



Test Report

Report No	EF0808-1
Client	Dynastream Innovations, Inc. 228 River Ave Cochrane, Alberta T4C 2C1
Phone	403-932-9292
FRN	0008033557
	RSS-210 Issue 6; 47 CFR 15.249
Model FCC ID IC	AMP231 – Activity Monitor O6RAMP231 3797A-AMP231
Equipment Type Equipment Code	Low Power Communications Device Transmitter DXX
Results	As detailed within this report
Prepared by	 Evan Gould – Test Engineer
Authorized by	 Michael Buchholz – EMC Manager
Issue Date	5/16/06
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 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 Dynastream Innovations AMP231 Activity Monitor. It is a transmitter that operates in the range 2405-2479MHz.

Test Methodology

Radiated emissions testing is 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. Voltage variations were not performed for FCC due to the fact that the EUT is battery powered. Fresh batteries were used during testing. The environmental conditions are shown below.

Date	Temperature	Humidity
11/7/05	23.2°C	35%
11/11/05	23.7°C	19%
11/22/05	22.2°C	21%

Frequency range investigated: 30MHz – 25GHz

Measurement distance:	30MHz – 3GHz	3m
	3 – 25GHz	1m

Statement of Conformity

The AMP231 – Activity Monitor has been found to conform to the following parts of 47 CFR and RSS 210 as detailed below:

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 is battery powered
	A2.9	15.249	The unit complies with the requirements of 15.249

EUT Configuration

EUT Configuration				
Work Order: F0808				
Company: Dynastream Innovations, Inc.				
Company Address: 228 River Ave Cochrane, Alberta T4C 2C1				
Contact: Lise Vanterpool				
MN		SN		
EUT: AMP231		1 thru 6		
EUT Description: Activity Monitor				
EUT Max Frequency: 2479MHz				
Support Equipment:	MN	SN		
none				
EUT Cables:	Qty	Shielded?	Length	Ferrites
none				
Unpopulated EUT Ports:	Qty	Reason		
None				
Software / Operating Mode Description:				
AMP231 transmits an approximately 200µs pulse every 15ms in normal operation. The different samples make possible both normal operation and CW mode at the lowest, middle, and highest frequency.				

Fundamental Measurement

LIMIT

Average: 50mV/m = 93.9dBμV/m @ 3m [15.249(a)]

Peak: 93.9dBμV/m + 20dB = 113.9dBμV/m @ 3m [15.35(b)]

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

MEASUREMENTS

Radiated Emissions Table								Curtis-Straus LLC			
Date: 07-Nov-05				Company: Dynastream				Work Order: F0808			
Engineer: Evan Gould				EUT Desc: AMP231							
Frequency Range: 2400-2483.5MHz								Measurement Distance: 3 m			
Notes:								RBW: 1MHz VBW: 3MHz			
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Duty Cycle Factor (dB)	Adjusted Reading (dBμV/m)	47 CFR 15.249(a)			
								Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	
Hpk	2402.0	63.0	0.0	29.7	3.0	0.0	95.7	113.9	-18.2	Pass	
Hav	2402.0	63.0	0.0	29.7	3.0	20.0	75.7	93.9	-18.2	Pass	
Hpk	2479.0	63.9	0.0	29.9	3.2	0.0	97.0	113.9	-16.9	Pass	
Hav	2479.0	63.9	0.0	29.9	3.2	20.0	77.0	93.9	-16.9	Pass	
Hpk	2466.0	63.3	0.0	29.9	3.2	0.0	96.4	113.9	-17.5	Pass	
Hav	2466.0	63.3	0.0	29.9	3.2	20.0	76.4	93.9	-17.5	Pass	
Table Result: Pass by -16.9 dB Worst Freq: 2479.0 MHz											
Test Site: "T"		Pre-Amp: none		Cable: EMIR-HIGH 7			Analyzer: White		Antenna: Orange Horn		

Worse case 100ms on-time: 1.4ms

Duty Cycle Factor = $20 \cdot \log(100\text{ms}/1.4\text{ms}) = 37.1\text{dB}$ (20dB maximum)

Band Edge Measurements

LIMITS

Average: 50dB below level of Fundamental OR

General radiated emission limits of 15.209

"...whichever is the lesser attenuation." [15.249(d)]

Peak: {Average limit} + 20dB [15.35)b)]

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

MEASUREMENTS

Radiated Emissions Table								Curtis-Straus LLC		
Date: 07-Nov-05				Company: Dynastream				Work Order: F0808		
Engineer: Evan Gould				EUT Desc: AMP231						
Frequency Range: 2400-2483.5MHz						Measurement Distance: 3 m				
Notes:						RBW: 1MHz				
						VBW: 3MHz				
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Duty Cycle Factor (dB)	Adjusted Reading (dBμV/m)	47 CFR 15.209		
								Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
Transmitting at 2402MHz										
Hpk	2399.0	40.2	0.0	29.7	3.0	0.0	72.9	74.0	-1.1	Pass
Hav	2399.0	40.2	0.0	29.7	3.0	20.0	52.9	54.0	-1.1	Pass
Transmitting at 2479MHz										
Hpk	2483.5	39.1	0.0	30.0	3.2	0.0	72.3	74.0	-1.7	Pass
Hav	2483.5	39.1	0.0	30.0	3.2	20.0	52.3	54.0	-1.7	Pass
Table Result: Pass by -1.1 dB Worst Freq: 2399.0 MHz										
Test Site: "T"		Pre-Amp: none		Cable: EMIR-HIGH 7		Analyzer: White		Antenna: Orange Horn		

The measurement taken at 2399MHz shows that the lowest channel allowed must be at least 1MHz higher than 2402MHz. The lowest channel allowed for this product is now 2405MHz, which, according to the test data shown above, is sufficient.

