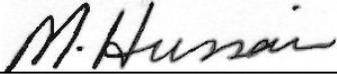


Report No	ED0553-1
Client	Vtech Telecommunications Ltd. Suite 200 – 7671 Alderbridge Way Richmond, BC, Canada V6X 1Z9
Phone	604-273-5131
Fax	604-276-9137
FRN	006-0955-82
Models	VTech 2418 (Base unit)
FCC ID	EW780-5298-B00
Equipment Type Equipment Code	Cordless Telephone Base Transceiver ETB
Results Report Type	As detailed within this report Class II Permissive Change
Prepared by	 Mairaj Hussain – Test Engineer
Authorized by	 Michael Buchholz – EMC Manager
Issue Date	8/1/03
Conditions of issue	This Test Report is issued subject to the conditions stated in ‘terms and conditions’ section of this

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

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Summary

This test report supports a Class II Permissive change intended to add a new model number to FCC ID EW780-5298-B00, previously attributed to the Vtech 2406 base. The new model is the VTech 2418, base of a cordless phone unit, which operates in the frequency range 2400 – 2483.5 MHz as defined by 15.249. The actual center frequencies in which the product operates are composed of 30 channels, in the range of 2410.2 – 2418.9 MHz with a channel separation of 300KHz. Both base units, VTech 2406 and VTech 2418 have the same RF circuitry.

The VTech 2418 base differs from the Vtech 2406 in the following way:

- T_x antenna is changed from “INVERTED F” type to “WIRE” type.

Test Methodology

All testing was performed according to the procedures specified in ANSI C63.4 (2000). The product was tested with modulation on and peak readings were compared against the average limit presented in section CFR 15.249.

Because it is a Class II permissive change verification, only those tests determined affected by the above changes were investigated.

Frequency range investigated:	0.15MHz – 30MHz	1GHz – 10GHz
--------------------------------------	-----------------	--------------

Measurement Distance:		
<i>Frequency (MHz)</i>	<i>Distance (m)</i>	<i>Comments</i>
AC line conducted	Conducted	AC side of AC/DC adapter
1GHz – 10 GHz	Radiated	Fundamental, Harmonics, & Spurious
10GHz – 18GHz	1 m	Radiated Spurious Measurements
18GHz – 26.5GHz	0.1 m	Radiated Spurious Measurements

All readings are peak unless otherwise noted.

Frequency Range	RBW	VBW
<30 MHz	9KHz	30KHz
30MHz – 1000MHz	120KHz	1MHz
> 1000MHz	1MHz	1MHz

EUT Configuration

EUT Configuration					
Work Order: D0553					
Company: Vtech Engineering Canada					
Company Address: Suite 200 - 7671 Alderbridge Way Richmond, BC V6X 1Z9					
Contact: Joseph Poon					
MN		SN	FCC ID		
EUT: Vtech 2418 (Base unit only)		PA 06/03 181	EW780-5298-B00		
EUT Description: 2.4GHz Cordless Phone (base only)					
EUT Max Frequency: 2.4189GHz					
Support Equipment:		MN	SN	FCC ID	
Component Telephone Power Supply Class 2		350905003CT	-	-	
EUT Cables:		Qty	Shielded?	Length	Ferrites
DC Power		1	No	2m	No
RJ11 Telephone Cable		1	No	2m	No
Unpopulated EUT Ports:		Qty	Reason		
None					
Software / Operating Mode Description:					
The EUT was put into Manual Test Mode, which allows the mode to be switched from "Active" to "Rx", as well as allowing the transmission channel to be set.					

