



|                                  |   |
|----------------------------------|---|
| Report No                        | ED0552-1  |
| Client                           | Dynastream Innovations, Inc.<br>228 River Avenue<br>Cochrane, Alberta T4C 2C1   |
| Phone                            | (403)-932-9292  |
| Fax                              | (403)-932-6521  |
| FRN                              | 0008033557  |
| <hr/>                            |   |
| Model                            | AMP331-P01  |
| FCC ID                           | O6RAMP331P  |
| Equipment Type<br>Equipment Code | Low Power Communication Device Transmitter<br>DXX   |
| Results                          | As detailed within this report  |
| <hr/>                            |   |
| Prepared by                      | <br>Evan Gould – Test Engineer     |
| Authorized by                    | <br>Michael Buchholz – EMC Manager |
| Issue Date                       | <u>7/30/03</u>  |
| Conditions of issue              | This Test Report is issued subject to the conditions stated in ‘terms and conditions’ section of this report.         |

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.

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## **Summary**

This report is an application for Certification of a Transmitter operating pursuant to 47 CFR 15.249. The product covered by this report is the AMP331 Activity Monitoring Pod (Model AMP331-P01). This report is designed to demonstrate the compliance of this device with the requirements outlined in 47 CFR Part 15 using the methods outlined in 47 CFR Part 2.

## **Test Methodology**

Radiated emissions testing is performed according to the procedures specified in ANSI C63.4 (2000).

Frequency range investigated: 30MHz –10GHz

Measurement distance: 3 Meters (30MHz - ~7GHz)  
1 Meter (~7GHz – 10GHz)

EUT power source: Fresh AAA battery

Emission Maximization: EUT rotated around three orthogonal axes  
Antenna height and polarization varied

### ***Statement of Conformity***

The Dynastream AMP331-P01 has been found to conform with the following parts of 47 CFR as detailed below:

| Part 2 | Part 15          | Comments   |
|--------|------------------|--|
|        | 15.15(b)         | The product contains no user accessible controls that increase transmission power above allowable levels.  |
| 2.925  | 15.19            | The label is shown in the label exhibit.   |
|        | 15.21            | Information to the user is shown in the instruction manual exhibit.  |
|        | 15.27            | No special accessories are required for compliance.  |
|        | 15.203           | The antenna is soldered to the transmitter board, which is not user accessible, and there is no external antenna connection.                                   |
|        | 15.205<br>15.209 | The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209. |
|        | 15.249           | The unit complies with the field strength limits of 15.249.  |

## Fundamental Frequency Measurement

### LIMIT

Quasi-Peak: 50mV/m = 93.9dB $\mu$ V/m @ 3m [15.249(a)]

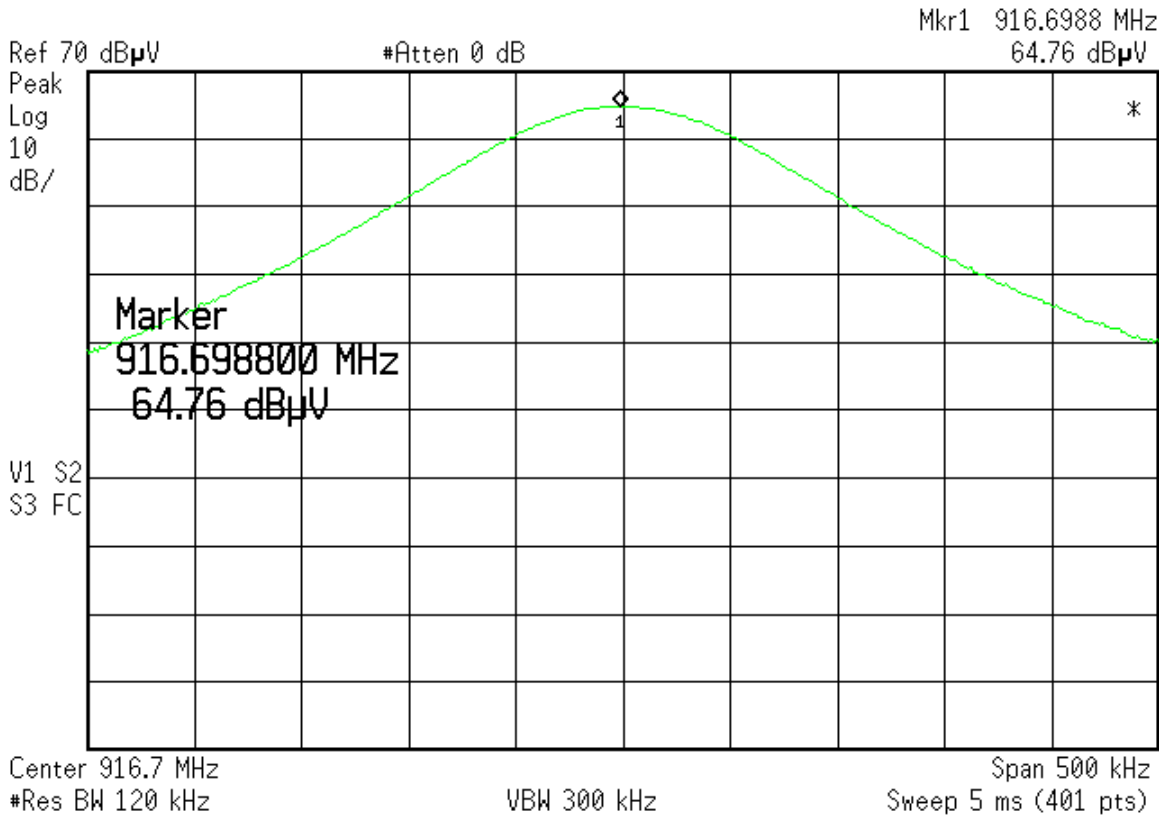
Note: If Peak measurements meet Quasi-Peak limits, then Quasi-Peak measurements are not required.