Radiated Spurious Emissions

LIMITS

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

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

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

MEASUREMENTS

Radiated Emissions Table								Curtis-Straus LLC		
Date: 11-Nov-05		22-Nov-05		Company: Dynamstream Innovations				Work Order: F0808		
Engineer: Evan Gould		Josh LeBlanc		EUT Desc: AMP231						
Frequency Range: 30MHz - 25GHz								Measurement Distance: 3 m		
Notes:								RBW: 1MHz		
								VBW: 3MHz		
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Duty Cycle Factor (dB)	Adjusted Reading (dBμV/m)	47 CFR 15.209		
								Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
Vpk	4932.0	48.8	17.8	35.6	3.1	0.0	69.7	74.0	-4.3	Pass
Vavg	4932.0	48.8	17.8	35.6	3.1	20.0	49.7	54.0	-4.3	Pass
30-1000MHz >>		Pre-Amp: Blue-Blk		Cable: RFI Cables		Analyzer: Red		Antenna: Gray		
1-18GHz >>		Pre-Amp: White		Cable: EMIR-HIGH 11		Analyzer: Orange		Antenna: Orange Horn		
18-25GHz >>		Pre-Amp: Yellow		Cable: EMIR-HIGH 11		Analyzer: Orange		Antenna: White Horn		

Test Equipment Used

REV. 28-OCT-2005

SPECTRUM ANALYZERS / RECEIVERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	9kHz-1.8GHz	8591E	HP	3441A03559	00024	I	13-JAN-2006
WHITE	9kHz-22GHz	8593E	HP	3547U01252	00022	I	08-MAR-2006
BLUE	9kHz-1.8GHz	8591E	HP	3223A00227	00070	I	03-NOV-2005
YELLOW	9kHz-2.9GHz	8594E	HP	3523A01958	00100	I	20-APR-2006
GREEN	9kHz-26.5GHz	8593E	HP	3829A03618	00143	I	02-AUG-2006
BLACK	9kHz-12.8GHz	8596E	HP	3710A00944	00337	I	27-DEC-2005
YELLOW-BLACK	20Hz-40.0MHz	3585A	HP	2504A05219	00030	I	Out of Service
TELECOM 3585A	20Hz-40.0MHz	3585A	HP	1750A02762	01067	I	04-FEB-2006
ORANGE	9kHz-26.5GHz	E4407B	HP	US39440975	00394	I	22-JUN-2006
EMI TEST RECEIVER	20-1000MHz	ESVS30	R&S	827957/001	01098	I	27-OCT-2006

LISNs/MEASUREMENT PROBES	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	956348	00753	II	15-APR-2006
BLUE (DC)	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	956349	00752	II	02-MAY-2006
YELLOW-BLACK	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	984735	00248	II	15-APR-2006
ORANGE	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	903707	00754	II	02-MAY-2006
GOLD (DC)	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	984734	00247	II	02-MAY-2006
BROWN	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	0411656	00986	II	04-MAY-2006
GREEN	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	0411657	00987	II	04-MAY-2006
YELLOW	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	0411658	1080	II	04-MAY-2006
WHITE-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972019	00678	II	15-APR-2006
BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972017	00675	II	15-APR-2006
RED-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972016	00677	II	15-APR-2006
BLUE-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972018	00676	II	15-APR-2006
BLUE MONITORING PROBE	0.01-150MHz	91550-2	TEGAM	12350	00807	I	26-MAY-2007
YELLOW MONITORING PROBE	0.01-150MHz	91550-2	ETS	50972	00493	I	24-NOV-2005
GREEN CURRENT TRANSFORMER	40Hz-20MHz	150	PEARSON	10226	00793	I	07-APR-2007
BLUE CISPR LINE PROBE	150kHz- 30MHz	N/A	C-S	N/A	00805	II	08-JUN-2007
BLACK CISPR LINE PROBE	150kHz- 30MHz	N/A	C-S	N/A	NONE	II	08-JUN-2007
CISPR TELCO VOLTAGE PROBE	10kHz-30MHz	CS A/C-10	C-S	CS01	00296	II	30-SEP-2006
CISPR 22 TELCO ISN	9kHz-30MHz	FCC-TLISN-T4	FISCHER	20115	00746	I	26-OCT-2006

OPEN AREA TEST SITE (OATS)	FCC CODE	IC CODE	VCCI CODE	CAT	CALIBRATION DUE
SITE F	93448	IC 2762-F	R-1688	II	04-APR-2007
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

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-1803	II	01-MAY-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	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	
DIPLEXER	40-220 GHz	DPL.26	OML	N/A	00813	I	03-MAR-2007

ABSORBING CLAMPS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
FISCHER CLAMP	30-1000MHz	F-201-23MM	FISCHER	10	00081	I	16-JAN-2006

HARMONIC & FLICKER ANALYZER	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
HFTS	HP6842A	HP	3531A-00169	00738	II	03-DEC-2005

100011/2 AC POWER SYSTEM	(2) 500I	CALIFORNIA INSTRUMENTS	HK53687/HK53688	00376	II	20-JAN-2006
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PREAMPS / ATTENUATORS / FILTERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	0.10-2000MHz	ZFL-1000-LN	C-S	N/A	00798	II	08-APR-2006
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
ORANGE	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00765	II	10-FEB-2006
WHITE	1-20GHz	SMC-12A	C-S	426643	00760	II	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	II	25-AUG-2006
HF (YELLOW)	18-26.5GHz	AFS4-18002650-60-8P-4	C-S	467559	00758	II	23-AUG-2007
HIGH PASS FILTER	1-18 GHz	SPA-F-55204	K&L	36	00817	II	06-JAN-2006
LOW PASS FILTER	1-9 GHz	11SL10-4100/X4400-O/O	K&L	4	00816	II	06-JAN-2006
HF 20dB 50W ATTENUATOR	0.03-20 GHz	PE 7019-20	PASTERNAK	01	00791	II	10-MAY-2007
HF 30dB 50W ATTENUATOR	0.03-20 GHz	PE 7019-30	PASTERNAK	02	1168	II	10-MAY-2007
LOW FREQ LPF	10-100kHz	L200K1G1	MICROWAVE CIRCUITS	4460-01 DC0432	1019	II	OUT OF SERVICE
LOW FREQ LPF	10-100kHz	L200K1G1	MICROWAVE CIRCUITS	4777-01 DC0434	1088	II	30-AUG-2006

