



# Nemko

**Test Report:** 5W54150

**Applicant:** BelAir Networks Inc.,  
603 March Road,  
Ottawa, ON  
K2K 2M5

**Apparatus:** BRM 3

**FCC ID:** RAR20001003

**In Accordance With:** FCC Part 15 Subpart C, 15.247  
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, General Manager

**Date:** January 16, 2006

**Total Number of Pages:** 37

## 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>     | BRM 3                      |
| <b>Specification:</b>          | FCC Part 15.247, Subpart C |
| <b>Compliance Status:</b>      | Complies                   |
| <b>Exclusions:</b>             | None                       |
| <b>Non-compliances:</b>        | None                       |
| <b>Report Release History:</b> | Original Release           |

Author: Xu Jin, 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.

Nemko Canada Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

## 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 Technical Specifications 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         |
| <b>Section 4 : Results Summary .....</b>              | <b>8</b>  |
| 4.1 FCC Part 15 Subpart C, 15.247 : Test Results..... | 9         |
| <b>Appendix A : Test Results.....</b>                 | <b>10</b> |
| Section 1. Power Line Conducted Emissions .....       | 10        |
| Section 2. 6dB Bandwidth .....                        | 14        |
| Section 3. Output Power .....                         | 18        |
| Section 4. Spurious Emissions.....                    | 23        |
| Section 5. Peak Power Spectrum Density .....          | 28        |
| Section 6. Supply Voltage Variation.....              | 32        |
| <b>Appendix B : Setup Photographs .....</b>           | <b>33</b> |
| Radiated Emission Setup Photos_Front.....             | 33        |
| <b>Appendix C : Block Diagram of Test Setups.....</b> | <b>36</b> |

## **Section 1 : Equipment Under Test**

### **1.1 Product Identification**

The Equipment Under Test was identified as follows:  
BRM 3

### **1.2 Samples Submitted for Assessment**

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

| <b>Sample No.</b> | <b>Description</b>                   | <b>Serial No.</b> |
|-------------------|--------------------------------------|-------------------|
| 1                 | BRM3                                 | K001362009        |
| 2                 | Digital board LMP                    | K001245162        |
| 3                 | H&S 23dBi Antenna                    | 00445             |
| 4                 | 15dBi Belair Patch Antenna           | 203-B             |
| 5                 | MaxRad omnidirectional Antenna 4dBi  | MMO58004NF        |
| 6                 | MaxRad omnidirectional Antenna 10dBi | MMO58010NF        |

The first samples were received on: Oct.17, 2005

### 1.3 Technical Specifications of the EUT

|                            |                                                                                                                |
|----------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>Manufacturer:</b>       | BelAir Networks Inc.                                                                                           |
| <b>Frequency Band</b>      | 5725MHz-5850MHz                                                                                                |
| <b>Operation Frequency</b> | 5740MHz-5835MHz                                                                                                |
| <b>Rated Output Power:</b> | 20dBm*                                                                                                         |
| <b>Emission Designator</b> | 16M5G1W                                                                                                        |
| <b>Modulation:</b>         | 802.11 a                                                                                                       |
| <b>Antenna Data:</b>       | (1).Maxrad 10dBi Antenna<br>(2).Maxrad 4dBi Antenna<br>(2) 15dBi BelAir Patch Antenna<br>(3) H&S 23dBi Antenna |
| <b>Antenna Connector:</b>  | MCX                                                                                                            |

\* Manufacture's rated power is average power measured using a wide band power meter with a thermocouple detector.

## 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 |
| Spectrum Analyzer           | Rohde & Schwarz | FSU           | FA001877         | May 17/05   | May 17/06   |
| 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   |
| Biconical (1) Antenna       | EMCO            | 3109          | FA000805         | April 22/05 | April 22/06 |
| Log Periodic Antenna #1     | EMCO            | LPA-25        | FA000477         | Aug. 29/05  | Aug. 29/06  |
| 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 - 18GHz 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         |
| Signal Generator            | Rhode & Schwarz | SMR 40        | FA001879         | July 13/05  | July 13/06  |
| Power Meter                 | HP              | 4418B         | FA001678         | Mar 8/05    | Mar 8/06    |
| Power Probe                 | HP              | 8487A         | FA001741         | May 26/05   | May 26/06   |
| LISN                        | EMCO            | 4825/2        | FA001545         | Jan 13/05   | Jan 13/06   |
| Transient Limiter           | Hewlett-Packard | 1194 7A       | FA000975         | May 25/05   | May 25/06   |

\* COU (Calibrate on Use)

\*\* NCR (No Calibration Required)

## **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.

## **Section 4 : Results Summary**

This section contains the following:

FCC Part 15.247, Subpart C: Test Result

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, 15.247 : Test Results**

| Section | Clause       | Test Description               | Required | Result |
|---------|--------------|--------------------------------|----------|--------|
| 1       | 15.207(a)    | Power-line Conducted Emissions | Y        | PASS   |
| 2       | 15.247(a)(2) | 6dB Bandwidth                  | Y        | PASS   |
| 3       | 15.247(b)(3) | Output Power                   | Y        | PASS   |
| 4       | 15.247(c)    | Spurious Emissions             | Y        | PASS   |
| 5       | 15.247(d)    | Peak Power Spectral Density    | Y        | PASS   |
| 6       | 15.31(e)     | Supply Voltage Variation       | Y        | PASS   |

## Appendix A : Test Results

### Section 1. Power Line Conducted Emissions

#### Criteria: Clause 15.207(a)

|                                                  |            |           |
|--------------------------------------------------|------------|-----------|
| 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:

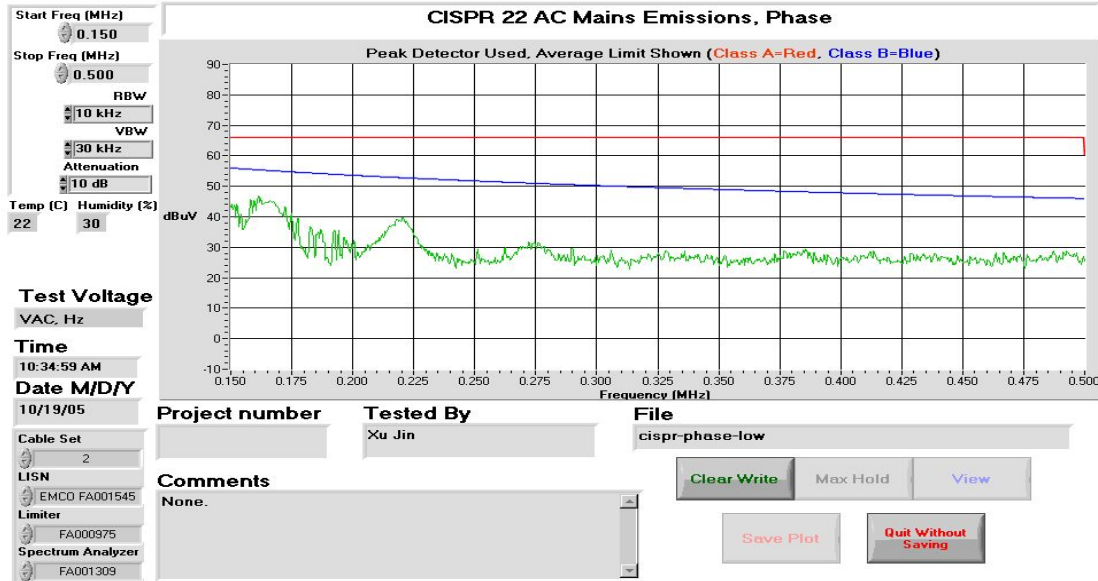
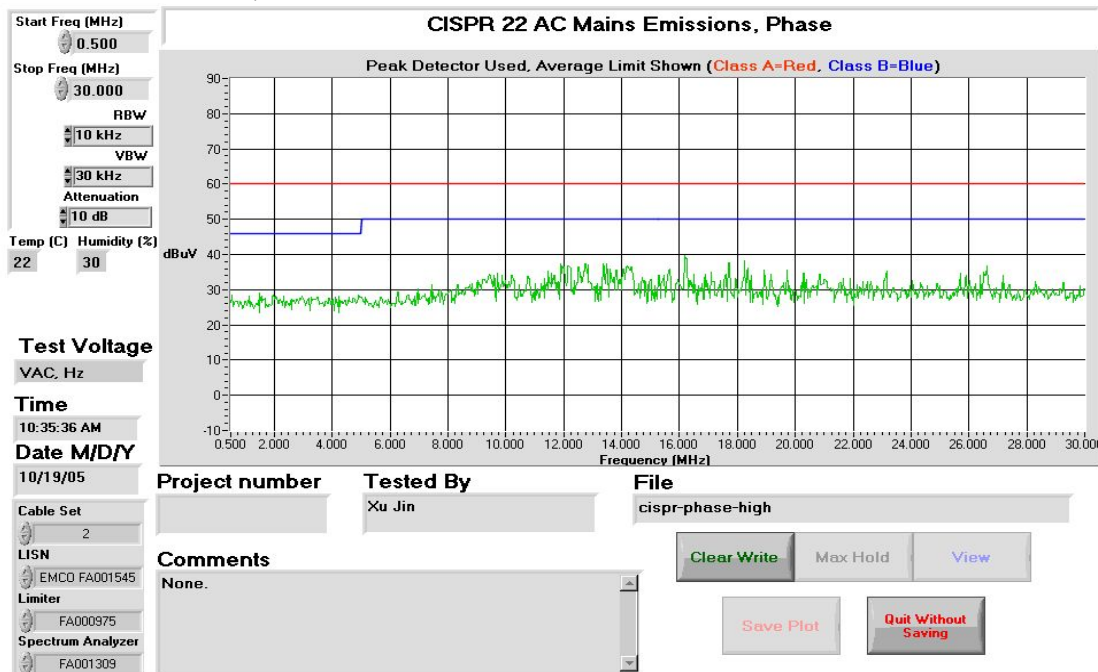
|                     |              |              |        |
|---------------------|--------------|--------------|--------|
| Sample Number:      | 1,2          | Temperature: | 22 °C  |
| Date:               | Oct.19, 2005 | Humidity:    | 50 %   |
| Modification State: | 0            | Tester:      | Xu Jin |
|                     |              | Laboratory:  | Ottawa |