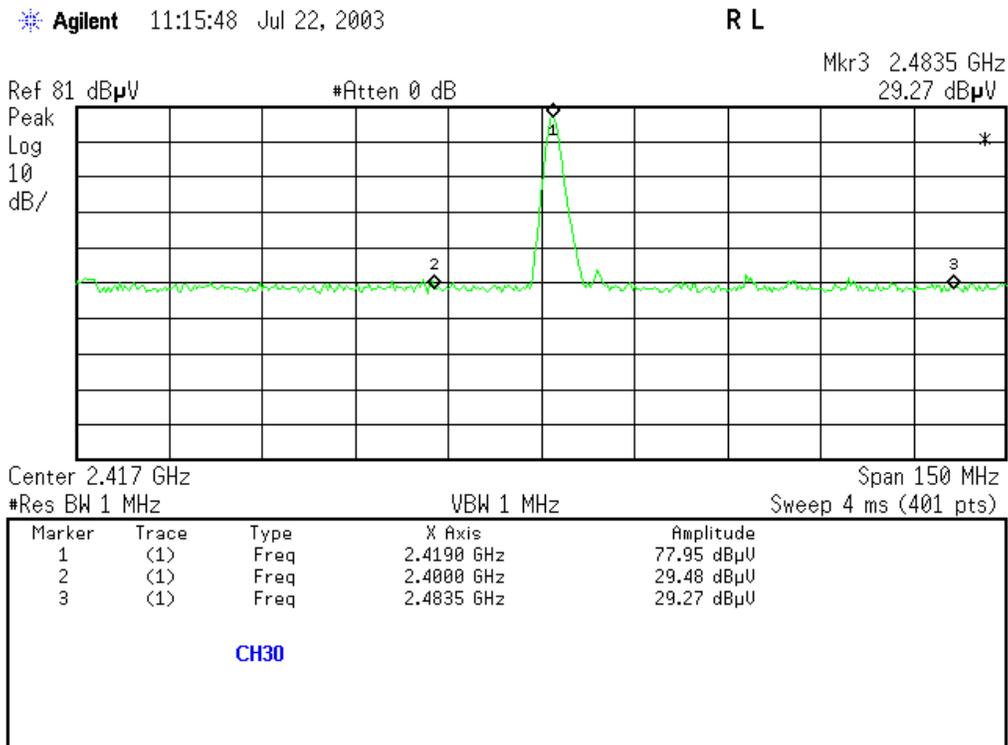
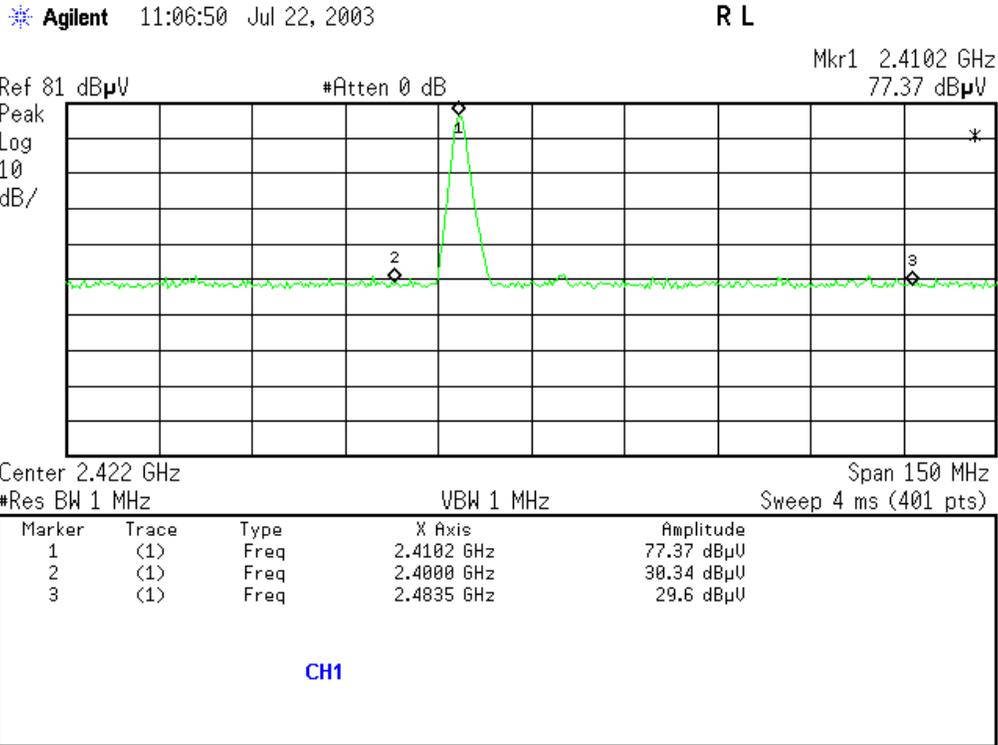
Statement of Conformity

The VTech 2418 (Base unit), has been found to conform with the following parts of the 47 CFR as detailed below:

47 CFR Part #	47 CFR Part #	Comments
	15.15(b)	The product contains no user accessible controls that increase transmission power above allowable levels.
	15.27	No special accessories are required for compliance.
	15.31(e)	Readings were taken at the fundamental frequency with the supply voltage varied 15% below the lowest nominal rated voltage and 15% above the highest nominal rated voltage.
	15.207	The unit meets the AC line conducted requirements of section 15.207. Testing was performed on AC side of AC/DC adapter.
	15.203	The antenna is attached to the transmitter board, and there is no external antenna connection..
	15.205 15.209	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.
	15.249	The EUT complies with the field strength requirement of 15.249.

Test Data and Plots

Section 15.249 (b)



Radiated Emissions Table (Band Edge)							Curtis-Straus LLC				
Date: 22-Jul-03		Company: Vtech		Table 1							
Engineer: Mairaj Hussain		EUT Desc: 2418 (Base unit)		Work Order: D0553							
Measurement Distance: 3 m							Notes:				
							EUT Max Freq: 2418.5 MHz				
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC 15.249				
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)		
BE w CH1	Vpk	2400.0	30.3	19.6	30.7	1.9	43.3	54.0	-10.7	Pass	
	Vpk	2483.5	29.6	19.7	30.9	1.9	42.7	54.0	-11.3	Pass	
BE w CH30	Vpk	2400.0	29.5	19.6	30.7	1.9	42.5	54.0	-11.5	Pass	
	Vpk	2483.5	29.3	19.7	30.9	1.9	42.4	54.0	-11.6	Pass	
Table Result: Pass by -10.7 dB							Worst Freq: 2400.0 MHz				
Test Site: "A"		Pre-Amp: White		Cable: 5 RG142LL		Analyzer: Orange		Antenna: Black Horn			

Note: All readings are peak unless otherwise noted.