ANTENNAS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
GREEN BILOG	30-2000MHz	CBL6112B	CHASE	2742	00620	II	06-APR-2006
GREEN-BLACK BILOG	30-2000MHz	CBL6112B	CHASE	2412	00127	II	06-JAN-2006
GREEN-RED BILOG	30-2000MHz	CBL6112B	CHASE	2435	00990	II	OUT OF SERVICE
BLUE BILOG	30-1000MHz	3143	EMCO	1271	00803	II	06-MAY-2007
GRAY BILOG	20-2000MHz	3141	EMCO	9703-1038	00066	II	06-MAY-2007(EMI) / 05-AUG-2006(RFI)
YELLOW-BLACK BILOG	20-2000MHz	CBL6140A	CHASE	1112	00126	II	06-MAY-2007(EMI) / 12-AUG-2006(RFI)
RED-WHITE BILOG	30-2000MHz	JB1	SUNOL	A091604-1	01105	II	28-SEP-2006
RED-BLACK BILOG	30-2000MHz	JB1	SUNOL	A091604-2	01106	II	28-SEP-2006
YELLOW HORN	1-18GHz	3115	EMCO	9608-4898	00037	I	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	I	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	II	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	II	18-MAR-2007
ADJUSTABLE DIPOLE	30-1000MHz	3121C	EMCO	1371	00756	II	18-MAR-2007
RE101 LOOP SENSOR	30Hz-100kHz	RE101-13.3cm	C-S	N/A	00818	II	13-MAR-2007
RS101 RADIATING LOOP	30Hz-100kHz	RS101-12cm	C-S	N/A	00819	II	13-MAR-2007
RS101 LOOP SENSOR	30Hz-100kHz	RS101-4cm	C-S	N/A	00820	II	13-MAR-2007

EFT	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
EFT DIRECT COUPLING CAP	N/A	C-S	01	00794	II	29-JAN-2006

ESD GENERATORS	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
GREEN	NSG435	SCHAFFNER	000839	00763	I	17-FEB-2006
RED	NSG435	SCHAFFNER	001625	00762	I	29-DEC-2005
YELLOW	930D	ETS	201	00673	I	18-AUG-2007

BEST EMC-2	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
BLUE	711-1100	SCHAFFNER	199824-002SC	00117	II	16-JUN-2006 (SURGE) / 03-AUG-2006 (D+I) / 05-AUG-2006 (EFT)
RED	711-1100	SCHAFFNER	200122-074SC	00623	II	16-JUN-2006 (SURGE) / 04-AUG-2006 (D+I) / 03-DEC-2005 (EFT)

CHAMBERS AND STRIPLINE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RFI 1 CHAMBER	3 METER COMPACT	PANASHIELD	N/A	00797	II	12-AUG-2006
RFI 2 CHAMBER	04' x 07' SHIELDING SYSTEM	LINDGREN	13329	00795	II	05-AUG-2006
RFI 3 STRIPLINE	N/A	C-S	N/A	00796	III	NA
ENVIRONMENTAL (SAFETY)	ECL5	B-M-A INC.	2041	00029	I	12-JAN-2006
ENVIRONMENTAL (SAFETY)	SGTH-31S	B-M-A INC.	2245	00321	I	12-JAN-2006

AMPLIFIERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	0.5-1000MHz	10W1000 B	AR	18708	00032	II	05-AUG-2006 (RFI2) / 12-AUG-2006 (RFI1)
GREEN	0.5-1000MHz	10W1000 B	AR	23423	00123	II	05-AUG-2006 (RFI2)
BLUE	0.01-250MHz	75A250	AR	19165	00039	II	08-JUL-2006 (EU & NEBS CRFI)
BLACK	0.01-250MHz	75A250	AR	23411	00122	II	08-JUL-2006 (EU & NEBS CRFI) / 05-AUG-2006 (RFI2)
ORANGE	0.01-250MHz	75A250	AR	26827	00367	II	08-JUL-2006 (NEBS CRFI) / 12-AUG-2006 (RFI1)
HP489A	1.0-2.0GHz	HP489A	HP	449-00762	00971	II	OUT OF SERVICE
HUGHES 10W	1.0-2.0GHz	1177H09	HUGHES	272	RENTAL	II	14-JUL-2006
HP491C	2.0-4.0GHz	HP491C	HP	449-00636	00764	II	05-JUN-2006
HUGHES 10W	4.0-8.0GHz	1177H02	HUGHES	092	RENTAL	II	05-JUN-2006
HP493A #1	4.0-8.0GHz	HP493A	HP	171402242	00085	II	OUT OF SERVICE
HP493A #2	4.0-8.0GHz	HP493A	HP	449-00562	00771	II	OUT OF SERVICE
HP495A	7.0-10.0GHz	HP495A	HP	304-00237	00086	II	05-JUN-2006
AUDIO AMP		MPA-200	RADIO SHACK	700438	NONE	III	NA
AUDIO AMP		MPA-200	RADIO SHACK	708545	00862	III	NA

