Curtis-Straus

Test Report

Report No	EG0805-1
Client	IR-TEC International Ltd.
Phone Fax	886-2-29826332 886-2-29833163
FRN	0015242746
Models	DP250, DP550, DP550P
FCC ID	NRIGC171910
Equipment Type Equipment Code	Field Disturbance Sensor FDS
Standards	47 CFR 15.245 and DGT LP0002
Results	As detailed within this report
Prepared by	Josh LeBlanc – Test Engineer
Authorized by	Michael Buchholz – EMC Manager
Issue Date	9/13/06
Conditions of issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section of this report.

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Summary

This report is an application for certification of a transmitter operating pursuant to 47 CFR 15.245 and DGT LP0002. The product covered by this report is the DP250, DP550, and DP550P. They are low power motion detectors that all utilize the same model transmitter/receiver module operating at 10525MHz. Since the three models all utilize the same transceiver module, the DP550 was used for the intentional radiator tests. All three models were tested for spurious radiated and line conducted emissions.

Test Methodology

Radiated emissions testing was performed according to the procedures specified in ANSI C63.4 (2003). The EUT was maximized around all three orthogonal axes. The EUT has an integrated internal antenna which can not be maximized separately. The EUT is powered by 9-16Vdc. The standard test voltage was 12Vdc provided by a typical AC/DC power supply. The ambient environmental conditions were as follows:

Date	Temperature	Humidity
7/13/06	22.7°C	45%
7/14/06	25.2°C	43%
7/17/06	23.4°C	39%

Frequency range investigated:	.15MHz-53GHz

Measurement Distance:		
Frequency (MHz)	*Distance (m)*	*Comments*
Fundamental 10525	1 m	Radiated
Spurious & Harmonics 30 - 18000	3 m	Radiated
Spurious & Harmonics 18000 - 53000	.3 m	Radiated

All readings are peak unless otherwise noted. For frequencies below 30MHz, a RBW of 9 kHz, and a VBW of 30 kHz was used. For frequencies below 1000MHz, a RBW of 120 kHz and a VBW of 300 kHz was used. For frequencies above 1000MHz, a RBW of 1MHz and a VBW of 3MHz was used.

EUT Configuration

EUT Configuration					
Work Order:	G0805				
Company:	IR-TEC International Ltd.				
Company Address:	4F, 14 Lane 530, Chung Cheng N. Road Sanchung, Taipei Hsien, Taiwan				
Contact:	Jerry Lin				
	MN		**SN**		
EUT:	DP250		Test Sample 1		
EUT Description:	Infrared and Microwave motion detector				
EUT Max Frequency:	10525MHz				
Support Equipment:	**MN**		**SN**		
Audiovox DC supply	CNR405		not labeled		
EUT Cables:	**Qty**	**Shielded?**	**Length**	**Ferrites**	
Alarms	1	no	1m	none	
Tamper	1	no	1m	none	
DC power	1	no	1m	none	
Unpopulated EUT Ports:	**Qty**	**Reason**			
none					
Software / Operating Mode Description:					
The EUT was powered by an external 12V supply. It was continuosly monitoring for motion via infrared and microwave signals.					

EUT Configuration					
Work Order:	G0805				
Company:	IR-TEC International Ltd.				
Company Address:	4F, 14 Lane 530, Chung Cheng N. Road Sanchung, Taipei Hsien, Taiwan				
Contact:	Jerry Lin				
	MN		**SN**		
EUT:	DP550		Test Sample 1		
EUT Description:	Infrared and Microwave motion detector				
EUT Max Frequency:	10525MHz				
Support Equipment:	**MN**		**SN**		
Audiovox DC supply	CNR405		not labeled		
EUT Cables:	**Qty**	**Shielded?**	**Length**	**Ferrites**	
Alarms	1	no	1m	none	
Tamper	1	no	1m	none	
DC power	1	no	1m	none	
Unpopulated EUT Ports:	**Qty**	**Reason**			
none					
Software / Operating Mode Description:					
The EUT was powered by an external 12V supply. It was continuosly monitoring for motion via infrared and microwave signals.					

EUT Configuration

Work Order: G0805
Company: IR-TEC International Ltd.
Company Address: 4F, 14 Lane 530, Chung Cheng N. Road
Sanchung, Taipei Hsien, Taiwan
Contact: Jerry Lin

	MN	SN
EUT:	DP550P	Test Sample 1

EUT Description: Infrared and Microwave motion detector
EUT Max Frequency: 10525MHz

Support Equipment:	**MN**	**SN**
Audiovox DC supply	CNR405	not labeled

EUT Cables:	**Qty**	**Shielded?**	**Length**	**Ferrites**
Alarms	1	no	1m	none
Tamper	1	no	1m	none
DC power	1	no	1m	none

Unpopulated EUT Ports:	**Qty**	**Reason**
none		

Software / Operating Mode Description:

The EUT was powered by an external 12V supply. It was continuosly monitoring for motion via infrared and microwave signals.

Statement of Conformity

The DP250, DP550, and DP550P have been found to conform to the following parts of the 47 CFR, and DGT LP0002 as detailed below:

LP0002	47 CFR Part #	Comments
2.1	15.15(b)	The product contains no user accessible controls that increase transmission power above allowable levels.
	15.19	The label is shown in the label exhibit.
2.10	15.21	Information to the user is shown in the instruction manual exhibit.
	15.27	No special accessories are required for compliance.
	15.31(e)	The voltage was varied to ±15% of the rated supply voltage
2.2	15.203	The device utilizes an integral antenna.
2.2	15.204	The antenna is not accessible to the user and therefore cannot be easily removed.
2.7 2.8	15.205 15.209 15.245(b)(3)	The fundamental is not in a restricted band and the spurious emissions in the restricted bands comply with the general emission limits of 15.209.
2.3	15.207	The EUT meets the line conducted emissions limits.
3.11.1	15.245(a)	The EUT is a field disturbance sensor that is not a perimeter protection system.
3.11.1(2)	15.245(b)	The EUT meets the fundamental and harmonic field strength limits for the 10500 -10550MHz band.
3.11.1(2)	15.249(b)(1)(i)	The EUT meets the harmonic emission limits for indoor field disturbance sensors at the 2nd and 3rd harmonics.
2.8	15.245(b)(4)	The EUT meets the provisions of section 15.35 for limiting peak emissions.

Modifications required for compliance:
No modifications were required.

