

Report No	EE1000-1
Client	Colubris Networks
Phone	781-547-0378
Fax	781-684-0009
Models	CN200
FRN	0010292464
FCC ID	RTP-550-10016-4
IC	4891A-0100164
Equipment Type	Low Power Communication Device Transmitter
Equipment Code	DTS/NIH
Standards	47CFR15.247, 15E, RSS-210 Issue 5
Results	As detailed within this report
Prepared by	 Mairaj Hussain – Test Engineer
Authorized by	 Michael Buchholz – EMC Manager
Issue Date	12/28/04
Conditions of issue	This Test Report is issued subject to the conditions stated in ‘terms and conditions’ section of this

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Summary

This report is an application for certification of a transmitter operating under 47 CFR 15.247 of the FCC rules provided for operation of Digital Transmissions Systems and 15.407 Unlicensed National Information Infrastructure Devices operating in the frequency bands of 5.15-5.25GHz and 5.725 – 5.825 GHz. The product covered by this report is wireless LAN access device. The product was tested using the methods outlined in FCC public notice DA 02-2138, released August 30, 2002 and ANSI C63.4 (2003).

Spurious emissions testing was performed using 2.5dBi antennas. Furthermore, spurious emissions were tested in transmit and receive modes.

Test Methodology

Frequency range investigated:	150KHz – 40GHz
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Measurement Distance:		
<i>Frequency (MHz)</i>	<i>Distance (m)</i>	<i>Comments</i>
0.15 – 30MHz	-	AC line Conducted
30MHz – 26.5GHz	3	Fundamental & Spurious, Conducted
30MHz – 40GHz	3	Spurious Radiated

EUT antennas were maximized within their range of motion.

The product was powered by a support AC/DC power supply. Voltage variations were performed on the DC side of the supply. AC line conducted emissions were performed on AC side of the supply using a 50Ω/50μH LISN.

All readings are peak unless otherwise noted.

<i>Equipment Operation and FCC Rule Part</i>		
<i>CFR 47 Section</i>	<i>Band of Operation</i>	<i>Yes/No</i>
15.247	2.4GHz – 2.4835GHz	Yes
15.247	902MHz – 928MHz	No
15.247	5.725GHz – 5.850GHz	No
15.407	5.15GHz – 5.25GHz	Yes
15.407	5.25GHz – 5.35GHz	No
	5.47GHz – 5.725GHz	No
	5.725GHz – 5.825GHz	Yes

Modifications for Compliance

- i) Ferrite (steward pn:HFA187102-0A2) added on DC power cable at the power supply end.
- ii) Caps C578 & 579 removed .
- iii) Switch to lower gain antennas (2dBi)
- iv) Max value for PCDAC must be set at 44 for 5.15 - 5.25 GHz UNI band.
- v) Max value for PCDAC must be set at 30 for 5.725 – 5.825 GHz UNI band.
- vi) Max value for PCDAC must be set at 44 for 15.247 operation.
- vii) Switch to lower gain antennas (2dBi at 2.4GHz and 2.5dBi at 5.1 – 5.8GHz)