FIELD PROBES	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	0.01-1000MHz	HI-4422	HOLADAY	90369	00031	I	15-AUG-2006
GREEN	0.01-1000MHz	HI-4422	HOLADAY	97363	00136	I	26-AUG-2006
BLUE	0.01-1000MHz	HI-4422	HOLADAY	95696	01100	I	15-AUG-2006

SIGNAL GENERATORS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	0.09-2000MHz	HP8648B	HP	3847U02192	00366	I	15-FEB-2006
BLUE	0.1-1000MHz	HP8648A	HP	3426A00548	00034	I	25-AUG-2006
GREEN	0.09-2000MHz	HP8648B	HP	3623A02072	00125	I	17-OCT-2006
ORANGE	0.1-1000MHz	HP8648B	HP	3537A01210	00025	I	24-JUN-2006
BLACK (TELECOM)	0.01Hz-15MHz	HP33120A	HP	US36004674	00766	I	25-OCT-2006
YELLOW	0.01Hz-15MHz	HP33120A	HP	US36014119	00249	I	02-JUN-2006
BLUE-WHITE	0.1Hz-13MHz	HP3312A	HP	1432A07632	00775	I	11-MAR-2006
SWEeper	0.01-20.0GHz	HP83752A	HP	3610A01133	00087	II	03-MAY-2006
AM/FM STEREO SIG. GEN.	0.1-170MHz	LG3236	LEADER	3687301	00959	I	30-AUG-2006
IMPULSE GENERATOR	1-100Hz	CIG-25	ELECTRO-METRICS	290	00942	I	05-AUG-2006

BULK INJECTION CLAMPS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
GREEN	0.01-100MHz	95236-1	ETS	50215	00118	II	08-JUL-2006 (EU & NEBS CRFI)
RED	0.01-100MHz	95236-1	ETS	34026	1020	II	08-JUL-2006 (EU & NEBS CRFI)

CDN NETWORKS	RANGE	MN	MFR	ASSET	CAT	CALIBRATION DUE
BLACK	0.10-100MHz	20A M-2 (DC)	C-S	00783	II	08-JUL-2006
BLUE	0.10-100MHz	15A M-3	C-S	00806	II	08-JUL-2006
ORANGE	0.10-100MHz	15A M-2	C-S	00786	II	08-JUL-2006
RED	0.10-100MHz	15A M-3	C-S	00780	II	08-JUL-2006
WHITE	0.10-100MHz	15A M-3	C-S	00782	II	08-JUL-2006
YELLOW-BLACK	0.10-100MHz	15A M-3	C-S	00784	II	08-JUL-2006
GREEN	0.10-100MHz	30A M-3	C-S	00779	II	08-JUL-2006
YELLOW	0.10-100MHz	30A M-5	C-S	00804	II	08-JUL-2006
BLUE-WHITE	0.10-100MHz	15A M-5	C-S	00788	II	08-JUL-2006
BROWN	0.10-100MHz	M-3	C-S	1169	II	08-JUL-2006
BROWN-WHITE	0.10-100MHz	M-3	C-S	1170	II	08-JUL-2006
BROWN-BLACK	0.10-100MHz	M-2 (DC)	C-S	1171	II	08-JUL-2006
RED-BLACK	0.10-100MHz	M-2 (DC)	C-S	1177	II	08-JUL-2006
YELLOW (RES)	0.10-100MHz	100Ω RESISTOR NWK (M-1)	C-S	00810	II	05-OCT-2006
GREEN (RES)	0.10-100MHz	100Ω RESISTOR NWK (M-1)	C-S	1172	II	17-JAN-2006

OSCILLOSCOPES	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
EMC 100MHz	TDS 220	TEKTRONIX	C036986	1166	I	26-AUG-2006
PRODUCT SAFETY 100 MHz	TDS 340	TEKTRONIX	B012357	00737	I	06-OCT-2006
TELECOM 100 MHz	54645A	HP/AGILENT	US36320452	00103	I	06-JUL-2006

RMS VOLTMETERS/CURRENT CLAMP	MN	MNFR	SN	ASSET	CAT	CALIBRATION DUE
TRUE-RMS MULTIMETER	79III	FLUKE	71700298	00769	I	25-OCT-2006
TRUE-RMS MULTIMETER	177	FLUKE	83390024	00973	I	10-MAR-2006

TRUE-RMS MULTIMETER (REFERENCE)	177	FLUKE	83390025	00974	I	10-MAR-2006
TRUE-RMS MULTIMETER (TELECOM)	177	FLUKE	83430419	00975	I	10-MAR-2006
TRUE-RMS CLAMP METER (SAFETY)	36	FLUKE	68805882	00700	I	11-MAR-2006

SURGE GENERATORS	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
TRANSIENT WAVEFORM MONITOR	TWM-5	CDI	003982	00323	II	07-JUN-2006
UNIVERSAL SURGE GENERATOR	M5	CDI	003966	00324	II	09-JUN-2006
THREE PHASE COUPLING NWK	3CN	CDI	003455	00325	II	09-JUN-2006
1.2x50uS PLUGIN MODULE	1.2x50uS PLUGIN	CDI	N/A	00842	II	09-JUN-2006
10x160uS PLUGIN MODULE	10x160uS PLUGIN	C-S	N/A	00843	II	09-JUN-2006
10x560uS PLUGIN MODULE	10x560uS PLUGIN	C-S	N/A	00841	II	09-JUN-2006
PSURGE CONTROLLER MODULE	PSURGE 8000	HAEFELY	150267	00879	II	13-JUN-2006
COUPLING/DECOUPLING MODULE	PCD 900	HAEFELY	149213	00880	II	13-JUN-2006
IMPULSE MODULE	PIM 900	HAEFELY	149202	00881	II	13-JUN-2006
HIGH VOLTAGE CAP NWK 5kVDC, 18uF	CS-HVCC	C-S	01	00772	II	28-SEP-2006
NEBS SURGE GENERATOR	N/A	C-S	N/A	00088	II	08-JUN-2006
2x10uS SURGE GENERATOR	2x10uS	C-S	N/A	00846	II	09-JUN-2006
10x700uS SURGE GENERATOR	10x700uS	C-S	N/A	00847	II	09-JUN-2006
12 PAIR SURGE RESISTOR MODULE	N/A	C-S	N/A	00768	II	30-SEP-2006

