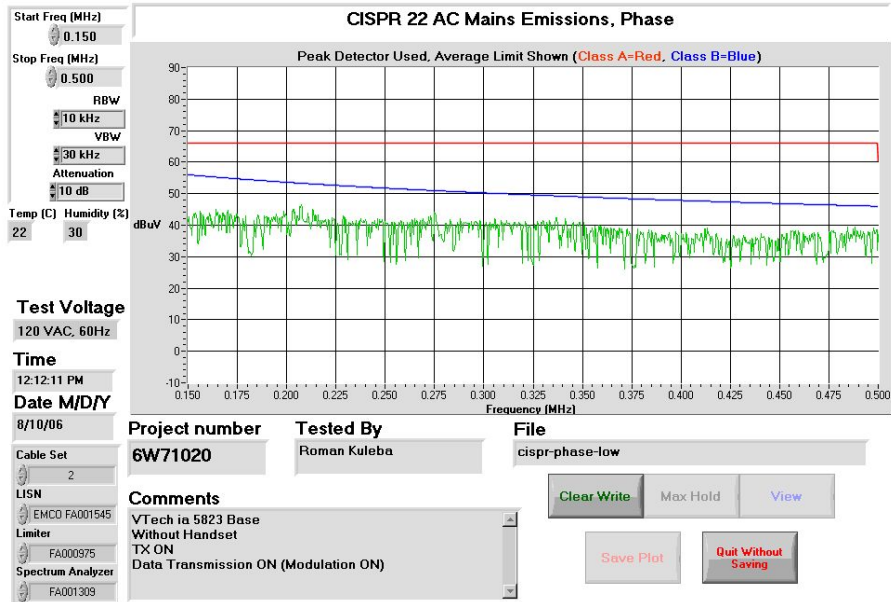
Without Handset, TX-ON

Test Date: August 10, 2006								
Engineer's Name: Roman Kuleba								
Tested as per: Table Top								
Port under test:								
Results: Refer to plots and tables (if applicable) of this section.								
Receiver Results:								
Conductor	Frequency (MHz)	Detector	Emission Level (dBUV)	LISN Loss (dB)	Cable Loss (dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)
Phase	0.1500	Quasi-Peak	33.1	0.00	0.00	33.10	66.0	32.9
		Average	3.5	0.00	0.00	3.50	56.0	52.5
	0.4500	Quasi-Peak	25.2	0.00	0.20	25.40	56.9	31.5
		Average	-3.2	0.00	0.20	-3.00	46.9	49.9
	0.5840	Quasi-Peak	28.8	0.00	0.03	28.83	56.0	27.2
		Average	0.9	0.00	0.03	0.93	46.0	45.1
	1.1487	Quasi-Peak	9.6	0.00	0.19	9.79	56.0	46.2
		Average	-1.0	0.00	0.19	-0.81	46.0	46.8
Neutral	0.1500	Quasi-Peak	32.3	0.00	0.00	32.30	66.0	33.7
		Average	2.6	0.00	0.00	2.60	56.0	53.4
	0.4500	Quasi-Peak	22.8	0.00	0.20	23.00	56.9	33.9
		Average	-4.8	0.00	0.20	-4.60	46.9	51.5
	0.5785	Quasi-Peak	20.5	0.00	0.04	20.54	56.0	35.5
		Average	0.6	0.00	0.04	0.64	46.0	45.4
	1.1491	Quasi-Peak	8.5	0.00	0.20	8.70	56.0	47.3
		Average	-1.2	0.00	0.20	-1.00	46.0	47.0
Notes								
Tested without handset and with transmission ON.								
Test Result								
Final Test Result: Pass.								

