



Report No	EG0097-1
Client	Tour Andover Controls 1 High Street North Andover, MA 01845
Phone	978-975-9570
FRN	0011099207
	RSS-210 Issue 6; 47 CFR 15.247
Model FCC ID IC	Wireless Adaptor DVE-WIRELESS 1026A-WIRE
Equipment Type Equipment Code Emission Designator	Digitally Modulated DTS 175KG1D
Results	As detailed within this report
Prepared by	 Evan Gould – Test Engineer
Authorized by	 Michael Buchholz – EMC Manager
Issue Date	5/5/06
Conditions of issue	This Test Report is issued subject to the conditions stated in ‘terms and conditions’ section of this report.

Table Of Contents

<i>Summary</i>	3
<i>Test Methodology</i>	3
<i>Statement of Conformity</i>	3
<i>EUT Configuration</i>	3
<i>Bandwidth</i>	3
<i>Peak Power</i>	3
<i>Spectral Density</i>	3
<i>Band Edge Measurements</i>	3
<i>Radiated Spurious Emissions</i>	3
<i>AC Line Conducted Emissions</i>	3
<i>Voltage Variations</i>	3
<i>Test Equipment Used</i>	3
<i>Terms And Conditions</i>	3



Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.247 and RSS-210(Annex 8). The product is the Tour Andover Controls Wireless Adaptor. It is a transmitter that operates in the range 2400-2483.5MHz.

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. The operating voltage was 4.5VDC. The environmental conditions are shown below.

Date	Temperature	Humidity
1/30/06	23.6°C	22%
1/31/06	23.6°C	22%
2/1/06	24°C	21%
2/2/06	24.2°C	19%
5/3/06	20.7°C	33%

Frequency range investigated: 0.15MHz – 25GHz

Measurement distance:	0.15 – 30MHz	Conducted
	30MHz – 3GHz	3m
	3 – 25GHz	1m

Testing was performed radiated due to the integral antenna. The channels tested were 0 (2405.5MHz), 7 (2440.5MHz), and 15 (2480.4MHz).

Statement of Conformity

The Wireless Adaptor 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 meets the AC Line conducted emissions requirements of 15.207.
	A2.9	15.247	The unit complies with the requirements of 15.247

EUT Configuration

EUT Configuration				
Work Order: G0097				
Company: Tour Andover Controls				
Company Address: 1 High Street North Andover, MA 01845				
Contact: Joe Burch				
Person Present: Joe Burch				
MN		SN		
EUT: Wireless Adaptor		Unit 1		
EUT Description: Wireless Adaptor				
EUT Max Frequency: 2480.5MHz				
Support Equipment:		MN	SN	
Dell Latitude LM laptop		TS30GI	7088446BYK4360A	
RadioShack AC Adaptor		273-1662A	-	
B&B Electronics RS-485 Converter		485SD9TB	-	
EUT Cables:	Qty	Shielded?	Length	Ferrites
Power/Data cable	1	No	6ft	No
Serial cable	1	No	10ft	No
Unpopulated EUT Ports:	Qty	Reason		
None				
Software / Operating Mode Description:				
Controlled EUT with HyperTerminal to set channel, power, modulation, and TX/RX mode.				



Bandwidth

LIMIT

The minimum 6 dB bandwidth shall be at least 500kHz. [15.247(a)(2)]