Spurious Radiated Emissions

Sections 15.245(b)(3), 15.205, 15.209

Spurious Radiated Emissions Table — *Curtis-Straus LLC*

Date: 13-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP250, DP550, DP550P

Frequency Range: 30-1000MHz **Measurement Distance:** 3 m

Notes:

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
No emissions were found			---	---	---	---	---	---	---	---	---	---

Test Site: RFI 2 **Pre-Amp:** Black **Cable:** RFI Cables **Analyzer:** Brown **Antenna:** Grey

Spurious Radiated Emissions Table — *Curtis-Straus LLC*

Date: 14-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP250, DP550, DP550P

Frequency Range: 1-18GHz **Measurement Distance:** 3 m

Notes:

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
No emissions were found			---	---	---	---	---	---	---	---	---	---

Test Site: T **Pre-Amp:** none **Cable:** EMIR-high #7 **Analyzer:** Brown **Antenna:** Orange

Radiated Emissions Table — *Curtis-Straus LLC*

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP250, DP550, DP550P

Frequency Range: 18-26.5GHz **Measurement Distance:** 0.3 m

Notes:

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC part 15.245 Limit (dBµV/m)	FCC part 15.245 Margin (dB)	FCC part 15.245 Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
No emissions were found												

Test Site: "T" **Pre-Amp:** 18-26.5GH **Cable:** 40GHz Mixer/18-26 **Analyzer:** Brown **Antenna:** 18-26.5GHz Horn

Spurious Radiated Emissions Table — *Curtis-Straus LLC*

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP550

Frequency Range: 26.5-40GHz **Measurement Distance:** 0.3 m

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
Hpk	27550.0	23.9	0.0	41.5	0.0	65.4				94.0	-28.6	Pass
Hpk	27950.0	24.1	0.0	41.6	0.0	65.7				94.0	-28.3	Pass
Havg	27950.0	9.6	0.0	41.6	0.0	51.2				74.0	-22.8	Pass
NF pk	30210.0	14.6	0.0	41.7	0.0	56.3				94.0	-37.7	Pass
NF avg	30210.0	0.1	0.0	41.7	0.0	41.8				74.0	-32.2	Pass
Hpk	30920.0	40.1	0.0	41.8	0.0	81.9				94.0	-12.1	Pass
Havg	30920.0	25.6	0.0	41.8	0.0	67.4				74.0	-6.6	Pass
Hpk	33120.0	31.6	0.0	42.7	0.0	74.3				94.0	-19.7	Pass
Havg	33120.0	17.1	0.0	42.7	0.0	59.8				74.0	-14.2	Pass
Hpk	33620.0	30.4	0.0	42.7	0.0	73.1				94.0	-20.9	Pass
Havg	33620.0	15.9	0.0	42.7	0.0	58.6				74.0	-15.4	Pass
Havg	27550.0	9.4	0.0	41.5	0.0	50.9				74.0	-23.1	Pass

Table Result: Pass by -6.6 dB ***Worst Freq:*** 30920.0 MHz

Test Site: "T" **Pre-Amp:** 40GHz Mi **Cable:** 40GHz Mixer/18-26 **Analyzer:** Brown **Antenna:** 40GHz Mixer

Spurious Radiated Emissions Table

Curtis-Straus LLC

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805

Engineer: Josh LeBlanc **EUT Desc:** DP250

Frequency Range: 26.5-40GHz **Measurement Distance:** 0.3 m

Notes:

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
Hpk	27550.0	15.3	0.0	41.5	0.0	56.8				94.0	-37.2	Pass
Havg	27550.0	0.8	0.0	41.5	0.0	42.3				74.0	-31.7	Pass
Hpk	27950.0	15.0	0.0	41.6	0.0	56.6				94.0	-37.4	Pass
Havg	27950.0	0.5	0.0	41.6	0.0	42.1				74.0	-31.9	Pass
NF pk	30210.0	14.6	0.0	41.7	0.0	56.3				94.0	-37.7	Pass
NF avg	30210.0	0.1	0.0	41.7	0.0	41.8				74.0	-32.2	Pass
Hpk	30920.0	39.4	0.0	41.8	0.0	81.2				94.0	-12.8	Pass
Havg	30920.0	24.9	0.0	41.8	0.0	66.7				74.0	-7.3	Pass
Hpk	33120.0	21.7	0.0	42.7	0.0	64.4				94.0	-29.6	Pass
Havg	33120.0	7.2	0.0	42.7	0.0	49.9				74.0	-24.1	Pass
Hpk	33620.0	21.2	0.0	42.7	0.0	63.9				94.0	-30.1	Pass
Havg	33620.0	6.7	0.0	42.7	0.0	49.4				74.0	-24.6	Pass

Table Result: Pass by -7.3 dB ***Worst Freq:*** 30920.0 MHz

Test Site: "T" **Pre-Amp:** 40GHz Mi **Cable:** 40GHz Mixer/18-26 **Analyzer:** Brown **Antenna:** 40GHz Mixer

Spurious Radiated Emissions Table

Curtis-Straus LLC

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805

Engineer: Josh LeBlanc **EUT Desc:** DP550P

Frequency Range: 26.5-40GHz **Measurement Distance:** 0.3 m

Notes:

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
Hpk	27550.0	16.1	0.0	41.5	0.0	57.6				94.0	-36.4	Pass
Havg	27550.0	1.6	0.0	41.5	0.0	43.1				74.0	-30.9	Pass
Hpk	27950.0	14.3	0.0	41.6	0.0	55.9				94.0	-38.1	Pass
Havg	27950.0	-0.2	0.0	41.6	0.0	41.4				74.0	-32.6	Pass
NF pk	30210.0	14.6	0.0	41.7	0.0	56.3				94.0	-37.7	Pass
NF avg	30210.0	0.1	0.0	41.7	0.0	41.8				74.0	-32.2	Pass
Hpk	30920.0	30.9	0.0	41.8	0.0	72.7				94.0	-21.3	Pass
Havg	30920.0	16.4	0.0	41.8	0.0	58.2				74.0	-15.8	Pass
Hpk	33120.0	21.1	0.0	42.7	0.0	63.8				94.0	-30.2	Pass
Havg	33120.0	6.6	0.0	42.7	0.0	49.3				74.0	-24.7	Pass
Hpk	33620.0	20.4	0.0	42.7	0.0	63.1				94.0	-30.9	Pass
Havg	33620.0	5.9	0.0	42.7	0.0	48.6				74.0	-25.4	Pass

Table Result: Pass by -15.8 dB ***Worst Freq:*** 30920.0 MHz

Test Site: "T" **Pre-Amp:** 40GHz Mi **Cable:** 40GHz Mixer/18-26 **Analyzer:** Brown **Antenna:** 40GHz Mixer