AC Powerline Conducted Emissions, continued

With Handset, Transmission OFF

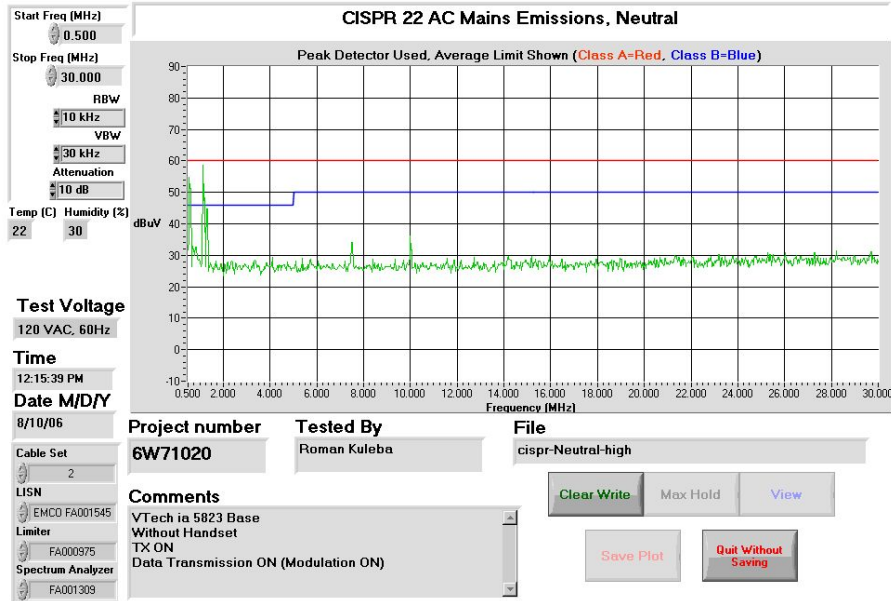
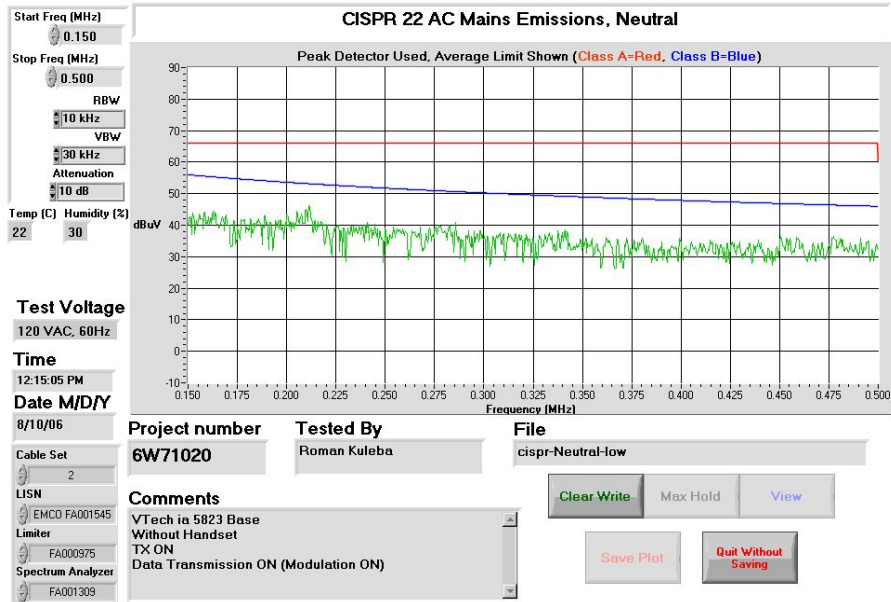
Spectral Plots