MEASUREMENT

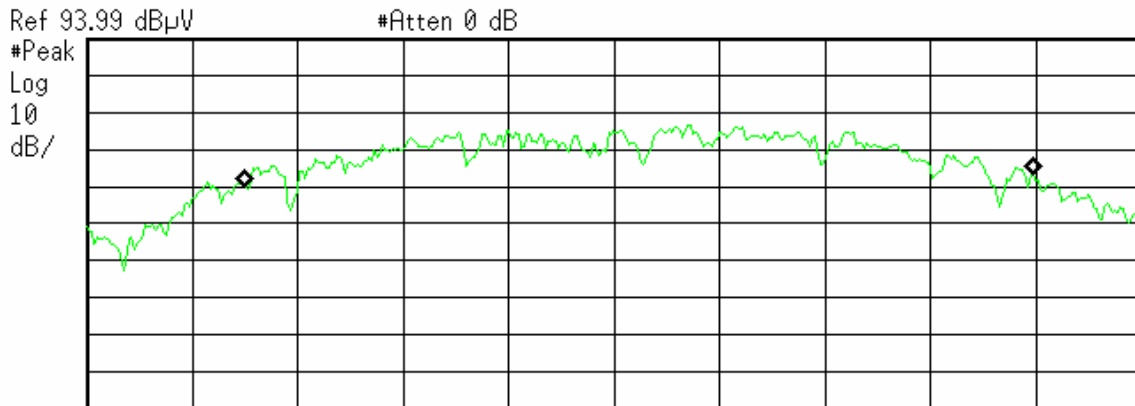
Measured 6dB bandwidth = 1.47MHz

PLOT

6dB Bandwidth

Agilent 14:24:11 Jan 30, 2006

R L



Ref 93.99 dBμV

#Atten 0 dB

#Peak
Log
10
dB/

Center 2.48 GHz

#Res BW 30 kHz

#VBW 300 kHz

Span 3 MHz

Sweep 5 ms (401 pts)

Occupied Bandwidth
2.2420 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 73.945 kHz
x dB Bandwidth 1.470 MHz



Peak Power

LIMIT

1W (EIRP) = 30dBm = 125.2dBμV/m @ 3m
 [15.247(b)(3)]

MEASUREMENTS

Peak Output Power										Curtis-Straus LLC		
Date: 30-Jan-06			Company: Tour Andover				Work Order: G0097					
Engineer: Evan Gould			EUT Desc: Wireless Adaptor									
Frequency Range: 2400-2483.5MHz							Measurement Distance: 3 m					
Notes: EIRP = Adjusted Reading - 104.77 + 20log(Distance[m]) Initial power readings were taken with a power setting of -4. Power deltas were later taken to reflect the allowed power settings: -11 for Channel 0, -6 for Channel 7, and -14 for Channel 15. The deltas and resultant EIRP's are shown below.												
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	Initial EIRP (dBm)	Power Delta (dB)	Adjusted EIRP (dBm)	---		
										Limit (dBm)	Margin (dB)	Result (Pass/Fail)
Hpk	2405.5	78.9	0.0	29.8	2.5	111.2	15.9	6.9	9.0	30.0	-21.0	Pass
Hpk	2440.5	78.7	0.0	29.8	2.6	111.1	15.8	2.0	13.8	30.0	-16.2	Pass
Hpk	2480.4	77.4	0.0	29.9	2.6	109.9	14.6	9.8	4.8	30.0	-25.2	Pass
Table Result: Pass by -14.0 dB										Worst Freq: 2405.5 MHz		
Test Site: "A"		Pre-Amp: none		Cable: EMIR-HIGH 10		Analyzer: Orange		Antenna: Orange Horn				



Spectral Density

LIMIT

8dBm in any 3kHz band [15.247(e)]

