



Test Report: 5W51685.1


Applicant: VTECH Telecommunications Canada Ltd.
200-7671 Alderbridge Way
Richmond, BC
V6X 1Z9

Apparatus: VTech I 6765 Base with Charging Base and
standalone charger

FCC ID: EW780-5656-00

In Accordance With: FCC Part 15 Subpart C, 15.247
Class II Permissive Change
FHSS System and Digitally Modulated Radiators
902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz

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

Authorized By: 
Sim Jagpal, Resource Manager

Date: 29 September 2005

Total Number of Pages: 23

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:	VTech I 6765 Base with Charging Base and standalone charger
Specification:	FCC Part 15 Subpart C, 15.247
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release

Author: Jason Nixon, Telecom 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:

VTech I 6765 Base with Charging Base and standalone charger

1.2 Samples Submitted for Assessment

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

Sample No.	Description	Serial No.
1	DIGITAL ANSWERING SYSTEM I6775PA#02	20050826
2	COMPONENT TELEPHONE POWER SUPPLY (M/N: SY-09060)	_____
3	5.8 GHZ DIGITAL SPREAD SPECTRUM PHONE BASE CHARGER	_____
4	COMPONENT TELEPHONE POWER SUPPLY M/N: U090020D12	_____
6	5.8 GHZ DIGITAL SPREAD SPECTRUM PHONE I6775PA#02A	20050826

The first samples were received on: September 12, 2005

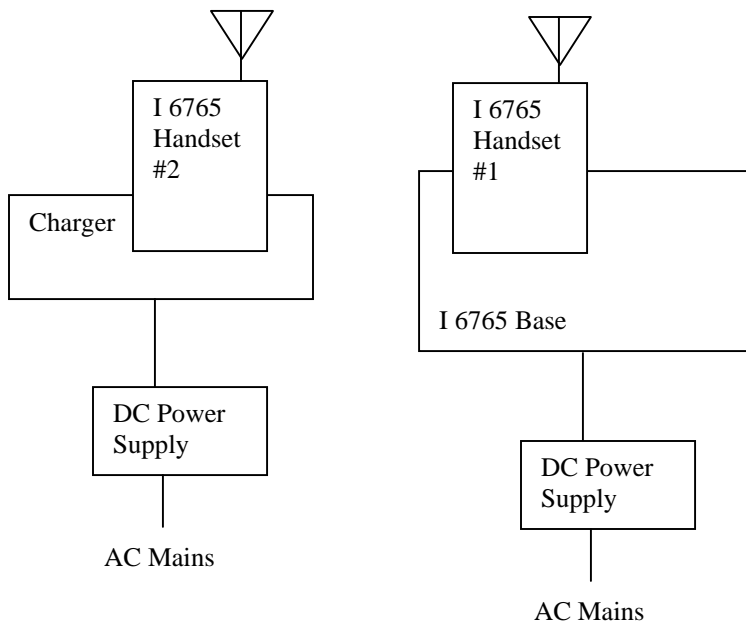
1.3 Theory of Operation

The system will consist of a maximum of 4 Portable Parts (PP is the handsets) and a single Fixed Part (FP is the base station). It will use Frequency Hopping Spread Spectrum (FHSS) in the 2400 to 2483.5 MHz and 5725MHz to 5850MHz ISM bands. Each of the handsets will have a radio transceiver. In order to reduce the cost, the base station will have only one radio transceiver. Therefore, the base and the 4 handsets will be multiplexed using a Time Division Multiple Access (TDMA) method. Time Division Duplexing (TDD) is employed for exchanging information between the base station and the various handsets.

1.4 Technical Specifications of the EUT

Manufacturer:	VTech (Dongguan) Electronics and Communications Ltd.
Operating Frequency:	5744.736 - 5825.952MHz
Peak Output Power:	27.2dBm
Emission Designator	627KF1D
Rated Power:	28.5dBm
Modulation:	GFSK
Antenna Data:	0dBi integral Antenna
Power Source:	120Vac 60Hz

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, 15.247

FHSS System and Digitally Modulated Radiators
902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz

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.
LISN	EMCO	4825/2	FA001545	Jan. 13/05	Jan. 13/06
Receiver	Rohde & Schwarz	ESHS 10	FA001918	Feb. 28/05	Feb. 28/06
Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 18/05	May 18/06
Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 18/05	May 18/06
Transient Limiter	Hewlett-Packard	1194 7A	FA000975	May 25/05	May 25/06
Spectrum Analyzer	Rohde & Schwarz	FSP	FA001920	March 22/05	March 22/06
Horn Antenna #1	EMCO	3115	FA000649	Dec. 22/04	Dec. 22/05
18.0 – 40.0GHz Horn Antenna	EMCO	3116	FA001847	April 25/05	April 25/06
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	July 14/05	July 14/06
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	July 14/05	July 14/06
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	July 14/05	July 14/06
5.0 – 18.0 GHz Amplifier	NARDA	DWT-186N23U40	FA001409	COU	COU
18.0 – 26.0 GHz Amplifier	NARDA	BBS-1826N612	FA001550	COU	COU
26 – 40.0 GHz Amplifier	NARDA	DBL-2640N610	FA001556	COU	COU

Section 3 : Observations

3.1 Modifications Performed During Assessment

No modifications were performed during assessment.

3.2 Record Of Technical Judgements

The following technical judgement was made:

3.2.1 Changes to the EUT

The following changes have been made to the apparatus for purpose of a Class II permissive change and it was judged that only radiated measurements need to be repeated:

For cost and better integration reasons the existing Microlinear transverter ML 5824 will be replace with a new Philips transverter IC UAA 3658. The Philips transverter IC is electrically equivalent to the existing Microlinear IC except for a few subtle differences.