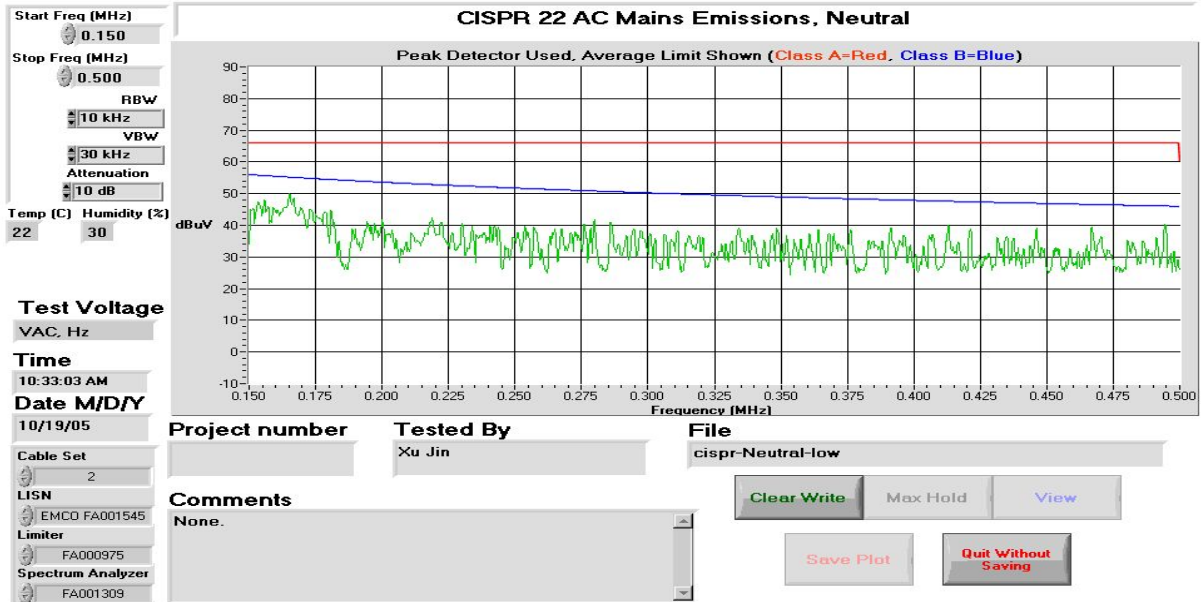
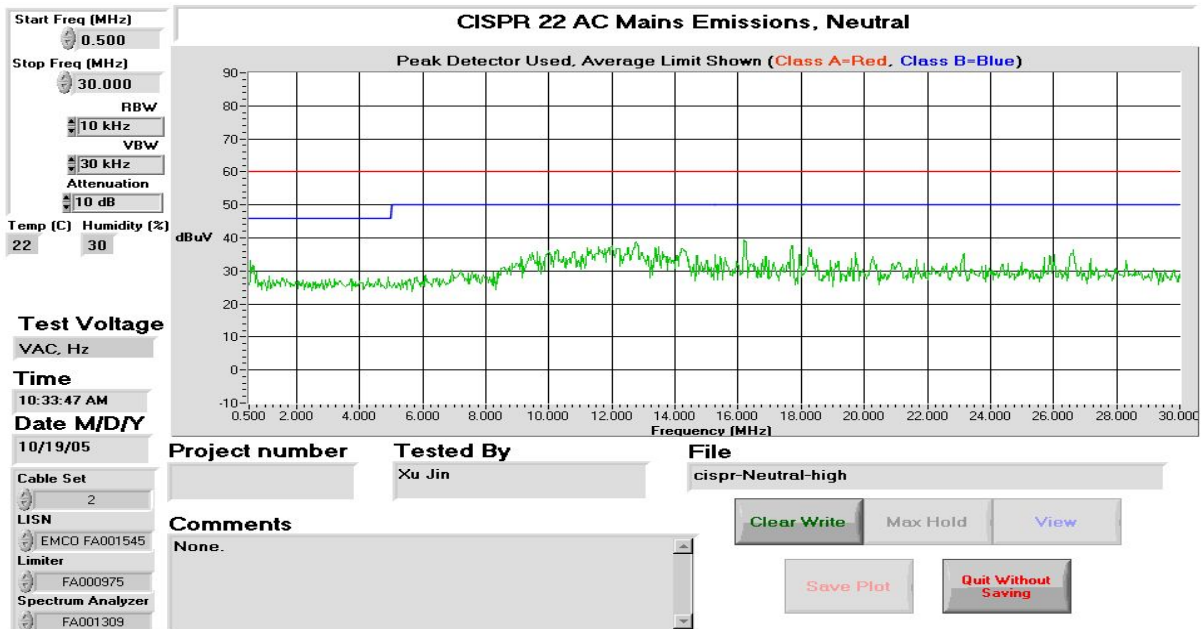
**Test Results:**           Complies

**Test Data:**            See Attached Plots and Tables.

**Conducted Disturbance at Mains, Setup Photos**



**Conducted Disturbance at Mains, Plots****Phase, 0.150 – 0.500 MHz****Phase, 0.500 – 30 MHz**

**Conducted Disturbance at Mains Plots, continued****Neutral, 0.150 – 0.500 MHz****Neutral, 0.500 – 30 MHz**

**Section 2. 6dB Bandwidth****Criteria: Clause 15.247(a)**

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

**Test Conditions:**

|                            |              |                     |        |
|----------------------------|--------------|---------------------|--------|
| <b>Sample Number:</b>      | 1,2          | <b>Temperature:</b> | 22 °C  |
| <b>Date:</b>               | Oct.17, 2005 | <b>Humidity:</b>    | 50 %   |
| <b>Modification State:</b> | 0            | <b>Tester:</b>      | Xu Jin |
|                            |              | <b>Laboratory:</b>  | Ottawa |

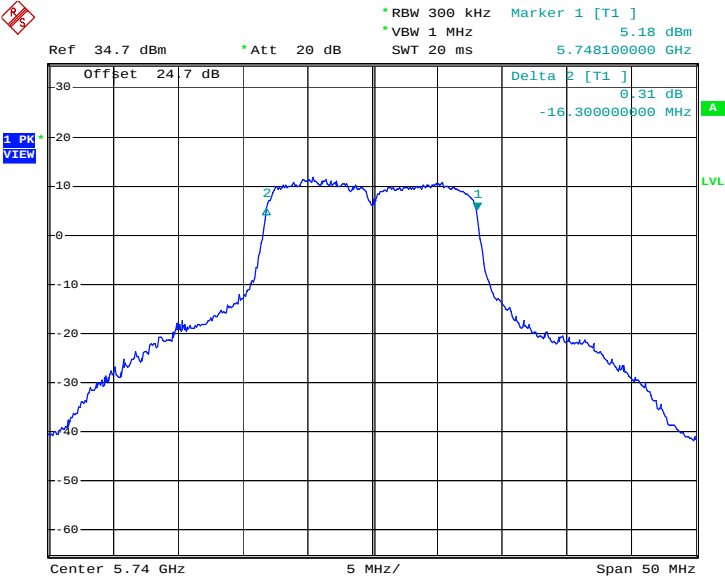
**Test Results:** Complies

**Test Data:** See attached table and graphics

**6dB Occupied Bandwidth (MHz)**

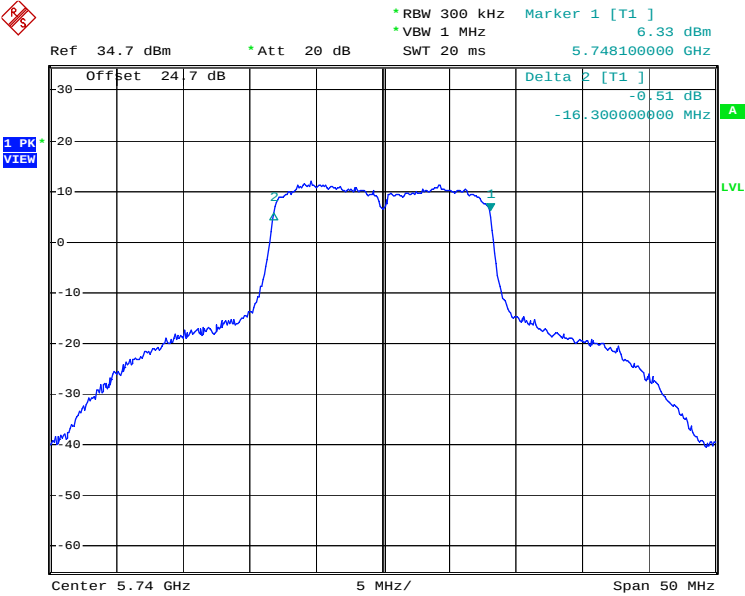
| <b>Frequency<br/>(MHz)</b> | <b>6<br/>Mb/s</b> | <b>54<br/>Mb/s</b> |
|----------------------------|-------------------|--------------------|
| 5740                       | 16.3              | 16.3               |
| 5790                       | 16.5              | 16.3               |
| 5835                       | 16.3              | 16.3               |