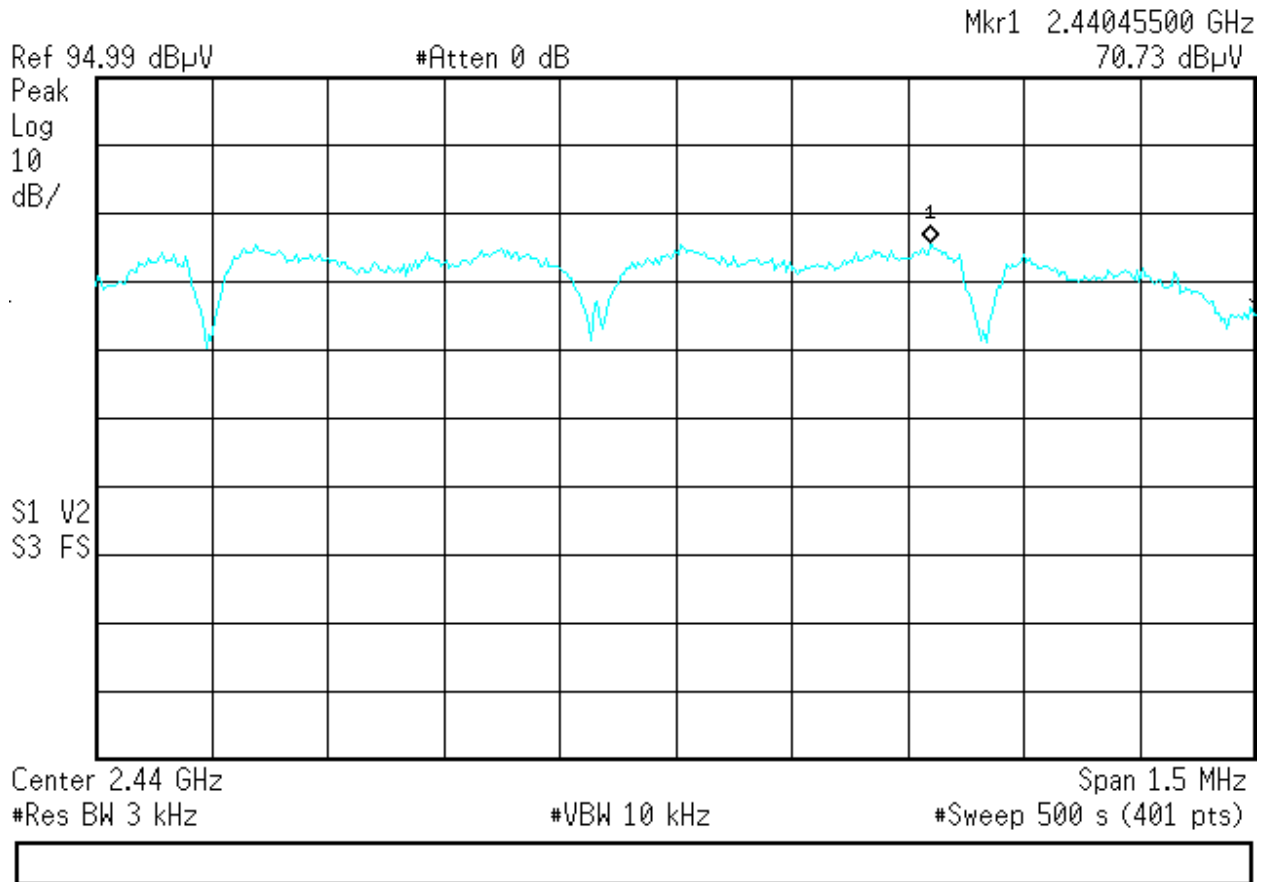
MEASUREMENTS

Power Spectral Density							Curtis-Straus LLC		
Date: 31-Jan-06		Company: Tour Andover Controls				Work Order: G0097			
Engineer: Evan Gould		EUT Desc: Wireless Adaptor							
Frequency Range: 2400-2483.5MHz					Measurement Distance: 1 m				
Notes: PPSD; RBW=3kHz; VBW=10kHz; sweep=500s; span=1.5MHz limit = 8dBm + 104.77 = 112.77dBuV/m @1m									
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBuV/m)	---		
Hpk	2440.5	70.7	0.0	29.2	2.6	102.5	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
Hpk	2405.5	71.4	0.0	29.1	2.5	103.0	112.7	-10.2	Pass
Hpk	2480.5	66.9	0.0	29.3	2.6	98.8	112.7	-13.9	Pass
Table Result:		Pass		by		-9.7 dB		Worst Freq: 2405.5 MHz	
Test Site: "A"		Pre-Amp: none		Cable: EMIR-HIGH 10		Analyzer: Orange		Antenna: Orange Horn	

ANALYZER PLOT

Channel 7 Power Spectral Density

Agilent 14:25:16 Jan 31, 2006



Band Edge Measurements

LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). [15.247(d)]

MEASUREMENTS

Band Edges								Curtis-Straus LLC		
Date: 03-May-06		Company: Tour Andover				Work Order: G0097				
Engineer: Evan Gould		EUT Desc: Wireless Adaptor								
Frequency Range: 2400-2483.5MHz					Measurement Distance: 1 m					
Notes: Duty cycle averaging factor = $20 \cdot \log(0.27) = 11.3\text{dB}$						RBW: 1MHz				
Detector: Peak						VBW: 3MHz (pk); 30Hz (ave)				
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)
Reduced Power Setting to -11										
Low Band Edge										
Channel 0										
Hpk	2390.0	43.1	0.0	29.1	2.5	0.0	74.7	83.5	-8.8	Pass
Hav	2390.0	43.1	0.0	29.1	2.5	11.3	63.4	63.5	-0.1	Pass
Reduced Power Setting to -14										
High Band Edge										
Channel 15										
Hpk	2483.5	42.5	0.0	29.3	2.6	0.0	74.4	83.5	-9.1	Pass
Hav	2483.5	42.5	0.0	29.3	2.6	11.3	63.1	63.5	-0.4	Pass
Table Result:		Pass		by		-0.1 dB		Worst Freq:		2390.0 MHz
Test Site: "A"		Pre-Amp: none		Cable: EMIR-HIGH 10		Analyzer: Orange		Antenna: Orange Horn		

Note: The 11.3dB duty cycle averaging factor is calculated from a worst case 100ms duty cycle of 27%, which is justified in a separate document along with the operational description.