### MEASUREMENT

| Radiated Emissions Table                    |                 |                      |                    |                           |                   |                                 | Curtis-Straus LLC    |                  |                    |
|---|-----------------|----------------------|--------------------|---------------------------|-------------------|---------------------------------|----------------------|------------------|--------------------|
| Date: 17-Jul-03                             |                 | Company: Dynastream  |                    |                           | Table: 1          |                                 |                      |                  |                    |
| Engineer: Evan Gould                        |                 | EUT Desc: AMP331     |                    |                           | Work Order: D0552 |                                 |                      |                  |                    |
| Frequency Range: 916.7MHz                   |                 |                      |                    | Measurement Distance: 3 m |                   |                                 |                      |                  |                    |
| Notes: continuous transmission; unmodulated |                 |                      |                    |                           |                   |                                 |                      |                  |                    |
| Antenna Polarization (H / V)                | Frequency (MHz) | Reading (dB $\mu$ V) | Preamp Factor (dB) | Antenna Factor (dB/m)     | Cable Factor (dB) | Adjusted Reading (dB $\mu$ V/m) | 47 CFR 15.249(a)     |                  |                    |
|   |                 |                      |                    |                           |                   |                                 | Limit (dB $\mu$ V/m) | Margin (dB)      | Result (Pass/Fail) |
| Vpk   | 916.7           | 64.8                 | 19.7               | 21.4                      | 4.1               | 70.6                            | 93.9                 | -23.3            | Pass               |
| Test Site: "F"                              |                 | Pre-Amp: Green       |                    | Cable: 65 ft RG8A/U       |                   | Analyzer: Orange                |                      | Antenna: Grn-Blk |                    |

### ANALYZER PLOT

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## Band Edge Measurements

### LIMITS

Quasi-Peak: 50dB below level of Fundamental OR  
 General radiated emission limits of 15.209  
 "...whichever is the lesser attenuation." [15.249(c)]

Note: If Peak measurements meet Quasi-Peak limits, then Quasi-Peak measurements are not required.

### MEASUREMENTS

| Radiated Emissions Table      |                 |                     |                    |                           |                   |                           | Curtis-Straus LLC |                  |                    |
|-------------------------------|-----------------|---------------------|--------------------|---------------------------|-------------------|---------------------------|-------------------|------------------|--------------------|
| Date: 17-Jul-03               |                 | Company: Dynastream |                    |                           | Table: 2          |                           |                   |                  |                    |
| Engineer: Evan Gould          |                 | EUT Desc: AMP331    |                    |                           | Work Order: D0552 |                           |                   |                  |                    |
| Frequency Range: 900-928.4MHz |                 |                     |                    | Measurement Distance: 3 m |                   |                           |                   |                  |                    |
| Notes:                        |                 |                     |                    |                           |                   |                           |                   |                  |                    |
| Antenna Polarization (H/V)    | Frequency (MHz) | Reading (dBµV)      | Preamp Factor (dB) | Antenna Factor (dB/m)     | Cable Factor (dB) | Adjusted Reading (dBµV/m) | FCC Class B       |                  |                    |
|                               |                 |                     |                    |                           |                   |                           | Limit (dBµV/m)    | Margin (dB)      | Result (Pass/Fail) |
| Vpk                           | 901.6           | 25.4                | 19.8               | 21.2                      | 4.9               | 31.7                      | 46.0              | -14.3            | Pass               |
| Vpk                           | 928.2           | 25.3                | 19.7               | 21.5                      | 5.0               | 32.1                      | 46.0              | -13.9            | Pass               |
| Test Site: "F"                |                 | Pre-Amp: Green      |                    | Cable: 65 ft RG8A/U       |                   | Analyzer: Orange          |                   | Antenna: Grn-Blk |                    |