Spurious Radiated Emissions Table

Curtis-Straus LLC

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805

Engineer: Josh LeBlanc **EUT Desc:** DP250, DP550, DP550P

Frequency Range: 33-53GHz **Measurement Distance:** 0.3 m

Notes:

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Mixer Loss (dB)	Antenna Gain (dB)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC part 15.245 Limit (dBµV/m)	FCC part 15.245 Margin (dB)	FCC part 15.245 Result (Pass/Fail)			
No emissions were found												

Test Site: "T" **Pre-Amp:** none **Cable:** EMIR-high #7 **Analyzer:** Brown **Antenna:** HP11970Q Mixer HP11970V Mixer

Sample Calculation:

Adjusted Reading = Reading – Pre Amp$_{(factor)}$ + Antenna$_{(factor)}$ + Cable$_{(factor)}$

Bandedges

Curtis-Straus LLC

Date: 14-Jul-06 **Company:** ADT Corp **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP550

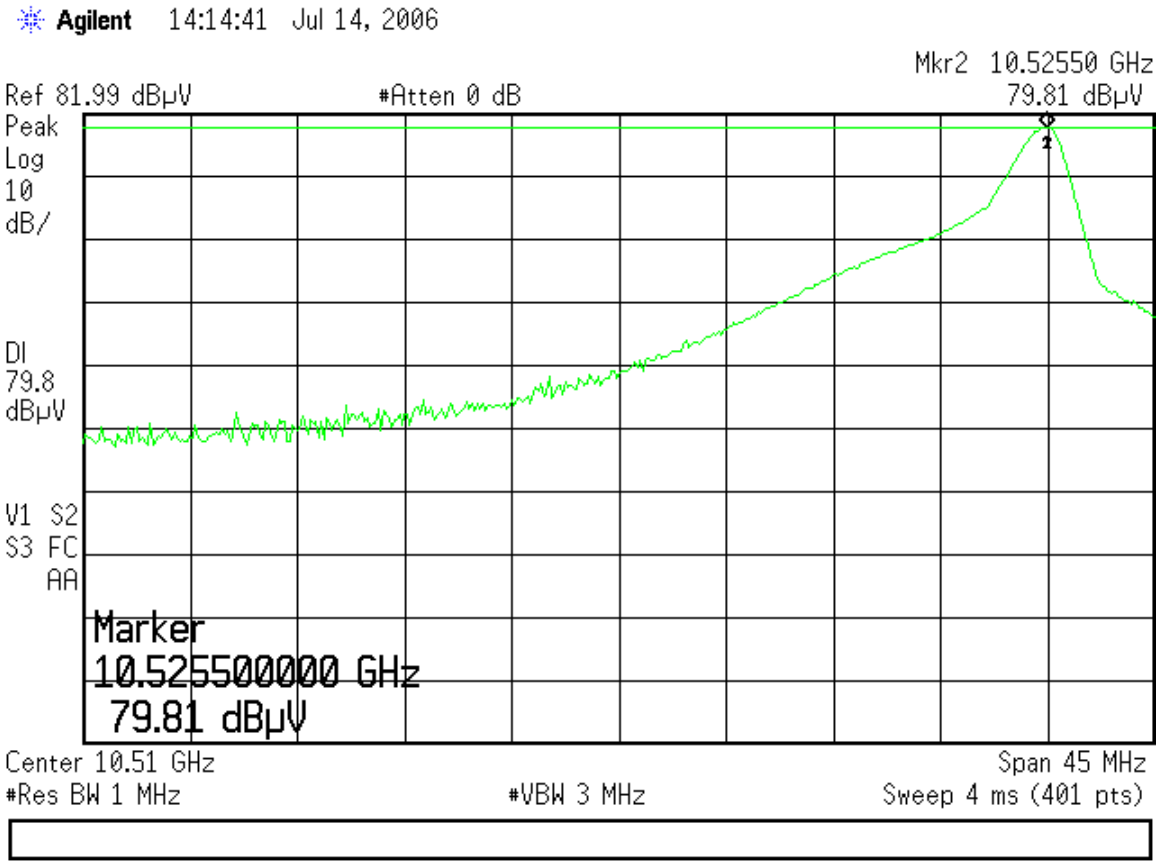
Frequency Range: Bandedges **Measurement Distance:** 1 m

Notes: The marker delta method was used to obtain the peak level at the bandedge.
The average was then obtained by subtracting a DCCF of 14.5dB from the peak level.

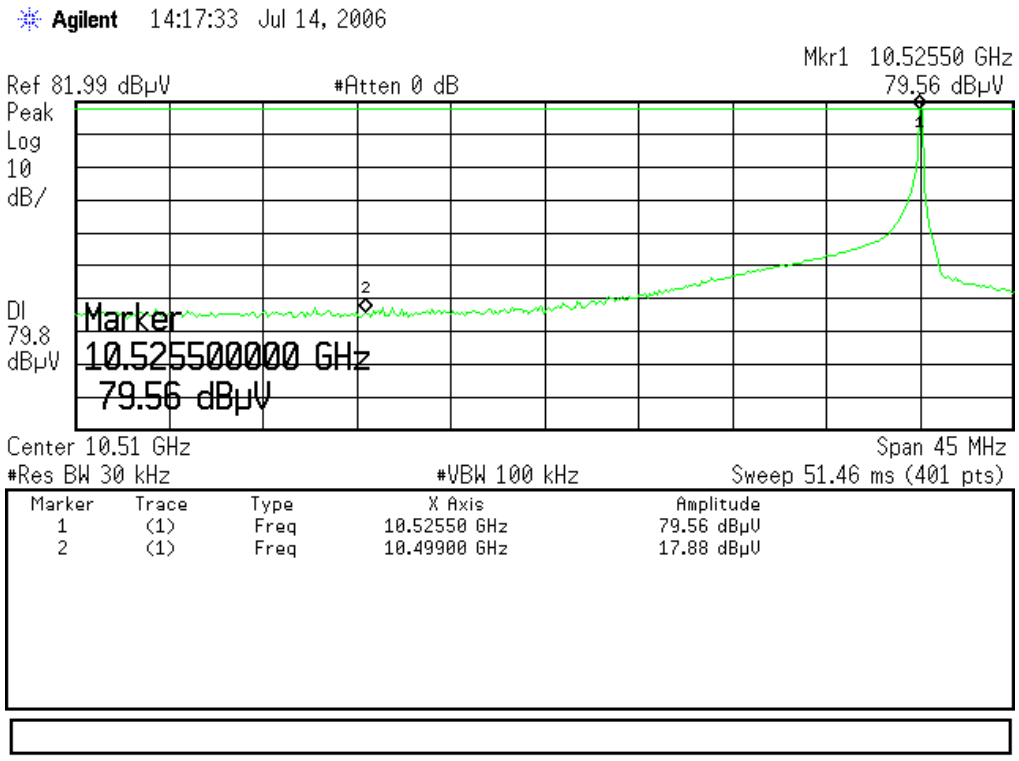
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
Marker Delta method; RBW = 1MHz, VBW = 3MHz, span = 45MHz							---	---	---	---	---	---
Fund Pk	10525.0	79.8	0.0	38.8	7.3	125.9	---	---	---			
Low BE: RBW = 30kHz, VBW = 100kHz, span = 45MHz							---	---	---			
Fund Pk	10525.0	79.6	0.0	38.8	7.3	125.7	---	---	---			
Low BE Pk	10499.0	17.9	0.0	38.8	7.4	64.1	---	---	---			
Delta = 61.7			---	---	---	---	---	---	---	---	---	---
Adj. BE Pk	10499.0	18.1	0.0	38.8	7.4	64.3	---	---	---	83.5	-19.2	Pass
BE average with DCCF = -14.5			---	---	---	---	---	---	---	---	---	---
Adj. BE Avg	10499.0	3.6	0.0	38.8	7.4	49.8	---	---	---	63.5	-13.7	Pass
High BE: RBW = 30kHz, VBW = 100kHz, span = 45MHz							---	---	---	---	---	---
Fund Pk	10525.0	79.6	0.0	38.8	7.3	125.7	---	---	---			
High BE Pk	10553.7	17.9	0.0	38.8	7.3	64.0	---	---	---			
Delta = 60.7			---	---	---	---	---	---	---	---	---	---
Adj. BE Pk	10553.7	19.1	0.0	38.8	7.3	65.2	---	---	---	83.5	-18.3	Pass
BE average with DCCF = -14.5			---	---	---	---	---	---	---	---	---	---
Adj. BE Avg	10553.7	4.6	0.0	38.8	7.3	50.7	---	---	---	63.5	-12.8	Pass