Radiated Spurious Emissions

LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). [15.247(d)]

MEASUREMENTS

Radiated Emissions Table							Curtis-Straus LLC			
Date: 01-Feb-06			Company: Tour Andover			Work Order: G0097				
Engineer: Evan Gould			EUT Desc: Wireless Adaptor			EUT Max Freq: 2480.4MHz				
Frequency Range: 30-1000MHz					Measurement Distance: 3 m					
Notes: TX and RX modes were scanned.								RBW: 120kHz		
Detector: Peak								VBW: 300kHz		
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	47 CFR 15.209			
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	
No spurious emissions detected										
Table Result:		Pass		by		N/A dB		Worst Freq:		N/A MHz
Test Site: "A"		Pre-Amp: Blue-Blk		Cable: EMIR-06		Analyzer: Yellow		Antenna: Grn-Red		

Radiated Emissions Table							Curtis-Straus LLC			
Date: 30-Jan-06		31-Jan-06		Company: Tour Andover			Work Order: G0097			
Engineer: Evan Gould		EUT Desc: Wireless Adaptor			EUT Max Freq: 2480.5MHz					
Frequency Range: 1-25GHz					Measurement Distance: 1 m					
Notes: TX and RX modes are represented in this table								RBW: 1MHz		
Duty cycle averaging factor = 20*log(0.27) = 11.3dB								VBW: 3MHz (pk); 30Hz (ave)		
Detector: Peak										
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)
Hpk	7321.5	48.6	17.2	37.3	4.9	0.0	73.6	83.5	-9.9	Pass
Hav	7321.5	48.6	17.2	37.3	4.9	11.3	62.3	63.5	-1.2	Pass
Vpk	4876.0	37.1	18.8	34.0	3.8	0.0	56.1	63.5	-7.4	Pass
Table Result:		Pass		by		-1.2 dB		Worst Freq:		7321.5 MHz
Test Site: "A"		Pre-Amp: Yel-Blk		Cable: EMIR-HIGH 10		Analyzer: Orange		Antenna: Orange Horn		
		Pre-Amp: Yellow						Antenna: White Horn		



Radiated Emissions Table							Curtis-Straus LLC		
Date: 03-May-06		Company: Tour Andover			Work Order: G0097				
Engineer: Evan Gould		EUT Desc: Wireless Adaptor							
Frequency Range: 4960MHz				Measurement Distance: 1 m					
Notes: 27% duty cycle = 11.3dB averaging factor									
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	47 CFR 15.209		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Channel 15; txpow = -6									
Vpk	4960.0	36.4	0.0	34.2	3.9	74.5	83.5	-9.0	Pass
Vav	4960.0	25.1	0.0	34.2	3.9	63.2	63.5	-0.3	Pass
Channel 7; txpow = -6									
Vpk	4880.0	33.9	0.0	34.0	3.8	71.7	83.5	-11.8	Pass
Vav	4880.0	22.6	0.0	34.0	3.8	60.4	63.5	-3.1	Pass
Channel 0; txpow = -6									
Vpk	4809.0	33.1	0.0	33.8	3.8	70.7	83.5	-12.8	Pass
Vav	4809.0	21.8	0.0	33.8	3.8	59.4	63.5	-4.1	Pass
Table Result:		Pass		by		-0.3 dB		Worst Freq: 4960.0 MHz	
Test Site: "T"		Pre-Amp: none		Cable: EMIR-HIGH 10		Analyzer: Orange		Antenna: Orange Horn	