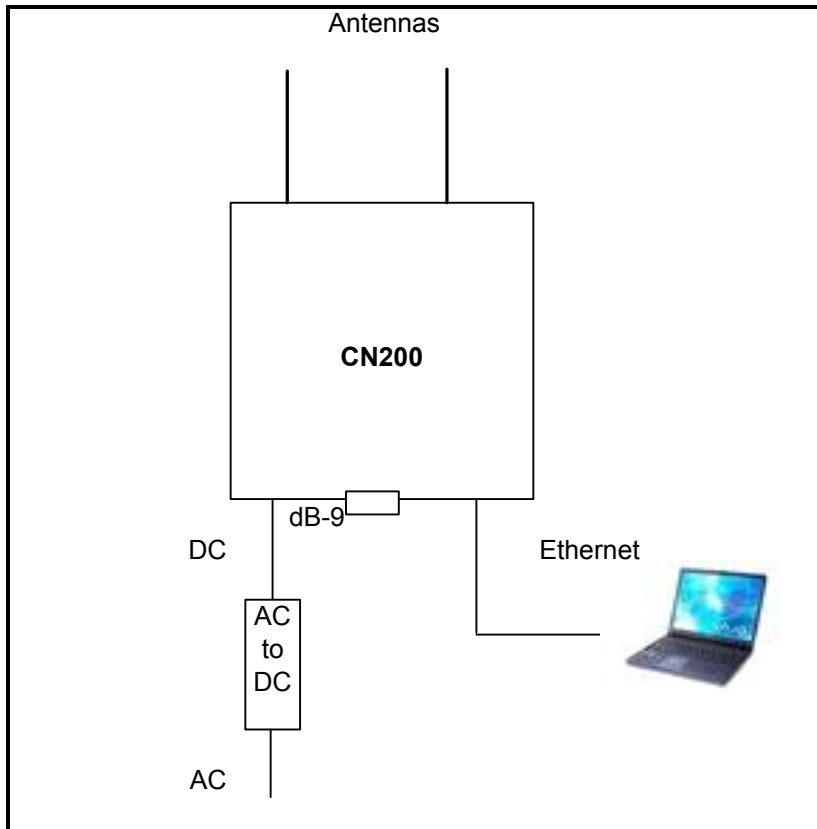
EUT Configuration

EUT Configuration				
Work Order: E1000				
Company: Colubris Networks				
Company Address: 200 west Street Waltham, MA 02451				
Contact: Gerrett Durling				
Person Present: Gerrett Durling				
MN		SN		
EUT: CN 200		Sample 1		
FSP power supply 9NA0150201		H00006938		
EUT Description: 802.11a/b/g wireless access point				
EUT Max Frequency: 5.8GHz				
Support Equipment:	MN	SN		
Dell latitude	PPX	-		
EUT Cables:	Qty	Shielded?	Length	Ferrites
AC power	1	No	1.5 m	None
DC	1	No	1 m	one
Ethernet	1	No	1.5 m	None
Unpopulated EUT Ports:	Qty	Reason		
dB-9	1	diagnostics only		
Software / Operating Mode Description:				
Operating continuously in Tx or Rx modes during the testing. A representative sample of available data rates, channels, and modulation techniques was picked for testing in order to represent different modes of operation.				

802.11g	Data Rate(mbps)	Modulation
	1	DSS
	2	
	5.5	
	11	
	6	
	12	
	9	
	18	OFDM
	24	
	36	
	48	
	54	
802.11b	1	DSS
	2	
	5.5	
	11	
802.11a	6	OFDM
	9	
	12	
	18	
	24	
	36	
	54	

Modulation Schemes	Data Rates (Mbps)
BPSK	6 & 9
QPSK	12 & 18
16-QAM	24 & 36
64-QAM	48 & 54

Test Setup Diagram



Statement of Conformity

The CN200 unit has been found to conform with the following parts of the 47 CFR as detailed below:

RSS- 210	47 CFR Part #	47 CFR Part #	Comments
5.7		15.15(b)	The product contains no user accessible controls that increase transmission power above allowable levels.
5.10	2.925	15.19	The label is shown in the label exhibit.
5.11		15.21	Information to the user is shown in the instruction manual exhibit.
		15.27	Please see the modification section of the report.
		15.31(e)	The input power was varied from its nominal value to 3.3V and 5.0V. The respective radiated power was measured see table.
5.5		15.203	The device utilizes reverse sex SMA type antenna connector.
5.5		15.204	See attached documentation describing the antenna(s).
6.2.1		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.
6.6		15.207	Unit is DC powered. Conducted EMI data is provided in this report.
		15.247(a)(2)	EUT complies with minimum 6dB BW requirement.
6.2.2(o)(b)		15.247(b)(3)	EUT complies with conducted POP requirement.
		15.247(b)(4)	Antennas used with the product have gain of 2dBi.
6.2.2(o)(e1)		15.247(d)	Spurious emissions comply with the requirements of this section and 15.205.
6.2.2(o)(b)		15.247(e)	EUT's power spectral density complies with the requirements of this section.
		15.247(i)	RF exposure exhibit for this section is attached.
		15.407(a)	EUT complies with the requirements of PoP of 50mW and PSD limit of 4dBm.
		15.407(a)(3)	EUT complies with the requirements of

			PoP of 1W and PSD limit of 17dBm.
		15.407(b)(1)	Spurious emissions above 1GHz comply with the requirements of this section and 15.205.
		15.407(b)(4)	Spurious emissions above 1GHz comply with the requirements of this section and 15.205.
		15.407(b)(6)	Unwanted emissions below 1GHz comply with section 15.209 and AC conducted emissions comply with section 15.207.
		15.407(g)	Product meets the requirements of frequency stability.
		15.407(f)	RF exposure exhibit for this section is attached.