5740MHz-6Mb/s



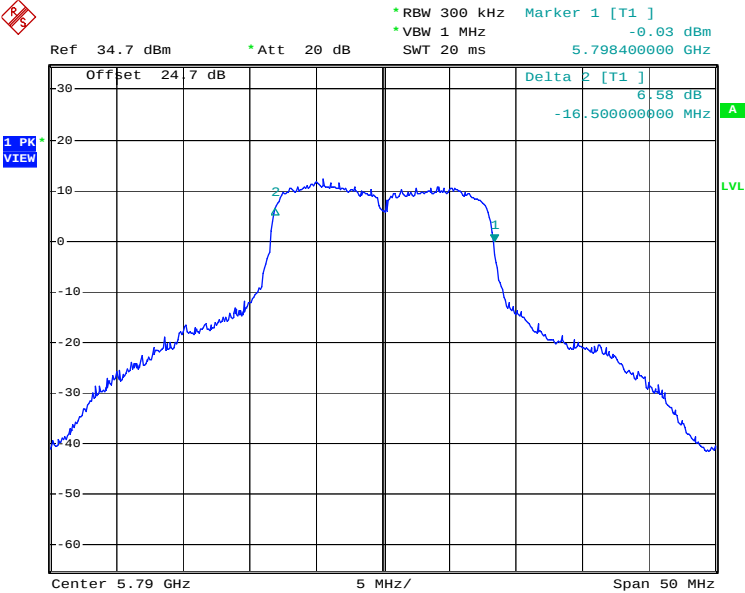
Date: 17.OCT.2005 21:57:04

5740MHz-54Mb/s



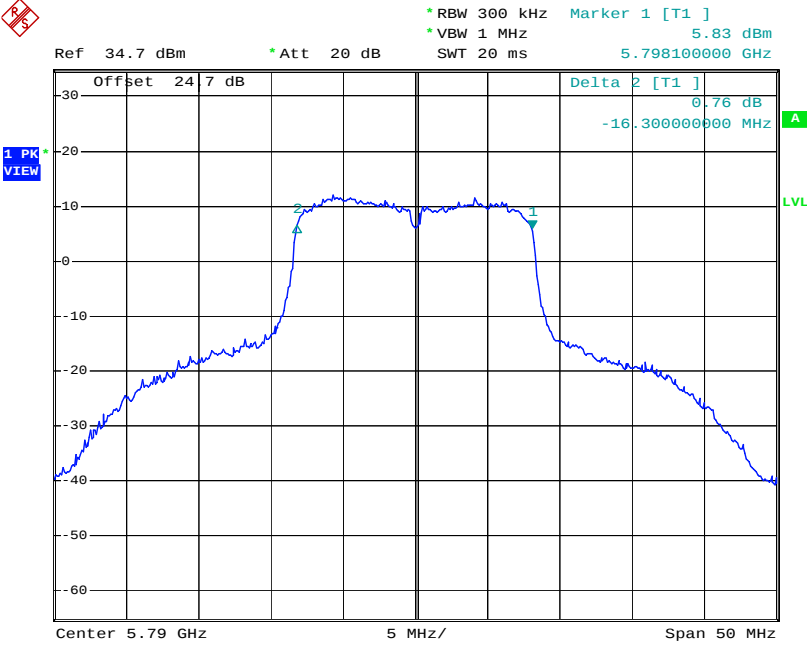
Date: 17.OCT.2005 22:05:28

5790MHz-6Mb/s



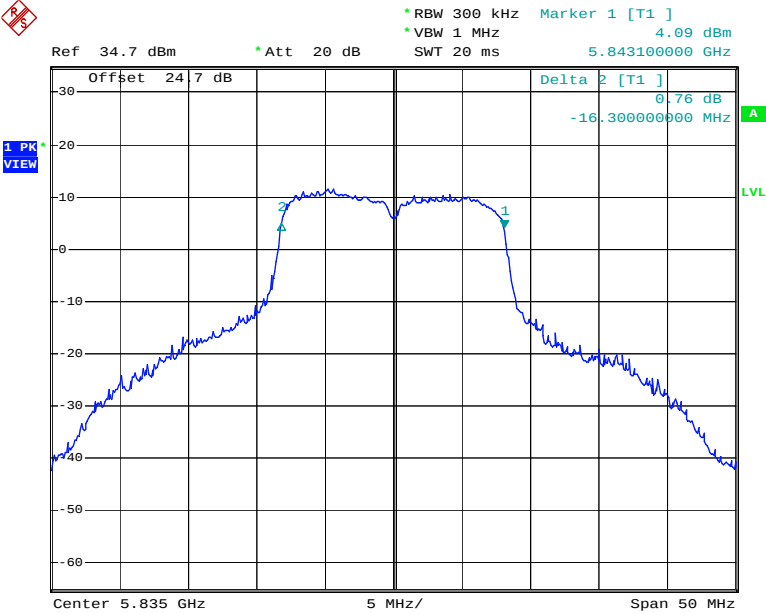
Date: 17.OCT.2005 22:06:58

5790MHz-54Mb/s



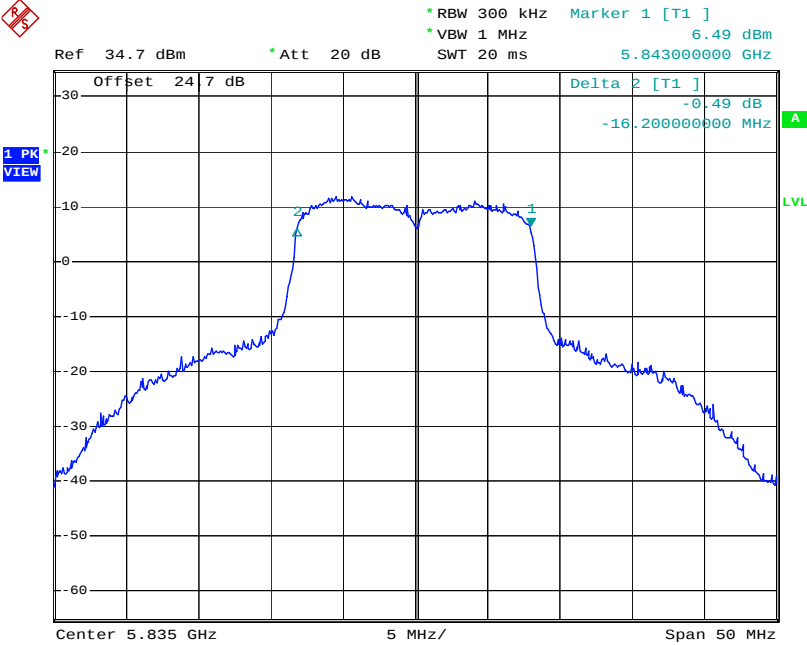
Date: 17.OCT.2005 22:09:34

5835MHz-6Mb/s



Date: 17.OCT.2005 22:15:05

5835MHz-54Mb/s



Date: 17.OCT.2005 22:18:52

### Section 3. Output Power

**Criteria: Clause 15.247(b)(3)**

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

**Test Conditions:**

|                            |              |                     |        |
|----------------------------|--------------|---------------------|--------|
| <b>Sample Number:</b>      | 1,2          | <b>Temperature:</b> | 22 °C  |
| <b>Date:</b>               | Oct.18, 2005 | <b>Humidity:</b>    | 50 %   |
| <b>Modification State:</b> | 0            | <b>Tester:</b>      | Xu Jin |
|                            |              | <b>Laboratory:</b>  | Ottawa |

**Test Method:** Output power was measured using sample detector on the spectrum analyzer according to FCC guidance on measurements for DTS and the documentation of FCC Public Notice: DA 02-2138.

**Test Results:** Complies

**Test Data:** See attached table and graphics

**Conducted Output Power Test Data (dBm)**

| Frequency<br>(MHz) | 6<br>Mb/s | 54<br>Mb/s |
|--------------------|-----------|------------|
| 5740               | 21.34     | 21.85      |
| 5790               | 21.08     | 21.70      |
| 5835               | 21.05     | 21.82      |

Manufacturer has declared there is 1dB cable loss between the radio module and antenna connector.