POWER/NOISE METERS	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
POWER METER	435B	HP	2445A11012	00773	I	06-APR-2006
POWER METER	437B	HP	2912A01367	01099	I	25-OCT-2006
POWER SENSOR	8481A	HP	2702A61351	00774	I	05-APR-2006
PSOPHOMETER	2429	BRUEL & KJAER	1237642	00585	II	14-FEB-2007
TRANSMISSION LINE TESTER (DBRNC)	185T	AMREL	998658	00823	II	07-MAR-2006

ANSI T1.315	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
SBC NOISE CART	C-S				III	CALIBRATION NOT REQUIRED
SBC TRANSIENT CART	C-S				III	WAVESHAPE VERIFIED BEFORE USE

OVERVOLTAGE CHAMBERS	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
72kW POWER FAULT SIMULATOR	OV1	C-S	N/A	00792	II	31-MAR-2007
POWER FAULT SIMULATOR	OV2	C-S	N/A	00116	II	31-MAR-2007

DIPOLE TAPE MEASURES	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
26FT TAPE #1	2338CME	LUFKIN	C3166-1	00776	I	13-MAR-2007
26FT TAPE #2	2338CME	LUFKIN	C3166-2	00777	I	13-MAR-2007

METEOROLOGICAL METERS	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
TEMP./HUMIDITY/ATM. PRESSURE GAUGE	7400 PERCEPTION II	DAVIS	N/A	00965	II	08-FEB-2007
TEMPERATURE /HUMIDITY GAUGE	THG-912	HUGER	4000562	00789	I	01-FEB-2007
WEATHER CLOCK (PRESSURE ONLY)	BA928	OREGON SCIENTIFIC	C3166-1	00831	I	02-FEB-2007

CONSUMABLES	SPEC.	MFR	STOCK/MN	ASSET	CAT	CALIBRATION DUE
NEBS CHEESEECLOTH	26-28M/KG	ED&D	ACC-01	N/A	III	N/A
NEBS CARBON BLOCK	3-MIL-GAP 1kV SURGE	RELIABLE	3AB	N/A	III	N/A

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-STRAUS¹
527 Great Road
Littleton, MA 01460
Barry Quinlan Phone: 978-486-8880
ELECTRICAL

Valid until: July 31, 2007

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*; Power Cross Overvoltage testing*;

Test Type	Test Method(s)
Emissions	
Radiated and Conducted Emissions	FCC 47 CFR Parts 15 & 18; C63.4; CISPR 22; EN55022; SABS CISPR 22; AS/NZS CISPR 22; AS/NZS 3548; Canada ICES-003; CNS13438; KN22; CISPR 11; EN 55011; SABS CISPR 11; AS/NZS CISPR 11; AS/NZS 2064; Canada ICES-001; CNS13803; KN11; CISPR 13; EN 55013; SABS CISPR 13; AS/NZS CISPR 13; AS/NZS 1053; KN13; CISPR 14-1; EN 55014-1; SABS CISPR 14; AS/NZS CISPR 14; AS/NZS 1044; CNS 13439; KN14; CISPR 15; EN 55015; KN15; GR-1089-CORE; CSA C108.8-M1983;
Harmonics	EN 61000-3-2; AS/NZS 61000.3.2
Flicker	EN 61000-3-3; AS/NZS 61000.3.3

1 Note: This accreditation covers testing performed at the laboratory listed above and the satellite facility located at 168 Ayer Rd, Littleton, MA 01460 and, for test types marked with an asterisk, at other sites as defined in "A2LA specific criteria for the accreditation of site testing and site calibration laboratories."

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Other Radio Standards	RTTE 01 (DGT-Taiwan);
FCC Standards and Test methods Support TCB Status--	
FCC Scope A - Unlicensed Radio Frequency Devices	
A1	1. 47 CFR Parts 11, 15 and 18 2. FCC MP-5, 3. ANSI C63.4-2003;
A2	1. 47 CFR Part 15 2. ANSI C63.4-2003;
A3	1. 47 CFR Part 15 2. ANSI C63.17-1998, 3. ANSI C63.4-2003;
A4	1. 47 CFR Part 15 2. ANSI C63.4-2003;
FCC Scope B - Licensed Radio Service Equipment	
B1	1. 47 CFR Parts 2, 22, 24, 25, and 27 2. ANSI/TIA-603-C (2004)
B2	1. 47 CFR Parts 2, 22, 74, 90, 95, and 97 2. ANSI/TIA-603-C (2004)
B3	1. 47 CFR Parts 2, 80, and 87 2. ANSI/TIA-603-C (2004)
B4	1. 47 CFR Parts 2, 21, 74, and 101 2. ANSI/TIA-603-C (2004)

Country Specific Standards and Other	
ITU EMC Standards	K.20; K.21; K.41; K.44
Swedish EMC Standards	BAKOM 3336.3
South African EMC Standards other than CISPR equivalents	SABS 1718-1; SANS 211/SABS CISPR 11; SANS 224/SABS CISPR 24; SANS 213/SABS CISPR 13; SANS 2200; SANS214-1/SABS CISPR 14-1; SANS214-2/SABS CISPR 14-2; SANS 215/SABS CISPR 15; SANS 222/SABS CISPR 22
Hong Kong EMC Standards	HKTA 1006; HKTA 1007; HKTA 1008; HKTA 1010; HKTA 1015; HKTA 1026; HKTA 1035; HKTA 1039; HKTA 1041; HKTA 1042; HKTA 1045
Singapore EMC Standards	IDA TS SRD; IDA TS EMC
Japanese VCCI Standards	VCCI V-3, VCCI V-4

