Curtis-Straus Test Report

Report No EF0764-3

> LS Starrett Client

> > 121 Crescent Street Athol, MA 01331

Phone 978-249-3551

FRN 0014116503

RSS-210 Issue 6; FCC Part 15.249

Model 1500-3 FCC ID TV81500-3 IC 6164A-15003

Equipment Type Low Power Communications Device Transmitter **Equipment Code** DXX **Emission Designator** K₁D

> Results As detailed within this report

Prepared by

David Harris – Test Engineer

Authorized by

Michael Buchholz – EMC Manager

Issue Date 1/17/06

Conditions of issue This Test Report is issued subject to the conditions stated in 'terms and conditions' section of this report.

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Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.249 and RSS-210(A2.9). The product is the EndNode, MN 1500-3. It is a transmitter that operates at 916.5 MHz.

Test Methodology

Radiated emissions testing are performed according to the procedures specified in ANSI C63.4 (2003) and RSS-GEN. Emissions were maximized by rotating the device around three orthogonal axes as well as varying the test antenna's height and polarity. The environmental conditions are shown below.

Date	Temperature (°c)	Humidity (%)
10/20/05	24.2	29
10/28/05	23.4	25

Frequency range investigated: 0.15MHz – 10GHz

Measurement distance:

30MHz – 3GHz 3m 3 – 10GHz 1m

A fresh battery was used for testing.



Statement of Conformity

The EndNode, MN 1500-3 has been found to conform to the following parts:

RSS-GEN	RSS 210	Part 15	Comments
5.3		15.15(b)	There are no controls accessible to the user that vary the output power.
5.2		15.19	The label is shown in the label exhibit.
7.1.5		15.21	Information to the user is shown in the instruction manual exhibit.
		15.27	No special accessories are required for compliance.
7.1.4		15.203	The antenna for this device is hardwired to the PCB.
	2.6	15.205 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.
7.2.2		15.207	EUT meets the AC Line conducted emissions requirements of 15.207.
	A2.9	15.249	The unit complies with the requirements of 15.249



EUT Configuration

EUT Configuration

Work Order: F0764 Company: LS Starrett

Company Address: 121 Crescent Street

Athol, MA 01331 **Contact:** John Belliveau

MN SN

EUT:

EndNode - Starrett Opto Connector 1500-3-N Sample 1

EUT Description: Endnode **EUT Max Frequency**: 916.6MHz

Support Equipment: MN SN

None

 EUT Cables:
 Qty
 Shielded?
 Length
 Ferrites

 Tool extension cable
 1
 Yes
 0.1m
 None

Unpopulated EUT Ports: Qty Reason

None

Software / Operating Mode Description:

EUT was running in the transmit mode specified by the test. The modes available are: sleep, ASK transmit, OOK transmit, and receive. Unless otherwise stated the EUT was operating in ASK transmit mode which is the maximum transmitted power level mode.



Fundamental Measurement

LIMIT

QuasiPeak: 93.9dBµV/m @ 3m [15.35(b)]

MEASUREMENTS

Fundam	ental										Curtis-Stra	us LLC
Date:	28-Oct-05			Company:	Company: LS Starrett					W	ork Order: F	0764
Engineer:	David Harris			EUT Desc:	T Desc: Endnode							
									Measuremer	nt Distance: 3	m	
Notes:												
			1				r					
Antenna			Preamp	Antenna	Cable	Adjusted		15.249		_		
Polarization	Frequency	Reading	Factor	Factor	Factor	Reading	Limit	Margin	Result			
(H / V)	(MHz)	(dBµV)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)			
Н	916.35	54.1	0.0	22.9	4.6	81.6	94.0	-12.5	Pass			
Table	e Result:	Pass	by	-12.5	dB				Wo	orst Freq:	916.35 N	ЛНz
Test Site:	"F"	Pre-Amp:	none	Cable:	EMIR-0	4	Analyzer:	Blue		Antenna: F	Red-White	

Band Edge Measurements

LIMITS

QuasiPeak limit: FCC Class B limits 46dBuV/m @ 3m [15.35)b)]

MEASUREMENTS

Band Ed	ges										Curtis-St	raus LLC
Date:	20-Oct-05			Company:	LS Starr	ett				W	ork Order	F0764
Engineer:	David Harris			EUT Desc:	Endnode							
									Measuremer	nt Distance:	3 m	
Notes:									EU.	T Max Freq:	916.3MHz	
Antenna			Preamp	Antenna	Cable	Adjusted				F	CC Class	В
Polarization	Frequency	Reading	Factor	Factor	Factor	Reading				Limit	Margin	Result
(H / V)	(MHz)	(dBµV)	(dB)	(dB/m)	(dB)	(dBµV/m)				(dBµV/m)	(dB)	(Pass/Fail)
Vpk	902.0	21.8	20.2	21.6	8.1	31.3				46.0	-14.7	Pass
Vpk	928.0	21.9	20.2	21.8	8.2	31.7				46.0	-14.3	Pass
Table	e Result:	Pass	by	-14.3	dB				Wo	orst Freq:	928.0	MHz
Test Site:	"A"	Pre-Amp:	Black	Cable:	EMIR-06	6	Analyzer:	White		Antenna:	Green	



Radiated Spurious Emissions

LIMITS

Average (above 1000MHz): $500\mu V/m = 53.9 dB\mu V/m @ 3m [15.249(a), (b), and (d)]$

QuasiPeak limit (30-1000MHz): FCC Class B limits @ 3m [15.35(b)]