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
15.247(a)(1)	Frequency hopping systems	N	
15.247(a)(1)(i)	Frequency hopping systems operating in the 902-928 MHz band	N	
15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725-5850 MHz band	N	
15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400-2483.5 MHz band	N	
15.247(a)(2)	Systems using digital modulation techniques	N	
15.247(b)(1)	Maximum peak output power of Frequency hopping systems operating in the 2400-2483.5 MHz band and 5725-5850 MHz band	Y	PASS
15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902-928 MHz band	N	
15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands	N	
15.247(b)(4)	Maximum peak output power	N	
15.247(c)(1)	Fixed point-to-point Operation with directional antenna gains greater than 6 dBi	N	
15.247(c)(2)	Transmitters operating in the 2400-2483.5 MHz band that emit multiple directional beams	N	
15.247(d)	Radiated Emissions Not in Restricted Bands	Y	PASS
15.247(e)	Power Spectral Density for Digitally Modulated Devices	N	
15.247(f)	Time of Occupancy for Hybrid Systems	N	

Notes:

Appendix A : Test Results

Clause 15.207(a) Powerline Conducted Emissions

Frequency of Conducted limit (dBmV)		
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:

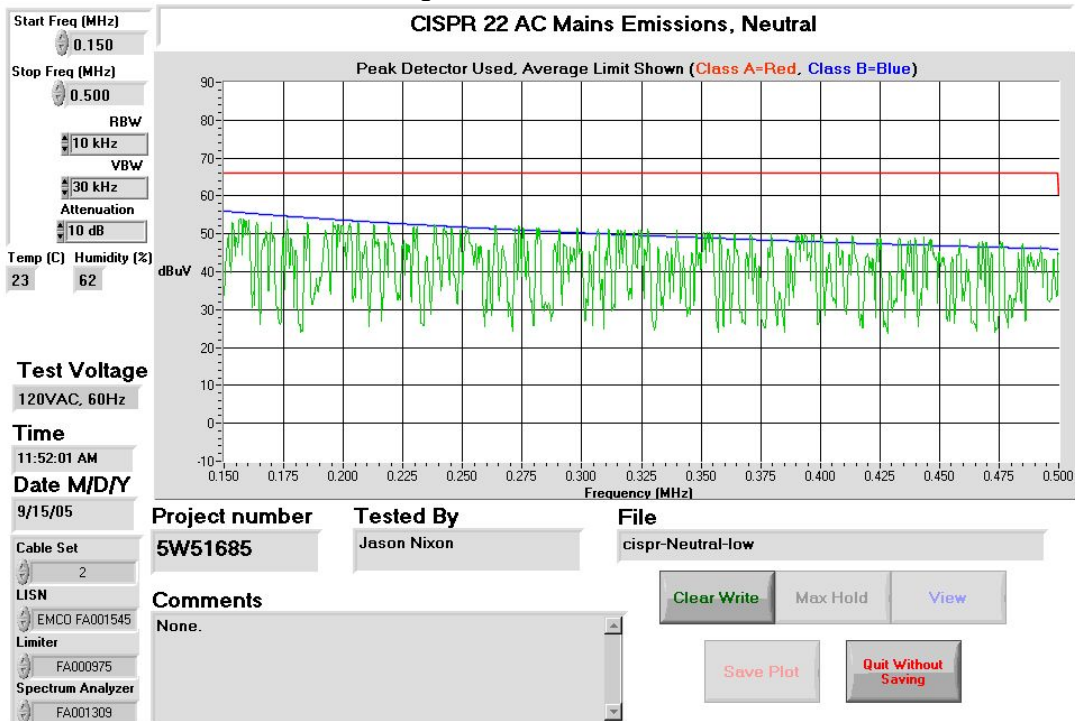
Sample Number:	1	Temperature:	23
Date:	September 15, 2005	Humidity:	62
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Shielded Room

Test Results: See Attached Plots and Table.

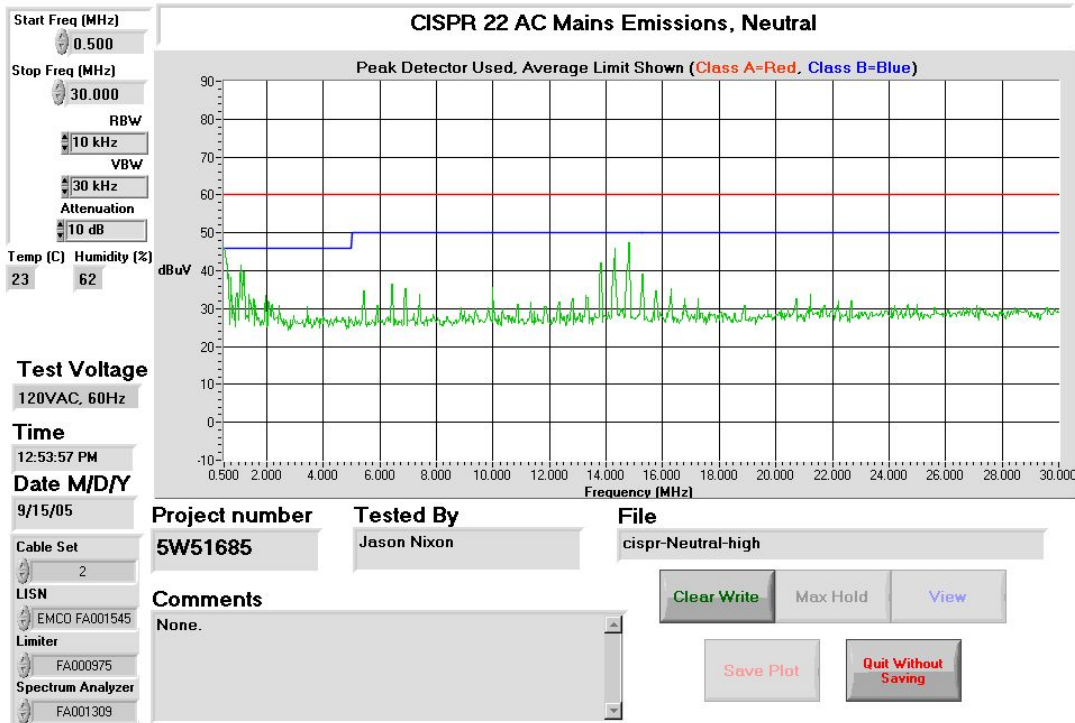
Additional Observations:

Plots were performed using a Peak detector. Any measurement above the limit was investigated using a Receiver.