AC Line Conducted Emissions
LIMITS

Frequency of emission (MHz)	Quasi-peak limit (dBµV)	Average limit (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 Mains Conducted Emissions							Curtis-Straus LLC			
Date: 02-Feb-06		Company: Tour Andover			Work Order: G0097					
Engineer: Ozgur Ozturk		EUT Desc: Wireless Adaptor			Test Site: EMI 1					
Notes:										
LISN(s): Brown Yellow										
Range: 0.15-30MHz			Other Equipment:			Spectrum Analyzer: Blue				
Frequency (MHz)	Q.P. Readings		Ave. Readings		Impedance Factor (dB)	FCC/CISPR B		FCC/CISPR B		Overall Result (Pass/Fail)
	QP1 (dBµV)	QP2 (dBµV)	AV1 (dBµV)	AV2 (dBµV)		qp Limit (dBµV)	qp Margin dB	AVE Limit (dBµV)	AVE Margin dB	
Transmitting mode										
0.19	11.2	9.6			20.0	64.0	-32.9	54.0	-22.9	Pass
0.38	9.3	10.9			20.0	58.3	-27.4	48.3	-17.4	Pass
7.88	3.2	5.5			20.0	60.0	-34.5	50.0	-24.5	Pass
16.59	7.3	6.4			20.0	60.0	-32.7	50.0	-22.7	Pass
21.11	6.6	7.9			20.0	60.0	-32.2	50.0	-22.2	Pass
28.64	15.2	18.0			20.0	60.0	-22.0	50.0	-12.0	Pass
Receiving mode										
0.19	12.1	12.1			20.0	64.0	-31.9	54.0	-21.9	Pass
0.38	11.0	12.3			20.0	58.3	-26.0	48.3	-16.0	Pass
0.51	9.8	10.6			20.0	56.0	-25.4	46.0	-15.4	Pass
5.93	7.6	6.2			20.0	60.0	-32.4	50.0	-22.4	Pass
21.26	5.4	7.5			20.0	60.0	-32.5	50.0	-22.5	Pass
28.64	15.2	18.1			20.0	60.0	-21.9	50.0	-11.9	Pass
Table Result: Pass by -11.88 dB Worst Freq: 28.64 MHz										



Voltage Variations

REQUIREMENT

Measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. [15.31(e)]

<i>Voltage Variations FCC 15.31(e)</i>	
Work Order: G0097	
Company: Tour Andover	
EUT: Wireless Adaptor	
Date: 2/2/2006	
Engineer: Evan Gould	
Analyzer: Orange	
Voltage Spec: 3.3VDC ±5%	
RBW: 1MHz	VBW: 3MHz
Voltage	RF Level
VDC	dBµV
2.7	98.8
3.3 (lowest possible)	98.8
5.75	98.8



Test Equipment Used

REV. 02-MAY-2006

SPECTRUM ANALYZERS / RECEIVERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	9kHz-1.8GHz	8591E	HP	3441A03559	00024	I	30-DEC-2006
WHITE	9kHz-22GHz	8593E	HP	3547U01252	00022	I	14-MAR-2007
BLUE	9kHz-1.8GHz	8591E	HP	3223A00227	00070	I	14-DEC-2006
YELLOW	9kHz-2.9GHz	8594E	HP	3523A01958	00100	I	20-MAY-2006
GREEN	9kHz-26.5GHz	8593E	HP	3829A03618	00143	I	21-NOV-2006
BLACK	9kHz-12.8GHz	8596E	HP	3710A00944	00337	I	02-NOV-2006
TELECOM 3585A	20Hz-40.0MHz	3585A	HP	2504A05219	00030	I	07-FEB-2007
TELECOM 3585A	20Hz-40.0MHz	3585A	HP	1750A03418	00558	1	Out of Calibration
TELECOM 3585A	20Hz-40.0MHz	3585A	HP	1750A02762	01067	I	01-MAR-2007
ORANGE	9kHz-26.5GHz	E4407B	HP	US39440975	00394	I	01-DEC-2006
BROWN (RENTAL)	9kHz-26.5GHz	E4407B	HP	SG44210511	Rental	1	05-JAN-2007
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-MAY-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	OUT OF SERVICE
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	OUT OF SERVICE
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-MAY-2006
BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972017	00675	II	15-MAY-2006
RED-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972016	00677	II	15-MAY-2006
BLUE-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972018	00676	II	15-MAY-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	23-JAN-2008
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
SITE J				II	11-APR-2008

LINE CONDUCTED TEST SITES	FCC CODE	IC CODE	VCCI CODE	CAT	CALIBRATION DUE
EMI 1	93448	N/A	C-1801	III	NA
EMI 2	93448	N/A	C-1802	III	NA
EMI 3	93448	N/A	C-1803	III	NA

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	33-50 GHz	11970Q	HP	3003A03155	00104	I	08-NOV-2007
MIXER / HORN	50-75 GHz	11970V/QWH-VPRROO	HP/QUINSTAR	2521A01197/8794001	1179	I	15-NOV-2007
MIXER	75-110 GHz	11970W	HP	2521A01334	00105	I	22-NOV-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	20-JAN-2008



HARMONIC & FLICKER ANALYZER	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
HFTS	HP6842A	HP	3531A-00169	00738	II	30-DEC-2007
10001I/2 AC POWER SYSTEM	(2) 500I	CALIFORNIA INSTRUMENTS	HK53687/HK53688	00376	II	09-JAN-2008