The max. output power measured therefore  
 $=21.85\text{dBm}-1\text{dB}=20.85\text{dBm}$

For Point to Point Operation:

Limit: P-P operation  $=30\text{dBm} + \text{Antenna gain}$

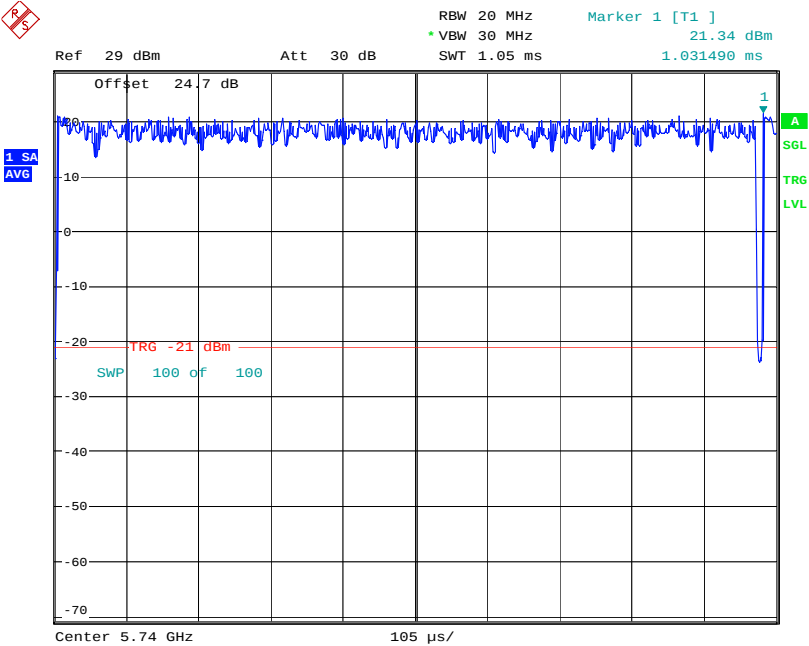
| No | Antenna Type               | Limit<br>(Conducted) | Max. Conducted Power<br>Measured             | Max. E.R.I.P                                   |
|----|----------------------------|----------------------|----------------------------------------------|------------------------------------------------|
| 1  | Maxrad 10dBi               | 30dBm                | $21.85\text{dBm}-1\text{dB}=20.85\text{dBm}$ | $20.85\text{dBm}+10\text{dBi}=30.85\text{dBm}$ |
| 2  | Maxrad 4dBi                | 30dBm                | $21.85\text{dBm}-1\text{dB}=20.85\text{dBm}$ | $20.85\text{dBm}+4\text{dBi}=24.85\text{dBm}$  |
| 3  | 15dBi BelAir Patch Antenna | 30dBm                | $21.85\text{dBm}-1\text{dB}=20.85\text{dBm}$ | $20.85\text{dBm}+15\text{dBi}=35.85\text{dBm}$ |
| 4  | H&S 23dBi                  | 30dBm                | $21.85\text{dBm}-1\text{dB}=20.85\text{dBm}$ | $20.85\text{dBm}+23\text{dBi}=43.85\text{dBm}$ |

For None Point to Point Operation

Limit: None P-P operation  $=30\text{dBm}+6\text{dBi}$  antenna (EIRP)

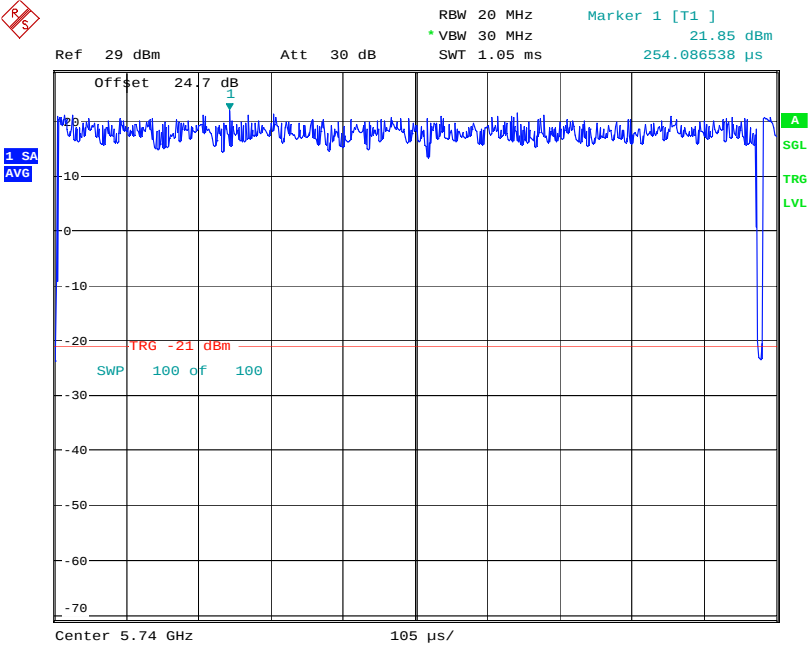
| No | Antenna Type               | Limit<br>(Conducted)                                   | Max. Conducted Power<br>Measured             | Max. E.R.I.P                                   |
|----|----------------------------|--------------------------------------------------------|----------------------------------------------|------------------------------------------------|
| 1  | Maxrad 10dBi               | $30\text{dBm}-(10\text{dBi}-6\text{dBi})=26\text{dBm}$ | $21.85\text{dBm}-1\text{dB}=20.85\text{dBm}$ | $20.85\text{dBm}+10\text{dBi}=30.85\text{dBm}$ |
| 2  | Maxrad 4dBi                | 30dBm                                                  | $21.85\text{dBm}-1\text{dB}=20.85\text{dBm}$ | $20.85\text{dBm}+4\text{dBi}=24.85\text{dBm}$  |
| 3  | 15dBi BelAir Patch Antenna | $30\text{dBm}-(15\text{dBi}-6\text{dBi})=21\text{dBm}$ | $21.85\text{dBm}-1\text{dB}=20.85\text{dBm}$ | $20.85\text{dBm}+15\text{dBi}=35.85\text{dBm}$ |