Conclusion:	The product meets the respective limit at lower/upper band edges.
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Sample calculation:

Adjusted Reading = reading + cable factor + antenna factor

Section 15.249 (b) (1)

Radiated Emissions Table (Fundamental)							Curtis-Straus LLC				
Date: 21-Jul-03		Company: Vtech		Table 2							
Engineer: Mairaj Hussain		EUT Desc: 2418 Base unit		Work Order: D0553							
Measurement Distance: 3 m							Notes:				
							EUT Max Freq: 2418.5 MHz				
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC 15.249				
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)		
CH15 Vpk	2414.3	79.5	19.6	30.7	1.9	92.5	94.0	-1.5	Pass		
CH1 Vpk	2410.0	78.9	19.6	30.7	1.9	91.9	94.0	-2.1	Pass		
CH30	2418.5	78.2	19.6	30.7	1.9	91.2	94.0	-2.8	Pass		
Table Result: Pass by -1.5 dB							Worst Freq: 2414.3 MHz				
Test Site: "T"		Pre-Amp: White		Cable: 5 RG142LL		Analyzer: Green		Antenna: Black Horn			

Sample calculation:

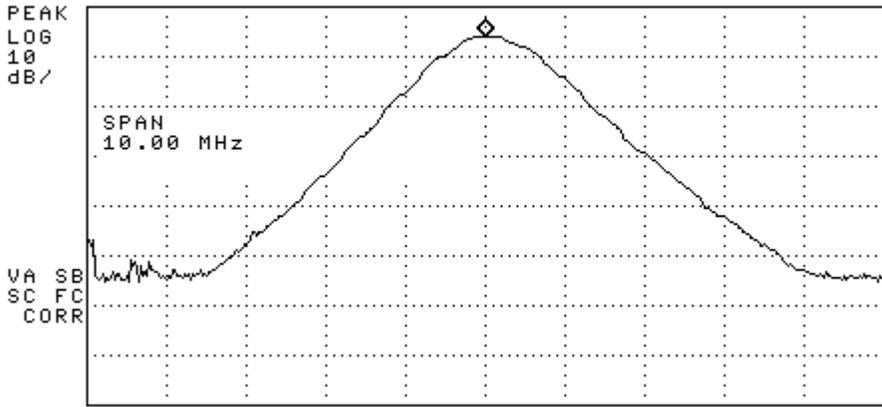
Adjusted Reading = reading + cable factor + antenna factor – pre amp factor

Conclusion:	The product meets the respective limit at fundamental.
--------------------	--

15:18:22 JUL 21, 2003

REF 85.0 dB μ V #AT 0 dB

MKR 2.41008 GHz
78.93 dB μ V



CENTER 2.41008 GHz #RES BW 1.0 MHz #VBW 1 MHz SPAN 10.00 MHz SWP 20.0 msec

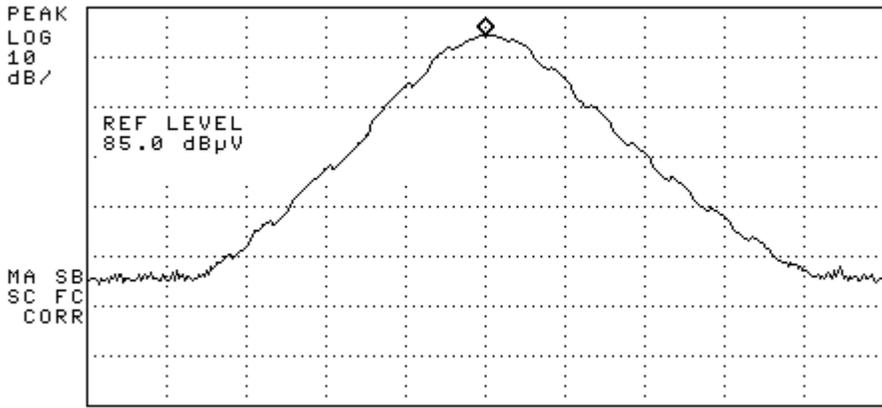
RL

CH1

15:10:18 JUL 21, 2003

REF 85.0 dB μ V #AT 0 dB

MKR 2.41430 GHz
79.45 dB μ V



CENTER 2.41430 GHz #RES BW 1.0 MHz #VBW 1 MHz SPAN 10.00 MHz SWP 20.0 msec

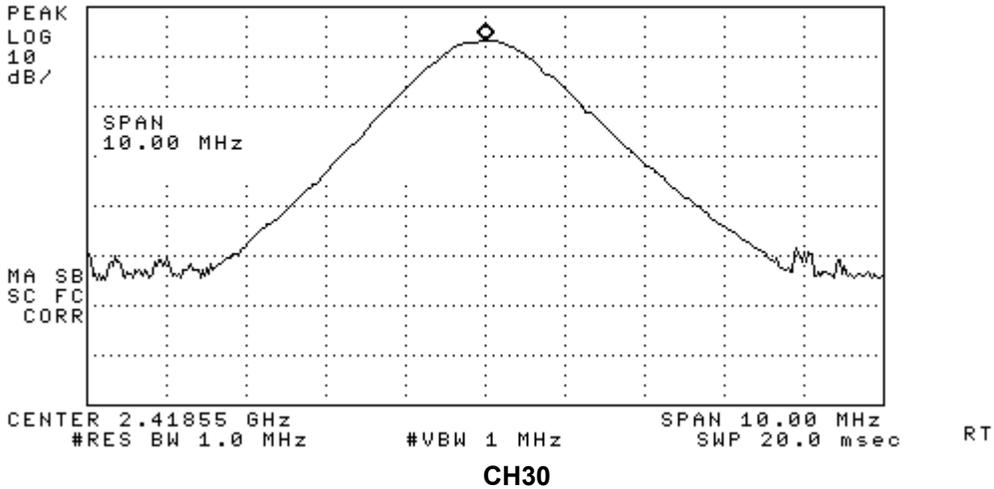
RT

CH15

16:31:58 JUL 21, 2003

REF 85.0 dBµV #AT 0 dB

MKR 2.41855 GHz
78.21 dBµV



Section 15.249 (d)