Test Site: "T" **Pre-Amp:** none **Cable:** EMIR-HIGH 7 **Analyzer:** Brown **Antenna:** Orange Horn

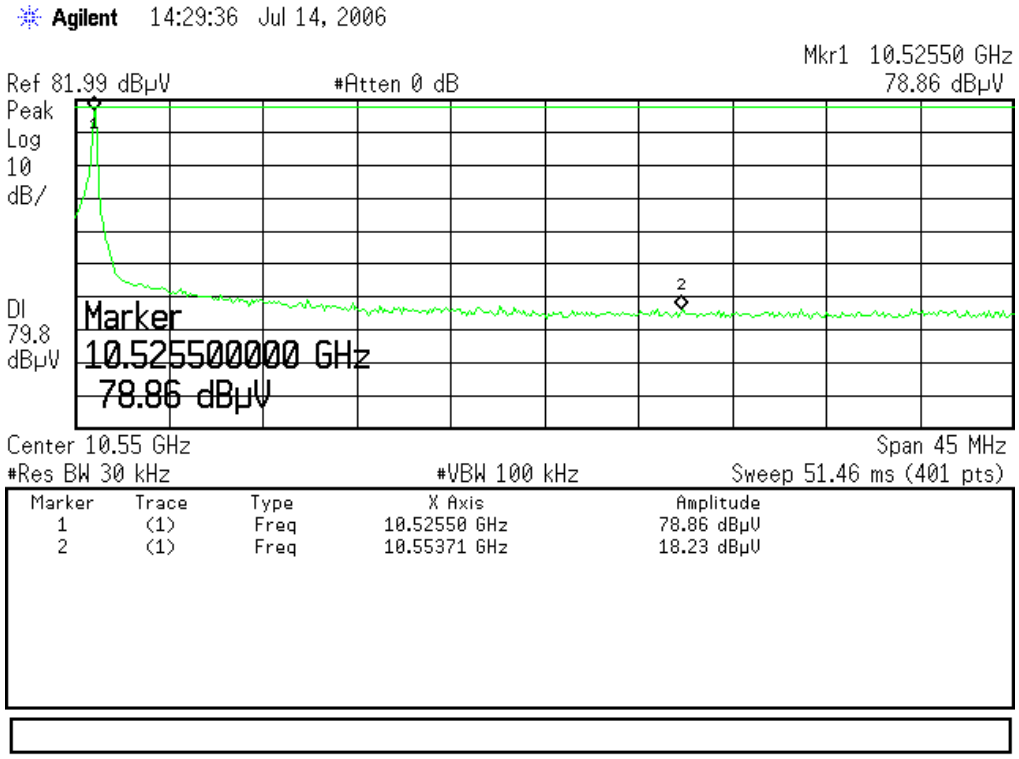
Plot showing fundamental peak at 1MHz RBW