AC Powerline Conducted Emissions, continued

With Handset, Transmission OFF

Spectral Plots



AC Powerline Conducted Emissions, continued

With Handset, Transmission OFF

Test Date: August 10, 2006									
Engineer's Name: Roman Kuleba									
<b>Tested as per: Table Top</b>									
Port under test:									
Results: Refer to plots and tables (if applicable) of this section.									
Receiver Results:									
Conductor	Frequency (MHz)	Detector	Emission Level (dBuV)	LISN Loss (dB)	Cable Loss (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	
Phase	0.1500	Quasi-Peak	32.7	0.00	0.00	32.70	66.0	33.3	
		Average	3.2	0.00	0.00	3.20	56.0	52.8	
	0.2100	Quasi-Peak	31.4	0.00	0.20	31.60	63.2	31.6	
		Average	3.9	0.00	0.20	4.10	53.2	49.1	
	0.4500	Quasi-Peak	26.1	0.00	0.20	26.30	56.9	30.6	
		Average	-2.5	0.00	0.20	-2.30	46.9	49.2	
	0.5787	Quasi-Peak	29.0	0.00	0.04	29.04	56.0	27.0	
		Average	4.0	0.00	0.04	4.04	46.0	42.0	
	1.1498	Quasi-Peak	8.5	0.00	0.20	8.70	56.0	47.3	
		Average	-0.8	0.00	0.20	-0.60	46.0	46.6	
	Neutral	0.1500	Quasi-Peak	31.5	0.00	0.00	31.50	66.0	34.5
			Average	2.2	0.00	0.00	2.20	56.0	53.8
0.2100		Quasi-Peak	29.1	0.00	0.20	29.30	63.2	33.9	
		Average	2.3	0.00	0.20	2.50	53.2	50.7	
0.4500		Quasi-Peak	22.0	0.00	0.20	22.20	56.9	34.7	
		Average	-5.4	0.00	0.20	-5.20	46.9	52.1	
0.5784		Quasi-Peak	18.8	0.00	0.04	18.84	56.0	37.2	
		Average	0.0	0.00	0.04	0.04	46.0	46.0	
1.1487		Quasi-Peak	8.8	0.00	0.19	8.99	56.0	47.0	
		Average	-0.8	0.00	0.19	-0.61	46.0	46.6	
Notes									
Tested with handset plugged into the base and with transmission OFF.									
Test Result									
Final Test Result: Pass.									

**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 (microvoltmeter)	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 <sup>1</sup>	3
88-216	150 <sup>2</sup>	3
216-960	200 <sup>3</sup>	3
Above 960	500	3

**Test Conditions:**

<b>Sample Number:</b>	2	<b>Temperature:</b>	23°C
<b>Date:</b>	August 10, 2006	<b>Humidity:</b>	45 %
<b>Modification State:</b>	0	<b>Tester:</b>	Roman Kuleba
		<b>Laboratory:</b>	Ottawa

**Test Results:**

Pass – no emissions within 20 dB below the limit were detected in the restricted bands.

**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.

All measurements were performed using a Peak Detector with 120 kHz RBW on frequencies below 1GHz and a Peak and Average Detector with 1MHz RBW on frequencies above 1GHz at a distance of 3 meters.

The EUT was measured on three orthogonal axes.

**Clause 15.249(a) Radiated emissions not in Restricted Bands**

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

**Test Conditions:**

<b>Sample Number:</b>	2	<b>Temperature:</b>	23°C
<b>Date:</b>	August 10, 2006	<b>Humidity:</b>	45 %
<b>Modification State:</b>	0	<b>Tester:</b>	Roman Kuleba
		<b>Laboratory:</b>	Ottawa

**Test Results:** Pass (see attached table).

**Additional Observations:**

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

All measurements were performed using a Peak Detector with 120 kHz RBW on frequencies below 1GHz and a Peak and Average Detector with 1MHz RBW on frequencies above 1GHz at a distance of 3 meters.

The EUT was measured on three orthogonal axes.

All measurements were performed at 3m.

Radiated emissions not in Restricted Bands, continued

Frequency (MHz)	Antenna	Polarity	RCVD Signal (dBµV)	Ant. Factor (dB)	Duty Cycle Corr.	Cable Loss (dB)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	
1	662.7176	LP1	V	9.0	20.6	0.0	3.7	33.3	46.0	12.7	Peak
2	662.7176	LP1	H	8.0	21.4	0.0	3.7	33.1	46.0	12.9	Peak
3	912.75	LP1	V	57.1	23.0	N/A	4.6	84.7	94.0	9.3	Peak
4	914.85	LP1	V	57.2	23.0	N/A	4.6	84.8	94.0	9.2	Peak
5	917.10	LP1	V	56.7	23.0	N/A	4.6	84.3	94.0	9.7	Peak
6	912.75	LP1	H	56.0	23.7	N/A	4.6	84.3	94.0	9.7	Peak
7	914.85	LP1	H	56.1	23.7	N/A	4.6	84.4	94.0	9.6	Peak
8	917.10	LP1	H	55.6	23.7	N/A	4.6	83.9	94.0	10.1	Peak