### ANALYZER PLOT

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POD & USB LINK

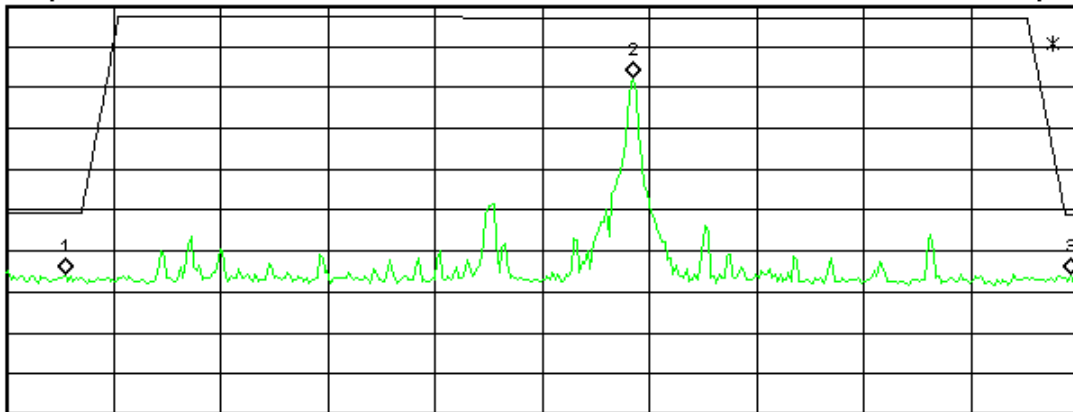
Ref 91 dBµV

#Atten 0 dB

Mkr3 928.16 MHz

25.29 dBµV

Peak  
Log  
10  
dB/



Start 900 MHz

Stop 928.4 MHz

#Res BW 120 kHz

VBW 300 kHz

Sweep 4.283 ms (401 pts)

| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 901.56 MHz | 25.35 dBµV |
| 2      | (1)   | Freq | 916.60 MHz | 73.5 dBµV  |
| 3      | (1)   | Freq | 928.16 MHz | 25.29 dBµV |

## ***Harmonic Frequency Measurements***

### **LIMITS**

Average:  $500\mu\text{V}/\text{m} = 53.9\text{dB}\mu\text{V}/\text{m}$  @ 3m [15.249(a), (b), and (d)]

Peak:  $53.9\text{dB}\mu\text{V}/\text{m} + 20\text{dB} = 73.9\text{dB}\mu\text{V}$  @ 3m [15.249(d)]

**Note:** If Peak measurements meet Average limits, then Average measurements are not required.

### **MEASUREMENTS**

**Note:** No harmonic or spurious emissions within 20dB of the limit were detected in the range 30MHz – 10GHz.

## Test Equipment Used

REV. 7/18/03

| <b>SPECTRUM ANALYZERS</b> | RANGE        | MN     | MFR | SN         | ASSET | CALIBRATION DUE |
|---------------------------|--------------|--------|-----|------------|-------|-----------------|
| YELLOW                    | 9kHz-2.9GHz  | 8594E  | HP  | 3523A01958 | 00100 | 08-JUL-2004     |
| ORANGE                    | 9kHz-26.5GHz | E4407B | HP  | US39440975 | 00394 | 27-JUN-2004     |

| <b>OPEN AREA TEST SITE (OATS)</b> | FCC CODE | IC CODE   | VCCI CODE | CALIBRATION DUE |
|-----------------------------------|----------|-----------|-----------|-----------------|
| SITE F                            | 93448    | IC 2762-F | R-468     | 25-MAR-2005     |

| <b>ANTENNAS</b>   | RANGE      | MN       | MFR   | SN        | ASSET | CALIBRATION DUE                     |
|-------------------|------------|----------|-------|-----------|-------|-------------------------------------|
| GREEN-BLACK BILOG | 30MHz-2GHz | CBL6112B | CHASE | 2412      | 00127 | 19-MAY-2005                         |
| GRAY BILOG        | 26MHz-2GHz | 3141     | EMCO  | 9703-1038 | 00066 | 19-MAY-2005(EMI) / 06-JUN-2004(RFI) |
| YELLOW HORN       | 1-18GHz    | 3115     | EMCO  | 9608-4898 | 00037 | 22-MAY-2005                         |

| <b>PREAMPS</b> | RANGE        | MN          | MFR | SN     | ASSET | CALIBRATION DUE |
|----------------|--------------|-------------|-----|--------|-------|-----------------|
| RED            | 0.10-2000MHz | ZFL-1000-LN | C-S | N/A    | 00798 | 17-MAR-2004     |
| GREEN          | 0.01-2000MHz | ZFL-1000-LN | C-S | N/A    | 00802 | 17-MAR-2004     |
| YELLOW-BLACK   | 1-20GHz      | SMC-12A     | C-S | 535055 | 00801 | 27-AUG-2003     |

Unless otherwise noted the calibration interval is one year. All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



## Terms And Conditions

### Paragraph 1. SERVICES. LABORATORY will:

- 1.1 Use the degree of care and skill ordinarily exercised by and consistent with the standards of the profession.
- 1.2 Perform all technical services in substantial accordance with the generally accepted laboratory principles and practices.
- 1.3 Retain all pertinent records relating to the services performed for a period of three (3) years following submission of the report describing such services, during which period the records will be made available to CLIENT upon reasonable request.

### Paragraph 2. CLIENT'S RESPONSIBILITIES. CLIENT or his authorized representative will:

- 2.1 Provide LABORATORY with all plans, schematics, specifications, addenda, change orders, drawings and other information for the proper performance of technical services.
- 2.2 Designate a person to act as CLIENT's representative with respect to LABORATORY's services to be performed on behalf of the CLIENT; such person or firm to have complete authority to transmit instructions, receive information and data, interpret and define CLIENT's policies and decisions with respect to the LABORATORY's work on behalf of the CLIENT and to order, at CLIENT's expense, such technical services as may be required.
- 2.3 Designate a person who is authorized to receive copies of LABORATORY's reports.
- 2.4 Undertake the following:
  - (a) Secure and deliver to LABORATORY, without cost to LABORATORY, preliminary representative samples of the equipment proposed to require technical services, together with any relevant data.
  - (b) Furnish such labor and equipment needed by LABORATORY to handle samples at the LABORATORY and to facilitate the specified technical services.