Plot showing lower bandedge delta at 30kHz RBW

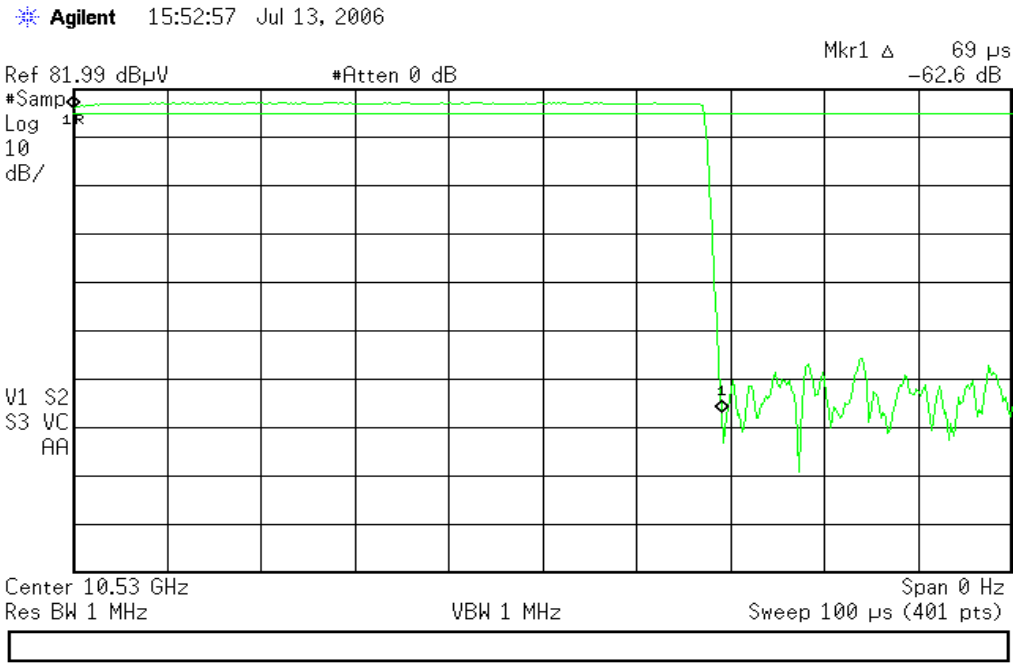


Plot showing upper bandedge delta at 30kHz RBW

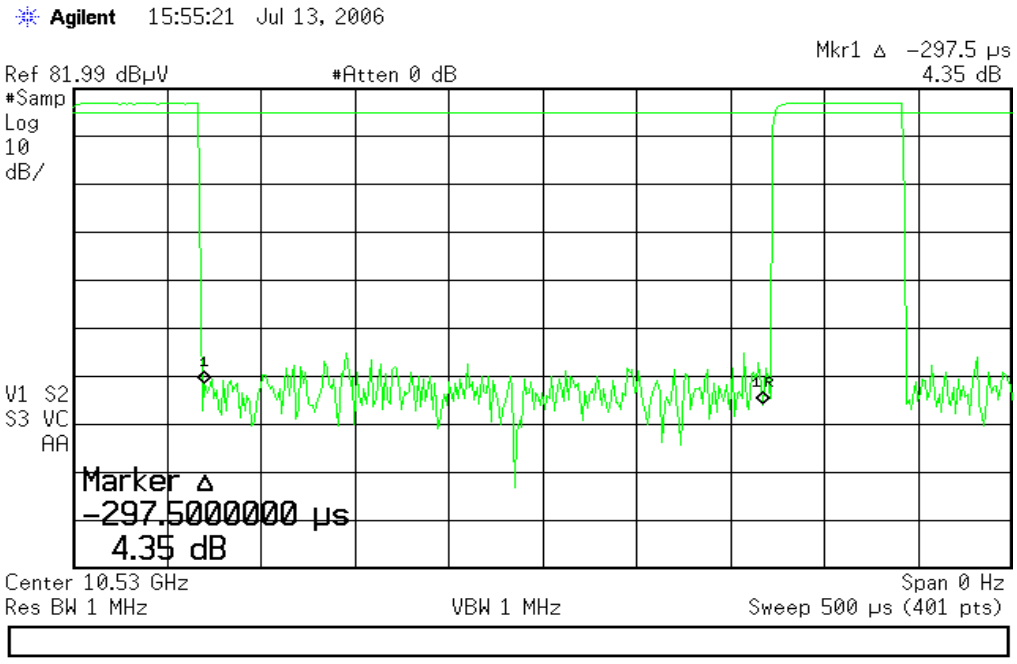


Duty Cycle Correction Factor

Plot showing transmission pulse width



Plot showing time between transmission pulses.



The transmission cycle time = 69uS pulse width +298uS off time = 367uS.
Number of cycles in 100mS = 100mS/367uS = 272.48 cycles
Transmission on time in 100ms = 272.48 cycles * 69uS pulse width = 18.8mS
DCCF = 20*log (18.8mS/100mS) = -14.5dB

Fundamental and Harmonic Field Strengths

Section 15.245(b), 15.245(b)(1)

Fundamental Radiated Emission Table — *Curtis-Straus LLC*

Date: 14-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP550

Frequency Range: Fundamental **Measurement Distance:** 1 m

Notes: The average reading was obtained by subtracting a DCCF of 14.5dB from the peak reading.

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC part 15.245 Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Fund Pk	10525.0	79.8	0.0	38.8	7.3	125.9	157.5	-31.6	Pass			
Fund Avg	10525.0	65.3	0.0	38.8	7.3	111.4	137.5	-26.1	Pass			

Test Site: "T" **Pre-Amp:** none **Cable:** EMIR-HIGH 7 **Analyzer:** Brown **Antenna:** Orange Horn

Harmonic Radiated Emissions Table — *Curtis-Straus LLC*

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP550

Frequency Range: 18-26.5GHz **Measurement Distance:** 0.3 m

Notes:

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC part 15.245 Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Hpk	21051.0	89.1	20.2	40.1	0.0	109.0	128.0	-19.0	Pass			
Havg	21051.0	74.6	20.2	40.1	0.0	94.5	108.0	-13.5	Pass			

Table Result: Fail by 35.0 dB ***Worst Freq:*** 21051.0 MHz

Test Site: "T" **Pre-Amp:** 18-26.5GH **Cable:** 40GHz Mixer/18-26 **Analyzer:** Brown **Antenna:** 18-26.5GHz Horn

Harmonic Radiated Emissions Table — *Curtis-Straus LLC*

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP550

Frequency Range: 26.5-40GHz **Measurement Distance:** 0.3 m

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC part 15.245 Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Hpk	31578.0	40.8	0.0	42.0	0.0	82.8	128.0	-45.2	Pass			
Havg	31578.0	26.3	0.0	42.0	0.0	68.3	108.0	-39.7	Pass			

Table Result: Pass by -5.7 dB ***Worst Freq:*** 31578.0 MHz

Test Site: "T" **Pre-Amp:** 40GHz Mi **Cable:** 40GHz Mixer/18-26 **Analyzer:** Brown **Antenna:** 40GHz Mixer

Harmonic Radiated Emissions Table — *Curtis-Straus LLC*

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP550

Frequency Range: 33-53GHz **Measurement Distance:** 0.3 m

Notes:

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Mixer Loss (dB)	Antenna Gain (dB)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC part 15.245 Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)			
Hpk	42105.0	32.1	23.1	24.0	1.3	32.5	128.0	-95.5	Pass			
Havg	42105.0	17.6	23.1	24.0	1.3	18.0	108.0	-90.0	Pass	---	---	---

Table Result: Pass by -90.0 dB ***Worst Freq:*** 42105.0 MHz

Test Site: "T" **Pre-Amp:** none **Cable:** EMIR-high #7 **Analyzer:** Brown **Antenna:** HP11970Q Mixer HP11970V Mixer