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole  
 Note 2: Detector Legend: Below 1GHz, Peak detector with 100 kHz RBW, 100KHz VBW  
 Above 1GHz, Peak detector with 1.0MHz RBW, 1.0MHz VBW

No harmonics above fundamental frequency within 20 dB below the limit were detected.

**Output Power Fluctuation due to Power Line Voltage Variation**

**Test Method:** Radiated power was monitored under power line voltage extreme conditions on Base Unit at channel 14 (914.85 MHz ).

**Extreme Voltage:** ±15 % of AC Mains Voltage (102 – 138 VAC).

**Test Result:** No measurable change in fundamental power level on Base Unit was observed during the test.

**Clause 15.249(d) Spurious emissions (except Harmonics)**

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.

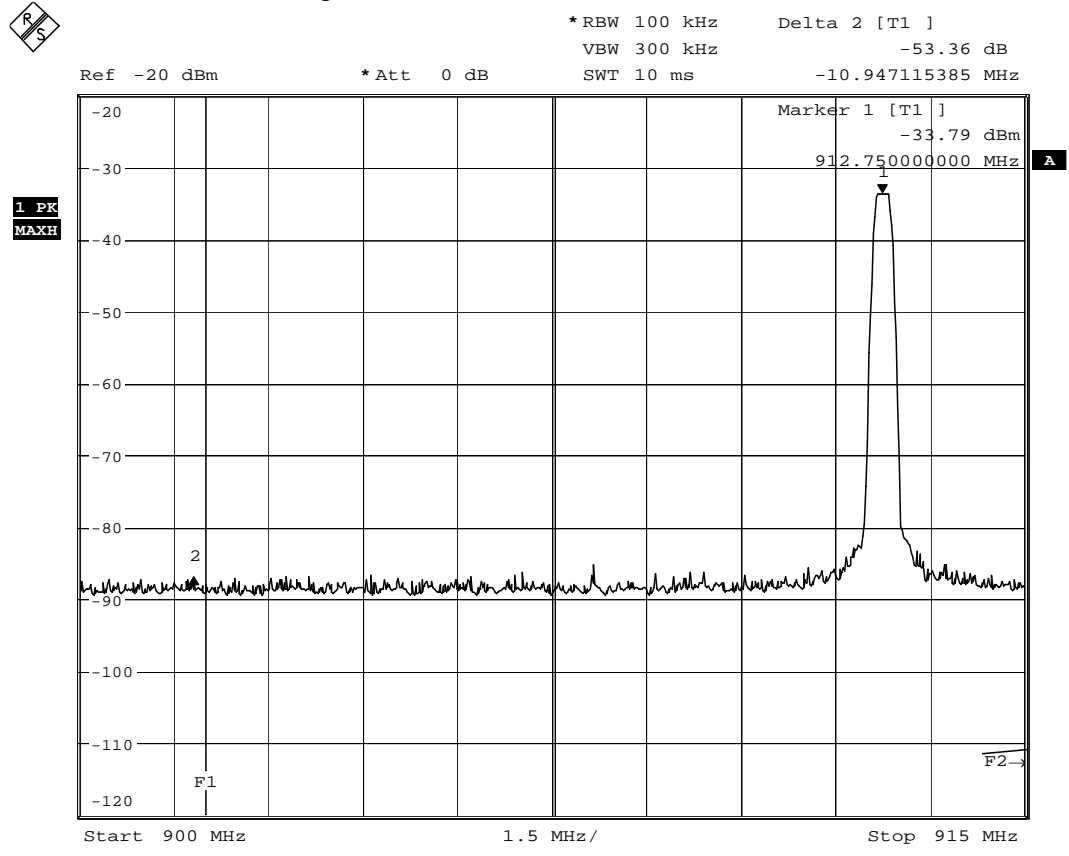
**Test Conditions:**

<b>Sample Number:</b>	2	<b>Temperature:</b>	23°C
<b>Date:</b>	August 10, 2006	<b>Humidity:</b>	45 %
<b>Modification State:</b>	0	<b>Tester:</b>	Roman Kuleba
		<b>Laboratory:</b>	Ottawa