PREAMPS / ATTENUATORS / FILTERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	0.10-2000MHZ	ZFL-1000-LN	C-S	N/A	00798	II	05-APR-2007
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	04-JAN-2007
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	28-DEC-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	14-APR-2007
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	05-JAN-2008
LOW PASS FILTER	1-9 GHZ	11SL10-4100/X4400-O/O	K&L	4	00816	II	05-JAN-2008
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	OUT OF SERVICE

ANTENNAS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
GREEN BILOG	30-2000MHZ	CBL6112B	CHASE	2742	00620	II	13-JAN-2008
GREEN-BLACK BILOG	30-2000MHZ	CBL6112B	CHASE	2412	00127	II	13-JAN-2008
GREEN-RED BILOG	30-2000MHZ	CBL6112B	CHASE	2435	00990	I	12-APR-2008
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	11-APR-2008
RED-BLACK BILOG	30-2000MHZ	JB1	SUNOL	A091604-2	01106	II	11-APR-2008
RED-BROWN BILOG	30-2000MHZ	JB1	SUNOL	A0032406	1218	I	30-MAR-2008
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	10kHz-30MHZ	PLA-130/A	ARA	1024	00755	I	22-FEB-2008
LARGE LOOP	20Hz-5MHz	6511	EMCO	9704-1154	00067	I	23-JAN-2008
ACTIVE MONOPOLE	30Hz-30MHz	3301B	EMCO	3824	00068	II	07-APR-2007
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	06-FEB-2008

ESD GENERATORS	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
GREEN	NSG435	SCHAFFNER	000839	00763	I	02-MAR-2007
RED	NSG435	SCHAFFNER	001625	00762	I	06-JAN-2007
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+) / 05-AUG-2006 (EFT)
RED	711-1100	SCHAFFNER	200122-074SC	00623	II	31-MAR-2007 (SURGE / D+) / 07-APR-2007 (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	11-JAN-2007



ENVIRONMENTAL (SAFETY)		SGTH-31S	B-M-A INC.	2245	00321	I	11-JAN-2007
AMPLIFIERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	0.5-1000MHZ	10W1000B	AR	18708	00032	II	05-AUG-2006 (RFI2) / 12-AUG-2006 (RF11)
GREEN	0.5-1000MHZ	10W1000B	AR	23423	00123	II	05-AUG-2006 (RFI2)
BLUE	0.01-250MHZ	75A250	AR	19165	00039	II	09-JAN-2007 (EUCRFI) / 10-DEC-2006 (NEBS CRFI)
BLACK	0.01-250MHZ	75A250	AR	23411	00122	II	10-JAN-2007 (EU CRFI) / 10-DEC-2006 (NEBS CRFI) / 05-AUG-2006 (RFI2)
ORANGE	0.01-250MHZ	75A250	AR	26827	00367	II	10-JAN-2007 (EU CRFI) / 10-DEC-2006 (NEBS CRFI) / 12-AUG-2006 (RF11)
BROWN 150W	0.1-250MHZ	150A250	AR	313454	RENTAL	II	NOT CALIBRATED
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	OUT OF SERVICE
HUGHES 10W	2.0-4.0GHZ	1177H01	HUGHES	137	RENTAL	II	02-MAY-2007
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	AUDIO FREQ	MPA-200	RADIO SHACK	700438	NONE	III	NA
AUDIO AMP	AUDIO FREQ	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	01-MAR-2007
GREEN	0.01-1000MHZ	HI-4422	HOLADAY	97363	00136	I	26-AUG-2006
BLUE	0.01-1000MHZ	HI-4422	HOLADAY	95696	01100	I	25-MAR-2007

SIGNAL GENERATORS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	0.09-2000MHZ	HP8648B	HP	3847U02192	00366	I	28-FEB-2007
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	OUT OF SERVICE
YELLOW	0.01Hz-15MHZ	HP33120A	HP	US36014119	00249	I	OUT OF SERVICE
BROWN	0.01Hz-15MHZ	HP33120A	HP	US36016621	1211	I	23-NOV-2006
WHITE (NEW)	0.01Hz-15MHZ	HP33120A	HP	TBD	1219	I	TBD
BLUE-WHITE	0.1Hz-13MHZ	HP3312A	HP	1432A07632	00775	I	11-MAR-2007
SWEEPER	0.01-20.0GHZ	HP83752A	HP	3610A01133	00087	II	02-MAY-2007
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) / 10-DEC-2006 (NEBS)
RED	0.01-100MHZ	95236-1	ETS	34026	1020	II	08-JUL-2006 (EU) / 10-DEC-2006 (NEBS)