### Paragraph 3. GENERAL CONDITIONS:

- 3.1 LABORATORY, by the performance of services covered hereunder, does not in any way assume any of those duties or responsibilities customarily vested in the CLIENT, its employees, or any other party, agency or authority.
- 3.2 LABORATORY shall not be responsible for acts of omissions of any other party or parties involved in the design, manufacture or maintenance of the equipment or the failure of any employee, contractor or subcontractor to undertake any aspect of equipment's design, manufacture or maintenance.
- 3.3 LABORATORY is not authorized to revoke, alter, release, enlarge or release any requirement of the equipment's design, manufacture or maintenance unless specifically authorized by CLIENT or his authorized representative.
- 3.4 THE ONLY WARRANTY MADE BY LABORATORY IN CONNECTION WITH ITS SERVICE PERFORMED HEREUNDER IS THAT IT WILL USE THAT DEGREE OF CARE AND SKILL AS SET FORTH IN PARAGRAPH 1 ABOVE. NO OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE OR INTENDED FOR SERVICES PROVIDED HEREUNDER.
- 3.5 Where the LABORATORY indicates that additional testing is advisable to obtain more valid or useful data, and where such testing has not been authorized, CLIENT agrees to view such test reports as inconclusive and preliminary.
- 3.6 The LABORATORY will supply technical service and prepare a report based solely on the sample submitted to the LABORATORY by the CLIENT. The CLIENT understands that application of the data to other devices is highly speculative and should be applied with extreme caution.
- 3.7 The LABORATORY agrees to exercise ordinary care in receiving, preserving and shipping (F.O.B. Littleton, MA) any sample to be tested, but assumes no responsibility for damages, either direct or consequential, which arise from loss, damage or destruction of the samples due to the act of examination, modification or testing, or technical services or circumstances beyond LABORATORY's control.
- 3.8 The LABORATORY will hold samples for thirty (30) days after tests are completed, or until the CLIENT's outstanding debts to the LABORATORY are satisfied, whichever is later.
- 3.9 The CLIENT recognizes that generally accepted error variances apply and agrees to consider such error variances in its use of test data.
- 3.10 It is agreed between LABORATORY and CLIENT that no distribution of any tests, reports or analysis other than that described below shall be made to any third party without the prior written consent of both parties unless such distribution is mandated by operation of law. It is agreed that tests, reports, or analysis results may be disclosed to third party auditors of the laboratory at the laboratory facility in the course of accreditation maintenance audits. No reference to reports or technical services of the LABORATORY shall be made in any advertising or promotional literature without the express written permission of the LABORATORY.
- 3.11 The CLIENT acknowledges that all employees of LABORATORY operate under employment contracts with the LABORATORY and CLIENT agrees not to solicit employment of such employees or to solicit information related to other clients from said employees.
- 3.12 In recognition of the relative risks and benefits of the project to both CLIENT and LABORATORY, the risks have been allocated such that the CLIENT agrees, to the fullest extent permitted by law, to limit the liability of the LABORATORY to the CLIENT for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, including attorneys' fees and costs and expert witness fees and costs, so that the total aggregate liability of the LABORATORY to the CLIENT shall not exceed \$100,000, or the LABORATORY'S total fee for services rendered on this project, whichever is greater. It is intended that this limitation apply to any and all liability or cause of action however alleged or arising, unless otherwise prohibited by law.

### Paragraph 4. INSURANCE:

- 4.1 LABORATORY shall secure and maintain throughout the full period of the services provided to the CLIENT adequate insurance to protect it from claims under applicable Workmen's Compensation Acts and also shall maintain one million dollars of general liability coverage to cover claims for bodily injury, death or property damage as may arise from the performance of its services.
- 4.2 The CLIENT hereby warrants that it has sufficient insurance to protect its employees adequately under applicable Workmen's Compensation Acts and for bodily injury, death, or property damage.
- 4.3 No insurance of whatever kind or type, which may be carried by either party is to be considered as in any way limiting any other party's responsibility for damages resulting from their operations or for furnishing work and materials.

**Paragraph 5. PAYMENT:**

- 5.1 CLIENT shall pay to LABORATORY such fees for services as previously agreed, orally or in writing, within 30 days of presentment of a bill for such services performed. In the event CLIENT ordered, orally or in writing, services but such services were not assigned a rate for billing, such services shall be billed at the LABORATORY's reasonable and customary rate.
- 5.2 CLIENT shall be responsible for all shipping, customs and other expenses related to services provided by LABORATORY to the CLIENT, and shall fully insure any test sample or other equipment provided to LABORATORY by the CLIENT.
- 5.3 Amounts overdue from CLIENT to LABORATORY shall be charged interest at a rate of 1½% per month.

**Paragraph 6. ISO/IEC GUIDE 17025 ADDITIONS:**

- 6.1 CLIENT agrees that this test report will not be reproduced except in full, without written approval from the LABORATORY.
- 6.2 CLIENT agrees that this test report shall not be used to claim product endorsement by A2LA or ANSI or any agency of the U.S. Government.
- 6.3 CLIENT agrees that test results presented herein relate only to the sample tested by the LABORATORY.