*Test Data and Plots***Section 15.31(e)**

Voltage Variation FCC 47CFR 15.31(e)			
Date: 12/9/2004 Company: Colubris Networks EUT: CN200 Engineer: Mairaj Hussain			
Nominal Temp: 20 degC PDAC set at 44			
Operating Frequency (MHz)	Nominal	-15%	15%
	5VDC	4.25 VDC	5.75 VDC
	Amplitude (channel power)		
2462	-6.01	-6.5	-6.1
5220	-9.9	-9.7	-9.5
5765	-5.1	-5.1	-4.7

Conclusion:	The peak output power does not change with input voltage.
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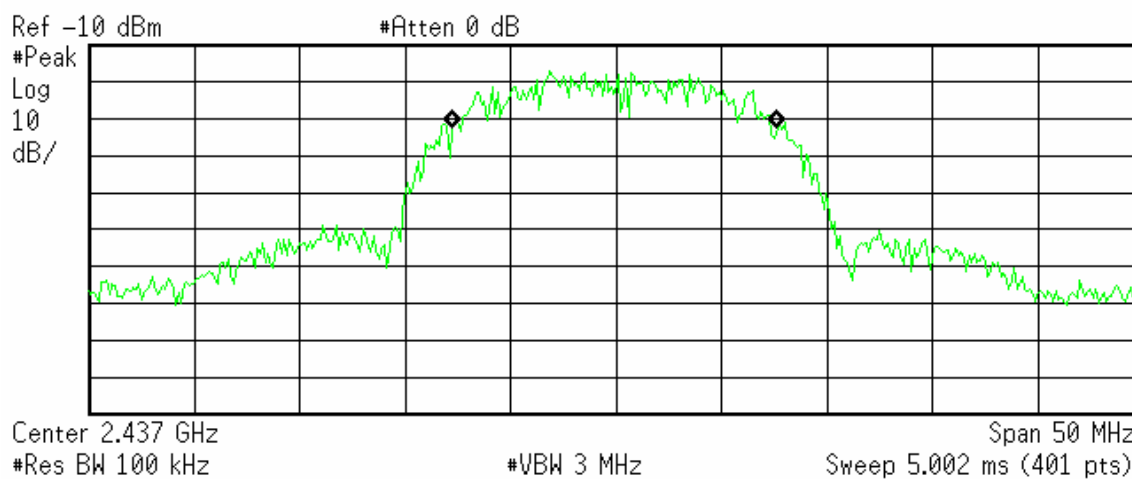
Note: Above PoP readings are off of spectrum analyzer and do not take in account for cable loss and any attenuator used.

15.247(a)(2)*6db Bandwidth shall be at least 500KHz***Operating mode: 802.11b**

Sample plot of 6dB/Occupied bandwidth

* Agilent 15:56:12 Dec 1, 2004

R L

**Occupied Bandwidth****15.4138 MHz****Occ BW % Pwr** 99.00 %
x dB -6.00 dB**Transmit Freq Error** -38.017 kHz
x dB Bandwidth 13.139 MHz*

CH6; DR 11mbps Long

15.247(a)(2)

Date: 12/1/2004 Company: Colubris Networks EUT: CN200 Engineer: Mairaj Hussain Analyzer: Orange Cable: #6				
RBW: 100KHz VBW: 3MHz Operating: 80211b				
Channel /Data Rate		6dB BW (MHz)	Occupied Bandwidth (MHz)	Minimum 6dB BW Requirement (MHz)
CH	1			
	1 mbps L	10.7	15.5	0.5
	5.5 mbps L	10.4	15.3	0.5
CH	11 mbps S	11	15.6	0.5
	6			
	1 mbps L	11	15.6	0.5
CH	5.5 mbps L	12.6	15.2	0.5
	11 mbps S	13.1	15.4	0.5
	11			
CH	1 mbps L	9.8	15.4	0.5
	5.5 mbps L	11.6	15.3	0.5
	11 mbps S	10.6	15.3	0.5