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Immunity	
Electrostatic Discharge (ESD)	EN 61000-4-2; AS/NZS 61000.4.2; KN61000-4-2
Radiated Immunity (RFI)	EN 61000-4-3; AS/NZS 61000.4.3; KN61000-4-3
Electrical Fast Transient Bursts (EFT)	EN 61000-4-4; AS/NZS 61000.4.4; KN61000-4-4
Surge	EN 61000-4-5; AS/NZS 61000.4.5; KN61000-4-5
Conducted Immunity	EN 61000-4-6; AS/NZS 61000.4.6; KN61000-4-6
Magnetic Immunity	EN 61000-4-8; AS/NZS 61000.4.8; KN61000-4-7
Voltage Dips and Interrupts	EN 61000-4-11; KN61000-4-11
Low Frequency Conducted Disturbances	EN 61000-2-2

Family Product or Industry Specific Specifications including emissions and/or immunity	GR-1089-CORE; GR-78-CORE (ESD) EN50081-1; EN50081-2; EN50082-2; EN50082-1; EN 61000-6-1; EN 61000-6-2; EN 61000-6-3; EN 61000-6-4; EN 50091-2; EN 55024; CISPR 24 EN 55103-1; EN 55103-2; EN 61326; EN 61547; EN 50130-4; EN 50083-2; EN 60601-1-2; EN 60601-2-2; EN 60601-2-24; EN 60601-2-32; EN 60601-2-38; EN 60601-2-47; IEC 1800-3; EN 61800-3; EN 55020; CISPR 20; EN 60555 Part 2; EN 60555 Part 3; ETS 300 386-1; EN 300 386-2; EN 300 386, ETS 300 132-1; ETS 300 132-2; EN 60669-2-1; AS/NZS 3200.1.2; CNS 13783-1; ETR 283; C62.41
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Radiocommunications	
EU R&TTE Radio Standards;	EN 300 220-1; EN 300 220-3; EN 300 330-1; EN 300 330-2; EN 300 440-1; EN 300 440-2; EN 300 328; EN 300 385; EN 301 893
EU R&TTE EMC Standards	EN 300 339; EN 301 489-01; EN 301 489-03; EN 301 489-17
Canada Radio Standards	RSS-102; RSS-117; RSS-118; RSS-119; RSS-123; RSS-125; RSS-128; RSS-129; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-136; RSS-137; RSS-138; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-187; RSS-188; RSS-191; RSS-192; RSS-193; RSS-195; RSS-210; RSS-212; RSS-213; RSS-215; RSS-243; RSS-GEN; RSS-310; GL-36;
Australia/New Zealand Radio Standards	AS/NZS 4268; AS/NZS 4771; RFS29; Radiocommunications (Data Transmission Equipment Using Spread Spectrum Modulation Techniques); Radiocommunications (Spread Spectrum Devices); Radiocommunications (Short Range Devices); Radiocommunications (Low Interference Potential Devices);

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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 (excluding volume control)*; Protocol analysis* and Jitter testing*.	
Telecom Standards	Title
North American standards	
FCC 47 CFR Part 68 Telephone Terminal Equipment CS-03 Issue 9	Connection of terminal equipment to the telephone network. Analog and Digital Equipment. TCB Scope C1. Specification for terminal equipment, terminal systems, Network protection devices, connection arrangements and hearing aids compatibility.
TIA/EIA TSB31-B 1998	Bulletin Part 68 Rationale and Measurement Guidelines (Feb 1998)
TIA-968-A, A1, A2, A3	Telecommunications Telephone Terminal Equipment Technical Requirements for Connection of Terminal Equipment to the Telephone Network
T1.TRQ 6-2001	Technical Requirements for SHDSL, HDSL2, HDSL4 Digital Subscriber Line Terminal Equipment to Prevent Harm to the Telephone Network Industry
Australia standards	
AS/ACIF S002-2001	Analogue interworking and non-interference requirements for Customer Equipment for connection to the Public Switched Telephone Network
AS/ACIF S016-2001	Requirements for Customer Equipment for connection to hierarchical digital interfaces
AS/ACIF S031-2001	Requirements for ISDN Basic Access Interface
AS/ACIF S038-2001	Requirements for ISDN Primary Rate Access Interface
AS/ACIF S043-2001	Requirements for Customer Equipment for Connection to a Metallic Local Loop Interface of a Telecommunications Network — Part 1: General Part 2: Broadband Part 3: DC, Low Frequency AC and Voice band
International standards	
ITU-T G.703	Physical/electrical characteristics of hierarchical Digital interfaces
Hong Kong standards	
HKTA 2011	Network Connection Specification for Connection of Customer Premises Equipment (CPE) to Direct Exchange Lines (DEL) of the Public Switched Telephone Network (PSTN) in Hong Kong
HKTA 2014	Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Network (PTN) in Hong Kong using ISDN Basic Rate Access (BRA) based on ITU-T Recommendations