Radiated Emissions Table (Harmonics and Spurious)								Curtis-Straus LLC		
Date: 22-Jul-03		Company: Vtech			Table 3					
Engineer: Mairaj Hussain		EUT Desc: 2418 (Base unit)			Work Order: D0553					
Frequency Range: 1 - 26.5 GHz				Measurement Distance: 1 m< for 10GHz, 0.1m> for 10GHz						
Notes: Check harmonics with 2414.4MHz fundamental.				EUT Max Freq: 2418.5MHz						
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Distance Factor (dB)	Adjusted Reading (dBµV/m)	FCC 15.249		
								Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Hpk	4828.8	41.7	18.9	36.5	2.8	9.5	52.6	54.0	-1.4	Pass
Hpk	7243.4	32.1	18.5	39.5	3.9	9.5	47.5	54.0	-6.5	Pass
Hpk	9657.4	32.6	18.4	41.8	4.7	9.5	51.2	54.0	-2.8	Pass
Hpk	3658.7	43.2	18.9	34.2	2.5	9.5	51.5	54.0	-2.5	Pass
Table Result: Pass by 1.4 dB				Worst Freq: 4828.8 MHz						
Test Site: "A"		Pre-Amp: White		Cable: 5 RG142LL		Antenna: Black Horn				

Sample calculation:

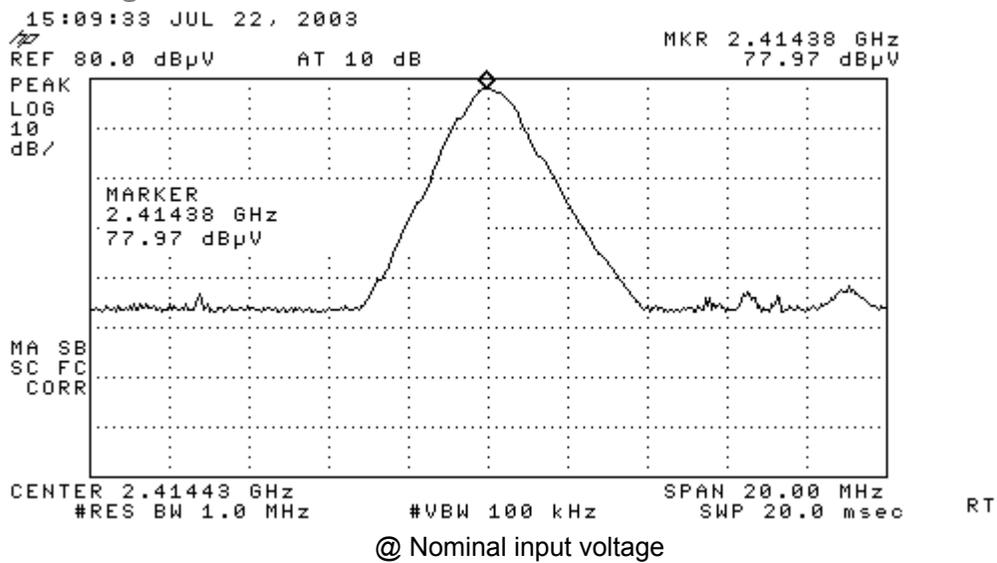
Adjusted reading = Reading + Antenna factor + Cable factor – Pre amp factor

Note: Only 1 – 26.5 GHz frequency range was investigated.

Voltage Variation

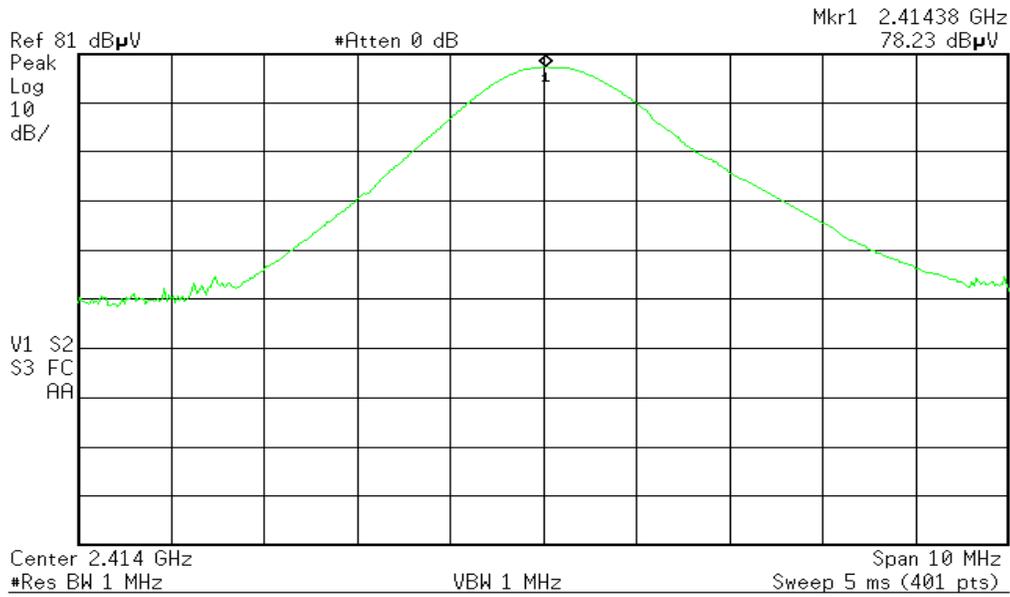
Voltage Variation Table							Curtis-Straus LLC		
Date: 22-Jul-03		Company: Vtech			Table 5				
Engineer: Mairaj Hussain		EUT Desc: 2418 (Base unit)			Work Order: D0553				
Measurement Distance: 3m									
Notes: Check harmonics with 2414.4MHz fundamental.							EUT Max Freq: 2418.5MHz		
Input Voltage (V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	FCC 15.249		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
Nominal	2414.3	78.0	19.6	30.7	1.9	91.0	94.0	-3.0	PASS
134.5	2414.3	78.2	19.6	30.7	1.9	91.2	94.0	-2.8	PASS
99.5	2414.3	78.5	19.6	30.7	1.9	91.5	94.0	-2.5	PASS
Table Result: Pass			by 1.4 dB		Worst Freq: 4828.8 MHz				
Test Site: "A"		Pre-Amp: White		Cable: 5 RG142LL			Antenna: Black Horn		