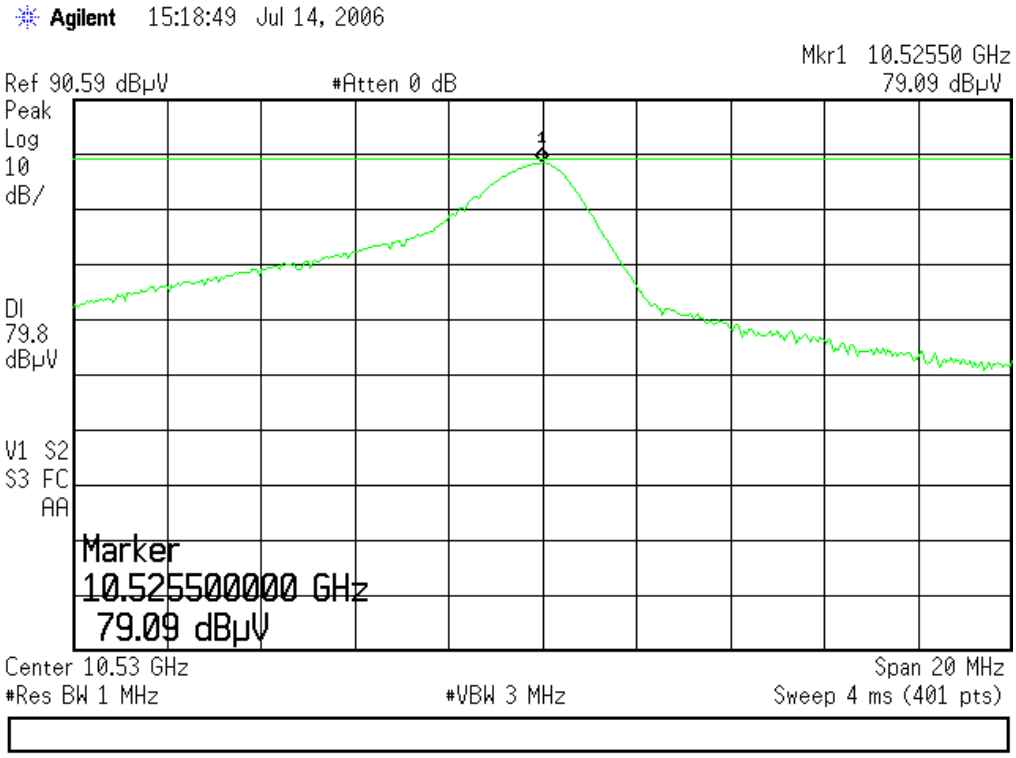
Sample Calculation:

Adjusted Reading = Reading – Pre Amp$_{(factor)}$ + Antenna$_{(factor)}$ + Cable$_{(factor)}$

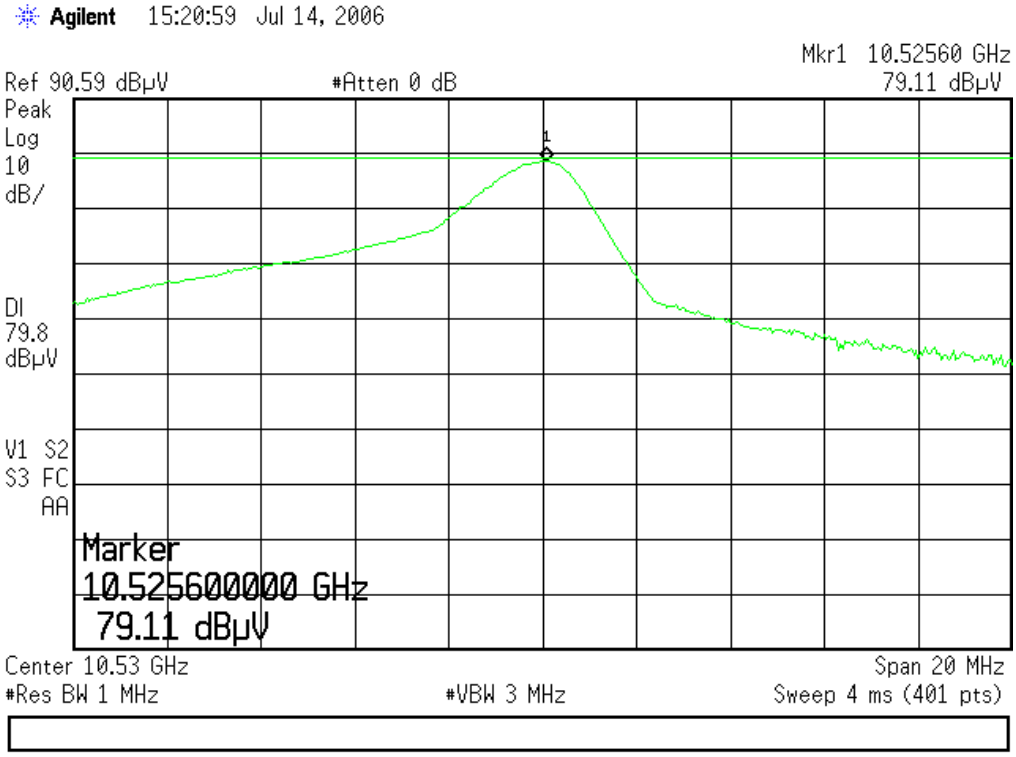
Voltage Variations at the Fundamental

Section 15.31(e)

DC input voltage = 7.65Vdc



DC input voltage = 18.4Vdc



AC Line Conducted Emissions

Section 15.207

AC Mains Conducted Emissions — *Curtis-Straus LLC*

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP250 **Test Site:** EMI3
Notes: AC side of the DC supply
Measurement Device: Orange LISN
Range: 0.15-30MHz **Spectrum Analyzer:** Red

	Q.P. Readings		Ave. Readings		Impedance Factor	---		FCC/CISPR B		FCC/CISPR B		Overall
Frequency	QP1	QP2	AV1	AV2		Limit	Margin	qp Limit	qp Margin	AVE Limit	AVE Margin	Result
(MHz)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dB)	(dBµV)	dB	(dBµV)	dB	(dBµV)	dB	(Pass/Fail)
0.15	33.5	27.2	28.2	22.7	21.6	---	---	66.0	-10.9	56.0	-6.2	Pass
0.29	21.8	20.1	19.6	18.3	20.5	---	---	60.6	-18.3	50.6	-10.6	Pass
0.38	9.2	14.2	7.9	7.1	20.5	---	---	58.3	-23.6	48.3	-19.9	Pass
0.48	14.1	13.8	11.7	10.0	20.5	---	---	56.3	-21.7	46.3	-14.1	Pass
0.66	28.7	24.6	20.3	20.8	20.5	---	---	56.0	-6.8	46.0	-4.7	Pass
0.86	7.3	9.1	5.7	4.4	20.4	---	---	56.0	-26.5	46.0	-19.9	Pass