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<u>Telecom Standards</u> HKTA 2028 HKTA 2029 HKTA 2030 HKTA 2031 HKTA 2032 HKTA 2033 <u>European standards</u> TBR 1: 1995 TBR 2: 1997 TBR 3: 1995 + Amdt : 1997 TBR 4: 1995 + Amdt : 1997 TBR 012: 1993 + Amdt : 1996 TBR 013: 1996 (A2LA Cert. No. 1627.01) 3/20/06	<u>Title</u> Network connection specification for connection of CPE to the PTNs in Hong Kong using digital leased circuits at data rate of 1544 kbit/s Network connection specification for connection of CPE to the PTNs in Hong Kong using digital leased circuits at data rate of 2048 kbit/s Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Network (PTN) in Hong Kong using Digital Leased Circuits at nx64 kbit/s Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Network (PTN) in Hong Kong using Digital Leased Circuits below 64 kbit/s Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Networks in Hong Kong using Asymmetric Digital Subscriber Lines (ADSL) based on ITU-T Recommendation G.992.1 Network Connection Specification for Connection of Customer Premises Equipment (CPE) to Fixed Telecommunications Networks in Hong Kong using Splitterless Asymmetric Digital Subscriber Lines (ADSL) based on ITU-T Recommendation G.992.2 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 signaling rate up to, and including, 1 984 kbit/s Attachment requirements for Data Terminal Equipment (DTE) to connect to Packet Switched Public Data Networks (PSPDNs) for CCITT Recommendation X.25 interfaces at data signaling rates up to 1 920 kbit/s utilizing interfaces derived from CCITT Recommendations X.21 and X.21 bit Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN primary rate access Business Telecommunications (BT); Open Network Provision (ONP) technical requirements; 2 048 kbit/s digital unstructured leased line (D2048U) Attachment requirements for terminal equipment Business Telecommunications (BTC); 2 048 kbit/s digital structured leased lines (D2048S); Attachment requirements for terminal equipment interface Page 5 of 10	<u>European standards (cont'd)</u> TBR 21: 1998 TBR 24: 1997 <u>Taiwan standards (DGT)</u> ADSL01 ID0002 IS6100 PSTN01 (non-voice only) <u>New Zealand standards</u> PTC 200 (non-voice only) PTC 217 TNA 117 PTC 270 <u>Singapore Standards</u> IDA TS ADSL IDA TS ADSL 2 IDA TS DLCN 1 IDA TS ISDN 1 IDA TS ISDN 2 IDA TS PSTN (non-voice only) <u>South Africa standards</u> TE-001 (non-voice only) 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 Business Telecommunications (BTC); 34 Mbit/s Digital Unstructured and structured leased lines (D34U and D34S); Attachment requirements for Terminal equipment interface Asymmetric Digital Subscriber Line Terminal Equipment and POTS Splitter Technical Specifications DS1 Equipment Type Approval Guidelines ISDN Terminal Equipment Technical Specifications Technical Specifications for Terminal Equipment for Connection to Public Switched Telephone Network Requirements for Connection of Customer Equipment to Analogue Lines Requirements for Bandwidth Management Devices Telecom 2048 kbit/s Standard Network Interface Interim arrangements for ADSL CPE Type Approval Specification for Asymmetric Digital Subscriber Line (Full-rate ADSL) Modems Type Approval Specification for Asymmetric Digital Subscriber Line Splitterless (G-Lite) Modems Type Approval Specification for Digital Interfaces based on hierarchical bit rates of 2048 kbit/s, 34 368 kbit/s and 139 264 kbit/s Type Approval Specification for connection of Terminal Equipment to Integrated Services Digital Network (ISDN) Basic Access Type Approval Specification for connection of Terminal Equipment to Integrated Services Digital Network (ISDN) Primary Rate Access (PRA) Type Approval Specification for connection of Terminal Equipment to Public Switched Telephone Network (PSTN) Standard for Telecommunication Line Terminal Equipment (TLTE) for Connection to the Public Switched Telephone Network (PSTN) Page 6 of 10
<u>Product Safety</u> General test methods: Power input*, Permanence of marking*, Accessibility*, Permissibly limits*, Energy hazard measurement*, SELV circuits*, TNV limits*, Limited current*, Capacitor Discharge / voltage limitation*, Ring signal*, Humidity conditioning*, Creepage / Clearance / Distance thru Insulation (excluding CTI)*, Limited power measurement*, Ground Bond/Earthing*, Ground continuity*, Temperature*, Stability*, Applied force*, Steel sphere impact*, Mold stress*, Battery reverse current*, Ball pressure*, Leakage current*, Component abnormal*, Electric strength*, Impulse*, Overvoltage*, Acoustic sound pressure*, 130mm / 20mm flame*, Needle flame*, Hot flaming oil*, Locked rotor/motor armature*, Vibration, Bump, Drop*, Strain relief*, Torque*, Insulation resistance*, Sound level*, Handle loading*, Liquid overflow*, Spillage*, Liquid leakage*, Transformer shorts/overloads*, Rain test*, Wall mount*, Laser radiation (excluding x-ray)*, Voltage surge*, Functionality*, Protective impedance abnormal*, Capacitor short circuit abnormal*, Output abnormal*, Multi-supply abnormal*, Cooling abnormal*, Heating device abnormal*, Interlock abnormal*, Rigidity*, Cleaning* <u>Product Safety Standards</u> <u>Specific Product Safety Standards</u> UL 60950 2000 IEC 60950 1999 EN 60950 2000 IEC 60950-1 2001 UL 60950-1 2003 CSA C22.2 No. 60950-00 CSA C22.2 No. 60950-1 03 IEC 61010-1 1993 EN 61010-1 1993, 2001 IEC 61010-1 2001 UL 61010B-1 2003 CAN/CSA 1010-1 1999 (Including AM 2) IEC 60601-1 1995 EN 60601-1 1995 (Including AM 2) UL 2601-1 1997 IEC 60065 1998, 2000 ANSI/UL 6500: 1998 CAN/CSA 60065-00 AS/NZS 60065 2000 Canadian C22.2 No. 1-94 (1-98) 1994, 1998 EN 60065 1994 IEC 60825 1990 EN 60825-1 1994 (A2LA Cert. No. 1627.01) 3/20/06	<u>Title</u> Safety of information technology equipment Safety of information technology equipment Safety of information technology equipment, including Electrical business 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. Electrical equipment for laboratory use Part 1: General requirements. Medical electrical equipment. Part 1: General requirements for safety. Medical electrical equipment. Part 1: General Requirements for safety. Audio, video and similar electronic apparatus – Safety requirements Audio/video and musical instrument apparatus for Household, commercial and similar general use Australian/New Zealand Standard – Approval and test Specification – Mains operated electronic and related Equipment for household and similar general use Audio, video and similar electronic equipment. Consumer and commercial products Safety requirements for main operated electronic and related apparatus for household and similar general use. Radiation safety of laser products, equipment Classification, requirements and user's guide Safety of laser products Part 1: equipment Page 7 of 10	<u>Product Safety Standards</u> IEC 60825-1 2001 IEC 60825-2 2000-5 IEC 60825-4 1997-11 21 CFR 1040.10 IEC 60335-1 1995 (Including AM2 – 1997 & AM 12 – 1997) EN 60335-1 2001 UL 60335-1 1998 CAN/CSA E335-1 1994 UL 61010A-1: 2002 EN 61010-1: 2001 AS/NZS 60950: 2000 EN 60950-1: 2001 AS/NZS 60950-1: 2003 UL 61010 -1: 2004 UL 60601-1: 2003 IEC 60601-1-1: 2000 EN 60601-1-1: 2001 UL 60065: 2003 CSA 60065: 2003 IEC 60065: 2001 EN 60065: 2002 EN 60204 -1: 1998 HKTA 2001 Classification, requirements and user's guide. Safety of laser products – Part 2: Safety of optical communication systems Safety of laser products – Part 4: Laser guards Performance standard for laser products Safety of household and similar electrical appliances Part 1: General requirements Electrical equipment for laboratory use; part 1: General requirements Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements Safety information technology equipment Information Technology Equipment – Safety – Part 1: General Requirements Information Technology Equipment – Safety – General requirements Electrical Equipment for Measurement, Control and Laboratory Use; Part 1: General Requirements Medical Electrical Equipment, Part 1: General Requirements for Safety Medical Electrical Equipment - Part 1: General Requirements For Safety 1: Collateral Standard: Safety Requirements For Medical Electrical Systems Medical Electrical Equipment - Part 1: General Requirements for Safety – Section 1-1. Collateral Standard: Safety Requirements For Medical Electrical Systems Audio, Video and Similar Electronic Apparatus – Safety Requirements Audio, Video and Similar Electronic Apparatus – Safety Requirements Audio, Video and Similar Electronic Apparatus – Safety Requirements Audio, Video and Similar Electronic Apparatus – Safety Requirements Safety of Machinery – Electrical Equipment of Machines – Part 1: Specification for General Requirements Compliance Test Specification – Safety and Electrical Protection Requirements for Subscriber Equipment Connected to the Public Telecommunications Networks In Hong Kong Page 8 of 10