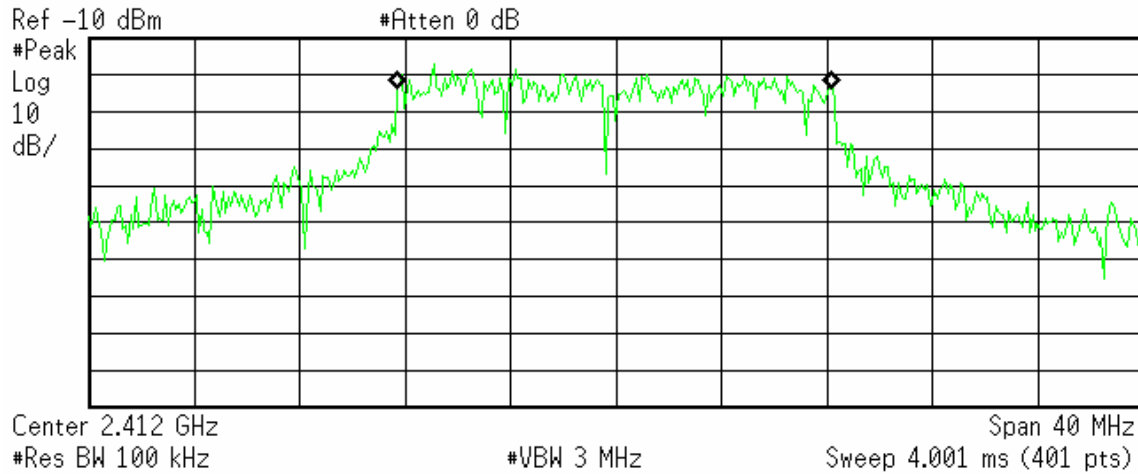
Operating mode: 802.11g

Sample 6dB/Occupied BW plot

CH1; 54mbps Long

* Agilent 10:36:01 Dec 2, 2004

R L



Occupied Bandwidth
16.5322 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -44.288 kHz
x dB Bandwidth 16.518 MHz*

15.247(a)(2)

Date: 12/2/2004				
Company: Colubris Networks				
EUT: CN200				
Engineer: JL				
Analyzer: Orange		Cable:	#6	
RBW: 100KHz		VBW:	3MHz	
Operating: 802.11g				
	Channel /Data Rate	6dB BW (MHz)	Occupied Bandwidth (MHz)	Minimum 6dB BW (MHz)
CH (2412MHz)	1			
	1 mbps L	12.4	15.6	0.5
	5.5 mbps L	10	15.4	0.5
	11 mbps L	11.9	15.5	0.5
	18 mbps	16.5	17	0.5
	54 mbps	16.5	16.5	0.5
CH (2437MHz)	6			
	1 mbps L	11	15.6	0.5
	5.5 mbps L	11	15.2	0.5
	11 mbps L	12	15.1	0.5
	18 mbps	16.5	16.6	0.5
	54 mbps	16.3	16.8	0.5
CH (2462MHz)	11			
	1 mbps L	11.4	15.4	0.5
	5.5 mbps L	10.5	15.3	0.5
	11 mbps L	12.3	15.2	0.5
	18 mbps	16	16.5	0.5
	54 mbps	15.7	16.7	0.5

15.247(b)(3)