5740MHz-6Mb/s



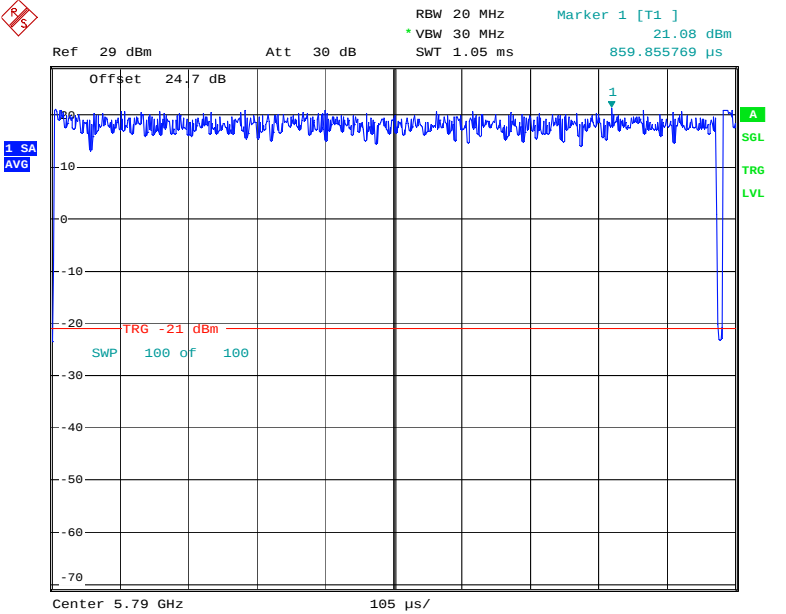
Date: 18.OCT.2005 10:51:56

5740MHz-54Mb/s



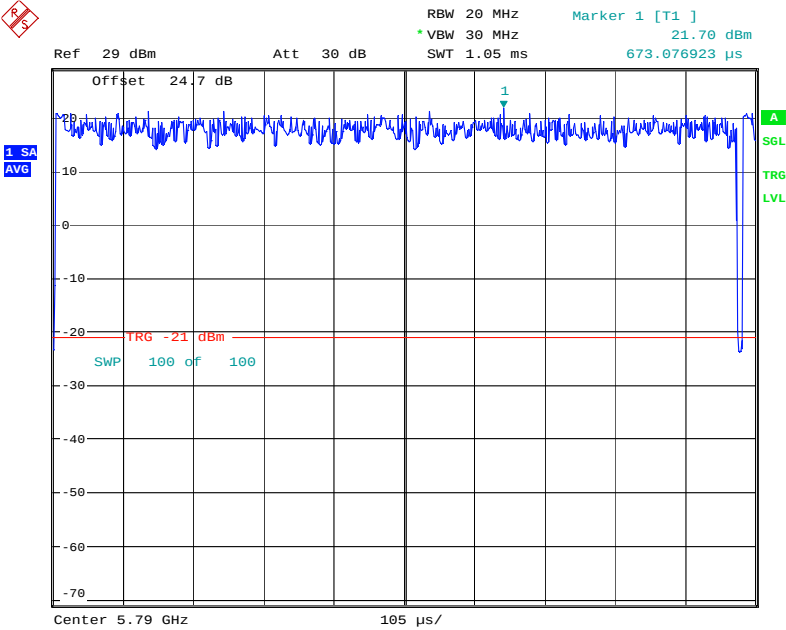
Date: 18.OCT.2005 10:52:45

5790MHz-6Mb/s



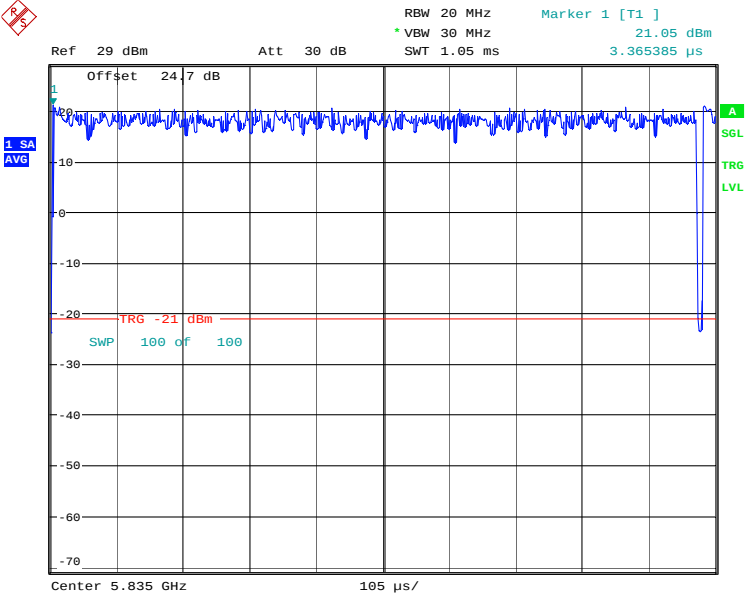
Date: 18.OCT.2005 10:53:53

5790MHz-54Mb/s



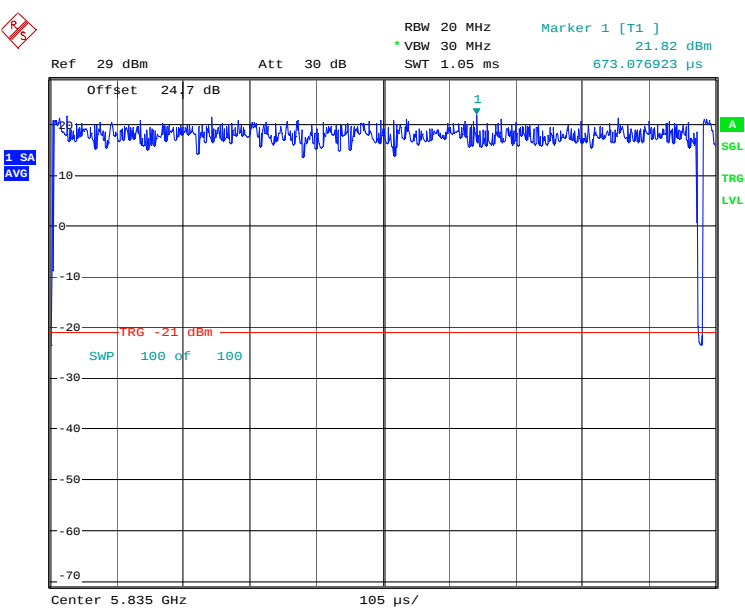
Date: 18.OCT.2005 10:54:57

5835MHz-6Mb/s



Date: 18.OCT.2005 10:56:02

5835MHz-54Mb/s



Date: 18.OCT.2005 10:56:54

## Section 4. Spurious Emissions

### Criteria: Clause 15.247(d)

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:      | 1,2,3,4,5,6  | Temperature: | 22 °C  |
| Date:               | Oct.18, 2005 | Humidity:    | 50 %   |
| Modification State: | 0            | Tester:      | Xu Jin |
|                     |              | Laboratory:  | Ottawa |

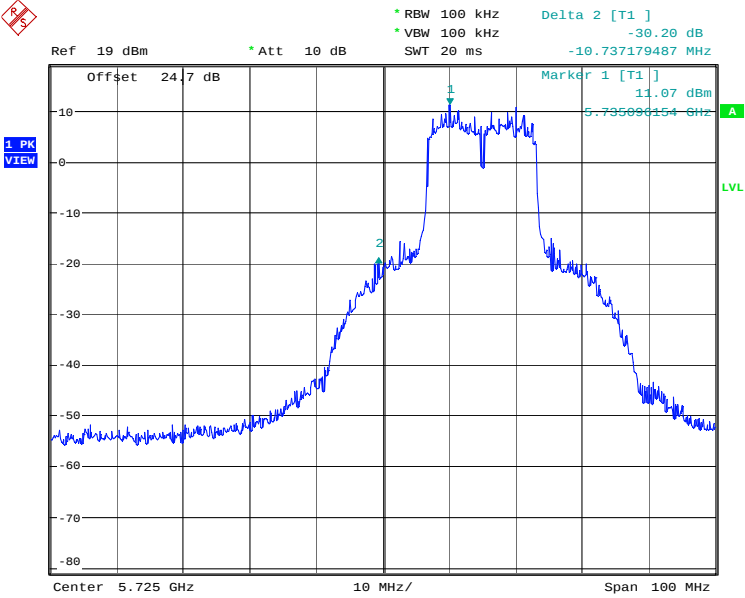
**Test Results:** Complies

**Test Data:** See attached table and graphics

Emissions were searched for all possible antenna configurations

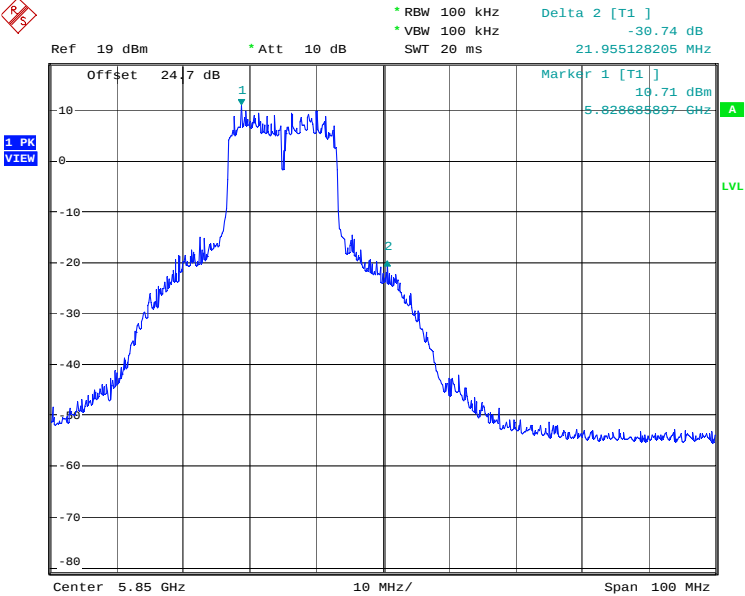
The DUT was searched to from 30MHz to 10<sup>th</sup> harmonic of the EUT, and for low, medium and high frequencies. Only worst case was reported.