**Test Results:** Pass (see attached plots).

Spurious emissions (except Harmonics), continued

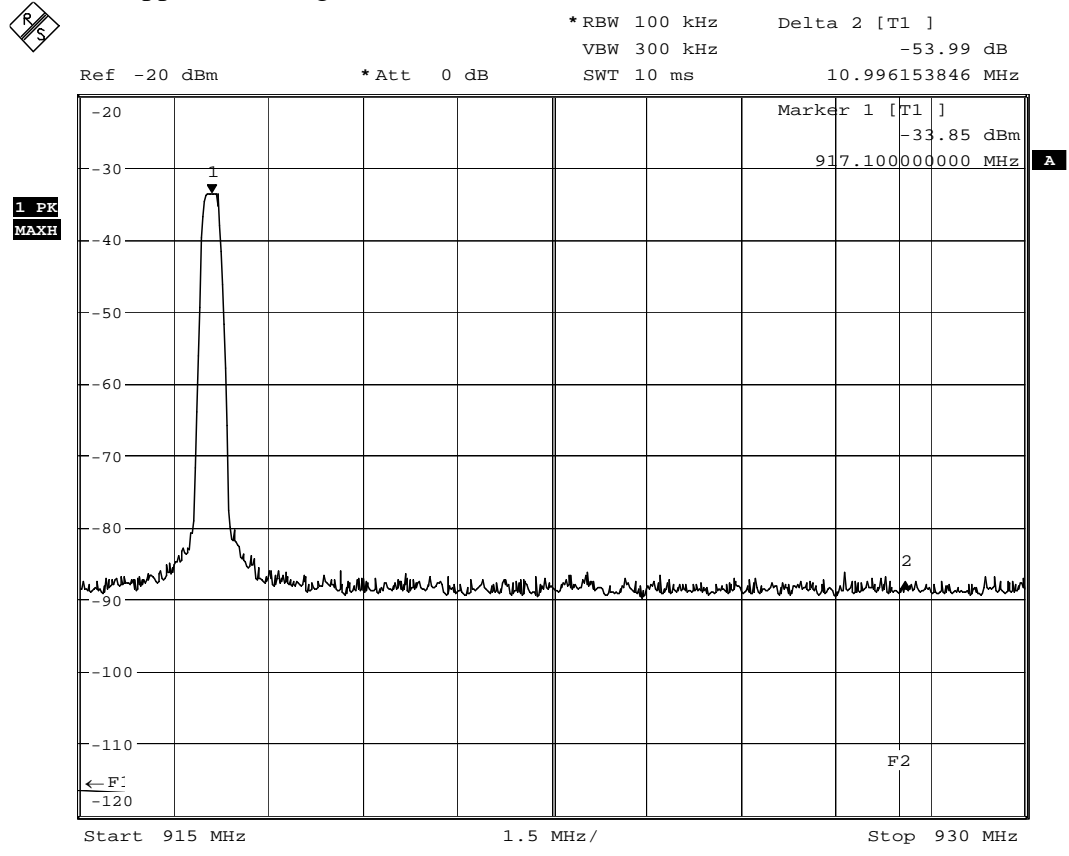
-50 dBc Lower Band-edge



Date: 10.AUG.2006 21:05:52

Spurious emissions (except Harmonics), continued