Voltage Variation Plots



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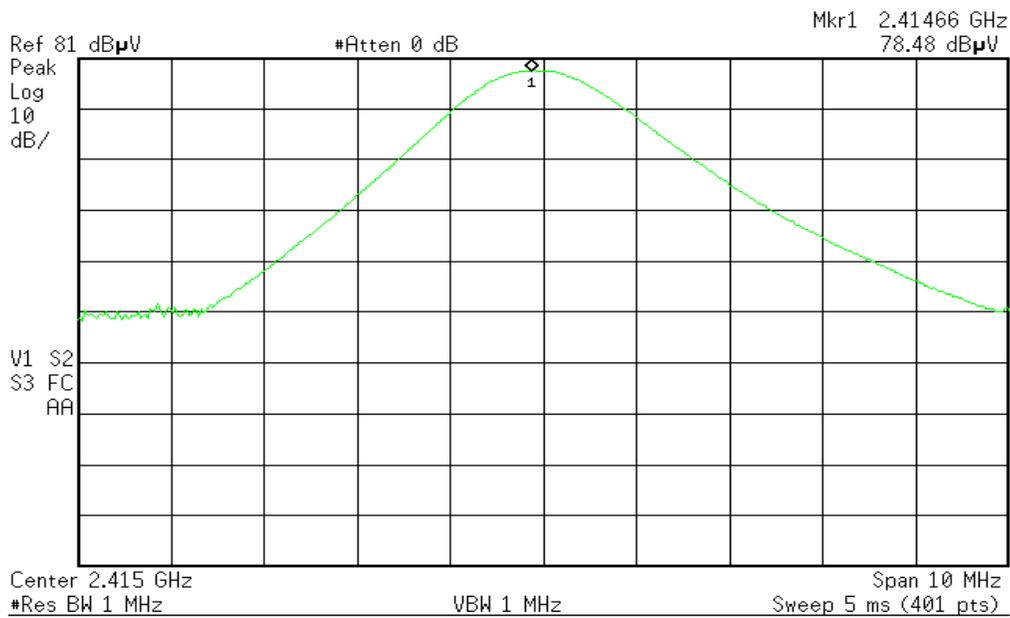
R L



@ 134.5V input voltage

Agilent 11:34:47 Jul 22, 2003

R L



@ 99.5V input voltage

AC Line Conducted Emission Measurements

AC Mains Conducted Emissions							Curtis-Straus LLC					
Date: 22-Jul-03			Company: Vtech			Table No: 6						
Engineer: Mairaj Hussain			EUT Desc: AT&T 2418 Base			Work Order: D0553						
Notes:							Test Site: EMI1					
LISN(s): Red							Spectrum Analyzer: Yellow					
Range: 0.15-30Mhz							Other Equipment: ---					
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			
0.15	27.0	21.7			20.0	66.0	-19.0	56.0	-9.0	Pass		
0.20	16.6	17.3			20.0	63.6	-26.3	53.6	-16.3	Pass		
0.45	7.5	7.8			20.0	56.9	-29.1	46.9	-19.1	Pass		
0.60	8.2	8.2			20.0	56.0	-27.8	46.0	-17.8	Pass		
0.80	1.0	-1.0			20.0	56.0	-35.0	46.0	-25.0	Pass		
11.96	18.5	12.0			20.0	60.0	-21.5	50.0	-11.5	Pass		
15.94	13.5	11.0			20.0	60.0	-26.5	50.0	-16.5	Pass		
19.92	4.0	2.2			20.0	60.0	-36.0	50.0	-26.0	Pass		
23.91	5.5	5.5			20.0	60.0	-34.5	50.0	-24.5	Pass		
27.90	5.0	6.0			20.0	60.0	-34.0	50.0	-24.0	Pass		

Table Result: Pass by -9.00 dB **Worst Freq:** 0.15 MHz

LIMITS

Quasi-Peak: 250µV = 47.9dBµV in the range 450kHz to 30MHz

[47 CFR 15.207(a) Revised as of October 1, 2001]