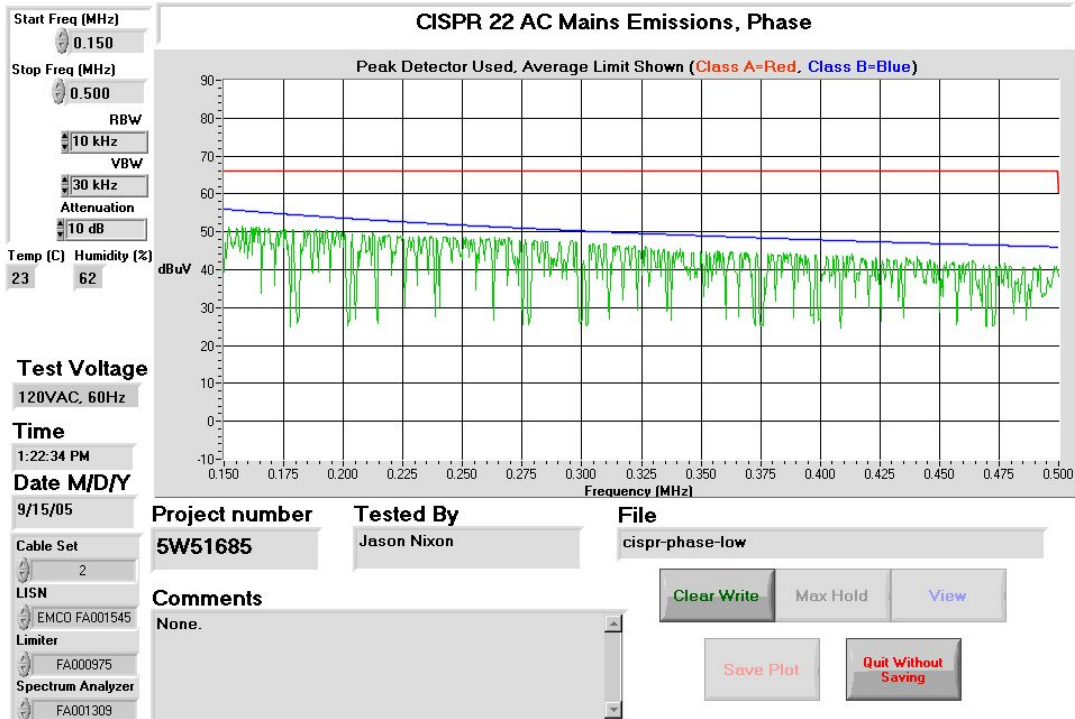
Base Station – Neutral Low Frequencies



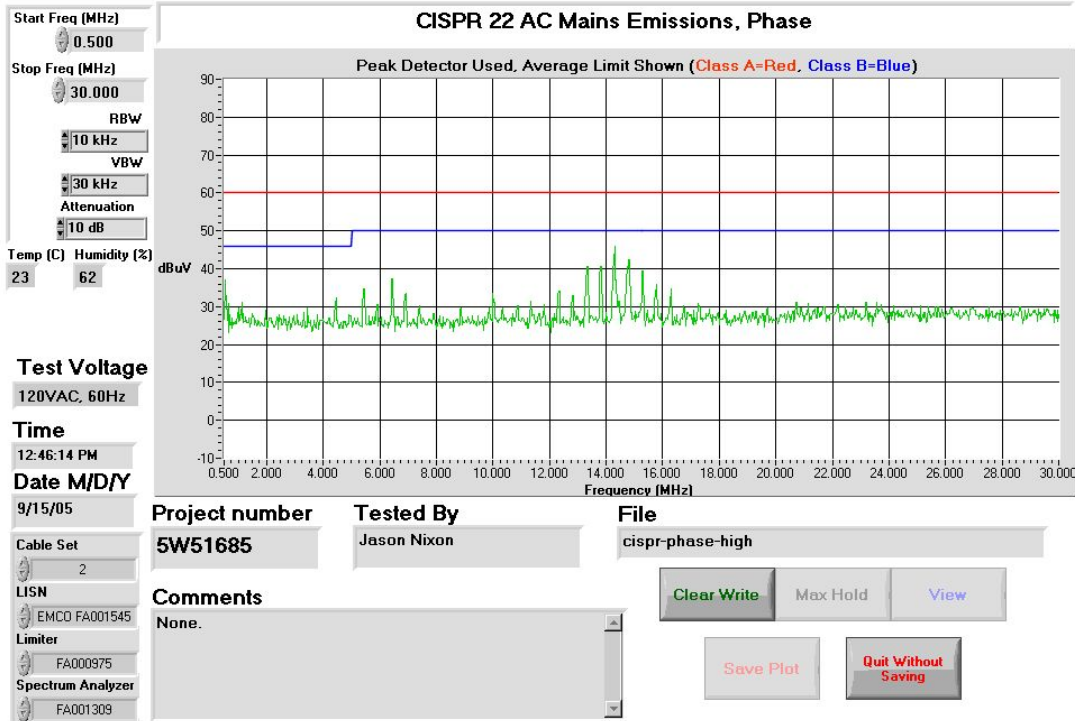
Base Station – Neutral High Frequencies



Base Station – Phase Low Frequencies



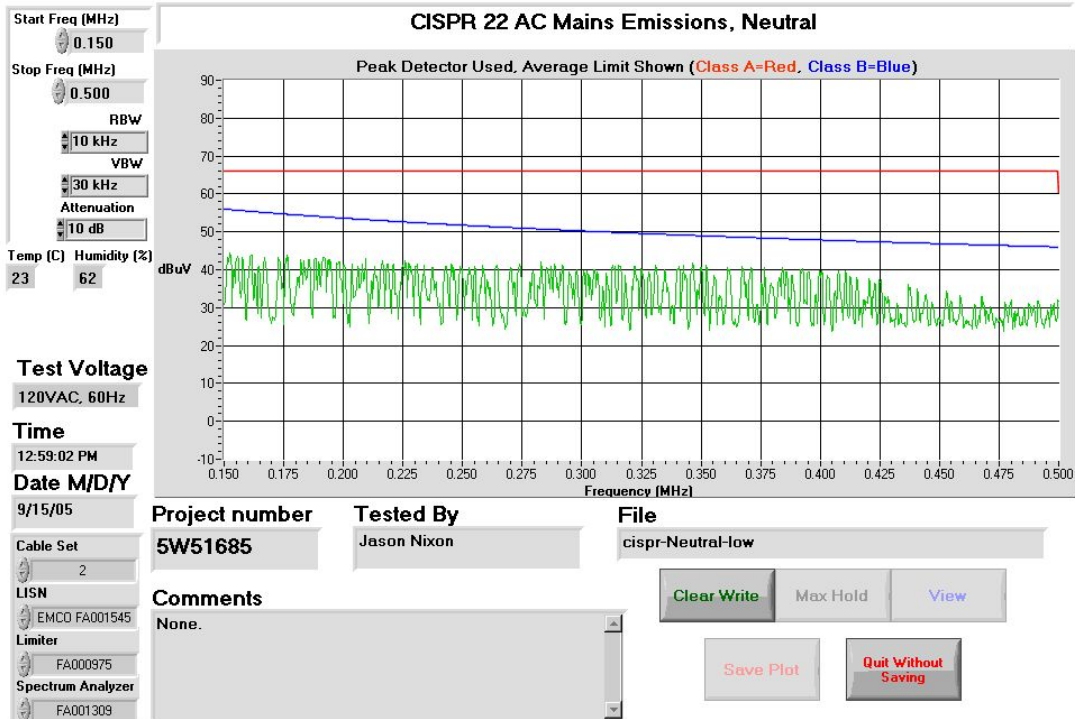
Base Station – Phase High Frequencies



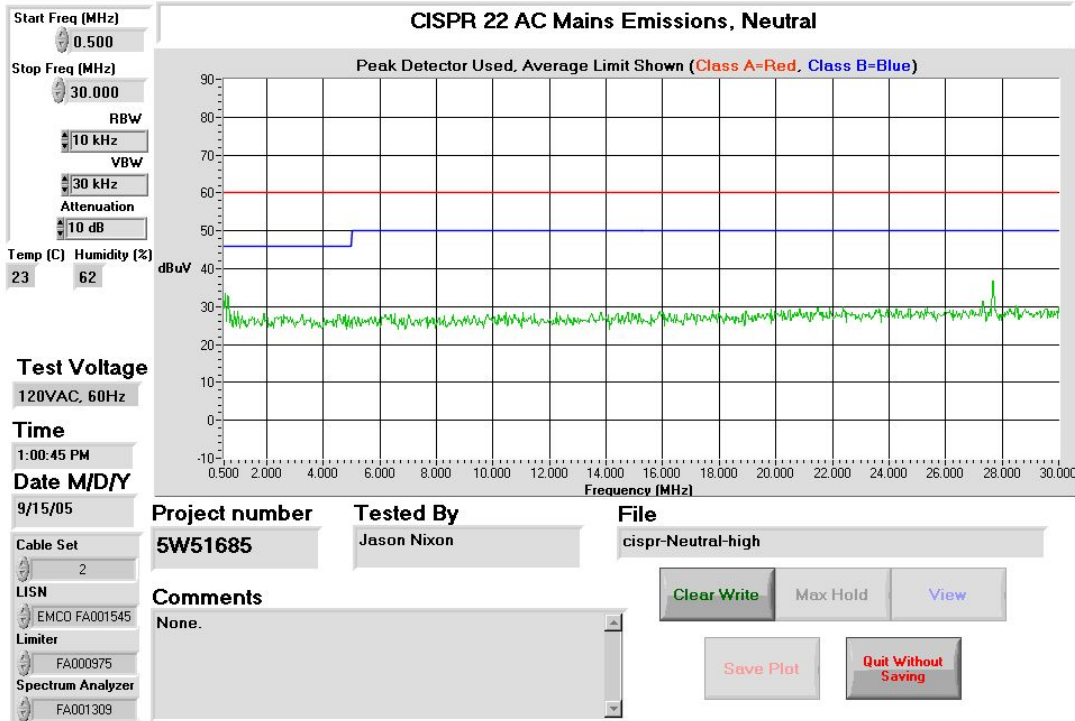
Base Conducted Results

Conductor	Frequency (MHz)	Detector	Emission Level (dBuV)	LISN Loss (dB)	Cable Loss (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	
1	Phase	0.1526	Quasi Peak	42.5	0.00	0.20	42.70	65.9	23.2
			Average	11.9	0.00	0.20	12.10	55.9	43.8
2	Phase	0.2335	Quasi Peak	40.3	0.00	0.20	40.50	62.3	21.8
			Average	9.6	0.00	0.20	9.80	52.3	42.5
3	Phase	0.2565	Quasi Peak	39.6	0.00	0.20	39.80	61.5	21.7
			Average	9.1	0.00	0.20	9.30	51.5	42.2
4	Phase	0.3416	Quasi Peak	36.3	0.00	0.20	36.50	59.2	22.7