Table Result: Pass by -4.70 dB ***Worst Freq:*** 0.66 MHz

AC Mains Conducted Emissions — *Curtis-Straus LLC*

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP550 **Test Site:** EMI3
Notes: AC side of the DC supply
Measurement Device: Orange LISN
Range: 0.15-30MHz **Spectrum Analyzer:** Red

	Q.P. Readings		Ave. Readings		Impedance Factor	---		FCC/CISPR B		FCC/CISPR B		Overall
Frequency	QP1	QP2	AV1	AV2		Limit	Margin	qp Limit	qp Margin	AVE Limit	AVE Margin	Result
(MHz)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dB)	(dBµV)	dB	(dBµV)	dB	(dBµV)	dB	(Pass/Fail)
0.15	28.1	33.9	22.6	28.0	21.6	---	---	66.0	-10.5	56.0	-6.4	Pass
0.29	22.7	21.0	16.2	17.1	20.5	---	---	60.6	-17.4	50.6	-13.0	Pass
0.48	17.5	9.2	9.0	8.9	20.5	---	---	56.3	-18.3	46.3	-16.8	Pass
0.57	14.4	10.4	7.2	6.5	20.5	---	---	56.0	-21.1	46.0	-18.3	Pass
0.66	22.0	21.3	21.4	20.8	20.5	---	---	56.0	-13.5	46.0	-4.1	Pass
0.95	12.1	11.3	6.2	6.1	20.4	---	---	56.0	-23.5	46.0	-19.4	Pass

Table Result: Pass by -4.10 dB ***Worst Freq:*** 0.66 MHz

AC Mains Conducted Emissions — *Curtis-Straus LLC*

Date: 17-Jul-06 **Company:** IR-TEC International Ltd. **Work Order:** G0805
Engineer: Josh LeBlanc **EUT Desc:** DP550P **Test Site:** EMI3
Notes: AC side of the DC supply
Measurement Device: Orange LISN
Range: 0.15-30MHz **Spectrum Analyzer:** Red

	Q.P. Readings		Ave. Readings		Impedance Factor	---		FCC/CISPR B		FCC/CISPR B		Overall
Frequency	QP1	QP2	AV1	AV2		Limit	Margin	qp Limit	qp Margin	AVE Limit	AVE Margin	Result
(MHz)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dB)	(dBµV)	dB	(dBµV)	dB	(dBµV)	dB	(Pass/Fail)
0.15	27.5	33.8	22.4	27.9	21.6	---	---	66.0	-10.6	56.0	-6.5	Pass
0.29	18.5	17.7	13.5	13.1	20.6	---	---	60.7	-21.6	50.7	-16.6	Pass
0.37	11.7	12.1	5.0	7.1	20.5	---	---	58.5	-25.9	48.5	-20.9	Pass
0.49	11.5	10.6	6.2	6.9	20.5	---	---	56.3	-24.3	46.3	-18.9	Pass
0.66	23.9	23.4	20.7	20.2	20.5	---	---	56.0	-11.6	46.0	-4.8	Pass
0.72	15.9	18.5	11.1	16.6	20.5	---	---	56.0	-17.0	46.0	-8.9	Pass

Table Result: Pass by -4.80 dB ***Worst Freq:*** 0.66 MHz

Test Equipment Used

REV. 12-JUL-2006

SPECTRUM ANALYZERS / RECEIVERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RED	9kHz-1.8GHz	8591E	HP	3441A03559	00024	I	30-DEC-2006
BROWN (RENTAL)	9kHz-26.5GHz	E4407B	HP	SG44210511	Rental	1	05-JAN-2007

LISNS/MEASUREMENT PROBES	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
ORANGE	10KHZ-30MHZ	8012-50-R-24-BNC	SOLAR	903707	00754	II	05-MAY-2007

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

LINE CONDUCTED TEST SITES	FCC CODE	IC CODE	VCCI CODE	CAT	CALIBRATION DUE
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	3003A07825/A046903-01	1086	I	23-AUG-2006
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

PREAMPS / ATTENUATORS / FILTERS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
BLACK	0.01-2000MHZ	ZFL-1000-LN	C-S	N/A	00799	II	25-AUG-2006

ANTENNAS	RANGE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
GRAY BILOG	20-2000MHZ	3141	EMCO	9703-1038	00066	II	06-MAY-2007(EMI) / 30-JUN-2007(RFI2)
ORANGE HORN	1-18GHZ	3115	EMCO	0004-6123	00390	I	09-JUN-2007

CHAMBERS AND STRIPLINE	MN	MFR	SN	ASSET	CAT	CALIBRATION DUE
RFI 2 CHAMBER	04' X 07' SHIELDING SYSTEM	LINDGREN	13329	00795	II	30-JUN-2007

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

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

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

Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("**Client**"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "**Conditions**"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("**Test Report**") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "**BUREAU VERITAS**," "**BUREAU VERITAS CONSUMER PRODUCTS SERVICES**," "**BVCPS**", "**MTL**", "**ACTS**", "**MTL-ACTS**" and **CURTIS-STRAUS** (collectively, the "**Marks**") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.
13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND

HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B)NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

Rev.160009121(2)_#684340 v13CS

A2LA Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999

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."*

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);

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 then 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

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	Connection of terminal equipment to the telephone network. Analog and Digital Equipment. TCB Scope C1.
CS-03 Issue 9	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

Telecom Standards	Title
HKTA 2028	Network connection specification for connection of CPE to the PTNs in Hong Kong using digital leased circuits at data rate of 1544 kbit/s
HKTA 2029	Network connection specification for connection of CPE to the PTNs in Hong Kong using digital leased circuits at data rate of 2048 kbit/s
HKTA 2030	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
HKTA 2031	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
HKTA 2032	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
HKTA 2033	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
European standards	
TBR 1: 1995	Attachment requirements for terminal equipment to Be connected to circuit switched data networks and Leased circuits using a CCITT Recommendation X.21 interface, or at an interface physically, functionally and electrically compatible with CCITT Recommendation X.21 but operating at any data signaling rate up to, and including, 1 984 kbit/s
TBR 2: 1997	Attachment requirements for Data Terminal Equipment (DTE) to connect to Packet Switched Public Data Networks (PSPDNs) for CCITT Recommendation X.25 interfaces at data signaling rates up to 1 920 kbit/s utilizing interfaces derived from CCITT Recommendations X.21 and X.21 bit
TBR 3: 1995 + Amdt : 1997	Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access
TBR 4: 1995 + Amdt : 1997	Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN primary rate access
TBR 012: 1993 + Amdt : 1996	Business Telecommunications (BT); Open Network Provision (ONP) technical requirements; 2 048 kbit/s digital unstructured leased line (D2048U) Attachment requirements for terminal equipment
TBR 013: 1996	Business TeleCommunications (BTC); 2 048 kbit/s digital structured leased lines (D2048S); Attachment requirements for terminal equipment interface

