



Test Report: 5W51685

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

Apparatus: VTech I 6765 Handset

FCC ID: EW780-5656-01

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:

A handwritten signature in blue ink, appearing to read 'Sim Jagpal', is positioned above the name of the authorized person.

Sim Jagpal, Resource Manager

Date: 29 September 2005

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:	VTech I 6765 Handset
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 Handset

1.2 Samples Submitted for Assessment

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

Sample No.	Description	Serial No.
6	5.8 GHZ DIGITAL SPREAD SPECTRUM PHONE I6775PA#02A	20050826

The first samples were received on: September 12, 2005

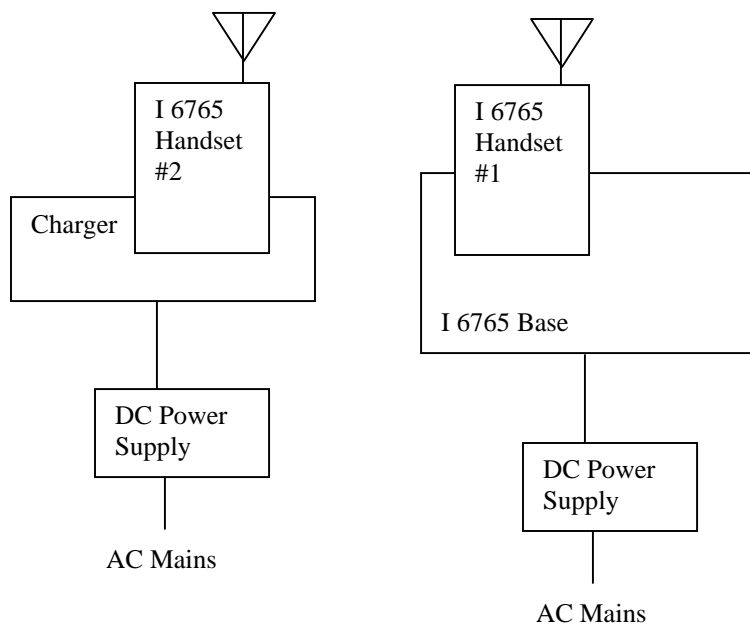
1.3 Theory of Operation

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:	2401.056 - 2482.272MHz
Peak Output Power:	19.5dBm
Emission Designator	620KF1D
Rated Power:	20.5dBm
Modulation:	GFSK
Antenna Data:	2dBi integral antenna
Power Source:	3.6VDC Ni-MH battery

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.
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	N	PASS
15.209(a)	Radiated Emissions within Restricted Bands	Y	
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	PASS
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	N	
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	Y	PASS
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	PASS
15.247(d)	Radiated Emissions Not in Restricted Bands	Y	
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 15.209(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	Field Strength	Measurement Distance
(MHz)	(microvoltsmeter)	(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	1001	3
88-216	1502	3
216-960	2003	3
Above 960	500	3

Test Conditions:

Sample Number:	6	Temperature:	31
Date:	September 13, 2005	Humidity:	52
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	OATS

Test Results:

See Attached Table for Results

Additional Observations:

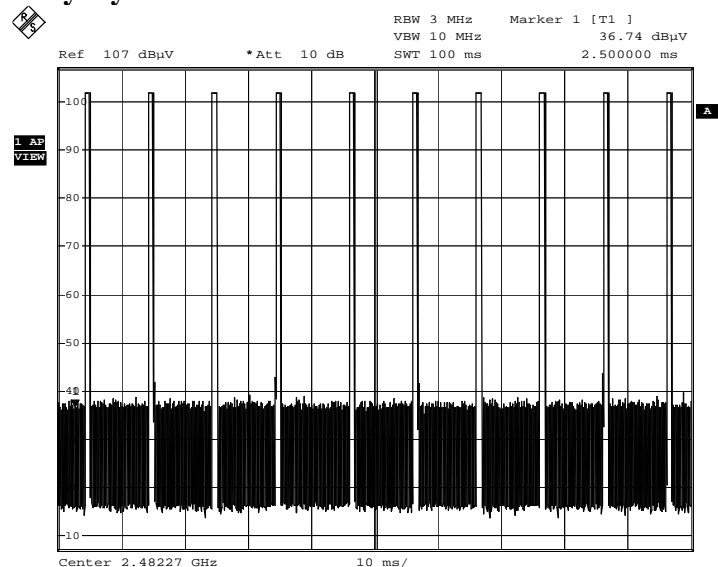
The Spectrum was searched from 30MHz to the 10th Harmonic.