			Average	7.2	0.00	0.20	7.40	49.2	41.8
5	Phase	0.4545	Quasi Peak	31.6	0.00	0.20	31.80	56.8	25.0
			Average	2.2	0.00	0.20	2.40	46.8	44.4
6	Phase	14.3760	Quasi Peak	21.4	0.20	0.25	21.85	60.0	38.2
			Average	7.7	0.20	0.25	8.15	50.0	41.9
7	Neutral	0.1526	Quasi Peak	42.8	0.00	0.20	43.00	65.9	22.9
			Average	10.2	0.00	0.20	10.40	55.9	45.5
8	Neutral	0.2335	Quasi Peak	41.1	0.00	0.20	41.30	62.3	21.0
			Average	11.4	0.00	0.20	11.60	52.3	40.7
9	Neutral	0.2565	Quasi Peak	40.7	0.00	0.20	40.90	61.5	20.6
			Average	10.1	0.00	0.20	10.30	51.5	41.2
10	Neutral	0.3416	Quasi Peak	39.6	0.00	0.20	39.80	59.2	19.4
			Average	10.5	0.00	0.20	10.70	49.2	38.5
11	Neutral	0.4545	Quasi Peak	37.2	0.00	0.20	37.40	56.8	19.4
			Average	6.9	0.00	0.20	7.10	46.8	39.7
12	Neutral	14.3576	Quasi Peak	34.5	0.20	0.28	34.98	60.0	25.0
			Average	13.3	0.20	0.28	13.78	50.0	36.2