Lower Band Edge Check\_Ch148, 5740MHz



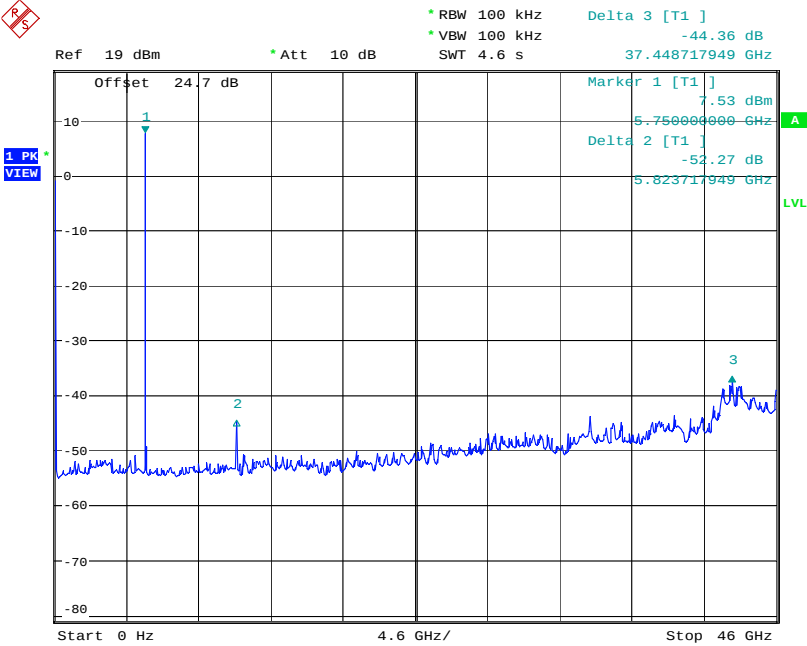
Date: 18.OCT.2005 13:57:31

Higher Band Edge Check\_Ch167, 5835MHz



Date: 18.OCT.2005 13:59:45

Full Span

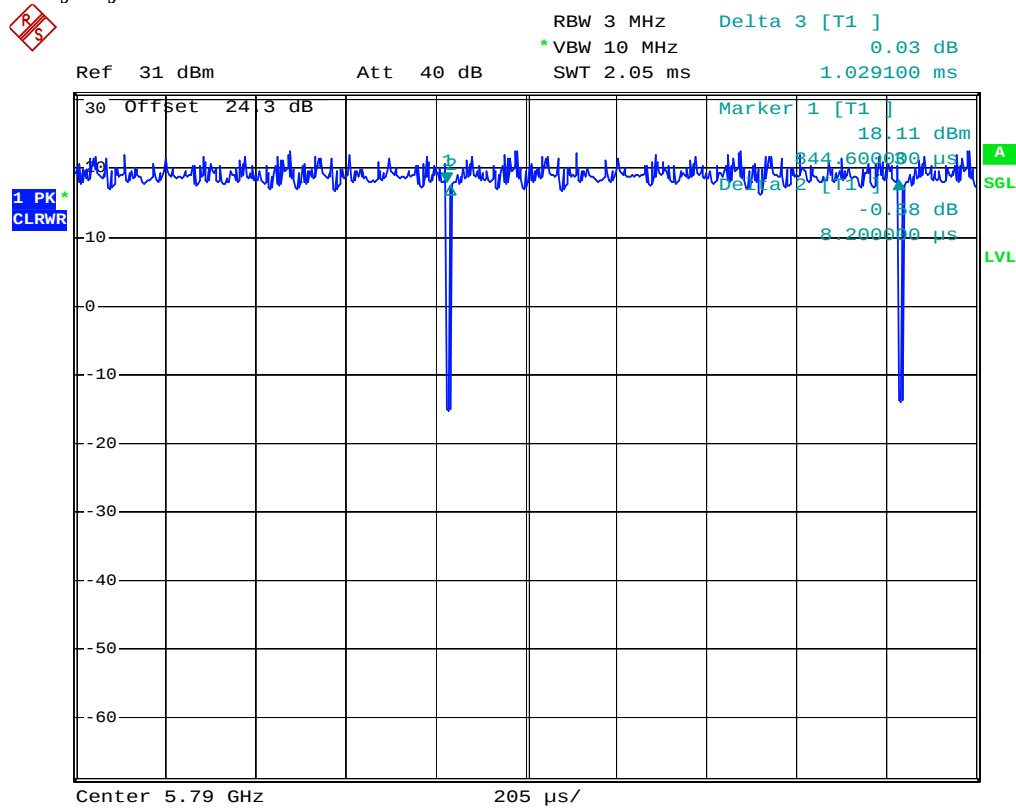


Date: 18.OCT.2005 13:48:05

**Radiated Emissions Test Data**

| Test Date: Oct. 20, 2005                                                                          |      |                     |                          |                        |                      |                       |                               |                   |                |          |
|---------------------------------------------------------------------------------------------------|------|---------------------|--------------------------|------------------------|----------------------|-----------------------|-------------------------------|-------------------|----------------|----------|
| Engineer's Name: Xu Jin                                                                           |      |                     |                          |                        |                      |                       |                               |                   |                |          |
| Tested as per: Table Top                                                                          |      |                     |                          |                        |                      |                       |                               |                   |                |          |
| Mains Input Voltage: 120VAC                                                                       |      |                     |                          |                        |                      |                       | Mains Input Frequency: 60Hz   |                   |                |          |
| Test Distance (meters): 3                                                                         |      |                     |                          |                        |                      |                       | Dome: 1                       |                   |                |          |
| Freq.<br>(MHz)                                                                                    | Ant. | Po<br>l.<br>V/<br>H | RCVD<br>Signal<br>(dBμV) | Ant.<br>Factor<br>(dB) | Amp.<br>Gain<br>(dB) | Cable<br>Loss<br>(dB) | Field<br>Strength<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) | Detector |
| 115.5016                                                                                          | BC1  | H                   | 6.5                      | 11.6                   | N/A                  | 1.8                   | 19.9                          | 43.5              | 23.6           | Q-Peak   |
| 115.5016                                                                                          | BC1  | V                   | 12.2                     | 12.0                   | N/A                  | 1.8                   | 26.0                          | 43.5              | 17.5           | Q-Peak   |
| 375.0200                                                                                          | LP1  | H                   | 17.2                     | 15.7                   | N/A                  | 2.9                   | 35.7                          | 46                | 10.3           | Q-Peak   |
| 375.0200                                                                                          | LP1  | V                   | 19.2                     | 15.5                   | N/A                  | 2.9                   | 37.5                          | 46                | 8.5            | Q-Peak   |
| 561.0000                                                                                          | LP1  | V                   | 15.8                     | 19.0                   | N/A                  | 3.3                   | 38.1                          | 46                | 7.9            | Q-Peak   |
| 561.0000                                                                                          | LP1  | H                   | 16.2                     | 19.7                   | N/A                  | 3.3                   | 39.2                          | 46                | 6.8            | Q-Peak   |
| 627.0000                                                                                          | LP1  | V                   | 18.3                     | 19.7                   | N/A                  | 3.5                   | 41.5                          | 46                | 4.5            | Q-Peak   |
| 627.0000                                                                                          | LP1  | H                   | 21.5                     | 19.9                   | N/A                  | 3.5                   | 44.9                          | 46                | 1.1            | Q-Peak   |
| 693.5000                                                                                          | LP1  | H                   | 15.7                     | 21.2                   | N/A                  | 3.8                   | 40.7                          | 46                | 5.3            | Q-Peak   |
| 693.5000                                                                                          | LP1  | V                   | 12.3                     | 20.9                   | N/A                  | 3.8                   | 37.0                          | 46                | 9              | Q-Peak   |
| 808.9000                                                                                          | LP1  | H                   | 10.9                     | 22.1                   | N/A                  | 4.3                   | 37.3                          | 46                | 8.7            | Q-Peak   |
| 808.9000                                                                                          | LP1  | V                   | 10.8                     | 21.5                   | N/A                  | 4.3                   | 36.6                          | 46                | 9.4            | Q-Peak   |
| Legend:                                                                                           |      |                     |                          |                        |                      |                       |                               |                   |                |          |
| Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole      |      |                     |                          |                        |                      |                       |                               |                   |                |          |
| Detector Legend: Q-Peak = 120kHz RBW, Average = 1.0MHz RBW, 10Hz VBW, Peak=1.0MHz RBW, 1.0MHz VBW |      |                     |                          |                        |                      |                       |                               |                   |                |          |

# Duty Cycle



Date: 20.OCT.2005 21:37:20

$$\text{Duty Cycle} = (1 - 8.2\mu\text{s} / 1029\mu\text{s}) \times 100\% = 99.2\%$$

**Section 5. Peak Power Spectrum Density****Criteria: Clause 15.247(e)**

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

**Test Conditions:**

|                            |               |                     |        |
|----------------------------|---------------|---------------------|--------|
| <b>Sample Number:</b>      | 1,2           | <b>Temperature:</b> | 22 °C  |
| <b>Date:</b>               | Oct. 18, 2005 | <b>Humidity:</b>    | 50 %   |
| <b>Modification State:</b> | 0             | <b>Tester:</b>      | Xu Jin |
|                            |               | <b>Laboratory:</b>  | Ottawa |

**Test Result:** Complies

**Test Data:** See attached tables and graphics

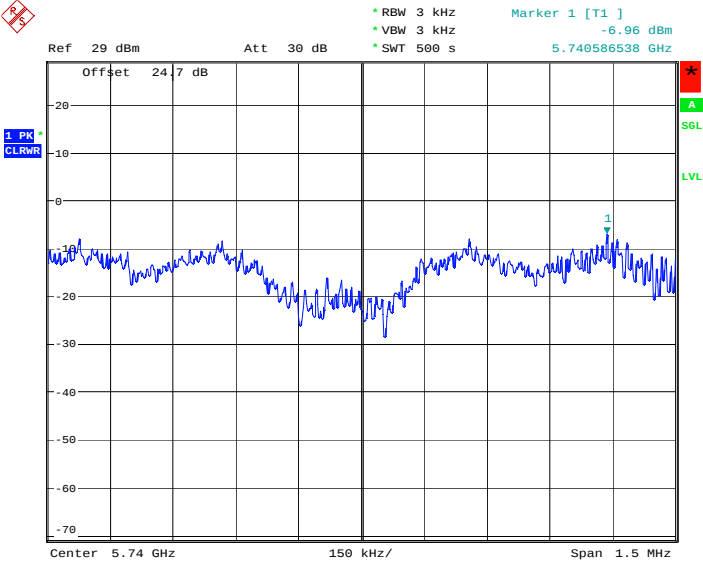
**Peak Power Spectrum Density Test Data(dBm/3KHz)**

| <b>Frequency<br/>(MHz)</b> | <b>6<br/>Mb/s</b> | <b>54<br/>Mb/s</b> |
|----------------------------|-------------------|--------------------|
| 5740                       | -6.96             | -6.65              |
| 5790                       | -7.86             | -6.65              |
| 5835                       | -6.69             | -6.83              |

Manufacturer has declared there is 1dB cable loss between the radio module and antenna connector.

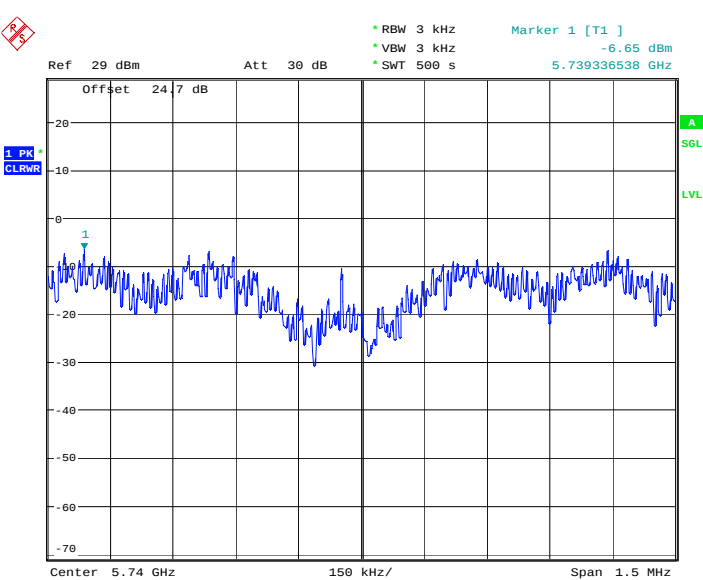
The Max. Peak Power Spectrum Density=-6.65dBm/3KHz-1dB=-7.63 dBm/3KHz