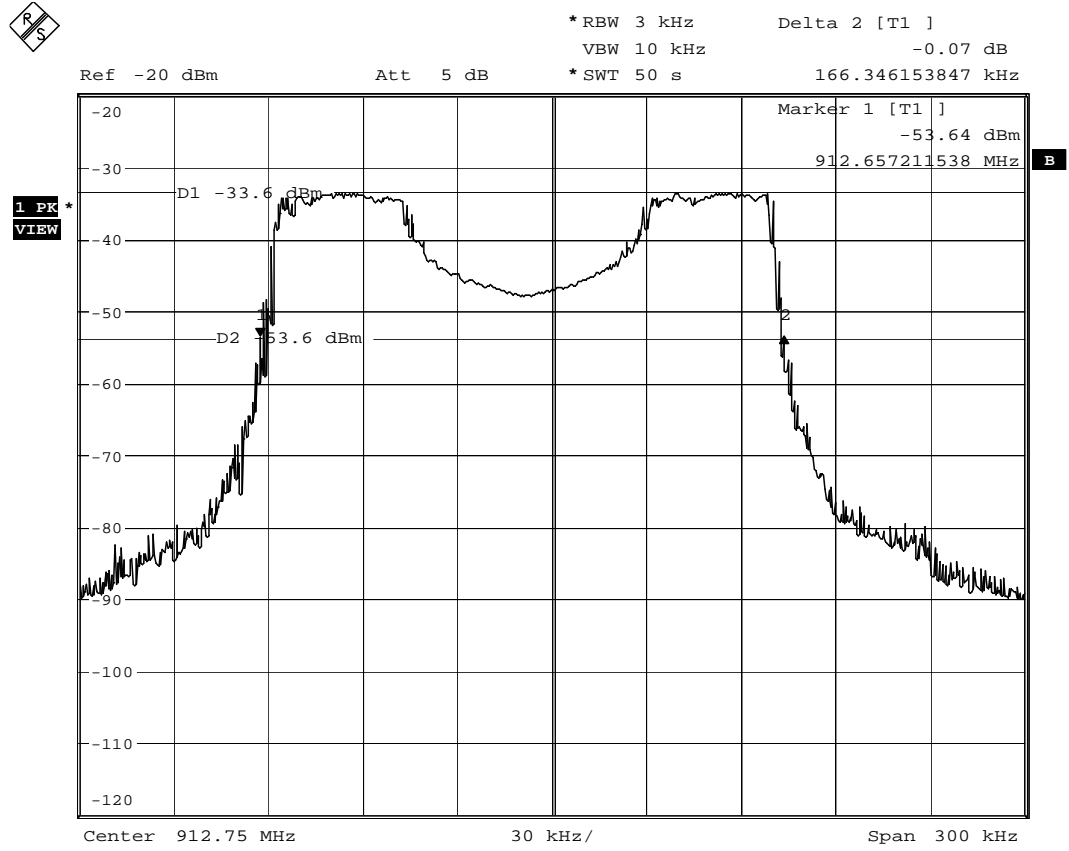
-50 dBc Upper Band-edge



Date: 10.AUG.2006 21:02:23

Spurious emissions (except Harmonics), continued

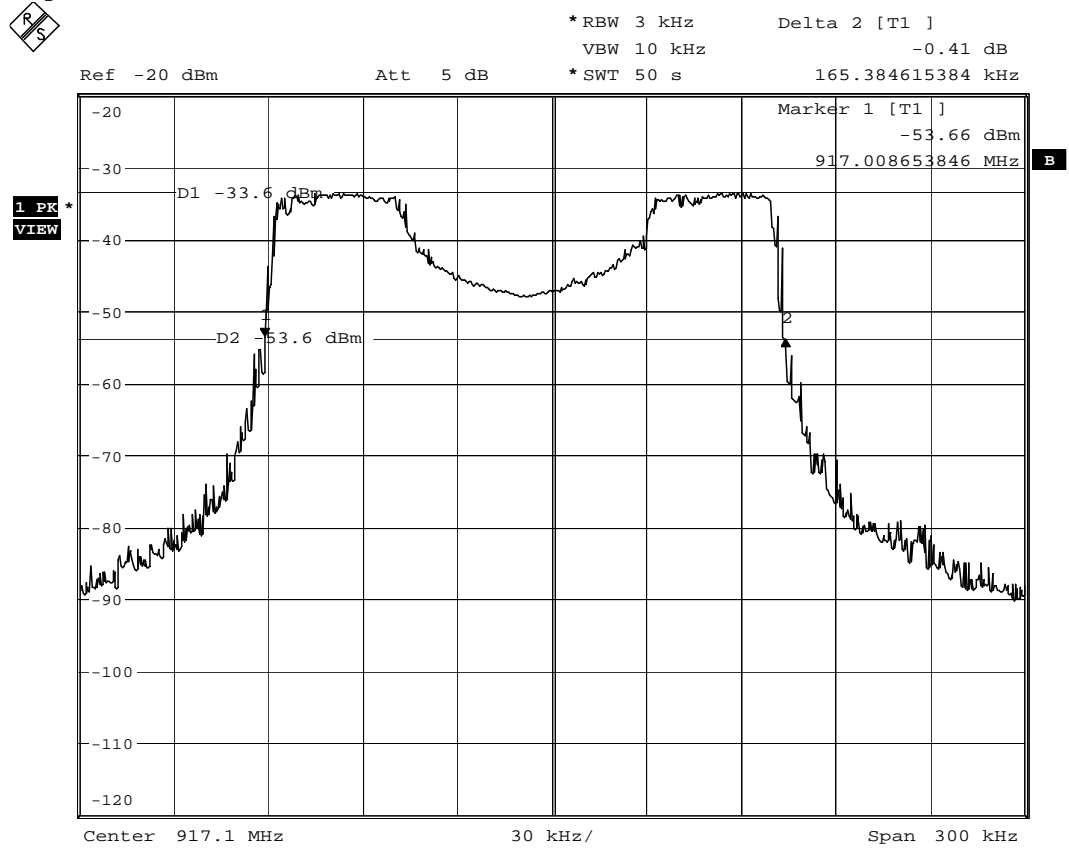
20 dB Occupied Bandwidth  