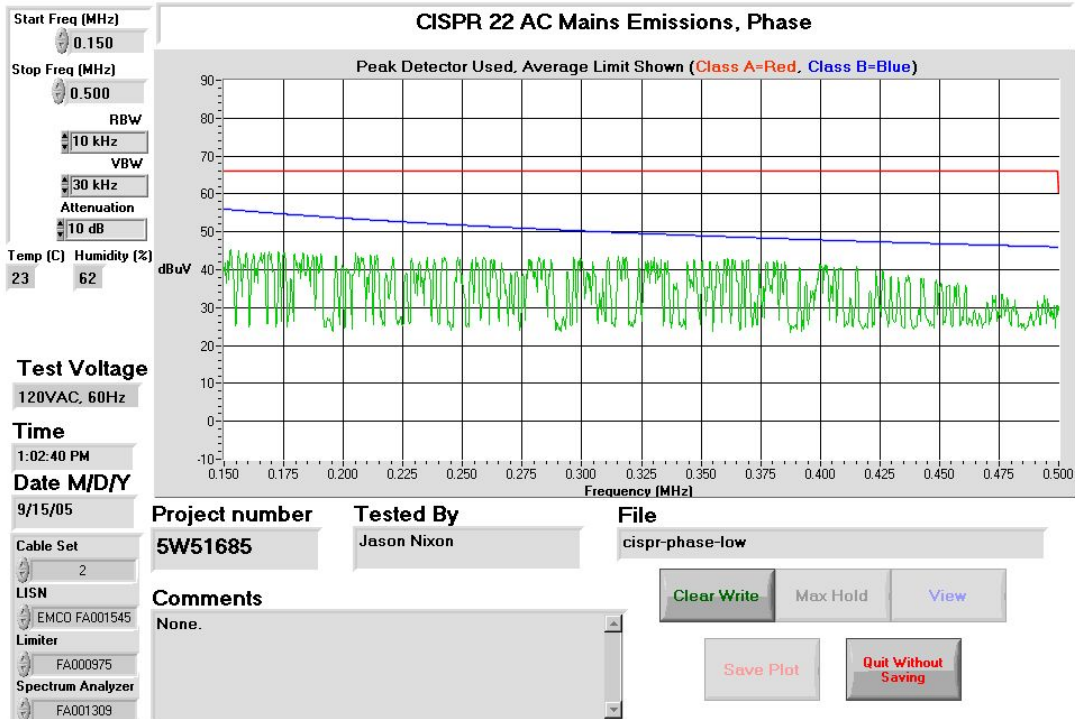
Charger – Neutral Low Frequencies



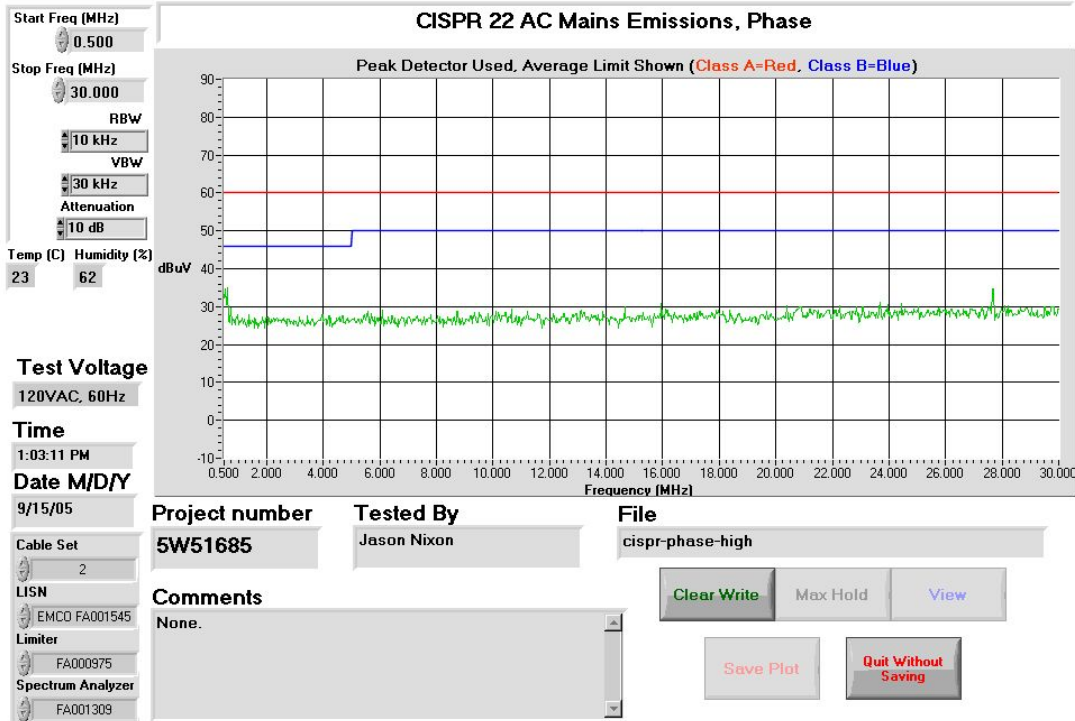
Charger – Neutral High Frequencies



Charger – Phase Low Frequencies



Charger – Phase High Frequencies



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	2400F (kHz)	300
0.490-1.705	24000F (kHz)	30
1.705-30.0	30	30
30-88	1001	3
88-216	1502	3
216-960	2003	3
Above 960	500	3

Test Conditions:

Sample Number:	1	Temperature:	23
Date:	September 13, 2005	Humidity:	58
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:

See Attached Table for Results

Additional Observations:

The Spectrum was searched from 30MHz to 40GHz

These results apply to emissions found in the Restricted bands defined in FCC Part 15 Subpart C, 15.205.

The EUT was measured on three orthogonal axis.

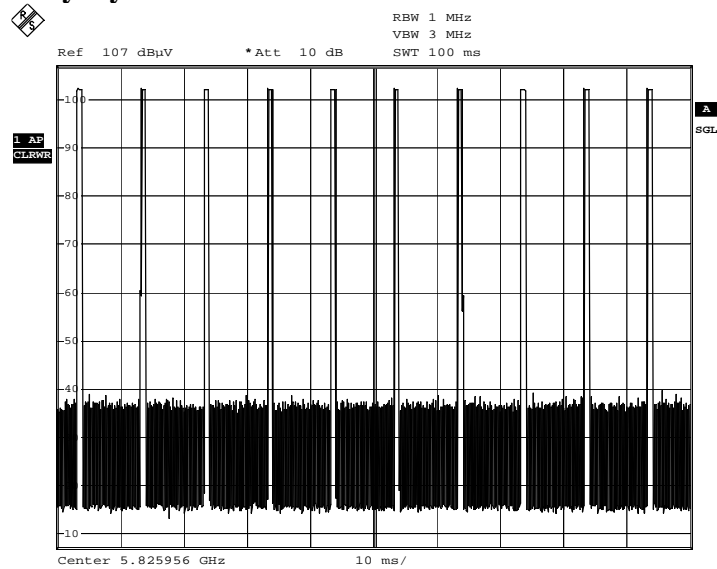
All measurements were performed using a Peak Detector with 1MHz RBW/VBW.

Emissions above 8GHz were measured at 1 meter and corrected to 3 meters using the formula $20\log(\text{Measuring distance}/\text{Limit distance})$.