5740MHz \_6Mb/s



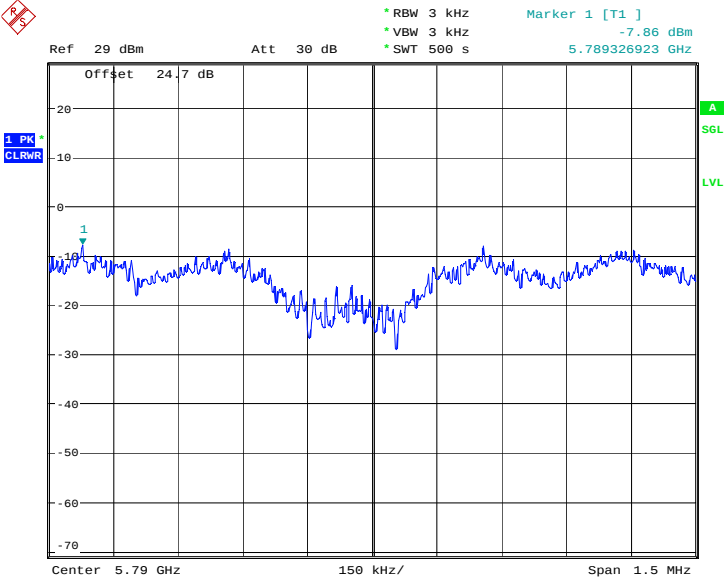
Date: 18.OCT.2005 11:52:14

5740MHz \_54Mb/s



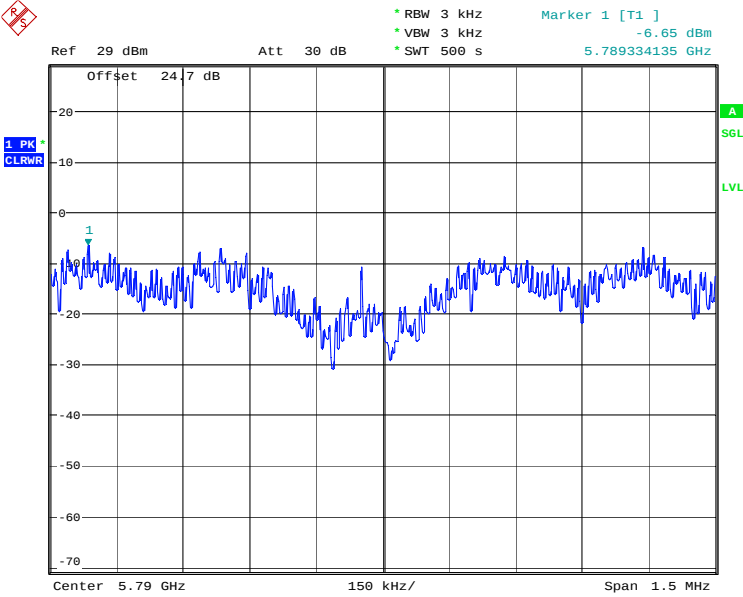
Date: 18.OCT.2005 12:01:50

5790MHz\_6Mb/s



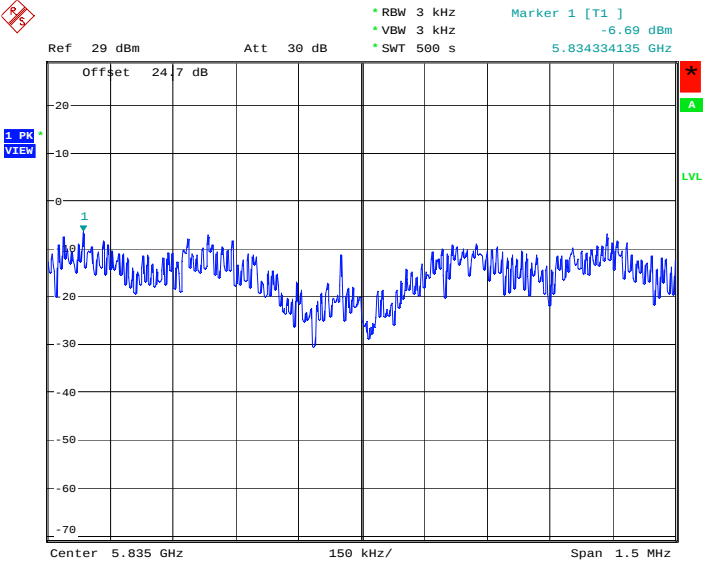
Date: 18.OCT.2005 13:14:48

5790MHz\_54Mb/s



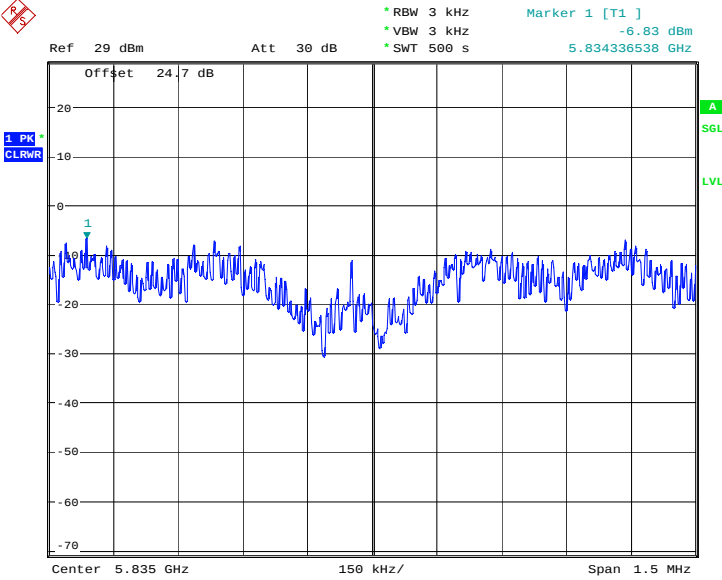
Date: 18.OCT.2005 13:24:33

5835MHz-6Mb/s



Date: 18.OCT.2005 11:25:06

5835MHz-54Mb/s



Date: 18.OCT.2005 11:44:44

## Section 6. Supply Voltage Variation

### Criteria: Clause 15.31

§ 15.31 (e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery-operated equipment, the equipment tests shall be performed using a new battery.

### Test Conditions:

|                            |               |                     |        |
|----------------------------|---------------|---------------------|--------|
| <b>Sample Number:</b>      | 1,2           | <b>Temperature:</b> | 22 °C  |
| <b>Date:</b>               | Oct. 19, 2005 | <b>Humidity:</b>    | 50%    |
| <b>Modification State:</b> | 0             | <b>Tester:</b>      | Xu Jin |
|                            |               | <b>Laboratory:</b>  | Ottawa |

**Test Method:** Average power for selected channels was verified under voltage extreme conditions using a wideband power meter with thermocouple detector.

**Extreme Voltage:**  $\pm 15\%$  of AC supply

**Test Result:** No major changed was noticed during the test.  
Refer to the attached tables.

|           | 120VAC     | Low Voltage Extreme |           | High Voltage Extreme |           |
|-----------|------------|---------------------|-----------|----------------------|-----------|
| Frequency | Ave. Power | Ave. Power          | Deviation | Ave. Power           | Deviation |
| 5790MHz   | 20.91      | 20.93               | 0.01%     | 20.94                | 0.01%     |

## **Appendix B : Setup Photographs**

### **Radiated Emission Setup Photos\_Front**



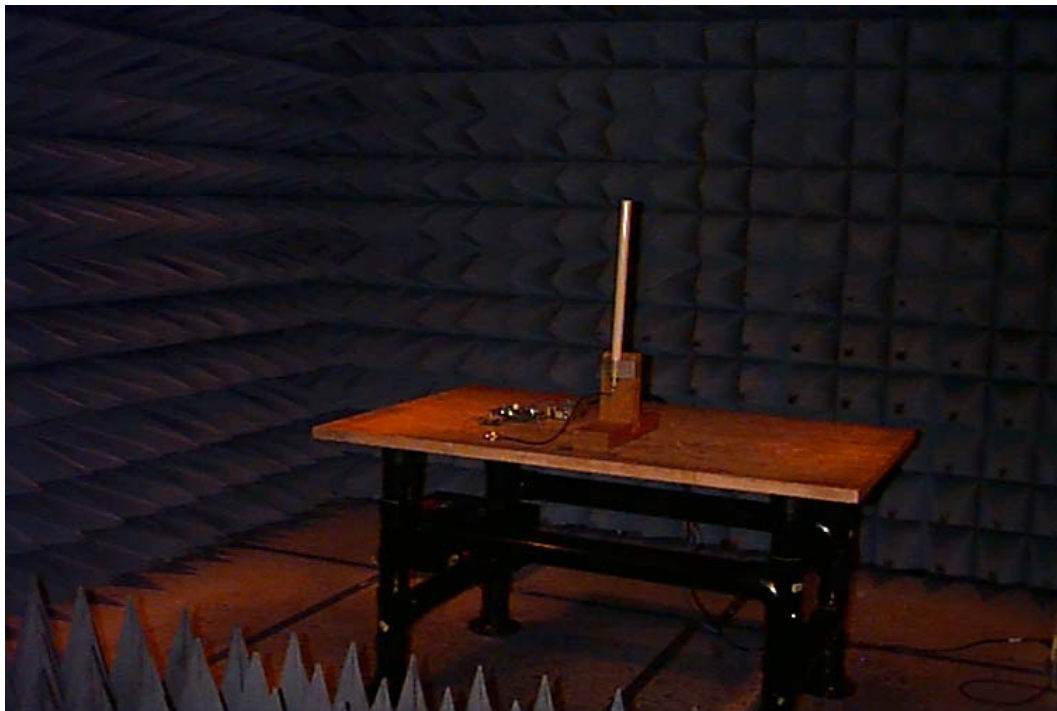
### **Radiated Emissions Setup Photos\_Back**