**A2LA Accreditation**

**SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999**

CURTIS-STRAUS  
 527 Great Road  
 Littleton, MA 01460  
 Jon Curtis Phone: 978-486-8880

**ELECTRICAL**

Valid until: July 31, 2003

Certificate Number: 1627-01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following Electromagnetic Compatibility (EMC), Telecommunications, and Product Safety tests:

**Electromagnetic Compatibility (EMC)**

Radiated emissions testing (electric and magnetic fields); Conducted emissions testing (voltage and current); Electrostatic Discharge testing; Electrical Fast Transient testing; Radiated Immunity testing; Conducted Immunity testing; Lightning Immunity testing; Voltage Dips, Interrupts and Voltage Variations testing; Magnetic Immunity testing; RF Power measurements; Frequency Stability measurements; Longitudinal Induction measurements; Harmonic emissions testing; Light flicker testing; Low frequency disturbance voltage testing; Disturbance Power measurements

| EMC Standards<br>Emissions                | Title   |   |   |
|---|---|---|---|
| CISPR 22 1997 with amendments 1 and 2     | Limits and methods of measurement of radio disturbance characteristics of information technology equipment.   | CNS 13439<br>AS/NZS 1053: 1999                                | Broadcast receiver and associated equipment<br>Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment.                  |
| CNS13438 1994                             | Limits and methods of measurement of radio interference characteristics of information technology equipment.  | CISPR 14 1993   | Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and electric apparatus.         |
| EN55022:1994 and 1998                     | Limits and methods of measurement of radio disturbance characteristics of information technology equipment.   | EN 55014 1993, 1997   | Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus. |
| SABS CISPR 22:1997                        | Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement  | AS/NZS 1044: 1995   | Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus. |
| Canada ICES-003 1997<br>AS/NZS 3548 1995  | Digital apparatus<br>Australian/New Zealand Standard Limits and methods of measurement of radio disturbance characteristics of information technology equipment   |   |   |
| CISPR 11 1990, 1997                       | Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.   | Immunity<br>CNS13783-1<br>SABS CISPR 14-1 1993                | Household Electrical Appliances<br>Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 1: Emission – Product family standard                     |
| EN 55011 1991, 1998                       | Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.   | SABS CISPR 14-2 1997  | Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity - Product family standard  |
| SABS CISPR 11:1997                        | Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics Limits and methods of measurement  | CISPR 14-2 1996   | Immunity requirements for household appliances, tools and similar apparatus.  |
| Canada ICES-001 1998                      | Industrial, scientific and medical radio frequency generators   | CISPR 20 with amendment 3                                     | Limits and methods of measurement of immunity characteristics of sound and television broadcast receivers and associated equipment.   |
| CNS13803<br>AS/NZS 2064: 1997             | Industrial, Scientific and Medical Instrument<br>Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.  | EN 55020 1995   | Electromagnetic immunity of broadcast receivers and associated equipment.   |
| CSA C108.8 – M1983                        | Electromagnetic Emission from Data Processing Equipment and Electronic Office Machines  | CISPR 24  | Information technology equipment – Immunity characteristics – Limits and methods of measurement   |
| CISPR 13 1996, 1998                       | Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment.   | SABS CISPR 24 1997  | Information technology equipment – Immunity characteristics – Limits and methods of measurement   |
| EN 55013 1990                             | Sound and television broadcast receivers and associated equipment: Electromagnetic compatibility. Part 1: Specification for limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment. | AS/NZS 3200.1.2: 1995   | Approval and test specification – Medical electrical Equipment – General requirements for safety – Collateral Standard: Electromagnetic compatibility – Requirements and tests.                               |
| EN 55013 Amend 12 1994                    | Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment. Amendment 12  | European Union Basic EMC Standards<br>EN 61000-4-2 1995, 1999 | Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 2: Electrostatic discharge immunity test – Basic EMC Publication   |
| SABS CISPR 13: 1996                       | Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment.   | EN 61000-4-3 1997, 1998<br>AS/NZS 61000.4.3 1999              | Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 3: Radiated, radio-frequency, electromagnetic field immunity test  |
| (A2LA Cert. No. 1627-01) Revised 02/21/02 | <i>Pete. Hays</i> Page 2 of 9   | (A2LA Cert. No. 1627-01) Revised 02/21/02                     | <i>Pete. Hays</i> Page 3 of 9   |
| EN 61000-4-4 1995                         | Electromagnetic compatibility (EMC). Part 4: Testing  | EN 61326 1998   | Electrical equipment for measurement, control and   |