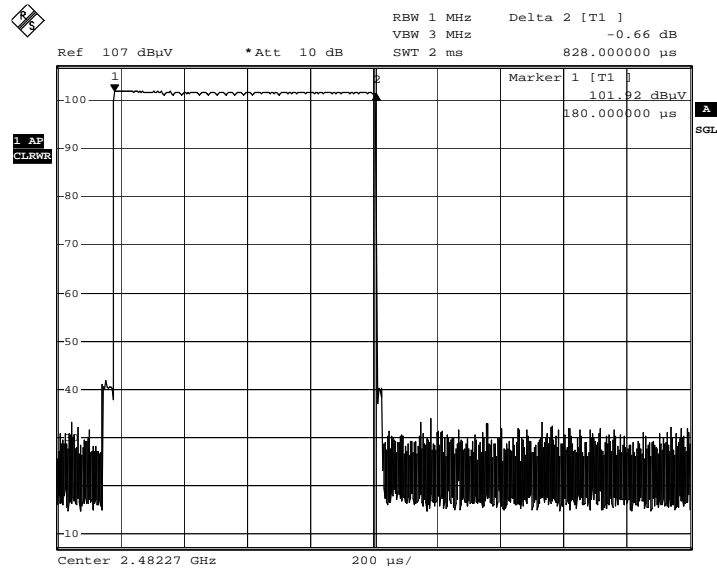
Frequency (MHz)	Antenna	Polarity	RCVD Signal (dBuV)	Ant. Factor (dB)	Amp. Gain / Cable Loss (dB)	Duty Cycle Corr. (dB)	Distance Correction (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	
1	11489.400	Horn1	V	60.8	39.9	24.6	21.6	9.5	66.6	74	7.4	Peak
									45.0	54	9.0	Average
2	11489.400	Horn1	H	64.2	40.1	24.6	21.6	9.5	70.2	74	3.8	Peak
									48.6	54	5.4	Average
3	22978.800	18-40GHz Horn	V	59.2	45.1	25.1	21.6	9.5	69.7	74	4.3	Peak
									48.1	54	5.9	Average
4	22978.800	18-40GHz Horn	H	55.9	45.0	25.1	21.6	9.5	66.3	74	7.7	Peak
									44.7	54	9.3	Average
5	11571.050	Horn1	V	58.1	39.8	24.6	21.6	9.5	63.9	74	10.1	Peak
									42.3	54	11.7	Average
6	11571.050	Horn1	H	57.7	40.1	24.6	21.6	9.5	63.6	74	10.4	Peak
									42.0	54	12.0	Average
7	11651.800	Horn1	V	55.8	39.8	24.6	21.6	9.5	61.6	74	12.4	Peak
									40.0	54	14.0	Average
8	11651.800	Horn1	H	56.9	40.0	24.6	21.6	9.5	62.9	74	11.1	Peak
									41.3	54	12.7	Average