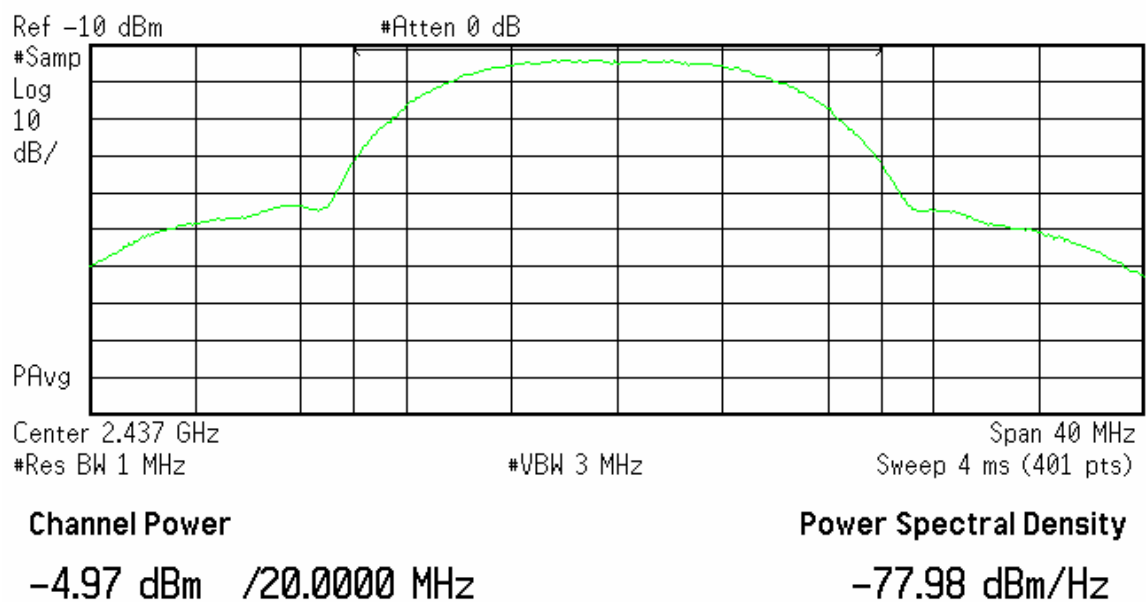
Maximum conducted output power shall be 1W or less.

Operating mode: 802.11b

Sample plot of conducted peak out put power.

Agilent 15:49:40 Dec 1, 2004

R L



CH6; DR 5.5mbps

15.247(b)(3)

Date: 12/1/2004				
Company: Colubris Networks				
EUT: CN200				
Engineer: Mairaj Hussain				
Analyzer: Orange		Cable: #6		
RBW: 1MHz		VBW: 3MHz		
Measurement method:		Integrated channel power		
	Channel /Data Rate	PoP measured (dBm)	PoP limit (dBm)	Margin (dB)
CH	1			
	1 mbps L	16	30	-14
	5.5 mbps L	16.2	30	-13.8
	11 mbps S	16	30	-14
CH	6			
	1 mbps L	15.4	30	-14.6
	5.5 mbps L	16.2	30	-13.8
	11 mbps S	15.7	30	-14.3
CH	11			
	1 mbps L	15.3	30	-14.7
	5.5 mbps L	15.4	30	-14.6
	11 mbps S	14.7	30	-15.3
Note: Above readings include a 1.1dB loss for cable and 20dB attenuator used at the input of analyzer.				