Bottom channel



Date: 10.AUG.2006 21:23:02

Spurious emissions (except Harmonics), continued

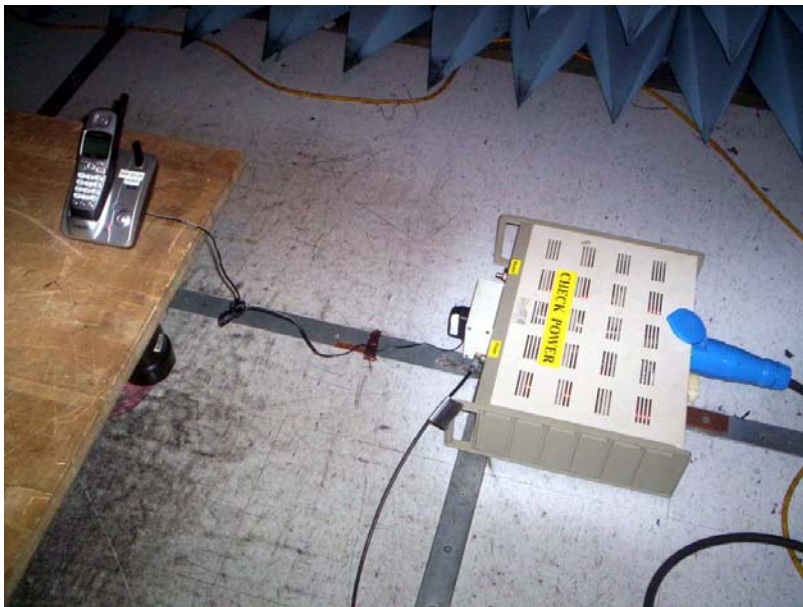
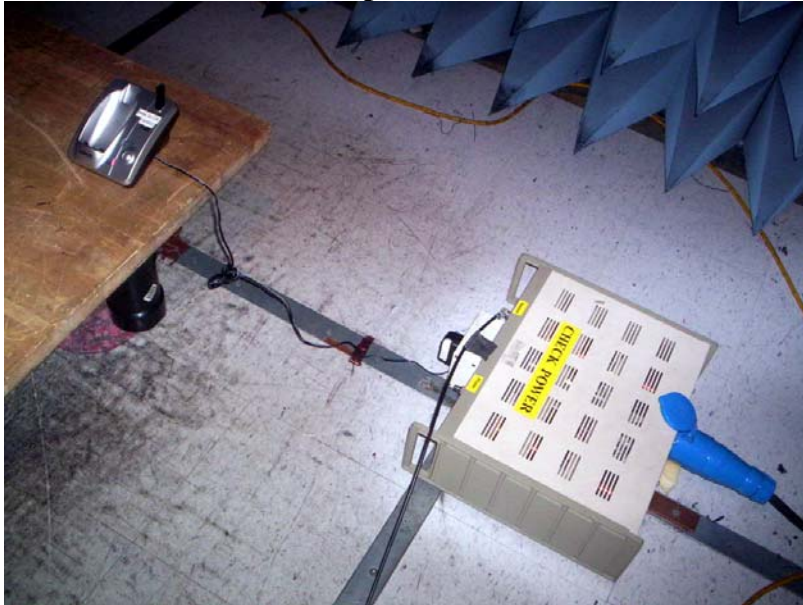
20 dB Occupied Bandwidth  
Top Channel