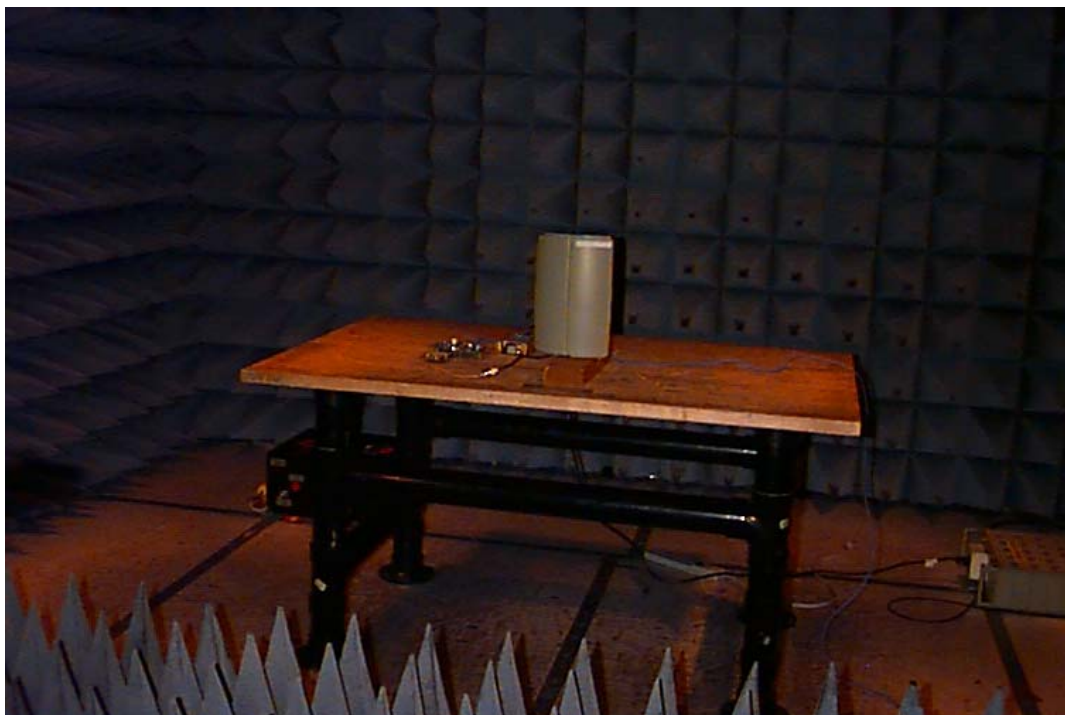
**4dBi Maxrad Antenna**



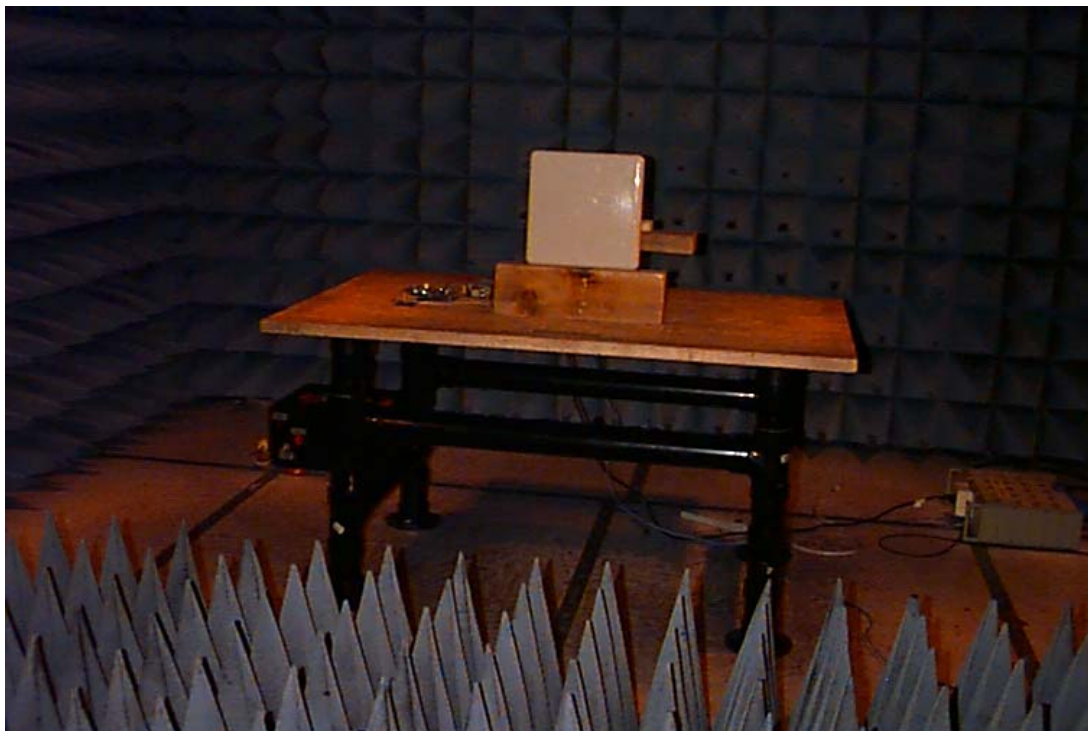
**10dBi Maxrad Antenna**



**15dBi Belair Patch Antenna**

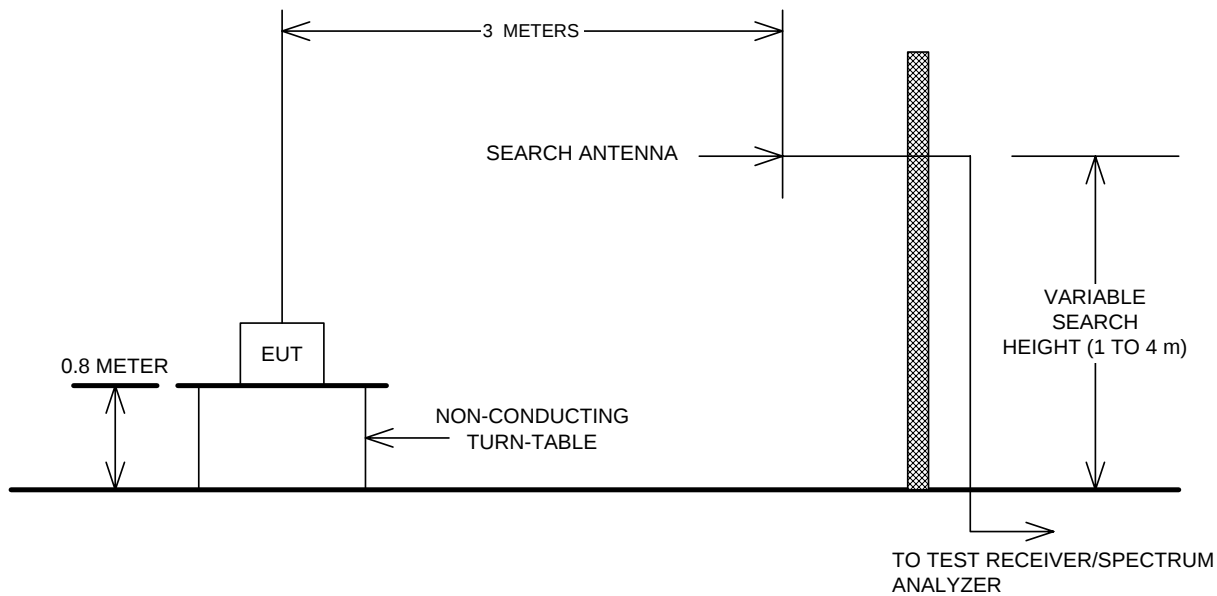


**23dBi H&S Antenna**

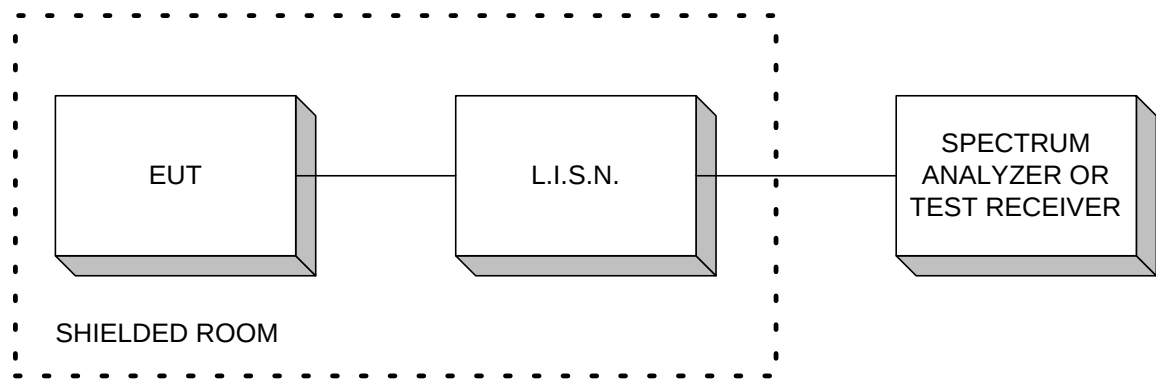


Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions



Conducted Emissions



Conducted Measurements