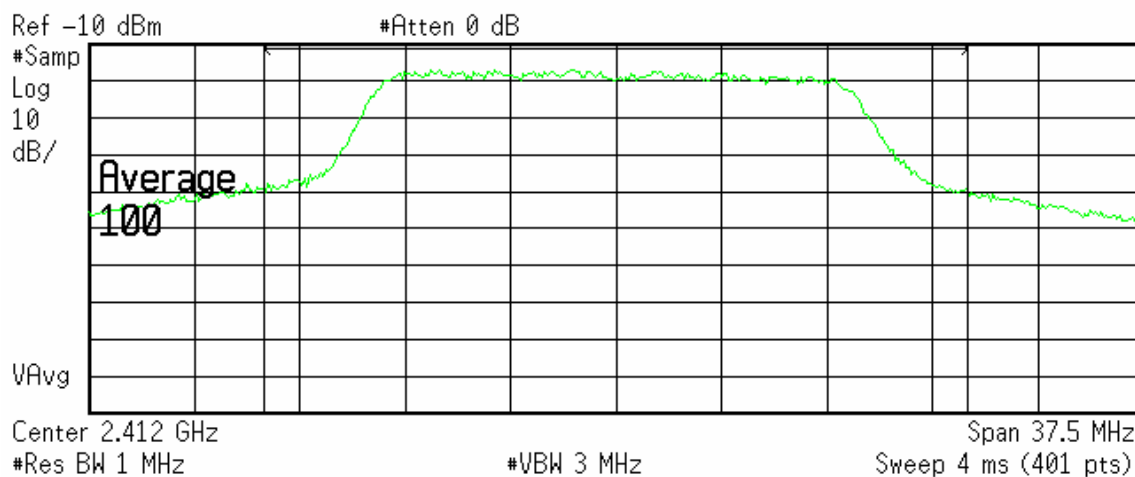
Operating mode: 802.11g

Sample PoP Plot

CH1; 18mbps

* Agilent 10:18:07 Dec 2, 2004

R L

**Channel Power****-5.16 dBm /25.0000 MHz****Power Spectral Density****-79.14 dBm/Hz**

15.247(b)(3)				
Date: 12/2/2004 Company: Colubris Networks EUT: CN200 Engineer: Mairaj Hussain/JL				
Analyzer: Orange		Cable: #6		
RBW: 1MHz		VBW: 3MHz		
Operating mode: 802.11g		PCDAC setting: 44		
Measurement method:		Integrated channel power		
	Channel /Data Rate	PoP measured (dBm)	PoP Limit (dBm)	Margin (dB)
CH (2412MHz)	1			
	1 mbps L	15.7	30	-14.3
	5.5 mbps L	16.1	30	-13.9
	11 mbps L	16.3	30	-13.7
	18 mbps	15.9	30	-14.1
	54 mbps	16	30	-14
CH (2437MHz)	6			
	1 mbps L	15.8	30	-14.2
	5.5 mbps L	16.2	30	-13.8
	11 mbps L	15.7	30	-14.3
	18 mbps	15.6	30	-14.4
	54 mbps	15.5	30	-14.5
CH (2462MHz)	11			
	1 mbps L	15.5	30	-14.5
	5.5 mbps L	15.3	30	-14.7
	11 mbps L	15.1	30	-14.9
	18 mbps	14.5	30	-15.5
	54 mbps	14.7	30	-15.3
Note: Above readings include a 1.1dB loss for cable and 20dB attenuator used at the input of analyzer.				

Note: POP option 2 method 1 as outlined in FCC document.

15.247(e)**Operating mode: 802.11b***Power spectral density shall be 8dBm or less.*Sample plot of PSD
CH1; DR 1 mbps Long

* Agilent 14:51:29 Dec 1, 2004

R L

Mkr1 2.4116375 GHz
-26.92 dBm

Ref -10 dBm

#Atten 0 dB

#Peak
Log
10
dB/V1 S2
S3 FC
AA

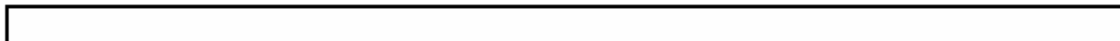
Center 2.411 GHz

#Res BW 3 kHz

#VBW 100 kHz

Span 500 kHz

#Sweep 1.6 s (401 pts)