European standards (cont'd)	
TBR 21: 1998	Terminal Equipment (TE); Attachment requirements For pan-European approval for connection to the Analogue Public Switched Telephone Networks (PSTNs) of TE (excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signaling
TBR 24: 1997	Business TeleCommunications (BTC); 34 Mbit/s Digital Unstructured and structured leased lines (D34U and D34S); Attachment requirements for Terminal equipment interface
Taiwan standards (DGT)	
ADSL01	Asymmetric Digital Subscriber Line Terminal Equipment and POTS Splitter Technical Specifications
ID0002	DS1 Equipment Type Approval Guidelines
IS6100	ISDN Terminal Equipment Technical Specifications
PSTN01 (non-voice only)	Technical Specifications for Terminal Equipment for Connection to Public Switched Telephone Network
New Zealand standards	
PTC 200 (non-voice only)	Requirements for Connection of Customer Equipment to Analogue Lines
PTC 217	Requirements for Bandwidth Management Devices
TNA 117	Telecom 2048 kbit/s Standard Network Interface
PTC 270	Interim arrangements for ADSL CPE
Singapore Standards	
IDA TS ADSL	Type Approval Specification for Asymmetric Digital Subscriber Line (Full-rate ADSL) Modems
IDA TS ADSL 2	Type Approval Specification for Asymmetric Digital Subscriber Line Splitterless (G-Lite) Modems
IDA TS DLCN 1	Type Approval Specification for Digital Interfaces based on hierarchical bit rates of 2048 kbit/s, 34 368 kbit/s and 139 264 kbit/s
IDA TS ISDN 1	Type Approval Specification for connection of Terminal Equipment to Integrated Services Digital Network (ISDN) Basic Access
IDA TS ISDN 2	Type Approval Specification for connection of Terminal Equipment to Integrated Services Digital Network (ISDN) Primary Rate Access (PRA)
IDA TS PSTN (non-voice only)	Type Approval Specification for connection of Terminal Equipment to Public Switched Telephone Network (PSTN)
South Africa standards	
TE-001 (non-voice only)	Standard for Telecommunication Line Terminal Equipment (TLTE) for Connection to the Public Switched Telephone Network (PSTN)

Product Safety

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*

Product Safety Standards	Title
Specific Product Safety Standards	
UL 60950 2000	Safety of information technology equipment
IEC 60950 1999	Safety of information technology equipment
EN 60950 2000	Safety of information technology equipment, including
IEC 60950-1 2001	Electrical business equipment.
UL 60950-1 2003	
CSA C22.2 No. 60950-00	
CSA C22.2 No. 60950-1 03	
IEC 61010-1 1993	Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements.
EN 61010-1 1993, 2001	Safety requirements for electrical equipment for measurement,
IEC 61010-1 2001	control and laboratory use, Part 1: General requirements.
UL 61010B-1 2003	
CAN/CSA 1010-1 1999 (*Including AM 2*)	Electrical equipment for laboratory use Part 1: General requirements.
IEC 60601-1 1995	Medical electrical equipment. Part 1: General requirements for safety.
EN 60601-1 1995 (*Including AM 2*)	Medical electrical equipment
UL 2601-1 1997	Medical electrical equipment. Part 1: General Requirements for safety.
IEC 60065 1998, 2000	Audio, video and similar electronic apparatus – Safety requirements
ANSI/UL 6500: 1998	Audio/video and musical instrument apparatus for Household,
CAN/CSA 60065-00	commercial and similar general use Australian/New Zealand
AS/NZS 60065 2000	Standard – Approval and test Specification – Mains operated electronic and related Equipment for household and similar general use
Canadian C22.2 No. 1-94 (1-98)	Audio, video and similar electronic equipment.
1994, 1998	Consumer and commercial products
EN 60065 1994	Safety requirements for main operated electronic and related apparatus for household and similar general use.
IEC 60825 1990	Radiation safety of laser products, equipment Classification, requirements and user's guide
EN 60825-1 1994	Safety of laser products Part 1: equipment

Product Safety Standards	Title
IEC 60825-1 2001	Classification, requirements and user's guide.
IEC 60825-2 2000-5	Safety of laser products – Part 2: Safety of optical communication systems
IEC 60825-4 1997-11	Safety of laser products – Part 4: Laser guards
21 CFR 1040.10	Performance standard for laser products
IEC 60335-1 1995	Safety of household and similar electrical appliances
(*Including AM2 – 1997 & AM 12 – 1997*)	Part 1: General requirements
EN 60335-1 2001	
UL 60335-1 1998	
CAN/CSA E335-1 1994	
UL 61010A-1: 2002	Electrical equipment for laboratory use; part 1: General requirements
EN 61010-1: 2001	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
AS/NZS 60950: 2000	Safety information technology equipment
EN 60950-1: 2001	Information Technology Equipment – Safety – Part1: General Requirements
AS/NZS 60950.1: 2003	Information Technology Equipment – Safety – General requirements
UL 61010 -1: 2004	Electrical Equipment for Measurement, Control and Laboratory Use; Part 1: General Requirements
UL 60601-1: 2003	Medical Electrical Equipment, Part 1: General Requirements for Safety
IEC 60601-1-1: 2000	Medical Electrical Equipment - Part 1: General Requirements For Safety 1: Collateral Standard: Safety Requirements For Medical Electrical Systems
EN 60601-1-1: 2001	Medical Electrical Equipment - Part 1: General Requirements for Safety – Section 1-1. Collateral Standard: Safety Requirements For Medical Electrical Systems
UL 60065: 2003	Audio, Video and Similar Electronic Apparatus – Safety Requirements
CSA 60065: 2003	Audio, Video and Similar Electronic Apparatus – Safety Requirements
IEC 60065: 2001	Audio, Video and Similar Electronic Apparatus – Safety Requirements
EN 60065: 2002	Audio, Video and Similar Electronic Apparatus – Safety Requirements
EN 60204 -1: 1998	Safety of Machinery – Electrical Equipment of Machines – Part 1: Specification for General Requirements
HKTA 2001	Compliance Test Specification – Safety and Electrical Protection Requirements for Subscriber Equipment Connected to the Public Telecommunications Networks In Hong Kong

Environmental Simulation

Test Technology	Test Standard	Supporting Standards
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	
Spraying-Splashing	IEC 60529	IP-x3 & IP-x4
Storage (Temperature & Humidity)*	ETS 300 019	IEC 60068-2-1 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

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.*