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|---|--|--|
| <p>EN 61000-4-5 1995<br/>AS/NZS 61000.4.5 1999<br/>EN 61000-4-6 1996<br/>AS/NZS 61000.4.6 1999</p> <p>EN 61000-4-8 1994</p> <p>EN 61000-4-11 1994</p> <p>ENV 61000-2-2 1993</p> <p><i>EU Product Family Standards</i><br/>EN 50081-1 1992</p> <p>EN 50081-2 1993</p> <p>EN 50082-1 1992, 1998</p> <p>EN 50082-2 1995</p> <p>EN 61000-6-1 1997</p> <p>EN 61000-6-2 1998</p> <p>EN 50091-2 1996</p> <p>EN 55024 1998</p> <p>EN 55103-1 1997</p> <p>EN 55103-2 1997</p> <p>(A2LA Cert. No. 1627-01) Revised 02/21/02</p> | <p>and measurement techniques. Section 4: Electrical fast transient/burst immunity test – Basic EMC publication<br/>(EMC) Part 4: Testing and measurement techniques. Section 5: Surge immunity test<br/>Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 6: Immunity to conducted disturbances, induce by radio-frequency fields<br/>Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 8: Power frequency magnetic field immunity test.<br/>(EMC) Part 4: Testing and measurement techniques. Section 11: Voltage dips, short interruptions and voltage variations immunity tests.<br/>Electromagnetic compatibility (EMC). Part 2: Environment, Section 2: Compatibility levels for low-frequency conducted disturbances and signaling in public low-voltage power supply systems (IEC 1000-2-2:1990)</p> <p>Electromagnetic capability – Generic emission standard. Part 1: Residential, commercial and light industry. (I.S.)<br/>Electromagnetic compatibility – Generic emission standard. Part 2: Industrial environment<br/>Electromagnetic compatibility – Generic emission standard. Part 1: Residential, commercial and light industry<br/>Electromagnetic compatibility – Generic immunity Standard. Part 2: Industrial environment<br/>Electromagnetic Compatibility (EMC)- Part 6: Generic standards- Section 1: Immunity for residential, commercial and light-industrial environments<br/>Electromagnetic Compatibility (EMC)- Part 6: Generic standards- Section 2: Immunity for industrial environments<br/>Specification for Uninterruptible Power Systems (UPS). Part 2: EMC requirements<br/>Information technology equipment – Immunity Characteristics – Limits and methods of measurement.<br/>Electromagnetic Compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1: Emission<br/>Electromagnetic Compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control professional use. Part 2: Immunity</p> <p><i>Pete Hays</i></p> <p>Page 4 of 9</p> | <p>EN 61547 1996</p> <p>EN 50130-4 1996</p> <p>EN 55104 1995</p> <p>EN 50083-2 1995</p> <p>EN 60601-1-2 1993</p> <p>IEC 1800-3 1995</p> <p>EN 60555 Part 2 1987</p> <p>EN 60555 Part 3 1987</p> <p>EN 61000-3-2 1995<br/>AS/NZS 61000.3.2 1998<br/>EN 61000-3-3 1995<br/>AS/NZS 61000.3.3 1999</p> <p>ETS 300 386-1 1994</p> <p>ETS EN 300 386-2 1997, 1998</p> <p>ETS 300 132-1 1996</p> <p>ETS 300 132-2 1996</p> <p>ETR 283 1997</p> <p>(A2LA Cert. No. 1627-01) Revised 02/21/02</p> <p>laboratory use – EMC requirements<br/>Equipment for general lighting purposes – EMC immunity requirements<br/>Alarm Systems. Part 4: Electromagnetic compatibility. Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.<br/>Electromagnetic compatibility immunity – requirements for household appliances, tools and similar apparatus. Product family standard.<br/>Cabled distribution systems for television and sound signals. Part 2: Electromagnetic compatibility for equipment.<br/>Medical electrical equipment Part 1: general requirements for safety Section 2: Collateral standard: Electromagnetic compatibility – requirements and tests<br/>Adjustable speed electrical power drive systems. Part 3: EMC product standard including specific test methods.<br/>Disturbances in supply systems caused by household appliances and similar electrical equipment. Part 2: Harmonics<br/>Disturbances in supply systems caused by household appliances and similar electrical equipment. Part 3: Voltage fluctuations.<br/>Electromagnetic compatibility (EMC). Part 3: Limits Section 2: Limits for harmonic current emissions<br/>Electromagnetic compatibility (EMC). Part 3: Limits Section 2: Limitation of voltage fluctuations and flicker in low-voltage supply systems.<br/>Equipment Engineering (EE); Public telecommunication network equipment electromagnetic compatibility (EMC) requirements Part 1: Product family overview, compliance criteria and test levels<br/>Electromagnetic compatibility and radio spectrum matters (ERM); Telecommunication network equipment; Electromagnetic compatibility (EMC) requirements; Part 2: Product family standard.<br/>Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 1: Operated by alternating current (ac) derived from direct current (dc) sources<br/>Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 2: Operated by direct current (dc)<br/>Equipment Engineering (EE); Transient voltages at interface A on telecommunications direct current (DC) power distributions.</p> <p><i>Pete Hays</i></p> <p>Page 5 of 9</p> |