<i>Environmental Simulation</i>			Note 1. For standards or methods listed on the scope of accreditation without a revision date, laboratories are expected to be competent in the use of the current version within one year of the date of publication of the standard test method or upon the date specified by the standard method originator when the originator has implementation authority. When a superseded standard or method is required for an accredited test, the scope will include the superseded date/version. For those that support the TCB/CB status of the organization acting as a certifier on behalf of the FCC or IC the expectation is currency within 30 days of Federal Register publication of changes for FCC and 30 days after IC website update. This note shall not be construed as an Accreditation Body implication to adopt a more current standard than is required in a regulation or code (i.e. the legal requirement) which is adopted by the lab under their responsibility. * On-site test service is available for this technology, test, or method.
<u>Test Technology</u>	<u>Test Standard</u>	<u>Supporting Standards</u>	
Accessibility*	IEC 60529	IP-0x thru IP-6x	
Acoustic Noise*	GR-63-CORE Sec 4.6		
Airborne Contaminants	GR-63-CORE Sec 4.5	MFG & Hygroscopic Dust	
Altitude	GR-63-CORE Sec 4.1.3		
Cold Start*	ETS 300 019	IEC 60068-2-1	
Drip	IEC 60529	IP-x1 & IP-x2	
Drops*	ETS 300 019	IEC 60068-2-32	
	GR-63-CORE Sec 4.3		
Dust	IEC 60529	IP-5x & IP-6x	
Firearms Resistance Testing	GR-487		
Fire Resistance	ANSI.T1.319		
	GR-63-CORE Sec 4.2	Fire & Needle Flame	
Heat Dissipation*	GR-63-CORE Sec 4.1.4		
Illumination	GR-63-CORE Sec 4.7		
Operational Temperature & Humidity (OpTH)*	ETS 300 019	IEC 60068-2-1	
		IEC 60068-2-2	
		IEC 60068-2-14	
		IEC 60068-2-56	
	GR-63-CORE Sec 4.1.2		
Salt Fog & Spray	ASTM B117		
Spatial*	GR-63-CORE Sec 2.0 & 3.0	IP-x3 & IP-x4	
Spraying-Splashing	IEC 60529	IEC 60068-2-1	
Storage (Temperature & Humidity)*	ETS 300 019	IEC 60068-2-2	
		IEC 60068-2-14	
		IEC 60068-2-30	
		IEC 60068-2-56	
	GR-63-CORE Sec 4.1.1		
Vibration	ETS 300 019	IEC 60068-2-6	
		IEC 60068-2-27	
		IEC 60068-2-29	
		IEC 60068-2-32	
		IEC 60068-2-57	
		IEC 60068-2-64	
	GR-63-CORE Sec 4.4	Earthquake, Office & Transportation	
Water Immersion	IEC 60529	IP-x7 & IP-x8	
Water Jet	IEC 60529	IP-x5 & IP-x6	
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