Emission Level Peak = RCVD Signal + Ant. Factor – Amp Gain – Distance Correction
 Emission Level Average = RCVD Signal + Ant. Factor – Amp Gain – Distance Correction – Duty cycle Corr.

Duty Cycle Correction:



Base Dutycycle
Date: 15.SEP.2005 17:30:47



Handset On-time
Date: 15.SEP.2005 17:06:46

Duty cycle correction = $20\log((0.828 \times 10)/100) = -21.6\text{dB}$

Clause 15.247(b)(1) Maximum peak output power of Frequency hopping systems operating in the 2400-2483.5 MHz band and 5725-5850 MHz band

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

Test Conditions:

Sample Number:	1	Temperature:	31
Date:	September 13, 2005	Humidity:	62
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	OATS

Test Results:

Radiated Output Power:

Ch.	Freq.	ANT.	Pol V/H	Rx dBuV	Cable loss dB	Ant Factor dB/m	F.S. dBuV/m
low	5744.7000	Horn1	V	79.4	6.8	34.6	120.8
	5744.7000	Horn1	H	77.1	6.8	34.7	118.6
mid	5785.4000	Horn1	V	79.2	6.8	34.6	120.6
	5785.4000	Horn1	H	75.6	6.8	34.7	117.1
hi	5825.9000	Horn1	V	80.9	6.9	34.6	122.4
	5825.9000	Horn1	H	76.9	6.9	34.7	118.5

Measured value (V/m) = $10^{(FS/20)} = 1.31826V/m$ (122.4dBuV/m)

Antenna Gain (numeric) = $10^{(Ag/10)} = 1$ (0dBi)

Output Power (W) = $\frac{E^2 R^2}{30G} = 0.521W$

- E = Measured Value (V/m)
- R = Measurement distance
- G = Antenna Gain (numeric)

Additional Observations:

All Measurements were performed at 3m using a Peak Detector with a 1MHz RBW/VBW.

Clause 15.247(d) Radiated Emissions Not in Restricted Bands

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Conditions:

Sample Number:	1	Temperature:	23
Date:	September 13, 2005	Humidity:	58
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:

See Attached Table and Plots.

Freq. (MHz)	Ant	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp Gain/Cable Loss (dB)	Distance Corr. (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)
23141.600	18-40GHz Horn	V	56.0	45.1	25.1	9.5	66.5	97.8	31.3
23141.600	18-40GHz Horn	H	52.1	45.0	25.1	9.5	62.5	94.8	32.3
23303.600	18-40GHz Horn	V	55.0	45.1	25.1	9.5	65.5	100.5	35.0
23303.600	18-40GHz Horn	H	56.0	45.0	25.1	9.5	66.7	96.3	29.6

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
 Note 2: Positive Peak detector used

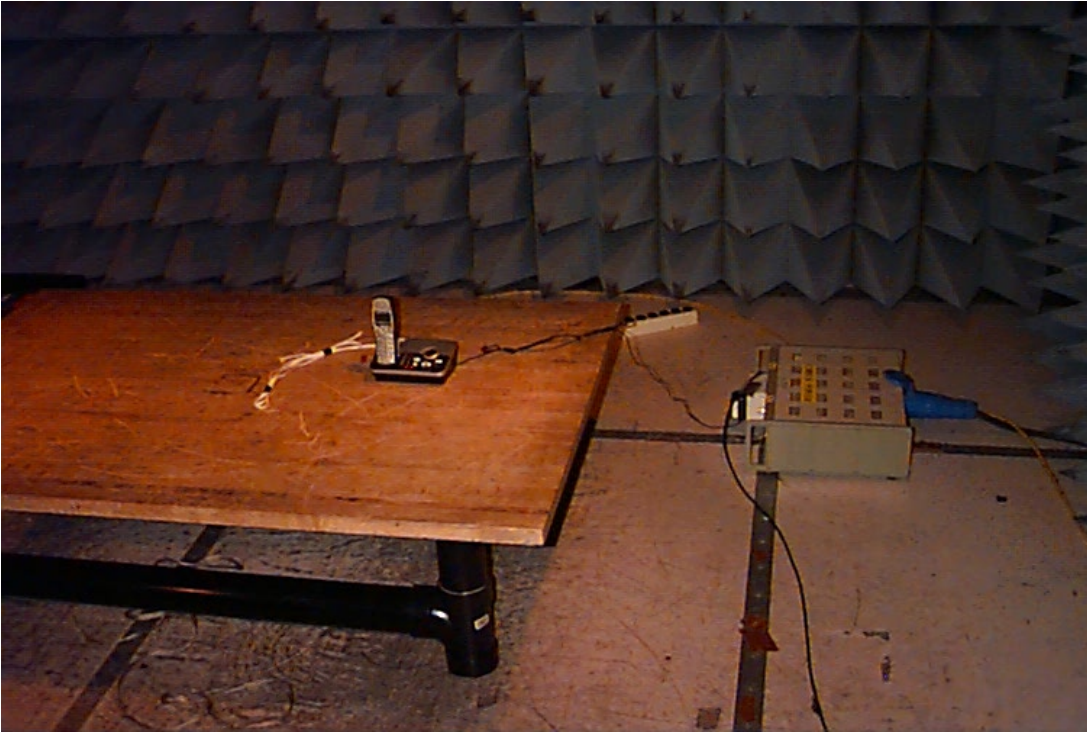
Additional Observations:

The measurements were performed at 1 meter and the emission levels corrected to 3 meters using the formula $20\log(\text{Measuring distance}/\text{Limit distance})$.