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	10-JAN-2007
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	10-JAN-2007
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	10-JAN-2007
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	10-JAN-2007
BROWN-WHITE	0.10-100MHZ	M-3	C-S	1170	II	10-JAN-2007
BROWN-BLACK	0.10-100MHZ	M-2 (DC)	C-S	1171	II	10-JAN-2007
RED-BLACK	0.10-100MHZ	M-2 (DC)	C-S	1177	II	
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	30-JAN-2007

OSCILLOSCOPES	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
EMC 100MHZ	TDS 220	TEKTRONIX	C036986	1166	I	26-AUG-2006
ESD REFERENCE 1GHZ	TDS 684B	TEKTRONIX	B011287	RENTAL	1	31-MAR-2007
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
ANSI T1.315						
SBC NOISE CART	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
SBC TRANSIENT CART		C-S			III	CALIBRATION NOT REQUIRED
		C-S			III	WAVESHAPE VERIFIED BEFORE USE
RMS VOLTMETERS/CURRENT CLAMP						
TRUE-RMS MULTIMETER	MN	MNFR	SN	ASSET	CAT	CALIBRATION DUE
TRUE-RMS MULTIMETER (REFERENCE)	79III	FLUKE	71700298	00769	I	25-OCT-2006
TRUE-RMS MULTIMETER	177	FLUKE	83390024	00973	I	21-MAR-2007
TRUE-RMS MULTIMETER (TELECOM)	177	FLUKE	83390025	00974	I	10-MAR-2007
TRUE-RMS CLAMP METER (SAFETY)	177	FLUKE	83430419	00975	I	21-MAR-2007
	36	FLUKE	68805882	00700	I	OUT OF SERVICE
SURGE GENERATORS						
TRANSIENT WAVEFORM MONITOR	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
UNIVERSAL SURGE GENERATOR	TWM-5	CDI	003982	00323	II	07-JUN-2006
THREE PHASE COUPLING NWK	M5	CDI	003966	00324	II	09-JUN-2006
1.2x50US PLUGIN MODULE	3CN	CDI	003455	00325	II	09-JUN-2006
10x160US PLUGIN MODULE	1.2x50US PLUGIN	CDI	N/A	00842	II	09-JUN-2006
10x560US PLUGIN MODULE	10x160US PLUGIN	C-S	N/A	00843	II	09-JUN-2006
PSURGE CONTROLLER MODULE	10x560US PLUGIN	C-S	N/A	00841	II	09-JUN-2006
COUPLING/DECOUPLING MODULE	PSURGE 8000	HAEFELY	150267	00879	II	13-JUN-2006
IMPULSE MODULE	PCD 900	HAEFELY	149213	00880	II	13-JUN-2006
HIGH VOLTAGE CAP NWK 5KVDC, 18μF	PIM 900	HAEFELY	149202	00881	II	13-JUN-2006
NEBS SURGE GENERATOR	CS-HVCC	C-S	01	00772	II	28-SEP-2006
2x10US SURGE GENERATOR	N/A	C-S	N/A	00088	II	08-JUN-2006
10x700US SURGE GENERATOR	2x10US	C-S	N/A	00846	II	09-JUN-2006
12 PAIR SURGE RESISTOR MODULE	10x700US	C-S	N/A	00847	II	09-JUN-2006
	N/A	C-S	N/A	00768	II	30-SEP-2006
POWER/NOISE METERS						
POWER METER	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
POWER METER	435B	HP	2445A11012	00773	I	12-APR-2007
POWER SENSOR	437B	HP	2912A01367	01099	I	12-APR-2007
PSOPHOMETER	8481A	HP	2702A61351	00774	I	12-APR-2007
TRANSMISSION LINE TESTER (DBRNC)	2429	BRUEL & KJAER	1237642	00585	II	14-FEB-2007
	185T	AMREL	998658	00823	II	16-MAR-2007
OVERVOLTAGE CHAMBERS						
72kW POWER FAULT SIMULATOR	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
POWER FAULT SIMULATOR	OV1	C-S	N/A	00792	II	31-MAR-2007
	OV2	C-S	N/A	00116	II	31-MAR-2007
DIPOLE TAPE MEASURES						
26FT TAPE #1	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
26FT TAPE #2	2338CME	LUFKIN	C3166-1	00776	I	13-MAR-2007
	2338CME	LUFKIN	C3166-2	00777	I	13-MAR-2007
METEOROLOGICAL METERS						
TEMP./HUMIDITY/ATM. PRESSURE GAUGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
TEMPERATURE /HUMIDITY GAUGE	7400 PERCEPTION II	DAVIS	N/A	00965	II	08-FEB-2007
WEATHER CLOCK (PRESSURE ONLY)	THG-912	HUGER	4000562	00789	I	01-FEB-2007
	BA928	OREGON SCIENTIFIC	C3166-1	00831	I	02-FEB-2007
CONSUMABLES						
NEBS CHEESECLOTH	SPEC.	MFR	STOCK/MN	ASSET	CAT	CALIBRATION DUE
NEBS CARBON BLOCK	26-28M/KG	ED&D	ACC-01	N/A	III	N/A
	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