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| <p><i>EU radio standards</i><br/>(ETS) EN 300 385 v1.2.1 1998</p> <p>(ETS) EN 300 220-1 v1.2.1 1997</p> <p>(ETS) EN 300 220-2 v1.2.1 1997</p> <p>(ETS) EN 300 330 v1.2.1 1998</p> <p>ETS 300 328 1996</p> <p>ETS EN 300 440 v1.2.1 1999</p> <p><i>Canada Radio Standards</i><br/>Canadian GL-36 1995</p> <p>Canadian RSS-119 1996</p> <p>Canadian RSS-134 1996</p> <p>Canadian RSS-210 Issue 3, Feb 5, 2000</p> <p>RFS29 1998</p> <p><i>FCC Standards</i><br/>47 CFR FCC low power transmitters operating on frequencies below 1 GHz, emergency alert systems, unintentional radiators and ISM devices.<br/>47 CFR FCC low power transmitters operating on frequencies above 1 GHz, with the exception of spread spectrum devices.</p> <p><i>Pete Hays</i></p> <p>(A2LA Cert. No. 1627-01) Revised 02/21/02</p> | <p>Electromagnetic compatibility and Radio spectrum matters (ERM); ElectroMagnetic Compatibility (EMC) standard for fixed radio links and ancillary equipment<br/>Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW; Part 1: Parameters intended for regulatory purposes<br/>Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW; Part 2: Supplementary parameters not intended for regulatory purposes<br/>Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices (SRD); Technical characteristics and test methods for radio equipment in the range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz<br/>Radio Equipment and Systems (RES); Wideband transmission systems; Technical characteristics and test conditions for data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques<br/>Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 1 Ghz to 40 Ghz frequency range</p> <p>Industry Canada – technical requirements for low power Devices in the 2400 – 2483.5 MHz band.<br/>Industry Canada – Land mobile and fixed radio transmitters and receivers, 27.41 to 960.0 MHz<br/>Industry Canada – 900 MHz narrowband personal communications services<br/>Industry Canada – Low power license-exempt radio communication devices<br/>Specification for Restricted Radiation Radio Apparatus (New Zealand)</p> <p>Scope A1</p> <p>Scope A2</p> <p><i>Pete Hays</i></p> <p>Page 6 of 9</p> | <p>47 CFR FCC Unlicensed Personal Communications System (PCS) devices<br/>47 CFR FCC Unlicensed National Information Infrastructure devices and low power transmitters using spread spectrum techniques.<br/>47 CFR FCC Personal mobile Radio Services in the following FCC Rule Parts 22, 24, 25, 27.<br/>47 CFR FCC General Mobile Radio Services in the following FCC Rule Parts 22, 74, 90, 95, 97.<br/>47 CFR FCC Maritime and Aviation RadioServices in 47 CFR Parts 80 and 87<br/>47 CFR FCC Microwave Radio Services in 47 CFR Parts 21, 74 and 101.<br/>FCC/OST MP-5 1986</p> <p>GR-1089-CORE 1997, 1999</p> <p><i>ANSI EMC Standards</i><br/>ANSI C63.4 1992, 1999</p> <p>ANSI C63.5 1988</p> <p><i>IEEE EMC Standards</i><br/>IEEE C62.41 1980</p> <p><i>Swedish EMC Standards</i><br/>BAKOM 3336.3 1995</p> <p><i>South African EMC standards other than CISPR equivalents</i><br/>SABS 1718-1: 1996</p> <p><i>Japanese VCCI Standards</i><br/>VCCI V-3/99.05 1999<br/>VCCI V-4/99.05 1999</p> <p>Scope A3</p> <p>Scope A4</p> <p>Scope B1</p> <p>Scope B2</p> <p>Scope B3</p> <p>Scope B4</p> <p>FCC (Federal Communications Commission) methods of measurement of radio noise emissions from industrial, scientific and medical equipment.<br/>Bellcore electromagnetic compatibility and electrical safety – Generic criteria for network telecommunications equipment.<br/>American National Standard of methods of measurement of radio-noise emissions for low-voltage electrical and electronic equipment in the range of 9 kHz to 40GHz.<br/>American National Standard for electromagnetic compatibility – radiated emissions measurements in electromagnetic interference (EMI) control – calibration of antennas.<br/>IEEE recommended practice on surge voltages in low-voltage AC power circuits<br/>Electromagnetic compatibility and electrical safety (EMC &amp; S) for wired terminal equipment. Harmonization documentation information over the OFCOM requirements.<br/>South African Bureau of Standards: Specification for Gaming equipment. Part 1: Casino equipment.<br/>Technical Requirements<br/>Instruction for Test Conditions for Requirement under test</p> <p><i>Pete Hays</i></p> <p>(A2LA Cert. No. 1627-01) Revised 02/21/02</p> |
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**Telecommunications**

Telecommunications Registration; General test methods; Lightning surge; Drop testing; Balance testing; Signal power (metallic and longitudinal); Frequency measurements; Pulse templates; Leakage testing; Impedance testing; Hearing Aid Compatibility testing; Protocol analysis and Jitter testing.

| Telecom Standards                               | Title   |                                |  |
|---|---|--------------------------------|--|
| FCC 47 CFR Part 68 Telephone Terminal Equipment | Connection of terminal equipment to the telephone network. Analog and Digital Equipment. TCB Scope C1.  | TBR 013 : 1996                 | Business TeleCommunications (BTC); 2 048 kbit/s digital structured leased lines (D2048S); Attachment requirements for terminal equipment interface   |
| CS-03 Issue 8 1996 through amendment 3          | Specification for terminal equipment, terminal systems, Network protection devices, connection arrangements and hearing aids compatibility. Bulletin Part 68 Rationale and Measurement Guidelines (Feb 1998)  | TBR 21 : 1998                  | Terminal Equipment (TE); Attachment requirements for pan-European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE (excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signaling |
| TIA/EIA TSB31-B 1998                            |   | TBR 24 : 1997                  | Business TeleCommunications (BTC); 34 Mbit/s digital unstructured and structured leased lines (D34U and D34S); Attachment requirements for terminal equipment interface  |
| TBR 1 : 1995                                    | Attachment requirements for terminal equipment to be connected to circuit switched data networks and leased circuits using a CCITT Recommendation X.21 interface, or at an interface physically, functionally and electrically compatible with CCITT Recommendation X.21 but operating at any data signalling rate up to, and including, 1 984 kbit/s | Australia<br>TS 002 : 1997     | Analogue Interworking and Non interference Requirements for Customer Equipment Connected to the Public Switched Telephone Network  |
| TBR 2 : 1997                                    | Attachment requirements for Data Terminal Equipment (DTE) to connect to Packet Switched Public Data Networks (PSPDNs) for CCITT Recommendation X.25 interfaces at data signalling rates up to 1 920 kbit/s utilizing interfaces derived from CCITT Recommendations X.21 and X.21 bis  | TS 016 : 1997                  | General Requirements for Customer Equipment Connected to Hierarchical Digital Interfaces   |
| TBR 3 : 1995 + Amdt : 1997                      | Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access  | TS 031 : 1997<br>TS 038 : 1997 | Requirements for ISDN Basic Access Interface Requirements for ISDN Primary Rate Access Interface   |
| TBR 4 : 1995 + Amdt : 1997                      | Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN primary rate access   | ASI/ACIF S043.2:2001           | Requirements for Customer Equipment for connection to a metallic loop interface of a Telecommunications Network – Part 2   |
| TBR 012 : 1993 + Amdt : 1996                    | Business TeleCommunications (BT); Open Network Provision (ONP) technical requirements; 2 048 kbit/s digital unstructured leased line (D2048U) Attachment requirements for terminal equipment  |                                | Broadband  |

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**Product Safety**

General test methods; Input tests; Electric strength tests; Impulse tests; Permanency of marking tests; Accessibility tests; Energy Hazard measurements; Capacitor discharge tests; Humidity conditioning; Earthing tests; Limited power source measurements; Stability tests; Steel ball tests; Lithium Battery Reverse Current measurements; Leakage current tests; Transformer abnormal tests; Telecom leakage tests; Overvoltage/power cross tests.

| Product Safety Standards   | Title  |   |  |
|--|--|---|--|
| <b>Specific Product Safety Standards</b>   |  | UL 3111-1 1996<br>UL 3121-1 1995<br>IEC 60601-1 1995  | Electrical measuring and test equipment. Part 1: General requirements.<br>Medical electrical equipment. Part 1: General requirements for safety.   |
| IEC 950 1991<br>Includes Amendments 1, 2, 3 and 4<br>UL 1950 1998                              | Safety of information technology equipment including electrical business equipment.  | EN 60601-1<br>UL 2601-1 1997  | Medical electrical equipment. Part 1: General Requirements for safety.   |
| CSA C22.2 No.950-95  | Safety of Information Technology Equipment (UL 1950)   | IEC 60065 1998, 2000  | Audio, video and similar electronic apparatus – Safety requirements  |
| UL 60950 2000<br>IEC 60950 2000<br>EN 60950 1997, 1998<br>IEC 60950-1 2001<br>AS/NZS 3260 1993 | Safety of information technology equipment<br>Safety of information technology equipment<br>Safety of information technology equipment, including Electrical business equipment.                 | ANSI/UL 6500: 1998<br>CAN/CSA 60065-00  | Audio/video and musical instrument apparatus for Household, commercial and similar general use   |
| AS/NZS 3260 Supp 1 1996  | Approval and test specification – Safety of information technology equipment including electrical business Equipment.  | AS/NZS 3250 1995<br>AS/NZS 60065 2000   | Australian/New Zealand Standard – Approval and test Specification – Mains operated electronic and related Equipment for household and similar general use  |
| ACA TS 001 1997  | Approval and test specification – Safety of information technology equipment including electrical business equipment – Alphabetical reference index to IEC 950 (Supplement to AS/NZS 3260:1993)  | Canadian C22.2 No. 1-94 (1-98)<br>1994, 1998<br>EN 60065 1994   | Audio, video and similar electronic equipment. Consumer and commercial products<br>Safety requirements for main operated electronic and related apparatus for household and similar general use. |
| UL 1459 1995<br>IEC 1010-1 1990<br>IEC 61010-1 1993  | Australian Communications Authority – Safety requirements for customer equipment.<br>Telephone Equipment   | IEC 60825 1990  | Radiation safety of laser products, equipment Classification, requirements and user's guide  |
| EN 61010-1 1993<br>IEC 61010-1 2000  | Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements.  | EN 60825-1 1994<br>IEC 60825-1 2001<br>IEC 60825-2 2000-5   | Safety of laser products Part 1: equipment Classification, requirements and user's guide.<br>Safety of laser products – Part 2: Safety of optical communication systems                          |
| UL 3101-1 1993<br>CAN/CSA 1010-1 1999 (Including AM 2)   | Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements.<br>Electrical equipment for laboratory use Part 1: General requirements. | IEC 60825-4 1997-11<br>IEC 60335-1 1995<br>(Including AM2 – 1997 & AM 12 – 1997)<br>EN 60335-1 2001<br>UL 60335-1 1998<br>CAN/CSA E335-1 1994 | Safety of laser products – Part 4: Laser guards<br>Safety of household and similar electrical appliances Part 1: General requirements  |

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