Appendix B : Setup Photographs

Conducted Emissions Setup:

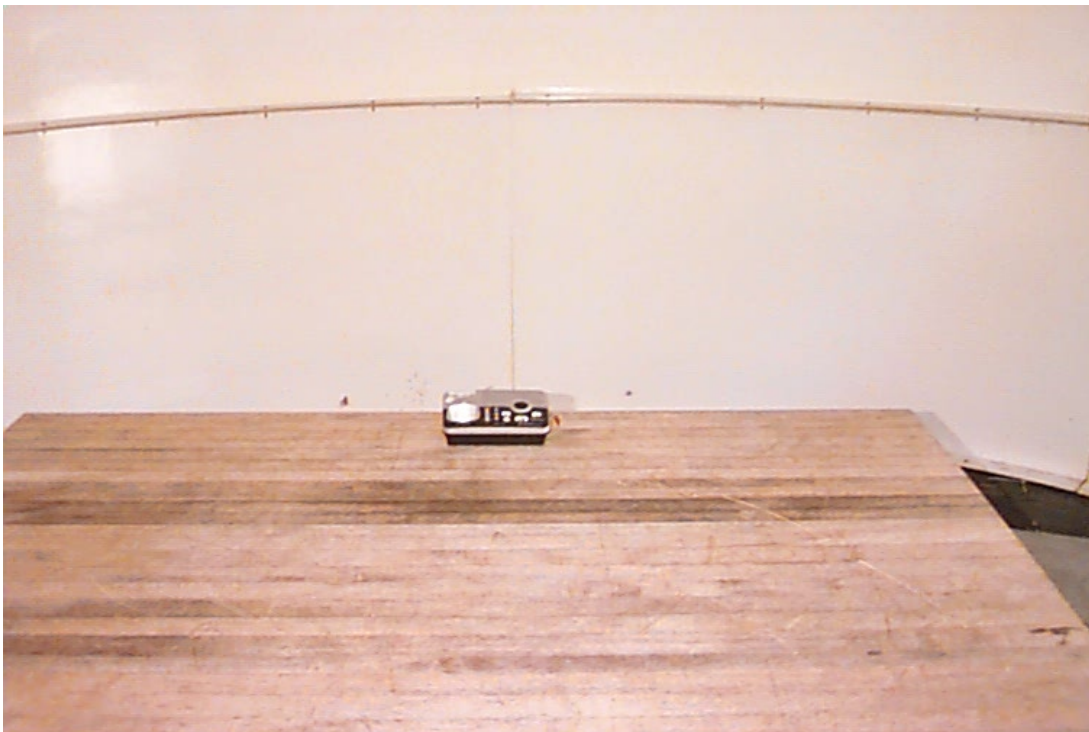
Base Station:



Charger:

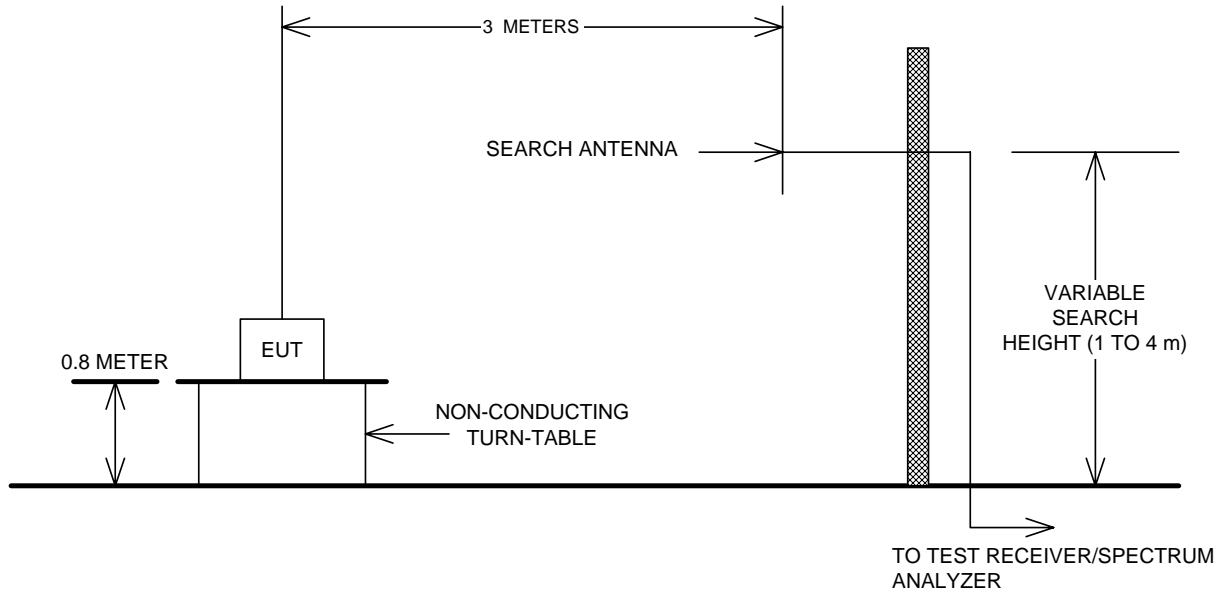


Spurious Emissions Setup:



Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions



Conducted Emissions