<u>SCOPE OF ACCREDITATION TO ISO/IEC 17025:1999</u>	
CURTIS-STRAUS ¹ 527 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; KN 22 (RRL No. 2005-82, September 29, 2005); CISPR 11; EN 55011; SABS CISPR 11; AS/NZS CISPR 11; AS/NZS 2064; Canada ICES-001; CNS13803; CISPR 13; EN 55013; SABS CISPR 13; AS/NZS CISPR 13; AS/NZS 1053; CISPR 14-1; EN 55014-1; SABS CISPR 14; AS/NZS CISPR 14; AS/NZS 1044; CNS 13439; CISPR 15; EN 55015; 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."	
(A2LA Cert. No. 1627.01) 3/27/06	Page 1 of 10

Immunity	RRL No. 2005-130 (December 27, 2005)
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
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);
(A2LA Cert. No. 1627.01) 3/27/06	Page 2 of 10

Other Radio Standards	RTTTE 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
(A2LA Cert. No. 1627.01) 3/27/06	Page 3 of 10

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
(A2LA Cert. No. 1627.01) 3/27/06	Page 4 of 10



<p><u>Telecom Standards</u></p> <p>HKTA 2028 HKTA 2029 HKTA 2030 HKTA 2031 HKTA 2032 HKTA 2033</p> <p><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</p> <p>(A2LA Cert. No. 1627.01) 3/27/06</p>	<p><u>European standards (cont'd)</u> TBR 21: 1998 TBR 24: 1997</p> <p><u>Taiwan standards (DGT)</u> ADSL01 ID0002 IS6100 PSTN01 (non-voice only)</p> <p><u>New Zealand standards</u> PTC 200 (non-voice only) PTC 217 TNA 117 PTC 270</p> <p><u>Singapore Standards</u> IDA TS ADSL IDA TS ADSL 2 IDA TS DLN 1 IDA TS ISDN 1 IDA TS ISDN 2 IDA TS PSTN (non-voice only)</p> <p><u>South Africa standards</u> TE-001 (non-voice only)</p> <p>(A2LA Cert. No. 1627.01) 3/27/06</p>	<p>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</p> <p>Asymmetric Digital Subscriber Line Terminal Equipment and POTS Splitter Technical Specifications DSL Equipment Type Approval Guidelines ISDN Terminal Equipment Technical Specifications Technical Specifications for Terminal Equipment for Connection to Public Switched Telephone Network</p> <p>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</p> <p>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)</p> <p>Standard for Telecommunication Line Terminal Equipment (TLTE) for Connection to the Public Switched Telephone Network (PSTN)</p> <p>Page 6 of 10</p>
<p><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*</p> <p><u>Product Safety Standards</u></p> <p><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</p> <p>(A2LA Cert. No. 1627.01) 3/27/06</p>	<p><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</p> <p>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</p> <p>(A2LA Cert. No. 1627.01) 3/27/06</p>	<p><u>Title</u> 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</p> <p>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</p> <p>Page 8 of 10</p>



<i>Environmental Simulation</i>		
<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
Dust	GR-63-CORE Sec 4.3	
Firearms Resistance Testing	IEC 60529	IP-5x & IP-6x
Fire Resistance	GR-487	
	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
Salt Fog & Spray	GR-63-CORE Sec 4.1.2	
Spatial*	ASTM B117	
Spraying-Splashing	GR-63-CORE Sec 2.0 & 3.0	
Storage (Temperature & Humidity)*	IEC 60529	IP-x3 & IP-x4 IEC 60068-2-1 IEC 60068-2-2 IEC 60068-2-14 IEC 60068-2-30 IEC 60068-2-56
	ETS 300 019	
Vibration	GR-63-CORE Sec 4.1.1	
	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 Earthquake, Office & Transportation IP-x7 & IP-x8 IP-x5 & IP-x6
Water Immersion	GR-63-CORE Sec 4.4	
Water Jet	IEC 60529	
	IEC 60529	

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 test 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.