Date: 10.AUG.2006 21:30:19

## Appendix B : Setup Photographs

### Conducted Emissions Setup:

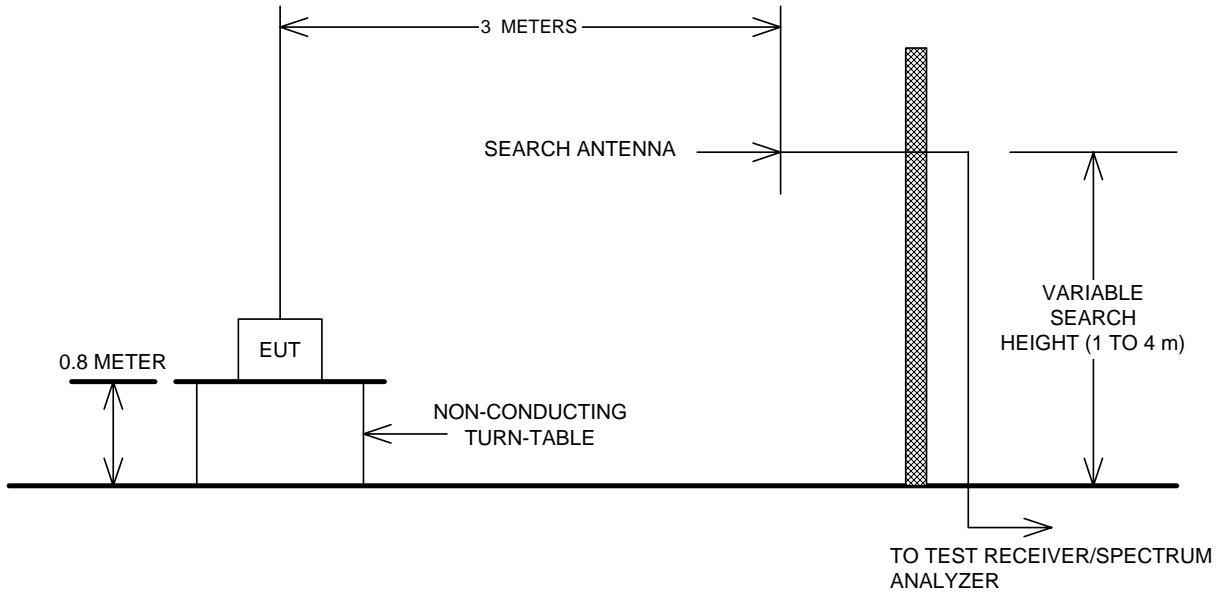


**Spurious Emissions Setup:**



### Appendix C : Block Diagram of Test Setups

#### Test Site For Radiated Emissions



#### Conducted Emissions