Note: On July 12, 2004, FCC adopts the conducted emissions limits of the European CISPR 22 standard as outlined below

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

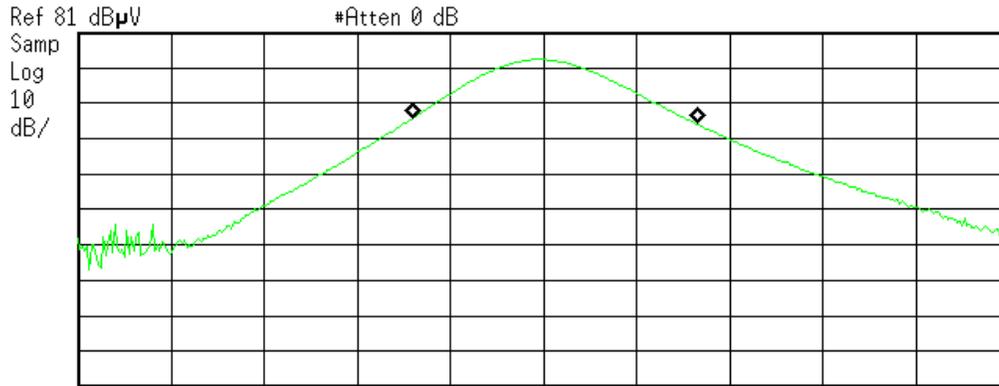
*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a) Revised as of October 1, 2002; amended by ET Docket 98-80; FCC 02-157, published in the Federal Register Vol. 67, No. 132, on Wednesday, July 10, 2002]

Occupied Bandwidth

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R L



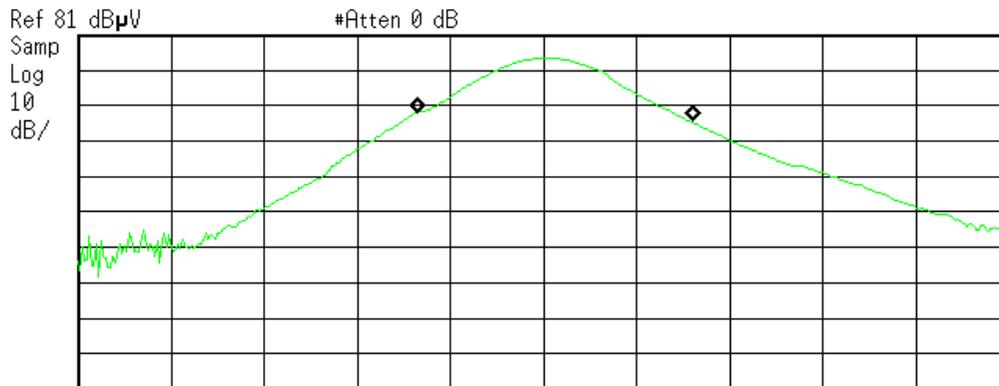
Center 2.41 GHz Span 10 MHz
 #Res BW 1 MHz #VBW 3 MHz Sweep 5 ms (401 pts)

Occupied Bandwidth Results (measuring..)	
Occupied Bandwidth	Occ BW % Pwr 99.00 %
3.040 MHz	
Transmit Freq Error 117.8 kHz	

CH1

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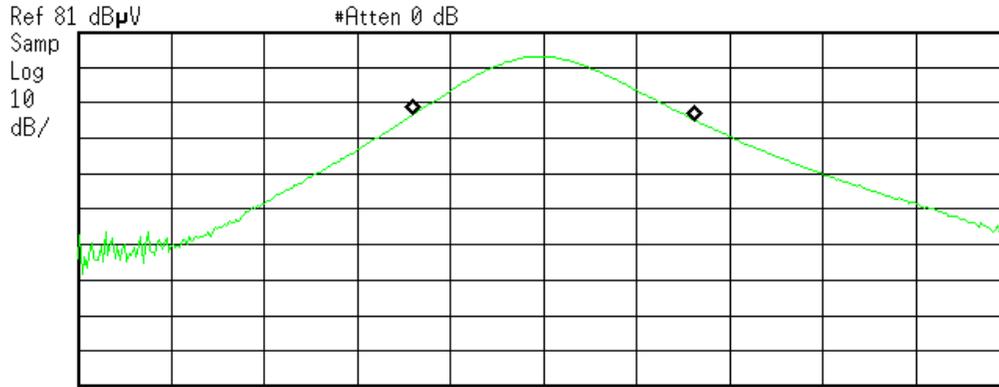
R L



Center 2.414 GHz Span 10 MHz
 #Res BW 1 MHz #VBW 3 MHz Sweep 5 ms (401 pts)

Occupied Bandwidth Results (measuring..)	
Occupied Bandwidth	Occ BW % Pwr 99.00 %
2.957 MHz	
Transmit Freq Error 131.1 kHz	

CH15



Occupied Bandwidth Results (measuring..)	
Occupied Bandwidth	Occ BW % Pwr 99.00 %
3.040 MHz	
Transmit Freq Error	116.2 kHz

CH30

Test Equipment Used

REV. 7/18/03

SPECTRUM ANALYZERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	9kHz-1.8GHz	8591E	HP	3441A03559	00024	21-MAY-2004
WHITE	9kHz-22GHz	8593E	HP	3547U01252	00022	25-FEB-2004
BLUE	9kHz-1.8GHz	8591E	HP	3223A00227	00070	04-SEP-2003
YELLOW	9kHz-2.9GHz	8594E	HP	3523A01958	00100	08-JUL-2004
GREEN	9kHz-26.5GHz	8593E	HP	3829A03618	00143	02-OCT-2003
BLACK	9kHz-12.8GHz	8596E	HP	3710A00944	00337	15-JUL-2004
YELLOW-BLACK	20Hz-40.0MHz	3585A	HP	2504A05219	00030	25-NOV-2003
ORANGE	9kHz-26.5GHz	E4407B	HP	US39440975	00394	27-JUN-2004

LISNS/MEASUREMENT PROBES	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	956348	00753	01-APR-2004
BLUE	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	956349	00752	01-APR-2004
YELLOW-BLACK	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	984735	00248	01-APR-2004
ORANGE	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	903707	00754	24-OCT-2003
GOLD	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	984734	00247	01-APR-2004
WHITE-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972019	00678	01-APR-2004
BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972017	00675	01-APR-2004
RED-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972016	00677	01-APR-2004
BLUE-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972018	00676	01-APR-2004
BLUE MONITORING PROBE	0.01-150MHz	91550-2	TEGAM	12350	00807	21-MAY-2005
YELLOW MONITORING PROBE	0.01-150MHz	91550-2	ETS	50972	00493	21-NOV-2003
GREEN CURRENT TRANSFORMER	40Hz-20MHz	150	PEARSON	10226	00793	03-APR-2004
CISPR LINE PROBE	150kHz-30MHz	N/A	C-S	01	00805	20-DEC-2004
CISPR TELCO VOLTAGE PROBE	150kHz-30MHz	CS A/C-10	C-S	CS01	00296	12-SEP-2003
CISPR 22 TELCO ISN	9kHz-30MHz	FCC-TLISN-T4	FISCHER	20115	00746	15-OCT-2003

OPEN AREA TEST SITE (OATS)	FCC CODE	IC CODE	VCCI CODE	CALIBRATION DUE
SITE F	93448	IC 2762-F	R-468	25-MAR-2005
SITE T	93448	IC 2762-T	R-905	25-MAR-2005
SITE A	93448	IC 2762-A	R-903	25-MAR-2005
SITE M	93448	IC 2762-M	R-904	25-MAR-2005
BUBBLE (HP FACILITY)	N/A	N/A	R-1467	16-MAY-2005

LINE CONDUCTED TEST SITES	FCC CODE	IC CODE	VCCI CODE	CALIBRATION DUE
EMI 1	93448	N/A	C-480	01-MAY-2006
EMI 2	93448	N/A	C-480	01-MAY-2006
EMI 3	93448	N/A	C-480	01-MAY-2006
BUBBLE (HP FACILITY)	N/A	N/A	C-1556	16-MAY-2005

ANTENNAS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
GREEN BILOG	30MHz-2GHz	CBL6112B	CHASE	2742	00620	19-MAY-2005
GREEN-BLACK BILOG	30MHz-2GHz	CBL6112B	CHASE	2412	00127	19-MAY-2005
GREEN-WHITE BILOG	30MHz-2GHz	CBL6112B	CHASE	2574	00319	19-MAY-2005
RED BILOG	30MHz-1GHz	3143	EMCO	1270	00042	17-MAR-2005
BLUE BILOG	30MHz-1GHz	3143	EMCO	1271	00803	17-MAR-2005
GRAY BILOG	26MHz-2GHz	3141	EMCO	9703-1038	00066	19-MAY-2005(EMI) / 06-JUN-2004(RFI)
YELLOW-BLACK BILOG	20-2000MHz	CBL6140A	CHASE	1112	00126	19-MAY-2005(EMI) / 09-JUN-2004(RFI)
YELLOW HORN	1-18GHz	3115	EMCO	9608-4898	00037	22-MAY-2005
BLACK HORN	1-18GHz	3115	EMCO	9703-5148	00056	12-JUN-2005
ORANGE HORN	1-18GHz	3115	EMCO	0004-6123	00390	04-JUN-2005
HF (WHITE) HORN	18-26.5GHz	801-WLM	WAVELINE	00758	00758	15-JUL-2005
SMALL LOOP	9kHz-30MHz	PLA-130/A	ARA	1024	00755	27-JAN-2004
LARGE LOOP	20Hz-5MHz	6511	EMCO	9704-1154	00067	05-NOV-2003
ACTIVE MONOPOLE	30Hz-30MHz	3301B	EMCO	3824	00068	08-APR-2004
INDUCTION COIL	50-60Hz	1000-4-8	C-S	N/A	00778	16-SEP-2004
ADJUSTABLE DIPOLE	30-1000MHz	3121C	EMCO	1370	00757	26-JUN-2005
ADJUSTABLE DIPOLE	30-1000MHz	3121C	EMCO	1371	00756	26-JUN-2005

RE101 LOOP SENSOR	30Hz-100kHz	RE101-13.3CM	C-S	N/A	00818	07-JAN-2005
RS101 RADIATING LOOP	30Hz-100kHz	RS101-12CM	C-S	N/A	00819	07-JAN-2005
RS101 LOOP SENSOR	30Hz-100kHz	RS101-4CM	C-S	N/A	00820	07-JAN-2005

MIXERS/DIPLEXERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
MIXER / HORN	26.5-40 GHz	11970A/28-442-6	HP/ATM	2332A00900/A046903-01	00369	09-JUL-2004
MIXER / HORN	40-60 GHz	M19HW/A	OML	U30110-1	00821	03-JAN-2005
MIXER / HORN	60-90 GHz	M12HW/A	OML	E30110-1	00822	03-JAN-2005
MIXER / HORN	90-140 GHz	MO8HW/A	OML	F21206-1	00811	05-DEC-2004
MIXER / HORN	140-220 GHz	MO5HW/A	OML	G21206-1	00812	05-DEC-2004
DIPLEXER		DPL.26	OML	N/A	00813	05-DEC-2004

PREAMPS / ATTENUATORS / FILTERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	0.10-2000MHZ	ZFL-1000-LN	C-S	N/A	00798	17-MAR-2004
BLUE	0.01-2000MHZ	ZFL-1000-LN	C-S	N/A	00759	07-AUG-2003
BLUE-BLACK	0.01-2000MHZ	ZFL-1000-LN	C-S	N/A	00800	08-APR-2004
GREEN	0.01-2000MHZ	ZFL-1000-LN	C-S	N/A	00802	17-MAR-2004
BLACK	0.01-2000MHZ	ZFL-1000-LN	C-S	N/A	00799	17-MAR-2004
ORANGE	0.01-2000MHZ	ZFL-1000-LN	C-S	N/A	00765	17-MAR-2004
WHITE	1-20GHZ	SMC-12A	C-S	426643	00760	27-AUG-2003
YELLOW-BLACK	1-20GHZ	SMC-12A	C-S	535055	00801	27-AUG-2003
ORANGE-BLACK	1-20GHZ	SMC-12A	C-S	637367	00761	04-MAR-2004
HF (YELLOW)	18-26.5GHZ	AFS4-18002650-60-8P-4	C-S	467559	00758	15-JUL-2004
HIGH PASS FILTER	1-18 GHZ	SPA-F-55204	K&L	36	00817	31-DEC-2003
LOW PASS FILTER	1-9 GHZ	11SL10-4100/X4400-O/O	K&L	4	00816	31-DEC-2003
HF 20DB ATTENUATOR	0.03-20 GHz	PE 7019-20	PASTERNAK	01	00791	21-MAY-2005

ABSORBING CLAMPS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
FISCHER CLAMP	30-1000MHZ	F-201-23MM	FISCHER	10	00081	04-JAN-2004

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

A2LA Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999

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

ELECTRICAL

Valid until: July 31, 2003

Certificate Number: 1627-01

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

Electromagnetic Compatibility (EMC)

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

EMC Standards Emissions	Title		
CISPR 22 1997 with amendments 1 and 2	Limits and methods of measurement of radio disturbance characteristics of information technology equipment.	CNS 13439 AS/NZS 1053: 1999	Broadcast receiver and associated equipment Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment.
CNS13438 1994	Limits and methods of measurement of radio interference characteristics of information technology equipment.	CISPR 14 1993	Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and electric apparatus.
EN55022:1994 and 1998	Limits and methods of measurement of radio disturbance characteristics of information technology equipment.	EN 55014 1993, 1997	Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus.
SABS CISPR 22:1997	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	AS/NZS 1044: 1995	Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus.
Canada ICES-003 1997 AS/NZS 3548 1995	Digital apparatus Australian/New Zealand Standard Limits and methods of measurement of radio disturbance characteristics of information technology equipment		
CISPR 11 1990, 1997	Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.	Immunity CNS13783-1 SABS CISPR 14-1 1993	Household Electrical Appliances Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 1: Emission – Product family standard
EN 55011 1991, 1998	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.	SABS CISPR 14-2 1997	Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity - Product family standard
SABS CISPR 11:1997	Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics Limits and methods of measurement	CISPR 14-2 1996	Immunity requirements for household appliances, tools and similar apparatus.
Canada ICES-001 1998	Industrial, scientific and medical radio frequency generators	CISPR 20 with amendment 3	Limits and methods of measurement of immunity characteristics of sound and television broadcast receivers and associated equipment.
CNS13803 AS/NZS 2064: 1997	Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.	EN 55020 1995	Electromagnetic immunity of broadcast receivers and associated equipment.
CSA C108.8 – M1983	Electromagnetic Emission from Data Processing Equipment and Electronic Office Machines	CISPR 24	Information technology equipment – Immunity characteristics – Limits and methods of measurement
CISPR 13 1996, 1998	Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment.	SABS CISPR 24 1997	Information technology equipment – Immunity characteristics – Limits and methods of measurement
EN 55013 1990	Sound and television broadcast receivers and associated equipment: Electromagnetic compatibility. Part 1: Specification for limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment.	AS/NZS 3200.1.2: 1995	Approval and test specification – Medical electrical Equipment – General requirements for safety – Collateral Standard: Electromagnetic compatibility – Requirements and tests.
EN 55013 Amend 12 1994	Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment. Amendment 12	European Union Basic EMC Standards EN 61000-4-2 1995, 1999	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 2: Electrostatic discharge immunity test – Basic EMC Publication
SABS CISPR 13: 1996	Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment.	EN 61000-4-3 1997, 1998 AS/NZS 61000.4.3 1999	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 3: Radiated, radio-frequency, electromagnetic field immunity test
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EN 61000-4-4 1995	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 4: Electrical	EN 61326 1998	Electrical equipment for measurement, control and laboratory use – EMC requirements

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

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

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Product Safety

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

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

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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.