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.

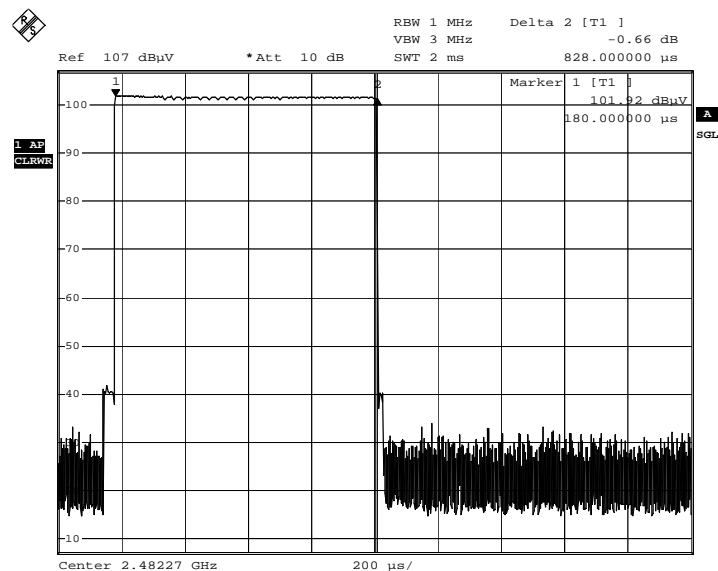
	Frequency (MHz)	Antenna	Polarity	RCVD Signal (dBuV)	Ant. Factor (dB)	Amp. Gain / Cable Loss (dB)	Duty Cycle Corr.	Distance Correction	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4801.8400	Horn1	V	76.7	33.4	45.9	21.6	0.0	64.3 42.7	74.0 54.0	9.7 11.3	Peak Average
2	4801.8400	Horn1	H	77.3	33.5	45.9	21.6	0.0	65.0 43.4	74.0 54.0	9.0 10.6	Peak Average
3	4883.2400	Horn1	V	73.4	33.4	44.6	21.6	0.0	62.2 40.6	74.0 54.0	11.8 13.4	Peak Average
4	4883.2400	Horn1	H	78.5	33.5	44.6	21.6	0.0	67.5 45.9	74.0 54.0	6.5 8.1	Peak Average
5	7324.8600	Horn1	V	66.7	36.5	43.7	21.6	0.0	59.5 37.9	74.0 54.0	14.5 16.1	Peak Average
6	7324.8600	Horn1	H	68.8	36.7	43.7	21.6	0.0	61.9 40.3	74.0 54.0	12.1 13.7	Peak Average
7	4964.5400	Horn1	V	72.6	33.4	43.9	21.6	0.0	62.2 40.6	74.0 54.0	11.8 13.4	Peak Average
8	4964.5400	Horn1	H	79.0	33.5	43.9	21.6	0.0	68.6 47.0	74.0 54.0	5.4 7.0	Peak Average
9	7446.8100	Horn1	V	66.2	36.5	44.3	21.6	0.0	58.5 36.9	74.0 54.0	15.5 17.1	Peak Average
10	7446.8100	Horn1	H	67.4	36.7	44.3	21.6	0.0	59.9 38.3	74.0 54.0	14.1 15.7	Peak 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:



Handset duty cycle

Date: 15.SEP.2005 17:04:54

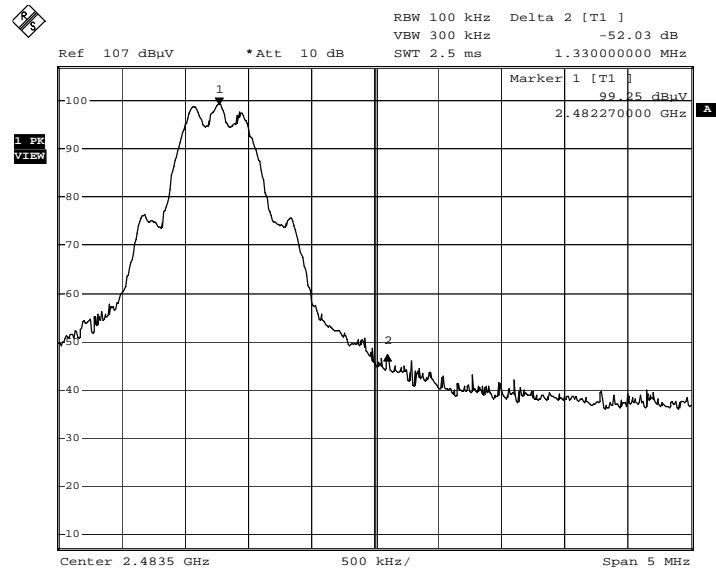


Handset On-time

Date: 15.SEP.2005 17:06:46

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

Delta Marker Measurement for 2.4835MHz Band Edge



Handset Upper Bandedge Delta Marker

Date: 15.SEP.2005 17:02:56

Measured Field Strength for High Channel in 1MHz RBW = 114.8dBuV/m

Delta Marker = 52.03dB

Therefore, Peak Field Strength = 114.8dBuV/m – 52.03dB = 62.77dBuV/m

Limit = 74dBuV/m

Average Field Strength = 62.77dBuV/m – 21.6dB(Duty Cycle) = 41.17dBuV/m

Limit = 54dBuV/m

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:	6	Temperature:	31
Date:	September 13, 2005	Humidity:	52
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	OATS

Test Results:**Radiated Output Power:**

Ch.	Freq.	Pol V/H	ANT.	Rx dBuV	Cable loss dB	Ant Factor dB/m	F.S. dBuV/m
low	2400.9200	V	Horn1	81.7	5.2	28.8	115.6
	2400.9200	H	Horn1	82.6	5.2	28.8	116.5
mid	2441.7200	V	Horn1	82.2	5.8	28.8	116.7
	2441.7200	H	Horn1	82.0	5.8	28.8	116.6
hi	2482.2700	V	Horn1	79.2	6.4	28.8	114.3
	2482.2700	H	Horn1	79.6	6.4	28.8	114.8

$$\text{Measured value (V/m)} = 10^{(FS/20)} = 0.68391 \text{ V/m (116.7 dBuV/m)}$$

$$\text{Antenna Gain (numeric)} = 10^{(Ag/10)} = 1.585 \text{ (2dBi)}$$

$$\text{Output Power (W)} = \frac{E^2 R^2}{30G} = 0.0885 \text{ W}$$

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 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:	6	Temperature:	31
Date:	September 13, 2005	Humidity:	52
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	OATS

Test Results:

See Attached Table and Plots.

Freq. (MHz)	Ant	Pol. V/H	RCVD Signal (dBμV)	Ant. Factor/Cable Loss (dB)	Amp. Gain (dB)	Duty Cycle Corr. (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)
7202.7600	Horn1	V	66.8	47.5	53.7	21.6	60.5	95.6	35.1
7202.7600	Horn1	H	63.7	47.7	53.7	21.6	57.7	96.5	38.8
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole									
Note 2: Positive Peak detector used									

Additional Observations:

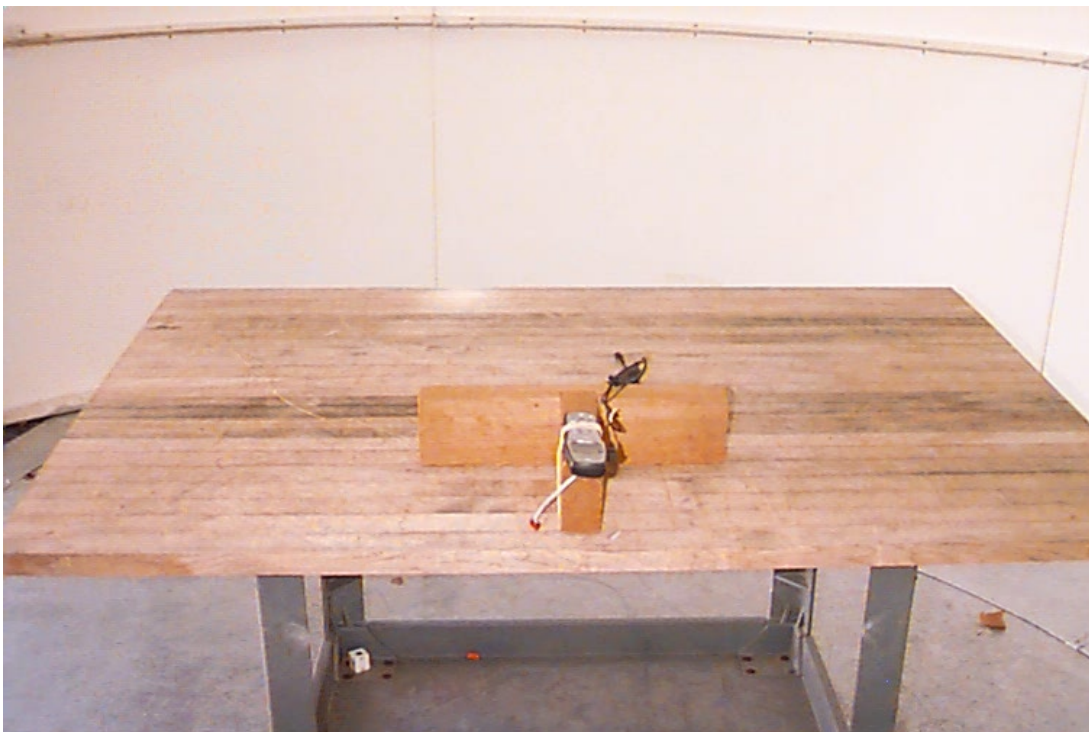
All measurements were performed at 3 meters using a Peak Detector with a 100kHz RBW/VBW.

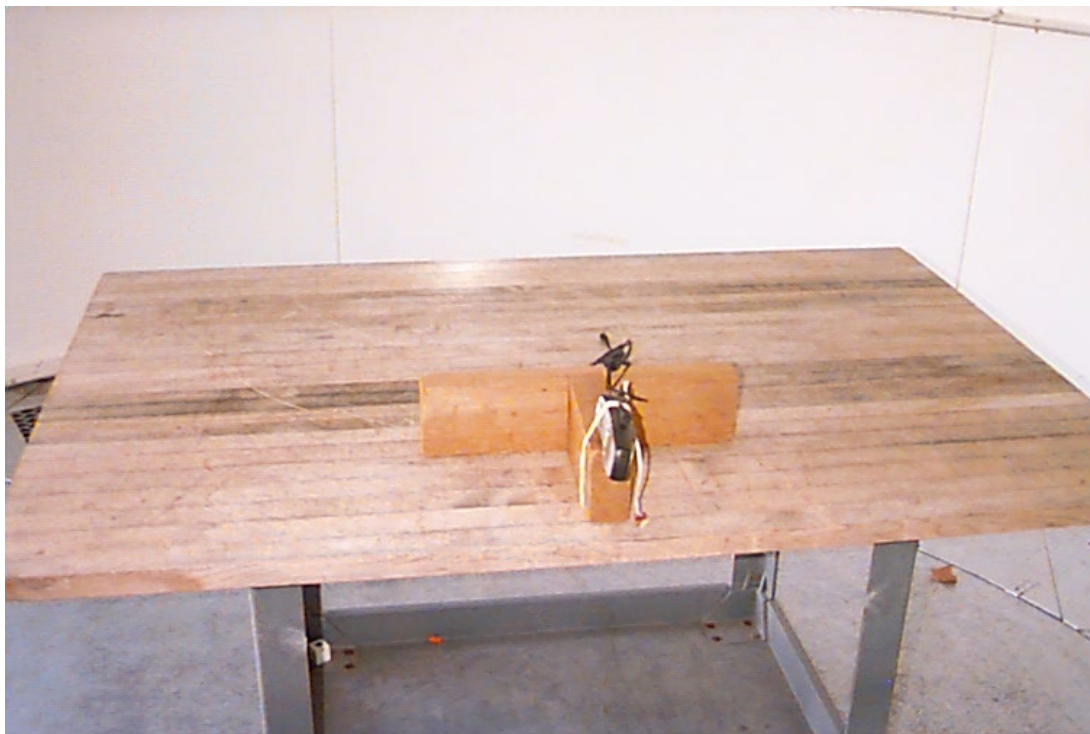
The EUT was measured on three orthogonal axis.

The spectrum was searched from 30MHz to 26GHz.

Appendix B : Setup Photographs

Spurious Emissions Setup:





Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions