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

MEASUREMENTS

Spurious	s Emissi	ons									Curtis-St	raus LLC
	28-Oct-05			Company:						W	ork Order:	F0764
Engineer:	David Harris			EUT Desc:	Endnod	е						
Frequency Range: 30MHz-10GHz Measurement Distance: 3 m												
Notes:									EU	Max Freq:	916.3MHz	
Antenna			Preamp	Antenna	Cable	Adjusted				F	CC Class I	В
Polarization	Frequency	Reading	Factor	Factor	Factor	Reading				Limit	Margin	Result
(H / V)	(MHz)	(dBµV)	(dB)	(dB/m)	(dB)	(dBµV/m)				(dBµV/m)	(dB)	(Pass/Fail)
Н	1832.0	34.8	18.7	28.4	2.5	47.0				54.0	-7.0	Pass
Н	2749.0	27.5	20.3	30.7	3.0	40.9				54.0	-13.1	Pass
Table	e Result:	Pass	by	-7.0	dB				Wo	orst Freq:	1832.0	MHz
Test Site:	"F"	Pre-Amp:	Yel-Blk	Cable:	EMIR-H	IGH 5	Analyzer: Ora	ange		Antenna:	Yellow Horr	1

AC Line Conducted Emissions **LIMITS**

Frequency of	Quasi-peak limit	Average limit		
emission (MHz)	(dBµV)	(dBµV)		
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.

[47 CFR 15.207(a)]

MEASUREMENTS

AC Line Conducted Emissions is NA because the EUT is Battery powered.

Voltage Variations

Voltage Variations test is NA because the EUT is battery powered.



Test Equipment Used

RED									v. 05-OCT		
RED			RANGE	MN	l MFF	2	SN	ASSET	Сат	Ī	CALIBRATION DUE
WHITE 994Hz-200Hz 8593E HP 3223A0272 00070 0 0 0 0 0 0 0 0		5	0117 1 0017	0504	IF LID	2444	102550	00004			42 IAN 2006
BLUE											
Yellow 98H+2-90cht 8594E HP 3823A01498 00100 1 22-APR-2006											
GREEN 9941-22-05-0FL 8593E HP 3829A03818 00143 1 02-AUG-2006											
BILACK 99th-1280Hz 2096-000 1									-		
Yellow-Black 2014-4-0.0MHz 3585A HP 2504A05219 00030 1 Out of Service											
TELECOM 3585A 2014-40.0MHz 34585A HP 1750A02762 01067 1		014							- !		
CRANSE Mile 2-26-50Hz E4407B HP US39440975 0.0394 1 22-JUN-2006											
March Marc		35A							!		
LISNS/MEASUREMENT PROBES MIN MFR SN ASSET CAT CALIBRATION DUE									!		
RED	EMI TEST RECE	IVER	20-1000MHZ	ESVS	30 R&S	8279	57/001	01098	I		27-001-2005
RED	LISNS/MEASUREM	1ENT	RANGE						ASSET	Сат	
BILUE (DC)	Probes										CALIBRATION DUE
Yellow-Bláck				8012-50-	R-24-BNC	SOLAR					15-APR-2006
ORANGE	BLUE (DC)	10)kHz-30MHz	8012-50-	R-24-BNC		95	6349		II	
GOLD (DC)	YELLOW-BLACK	(10	KHz-30MHz	8012-50-	R-24-BNC	SOLAR	98	4735	00248	II	15-APR-2006
BROWN	Orange	10	KHz-30MHz	8012-50-	R-24-BNC	SOLAR	90	3707	00754	II	02-MAY-2006
BROWN	GOLD (DC)	10	KHz-30MHz	8012-50-	R-24-BNC	SOLAR	98	4734	00247	II	02-MAY-2006
GREEN		10	KHz-30MHz	8012-50-	R-24-BNC					II	04-MAY-2006
YELLOW	Green	10	KHz-30MHz	8012-50-	R-24-BNC		041	11657			04-MAY-2006
WHITE-BLACK		10	KHz-30MHz								
BLACK		10	kHz-30MHz		_						
RED-BLACK											
BLUE-BLACK MOHE-30MHz 8610-50-TS-100-N SOLAR 972018 0.0676 11 15-APR-2006 15-APR-2006 15-APR-2007 1 26-MAY-2007 2 2 2 2 2 2 2 2 2											
Stille Monitoring Probe 0.01-150MHz 91550-2 ETS 50972 00493 24-NOV-2007											
Yellow Monttoring Probe 0.01-150MHz										"	
GREEN CURRENT TRANSFORMER 150KH2-20MHZ 150KH2-2 N/A C-S N/A 00805 II 07-APR-2007		KODL									
TRANSFORMER 150 PEARSON 10226 SUBSTITUTE 175 PEARSON 10226 SUBSTITUTE 107-APR-2007				910	50-2	EIS	30	J912			24-INOV-2003
BLUE CISPR LINE PROBE 150kHz-		• •	01 12 -2 01VII 12	1	50	PEARSO	N 10	0226	00793	'	07-APR-2007
BLACK CISPR LINE PROBE 105KHz					J/A	C-S	1	N/A	00805	II	08-JUN-2007
CISPR TELCO VOLTAGE PROBE 10kHz-30MHz	BLACK CISPR LINE P	ROBE							NONE	п	
CISPR 22 Telco ISN			30MHz								
OPEN AREA TEST SITE (OATS) FCC CODE IC CODE VCCI CODE CAT CALIBRATION DUE SITE F 934448 IC 2762-F R-1688 II 04-APR-2007 SITE A 93448 IC 2762-T R-905 II 11-AUG-2007 SITE M 93448 IC 2762-M R-903 II 13-AUG-2007 SITE M 93448 IC 2762-M R-904 II 19-MAR-2007 LINE CONDUCTED TEST SITES FCC CODE IC CODE VCCI CODE CAT CALIBRATION DUE EMI 1 93448 N/A C-1801 II 01-MAY-2006 EMI 2 93448 N/A C-1802 II 01-MAY-2006 EMI 3 93448 N/A C-1802 II 01-MAY-2006 EMI 3 93448 N/A C-1802 II 01-MAY-2006 EMI 4 93448 N/A C-1802 II 01-MAY-2006 EMI 5 8ASET CAT CALIBRATION DUE 11-MAY-2006 10-MAY-2006										- 11	
SITE F	0.0. 1. 22 12200							31.0	007.10		20 00 : 2000
SITE T 93448 IC 2762-T R-905 II 14-AUG-2007 SITE A 93448 IC 2762-A R-903 II 13-AUG-2007 SITE M 93448 IC 2762-M R-904 II 19-MAR-2007 SITE M SITE M	OPEN AREA TES	ST SITE (OA)	rs)	FCC C	ODE	IC CODE	. V	CCI CODE	Сат		CALIBRATION DUE
SITE A 93448 IC 2762-A R-903 II 13-AUG-2007 19-MAR-2007	SIT	ΈF				IC 2762-	F		II		04-APR-2007
SITE M 93448 IC 2762-M R-904 II 19-MAR-2007	SIT	ΈT		9344	8	IC 2762-	Τ	R-905	II		14-AUG-2007
LINE CONDUCTED TEST SITES FCC CODE IC CODE VCC CODE CAT CALIBRATION DUE	SIT	EΑ		9344	8	IC 2762-	A	R-903	II		13-AUG-2007
MIXER HORN 40-60 GHz M12HW/A OML E30110-1 00822 1 03-MAR-2007	SITI	E M		9344	8	IC 2762-l	М	R-904	II		19-MAR-2007
MIXERS/DIPLEXERS											
Mixers/Diplexers Range MN MFR SN ASSET CAT CALIBRATION DUE			ES						E		
MIXERS/DIPLEXERS RANGE MN MFR SN ASSET CAT CALIBRATION DUE MIXER / HORN 26.5-40 GHz 11970A/28-442-6 HP/ATM 2332A01695/A046903-01 1087 I 23-AUG-2006 MIXER / HORN 26.5-40 GHz 11970A/28-442-6 HP/ATM 3003A07825/A046903-01 1086 I 23-AUG-2006 MIXER / HORN 40-60 GHz M19HW/A OML U30110-1 00821 I 02-MAR-2007 MIXER / HORN 60-90 GHz M12HW/A OML E30110-1 00822 I 03-MAR-2007 MIXER / HORN 90-140 GHz MO8HW/A OML F21206-1 00811 I 03-MAR-2007 MIXER / HORN 140-220 GHz MO5HW/A OML G21206-1 00812 II OUT OF CALIBRATION DUE PREAMPS / ATTENUATORS / FILTERS RANGE MN MFR SN ASSET CAT CALIBRATION DUE BLUE 0.01-2000MHz ZFL-1000-LN C-S N/A 00798 II 08-APR-2006 <					-						
Mixers/Diplexers Range MN MFR SN Asset Cat Calibration Due											
Mixer Horn 26.5-40 GHz 11970A/28-442-6 HP/ATM 2332A01695/A046903-01 1087 1 23-AUG-2006 Mixer Horn 26.5-40 GHz 11970A/28-442-6 HP/ATM 3003A07825/A046903-01 1086 1 23-AUG-2006 Mixer Horn 40-60 GHz M19HW/A OML U30110-1 00821 1 02-MAR-2007 Mixer Horn 60-90 GHz M12HW/A OML E30110-1 00822 1 03-MAR-2007 Mixer Horn 90-140 GHz MO8HW/A OML F21206-1 00811 1 03-MAR-2007 Mixer Horn 140-220 GHz MO5HW/A OML G21206-1 00812 II OUT OF CALIBRATION DIPLEXER 40-220 GHz DPL.26 OML N/A 00813 1 03-MAR-2007 MIXER	Liv	11 3		9344	0	IN/A		C-1003		11	01-WA1-2000
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BLUE 0.01-2000MHz ZFL-1000-LN C-S N/A 00759 II 03-AUG-2006 BLUE-BLACK 0.01-2000MHz ZFL-1000-LN C-S N/A 00800 II 10-FEB-2006 GREEN 0.01-2000MHz ZFL-1000-LN C-S N/A 00802 II 21-JUL-2006 BLACK 0.01-2000MHz ZFL-1000-LN C-S N/A 00799 II 25-AUG-2006											
BLUE-BLACK 0.01-2000MHz ZFL-1000-LN C-S N/A 00800 II 10-FEB-2006 GREEN 0.01-2000MHz ZFL-1000-LN C-S N/A 00802 II 21-JUL-2006 BLACK 0.01-2000MHz ZFL-1000-LN C-S N/A 00799 II 25-AUG-2006											
GREEN 0.01-2000MHz ZFL-1000-LN C-S N/A 00802 II 21-JUL-2006 BLACK 0.01-2000MHz ZFL-1000-LN C-S N/A 00799 II 25-AUG-2006											
BLACK 0.01-2000MHz ZFL-1000-LN C-S N/A 00799 II 25-AUG-2006											
	BLACK	0.01-2	UUUMHZ	∠FL-100	U-LN	C-S		N/A	00799	II	



ORANGE	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00765	Ш	10-FEB-2006
WHITE	1-20GHz	SMC-12A	C-S	426643	00760	Ш	04-AUG-2006
BROWN	1-20GHz	PM2-38-218-4R5-17-15- SFF	C-S	PL1655	1132	II	27-JUN-2006
YELLOW-BLACK	1-20GHz	SMC-12A	C-S	535055	00801	П	25-AUG-2006
HF (YELLOW)	18-26.5GHz	AFS4-18002650-60-8P-4	C-S	467559	00758	П	23-AUG-2007
HIGH PASS FILTER	1-18 GHz	SPA-F-55204	K&L	36	00817	П	06-JAN-2006
Low Pass Filter	1-9 GHz	11SL10-4100/X4400-O/O	K&L	4	00816	П	06-JAN-2006
HF 20dB 50W ATTENUATOR	0.03-20 GHz	PE 7019-20	PASTERNACK	01	00791	П	10-MAY-2007
HF 30dB 50W ATTENUATOR	0.03-20 GHz	PE 7019-30	PASTERNACK	02	1168	П	10-MAY-2007
Low Freq LPF	10-100ĸHz	L200K1G1	MICROWAVE CIRCUITS	4460-01 DC0432	1019	II	OUT OF SERVICE
Low Freq LPF	10-100ĸHz	L200K1G1	MICROWAVE CIRCUITS	4777-01 DC0434	1088	II	30-AUG-2006

ANTENNAS	RANGE	MN	MFR	SN	ASSET	Ca T	CALIBRATION DUE
GREEN BILOG	30-2000MHz	CBL6112B	CHASE	2742	00620	II	06-APR-2006
GREEN-BLACK BILOG	30-2000MHz	CBL6112B	CHASE	2412	00127	Ш	06-JAN-2006
GREEN-RED BILOG	30-2000MHz	CBL6112B	CHASE	2435	00990	Ш	OUT OF SERVICE
BLUE BILOG	30-1000MHz	3143	EMCO	1271	00803	Ш	06-MAY-2007
GRAY BILOG	20-2000MHz	3141	EMCO	9703-1038	00066	Ш	06-MAY-2007(EMI) / 05-AUG-2006(RFI)
YELLOW-BLACK BILOG	20-2000MHz	CBL6140A	CHASE	1112	00126	Ш	06-MAY-2007(EMI) / 12-AUG-2006(RFI)
RED-WHITE BILOG	30-2000MHz	JB1	SUNOL	A091604-1	01105	Ш	28-SEP-2006
RED-BLACK BILOG	30-2000MHz	JB1	SUNOL	A091604-2	01106	Ш	28-SEP-2006
YELLOW HORN	1-18GHz	3115	EMCO	9608-4898	00037	ı	27-MAY-2007(EMI) / 05-JUN-2006 (RFI)
BLACK HORN	1-18GHz	3115	EMCO	9703-5148	00056	I	17-JUN-2007
ORANGE HORN	1-18GHz	3115	EMCO	0004-6123	00390	ı	09-JUN-2007
HF (WHITE) HORN	18-26.5GHz	801-WLM	WAVELINE	00758	00758	I	26-AUG-2007
SMALL LOOP	9kHz-30MHz	PLA-130/A	ARA	1024	00755	I	23-FEB-2006
LARGE LOOP	20Hz-5MHz	6511	EMCO	9704-1154	00067	I	12-NOV-2005
ACTIVE MONOPOLE	30Hz-30MHz	3301B	EMCO	3824	00068	Ш	04-MAY-2006
INDUCTION COIL	50-60Hz	1000-4-8	C-S	N/A	00778	II	26-SEP-2007
ADJUSTABLE DIPOLE	30-1000MHz	3121C	EMCO	1370	00757	Ш	18-MAR-2007
ADJUSTABLE DIPOLE	30-1000MHz	3121C	EMCO	1371	00756	Ш	18-MAR-2007
RE101 LOOP SENSOR	30Hz-100ĸHz	RE101-13.3cm	C-S	N/A	00818	II	13-MAR-2007
RS101 RADIATING LOOP	30Hz-100ĸHz	RS101-12cm	C-S	N/A	00819	Ш	13-MAR-2007
RS101 LOOP SENSOR	30Hz-100ĸHz	RS101-4cm	C-S	N/A	00820	Ш	13-MAR-2007

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



FCC ID: TV81500-3 IC: 6164A-15003 REPORT: EF0764-3

Terms And Conditions

Paragraph 1. SERVICES. LABORATORY will:

Use the degree of care and skill ordinarily exercised by and consistent with the standards of the profession.

Perform all technical services in substantial accordance with the generally accepted laboratory principles and practices.

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:

- Provide LABORATORY with all plans, schematics, specifications, addenda, change orders, drawings and other information for the proper performance of technical services
- 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.
- Designate a person who is authorized to receive copies of LABORATORY's reports.
- 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.

 Furnish such labor and equipment needed by LABORATORY to handle samples at the LABORATORY and to facilitate the specified technical services.

GENERAL CONDITIONS: Paragraph 3.

- 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.
- 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.
- 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.

 THE ONLY WARRANTY MADE BY LABORATORY IN CONNECTION WITH ITS SERVICE PERFORMED HEREUNDER IS 3.3
- THAT IT WILL USE THAT DEGREE OF CARE AND SKILL AS SET FORTH IN PARAGRAPH I ABOVE. NO OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE OR INTENDED FOR SERVICES PROVIDED HEREUNDER. 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.
- 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
- 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.
- 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 to the CLIENT for particles readered on this project, which were in the liability of the LABORATORY to the CLIENT shall not exceed \$100,000, or the LABORATORY to the CLIENT shall not exceed \$100,000. 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:

- 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
- 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:



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.

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. Amounts overdue from CLIENT to LABORATORY shall be charged interest at a rate of 1½% per month.

5.2

5.3

Paragraph 6. ISO/IEC GUIDE 17025 ADDITIONS:

- CLIENT agrees that this test report will not be reproduced except in full, without written approval from the LABORATORY.
- 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.
- 6.3 CLIENT agrees that test results presented herein relate only to the sample tested by the LABORATORY.



A2LA Accreditation

SCOPE OF ACCE	REDITATION TO ISO/IEC 17025-1999	EN 55011 1991, 1998	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio- frequency equipment.
	CURTIS-STRAUS ¹ 527 Great Road	SABS CISPR 11:1997	Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics Limits and methods of
	Littleton, MA 01460 ninlan Phone: 978-486-8880	Canada ICES-001 1998	measurement Industrial, scientific and medical radio frequency generators
Sarry Qu	ELECTRICAL	CNS13803 AS/NZS 2064: 1997	Industrial, Scientific and Medical Instrument Limits and methods of measurement of electromagnetic disturbance
Valid until: January 31, 2006	Certificate Number: 1627.01	CSA C108.8 – M1983	characteristics of industrial, scientific and medical (ISM) radio- frequency equipment. Electromagnetic Emission from Data Processing Equipment and
laboratory to perform the following Electroma	the A2LA evaluation process, accreditation is granted to this agnetic Compatibility (EMC), Telecommunications, and Product	CISPR 13:1996, 1998, 2001	Electronic Office Machines Limits and methods of measurement of radio interference
Safety tests:		EN 55012 1000 2001	characteristics of sound and television broadcast receivers and associated equipment.
Electrostatic Discharge testing; Electrical Fast testing; Lightning Immunity testing; Voltage I	etic fields); Conducted emissions testing (voltage and current); Transient testing; Radiated Immunity testing; Conducted Immunity Dips, Interrupts and Voltage Variations testing; Magnetic Immunity Stability measurements; Longitudinal Induction measurements;	EN 55013: 1990, 2001 EN 55013 Amend 12 1994	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. Limits and methods of measurement of radio disturbance
	ing; Low frequency disturbance voltage testing; Disturbance Power		characteristics of broadcast receivers and associated equipment. Amendment 12
EMC Standards	<u>Title</u>	SABS CISPR 13: 1996	Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment.
Emissions CISPR 22 1997 with amendments 1 and 2	Limits and methods of measurement of radio disturbance	CNS 13439 AS/NZS 1053: 1999	associated equipment. Broadcast receiver and associated equipment Limits and methods of measurement of radio interference characteristics of sound and
CNS13438 1994	characteristics of information technology equipment. Limits and methods of measurement of radio interference	CISPR 14 1993	television broadcast receivers and associated equipment. Limits and methods of measurement of radio disturbance
EN55022:1994 and 1998	characteristics of information technology equipment. Limits and methods of measurement of radio disturbance characteristics of information technology equipment.	(except discontinuous disturbances) EN 55014 1993, 1997	characteristics of electrical motor- operated and thermal appliances for household and similar purposes, electric tools and electric apparatus.
SABS CISPR 22:1997	characteristics of information technology equipment. Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	discontinuous disturbances)	Limits and methods of measurement of radio disturbance (except characteristics of electrical motor- operated and thermal appliances for household and similar purposes, electric tools and similar electric
Canada ICES-003 1997 AS/NZS 3548 1995	Digital apparatus Australian/New Zealand Standard Limits and methods of	AS/NZS 1044: 1995	apparatus. Limits and methods of measurement of radio disturbance (except
	measurement of radio disturbance characteristics of information technology equipment	discontinuous disturbances)	characteristics of electrical motor- operated and thermal appliances for household and similar purposes, electric tools and similar electric
CISPR 11 1990, 1997, 1999	Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.	Immunity	apparatus.
	(isin) italio nequency equipment	CNS13783-1 SABS CISPR 14-1 1993	Household Electrical Appliances Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 1: Emission –
¹ Note: This accreditation covers testing perfor located at 168 Ayer Rd, Littleton, MA 01460	rmed at the laboratory listed above and the satellite facility	SABS CISPR 14-2 1997 + A1:2001	Product family standard Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity - Product family standard
(A2LA Cert. No. 1627-01) 11/28/05	Page 1 of 11	(A2LA Cert. No. 1627-01) 11/28/05	Page 2 of 11
CISPR 14-2 1996, 1997 + A1:2001	Immunity requirements for household appliances, tools and similar apparatus.	EN 61000-6-1: 1997, 2001	Electromagnetic Compatibility (EMC)- Part 6: Generic standards- Section 1: Immunity for residential, commercial and light-industrial
CISPR 20: 1995, 2002 with amendment 3 (associated group only)	Limits and methods of measurement of immunity characteristics of sound and television broadcast receivers and associated	EN 61000-6-2: 1998, 2001	environments Electromagnetic Compatibility (EMC)- Part 6: Generic standards-
EN 55020: 1995, 2002 (associated group only)	equipment. Electromagnetic immunity of broadcast receivers and Associated equipment.	EN 50091-2 1996	Section 2: Immunity for industrial environments Specification for Uninterruptible Power Systems (UPS). Part 2: EMC requirements
CISPR 24	Information technology equipment – Immunity characteristics – Limits and methods of measurement	EN 55024 1998	Information technology equipment – Immunity Characteristics – Limits and methods of measurement.
SABS CISPR 24 1997	Information technology equipment – Immunity characteristics – Limits and methods of measurement	EN 55103-1 1997	Electromagnetic Compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for
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 55103-2 1997 (excluding Annex A3)	professional use. Part 1: Emission Electromagnetic Compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control professional use.
European Union Basic EMC Standards	Eccessing from company - requirements and tests.	EN 61326 1998	Part 2: Immunity Electrical equipment for measurement, control and laboratory use –
EN 61000-4-2: 1995, 1999, 2001	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 2: Electrostatic discharge	EN 61547 1996	EMC requirements Equipment for general lighting purposes – EMC immunity
EN 61000-4-3:1997, 1998, 2002 AS/NZS 61000.4.3 1999	immunity test – Basic EMC Publication Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 3: Radiated, radio-frequency,	EN 50130-4 1996	requirements Alarm Systems. Part 4: Electromagnetic compatibility. Product family standard: Immunity requirements for components of fire, intruder and
EN 61000-4-4 1995	electromagnetic field immunity test Electromagnetic compatibility (EMC). Part 4: Testing and	EN 55104 1995	social alarm systems. Electromagnetic compatibility immunity – requirements for household
EN 61000 4 5 1005	measurement techniques. Section 4: Electrical fast transient/burst immunity test – Basic EMC publication	EN 50083-2 1995	appliances, tools and similar apparatus. Product family standard. Cabled distribution systems for television and sound signals. Part 2:
EN 61000-4-5 1995 AS/NZS 61000.4.5 1999 EN 61000-4-6 1996	(EMC) Part 4: Testing and measurement techniques. Section 5: Surge immunity test. Electromagnetic compatibility (EMC). Part 4: Testing	EN 60601-1-2: 1993, 2002	Electromagnetic compatibility for equipment. Medical electrical equipment Part 1: general requirements for safety Section 2: Collateral standard: Electromagnetic compatibility –
AS/NZS 61000.4.6 1999	and measurement techniques. Section 6: Immunity to conducted disturbances, induce by radio-frequency fields.	IEC 1800-3 1995	requirements and tests Adjustable speed electrical power drive systems. Part 3: EMC product
EN 61000-4-8 1994	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 8: Power frequency magnetic field immunity test.	EN 60555 Part 2 1987	standard including specific test methods. Disturbances in supply systems caused by household appliances and similar electrical equipment. Part 2: Harmonics
EN 61000-4-11 1994	(EMC) Part 4: Testing and measurement techniques. Section 11: Voltage dips, short interruptions and voltage Variations	EN 60555 Part 3 1987	Disturbances in supply systems caused by household appliances and similar electrical equipment. Part 3: Voltage fluctuations.
ENV 61000-2-2 1993	immunity tests. 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)	EN 61000-3-2: 1995, 2000 AS/NZS 61000.3.2 1998 EN 61000-3-3 1995 AS/NZS 61000.3.3 1999	Electromagnetic compatibility (EMC). Part 3: Limits Section 2: Limits for harmonic current emissions Electromagnetic compatibility (EMC). Part 3: Limits Section 2: Limitation of voltage fluctuations and flicker in low-voltage supply systems.
EU Product Family Standards EN 50081-1 1992	Electromagnetic capability – Generic emission standard. Part 1:	ETS 300 386-1 1994	Equipment Engineering (EE); Public telecommunication network equipment electro-magnetic compatibility (EMC) requirements Part 1: Product family overview, compliance criteria and test levels
EN 50081-2 1993	Residential, commercial and light industry. (I.S.) Electromagnetic compatibility – Generic emission standard. Part		and the control of th
EN 50082-1 1992, 1998	Industrial environment Electromagnetic compatibility – Generic emission standard. Part		
EN 50082-2 1995	Residential, commercial and light industry Electromagnetic compatibility – Generic immunity Standard. Part 2: Industrial environment		
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ETS EN 300 386-2 1997, 1998,	Electromagnetic compatibility and radio spectrum matters (ERM);	EN 300 328-2:2001 v1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment
ETS EN 300 386 2000 v1.2.1, 2001 v1.3.1	Telecommunication network equipment; Electromagnetic compatibility (EMC) requirements; Part 2: Product family standard.		operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
ETS 300 132-1 1996	Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 1: Operated by	EN 301 489-1:2002	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment
ETS 300 132-2 1996	alternating current (ac) derived from direct current (dc) sources Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 2: Operated by	EN 60669-2-1:2002	and services; Part 1: Common technical requirements Switches for household and similar fixed electrical installations Part 2-1: Particular requirements – Electronic switches
ETR 283 1997	direct current (dc) Equipment Engineering (EE): Transient voltages at Interface A on telecommunications direct current (DC) power distributions.	Canada Radio Standards Canadian GL-36 1995	Industry Canada – technical requirements for low power Devices in the
EU radio standards		Canadian RSS-119 1999, 2000 Issue 6	2400 – 2483.5 MHz band. Industry Canada – Land mobile and fixed radio Transmitters and
(ETS) EN 300 385 v1.2.1: 1998, 1999	Electromagnetic compatibility and Radio spectrum matters (ERM); Electromagnetic Compatibility (EMC) standard for	Canadian RSS-134 1996 & 2000, Issue 1	receivers, 27.41 to 960.0 MHz Industry Canada – 900 MHz narrowband personal communications
EN 200 220 -1 2 1, 1009 1000	fixed radio links and ancillary equipment (ETS)	Rev 1	services
EN 300 330 v1.2.1: 1998, 1999	Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices (SRD); Technical characteristics	Canadian RSS-210 2000 Issue 3,	Industry Canada – Low power license-exempt radio 2001 Issue 5 communication devices
	and test methods for radio equipment in the range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz	RFS29 1998	Specification for Restricted Radiation Radio Apparatus (New Zealand)
ETS 300 328 1996	to 30 MHz Radio Equipment and Systems (RES); Wideband transmission	FCC Standards 47 CFR FCC low power transmitters	Scope A1
	systems; Technical characteristics and test conditions for data	operating on frequencies below 1 GHz,	
	transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques	emergency alert systems, unintentional radiators and ISM devices.	
ETS EN 300 440 v1.2.1 1999	Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices; Technical characteristics and test	47 CFR FCC low power transmitters operating on frequencies above 1 GHz,	Scope A2
	methods for radio equipment to be used in the 1 Ghz to 40 Ghz frequency range	with the exception of spread spectrum devices.	
EN 301 893:2002 v1.2.1	Broadband Radio Access Networks (BRAN); 5 GHz (draft) high performance RLAN; Harmonized EN covering Essential	47 CFR FCC Unlicensed Personal Scope	A3
	requirements of article 3.2 of the R&TTE Directive	Communications System (PCS) devices 47 CFR FCC Unlicensed National Scope	A4
ETS 300 836-1:1998	Broadband Radio Access Networks (BRAN); High Performance Radio Local Area Network (HIPERLAN) Type 1; Conformance	Information Infrastructure devices and low power transmitters using spread	
	testing specification; Part 1: Radio Type approval and Radio Frequency (RF) conformance test specification	spectrum techniques. 47 CFR FCC Personal mobile Scope	BI
EN301 489-17:2002 v1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for	Radio Services in the following FCC Rule Parts 22, 24, 25, 27.	
V1.2.1	radio equipment and services; Part 17: Specific conditions for	47 CFR FCC General Mobile Radio	B2
	2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment	Scope Services in the following FCC Rule Parts 22, 74, 90, 95, 97.	
		47 CFR FCC Maritime and Aviation Scope RadioServices in 47 CFR Parts	B3
		80 and 87 47 CFR FCC Microwave Radio Services	R4
		Scope in 47 CFR Parts 21, 74 and 101.	
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FCC/OST MP-5 1986	FCC (Federal Communications Commission) methods Of	TIA/EIA-IS-968	Telecommunications Telephone Terminal Equipment Technical
	measurement of radio noise emissions from industrial, scientific and medical equipment.		Requirements for Connection of Terminal Equipment to the Telephone Network
GR-1089-CORE: 1997, 1999 issue 2/ 2002 Issue 3	Bellcore electromagnetic compatibility and electrical safety – Generic criteria for network telecommunications equipment.	TIA/EIA-IS-883	Telecommunications Telephone Terminal Equipment Supplemental Technical Requirements for Connection of Stutter Dial Tone Detection Devices and ADSL Modems to the Telephone Network
ANSI EMC Standards ANSI C63.4: 1992, 1999, 2001, 2003	American National Standard for methods of measurement of	TIA-968-A	Telecommunications Telephone Terminal Equipment Technical Requirements for Connection of Terminal Equipment to the Telephone
ANSI C03.4. 1992, 1999, 2001, 2003	radio-noise emissions for low-voltage electrical and electronic		Network
ANSI C63.5 1988	equipment in the range of 9 kHz to 40GHz. American National Standard for electromagnetic compatibility –	T1.TRQ.6-2001	Technical Requirements for SHDSL, HDSL2, HDSL4 Digital Subscriber Line Terminal Equipment to Prevent Harm to the Telephone
	radiated emissions measurements in electromagnetic interference (EMI) control – calibration of antennas.	Canada VDSL	Network Industry Terminal Attachment Program Requirements and Test Methods for
IEEE EMC Standards		Issue 1 January 2003	Very-High-Bit-Rate Digital Subscriber Line (VDSL) Terminal Equipment
IEEE C62.41: 1980, 1991	IEEE recommended practice on surge voltages in low-voltage	AS/ACIF S002-2001	Analogue interworking and non-interference requirements for
	AC power circuits		Customer Equipment for connection to the Public Switched Telephone Network
Swedish EMC Standards BAKOM 3336.3 1995	Electromagnetic compatibility and electrical safety (EMC & S)	AS/ACIF S016-2001	Requirements for Customer Equipment for connection to hierarchical digital interfaces
	for wired terminal equipment. Harmonization document information over the OFCOM requirements.	AS/ACIF S031-2001 AS/ACIF S038-2001	Requirements for ISDN Basic Access Interface Requirements for ISDN Primary Rate Access Interface
South African FMC standards at an than CISBI		AS/ACIF S043-2001	Requirements for Customer Equipment for Connection to a Metallic
South African EMC standards other than CISPI SABS 1718-1: 1996	South African Bureau of Standards: Specification for Gaming		Local Loop Interface of a Telecommunications Network — Part 1: General
	equipment. Part 1: Casino equipment.		Part 2: Broadband Part 3: DC, Low Frequency AC and Voiceband
Japanese VCCI Standards VCCI V-3/99.05 1999	Technical Requirements	ITU-T G.703 HKTA 2028	Physical/electrical characteristics of hierarchical Digital interfaces Network connection specification for connection of CPE to the PTNs in
VCCI V-4/99.05 1999	Instruction for Test Conditions for Requirement under Test		Hong Kong using digital leased circuits at data rate of 1544 kbit/s Network connection specification for connection of CPE to the PTNs in
		HKTA 2029	Hong Kong using digital leased circuits at data rate of 2048 kbit/s
	methods; Lightning surge; Drop testing; Balance testing; Signal	TBR 1: 1995	Attachment requirements for terminal equipment to be connected to circuit switched data networks and leased circuits using a CCITT
power (metallic and longitudinal); Frequency m	easurements; Pulse templates; Leakage testing; Impedance uding volume control); Protocol analysis and Jitter testing.		Recommendation X.21 interface, or at an interface physically, functionally and electrically compatible with CCITT Recommendation
			X.21 but operating at any data signaling rate up to, and including,
Telecom Standards	<u>Title</u>	TBR 2:1997	1 984 kbit/s Attachment requirements for Data Terminal Equipment (DTE) to
FCC 47 CFR Part 68 Telephone	Connection of terminal equipment to the telephone Terminal Equipment network. Analog and Digital Equipment. TCB Scope		connect to Packet Switched Public Data Networks (PSPDNs) for CCITT Recommendation X.25 interfaces at data signaling rates up to 1
CS-03 Issue 8 1996 through amendment 5	C1. Specification for terminal equipment, terminal systems,		920 kbit/s utilizing interfaces derived from CCITT Recommendations X.21 and X.21 bit
	Network protection devices, connection arrangements and hearing aids compatibility.		
TIA/EIA TSB31-B 1998	Bulletin Part 68 Rationale and Measurement Guidelines (Feb 1998)		
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TBR 3: 1995 + Amdt: 1997	Integrated Services Digital Network (ISDN); Attachment	IEC 60950 2000	Safety of information technology equipment
TBR 4 : 1995 + Amdt : 1997	requirements for terminal equipment to connect to an ISDN using ISDN basic access Integrated Services Digital Network (ISDN); Attachment	EN 60950 1997, 1998, 2000 IEC 60950-1 2001 UL 60950-1 2003 CSA C22.2 No. 60950-00	Safety of information technology equipment, including Electrical business equipment.
TBR 012 : 1993 + Amdt : 1996	requirements for terminal equipment to connect to an ISDN using ISDN primary rate access Business Telecommunications (BT); Open Network Provision	CSA C22.2 No. 60950-00 CSA C22.2 No. 60950-1 03 AS/NZS 3260 1993	Approval and test specification – Safety of information technology
	(ONP) technical requirements; 2 048 kbit/s digital unstructured leased line (D2048U) Attachment requirements for terminal equipment	AS/NZS 3260 Supp 1 1996	equipment including electrical business Equipment. Approval and test specification – Safety of information technology equipment including electrical business equipment – Alphabetical
TBR 013: 1996	Business TeleCommunications (BTC); 2 048 kbit/s digital structured leased lines (D2048S); Attachment requirements for	ACA TS 001 1997	reference index to IEC 950 (Supplement to AS/NZS 3260:1993) Australian Communications Authority – Safety requirements for
TBR 21 : 1998	terminal equipment interface 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	UL 1459 1995 IEC 1010-1 1990 IEC 61010-1 1993 EN 61010-1 1993, 2001 IEC 61010-1 2001	customer equipment. Telephone Equipment Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements. Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements.
TBR 24: 1997	Frequency (DTMF) signaling Business TeleCommunications (BTC); 34 Mbit/s digital Unstructured and structured leased lines (D34U and D34S); Attachment requirements for terminal equipment interface	UL 61010B-1 2003 UL 3101-1 1993 CAN/CSA 1010-1 1999 (Including AM 2 UL 3111-1 1996 UL 3121-1 1995	Electrical equipment for laboratory use Part 1: General requirements. 2) Electrical measuring and test equipment. Part 1: General requirements.
Australia TS 002 : 1997	Analogue Interworking and Non interference Requirements for Customer Equipment Connected to the Public Switched Telephone Network	IEC 60601-1 1995 EN 60601-1 1995 (Including AM 2) UL 2601-1 1997 IEC 60065 1998, 2000	Medical electrical equipment. Part 1: General requirements for safety. Medical electrical equipment Medical electrical equipment. Part 1: General Requirements for safety. Audio, video and similar electronic apparatus – Safety requirements
TS 016: 1997	General Requirements for Customer Equipment Connected to Hierarchical Digital Interfaces	ANSI/UL 6500: 1998 CAN/CSA 60065-00	Audio/video and musical instrument apparatus for Household, commercial and similar general use
TS 031: 1997	Requirements for ISDN Basic Access Interface	AS/NZS 3250 1995	Australian/New Zealand Standard - Approval and test
TS 038 : 1997 AS/ACIF S043.2:2001	Requirements for ISDN Primary Rate Access Interface Requirements for Customer Equipment for connection to a metallic loop interface of a Telecommunications Network – Part 2 Broadband	AS/NZS 60065 2000 Canadian C22.2 No. 1-94 (1-98) 1998	Specification – Mains operated electronic and related Equipment for household and similar general use Audio, video and similar electronic equipment. Consumer and 1994, commercial products
D 1 1000	2 Broadband	EN 60065 1994	Safety requirements for main operated electronic and related apparatus
	ength tests; Impulse tests; Permanency of marking tests;	IEC 60825 1990	for household and similar general use. Radiation safety of laser products, equipment Classification,
tests; Limited power source measurements; So	ents; Capacitor discharge tests; Humidity conditioning; Earthing tability tests; Steel ball tests; Lithium Battery Reverse Current ormer abnormal tests; Telecom leakage tests; Over voltage/power	EN 60825-1 1994 IEC 60825-1 2001 IEC 60825-2 2000-5	requirements and user's guide Safety of laser products Part 1: equipment Classification, requirements and user's guide. Safety of laser products – Part 2: Safety of optical communication systems
Product Safety Standards	<u>Title</u>	IEC 60825-4 1997-11 IEC 60335-1 1995	Safety of laser products – Part 4: Laser guards Safety of household and similar electrical appliances
Specific Product Safety Standards IEC 950 1991	Safety of information technology equipment including Includes Amendments 1, 2, 3, and 4 electrical business equipment.	(Including AM2 – 1997 & AM 12 – 1997 EN 60335-1 2001 UL 60335-1 1998	7) Part 1: General requirements
UL 1950 1998	Safety of information technology equipment, including lectrical business equipment.	CAN/CSA E335-1 1994	
CSA C22.2 No.950-95 UL 60950 2000	Safety of Information Technology Equipment (UL 1950) Safety of information technology equipment		
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UL 61010A-1 : 2002	Electrical equipment for laboratory use; part 1: General		
EN 61010-1 : 2001	requirements Safety requirements for electrical equipment for measurement,		
AS/NZS 60950 : 2000	control, and laboratory use - Part 1: General requirements Safety information technology equipment		
Environmental 2			
Environmental Standards GR-63-CORE ETS 300 019 (vibration up to 1000Hz)	Title NEBS Requirements: Physical Protection Environmental conditions and environmental tests For telecommunications equipment		
² Environmental testing is performed at the sa	atellite facility located at 168 Ayer Rd, Littleton, MA 01460		
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