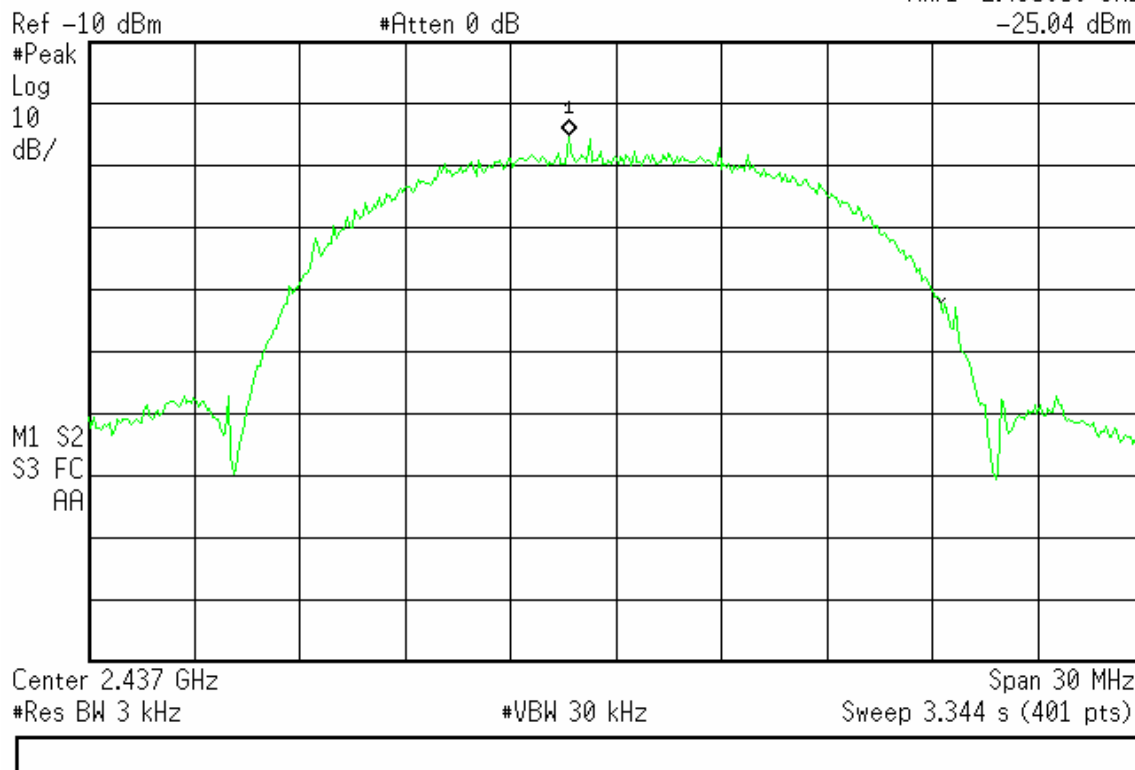
15.247(e)

Date: 12/1/2004				
Company: Colubris Networks				
EUT: CN200				
Engineer: Mairaj Hussain				
Analyzer: Orange			Cable: #6	
RBW: 3KHz			VBW: 100KHz	
Measurement method: PSD option 2 as outlined in FCC guidelines for DTS. Max hold readings.				
Channel /Data Rate		PSD (dBm)	PSD Limit (dBm)	Margin (dB)
CH 1	1 mbps L	-5.8	8	-13.8
	5.5 mbps L	3.5	8	-4.5
	11 mbps S	2.4	8	-5.6
CH 6	1 mbps L	3.5	8	-4.5
	5.5 mbps L	2.7	8	-5.3
	11 mbps S	3	8	-5
CH 11	1 mbps L	3.3	8	-4.7
	5.5 mbps L	2.1	8	-5.9
	11 mbps S	1.7	8	-6.3
Note: Above readings include a 1.1dB loss for cable and 20dB attenuator used at the input of analyzer.				

Operating mode: 802.11gSample plot
CH6; 5.5mbps L

* Agilent 11:13:06 Dec 2, 2004

R L

Mkr1 2.435650 GHz
-25.04 dBm

15.247(e)				
Date: 12/2/2004				
Company: Colubris Networks				
EUT: CN200				
Engineer: JL				
Analyzer: Orange		Cable: #6		
RBW: 3KHz		VBW: 30KHz		
Operating mode: 802.11g		PCDAC setting: 44		
Measurement method:		PSD option 2 as outlined in FCC guidelines for DTS. Max hold readings		
Channel /Data Rate	PSD (dBm)	PSD Limit (dBm)	Margin (dB)	
CH (2412MHz) 1				
1 mbps L	-7.1	8	-15.1	
5.5 mbps L	-6.4	8	-14.4	
11 mbps L	-7.3	8	-15.3	
18 mbps	-7.4	8	-15.4	
54 mbps	-6.9	8	-14.9	
CH (2437MHz) 6				
1 mbps L	-6.4	8	-14.4	
5.5 mbps L	-3.9	8	-11.9	
11 mbps L	-5.5	8	-13.5	
18 mbps	-7.7	8	-15.7	
54 mbps	-7.8	8	-15.8	
CH (2462MHz) 11				
1 mbps L	-6.8	8	-14.8	
5.5 mbps L	-6.3	8	-14.3	
11 mbps L	-3.1	8	-11.1	
18 mbps	-8.2	8	-16.2	
54 mbps	-8.7	8	-16.7	
Note: Above readings include a 1.1dB loss for cable and 20dB attenuator used at the input of analyzer.				

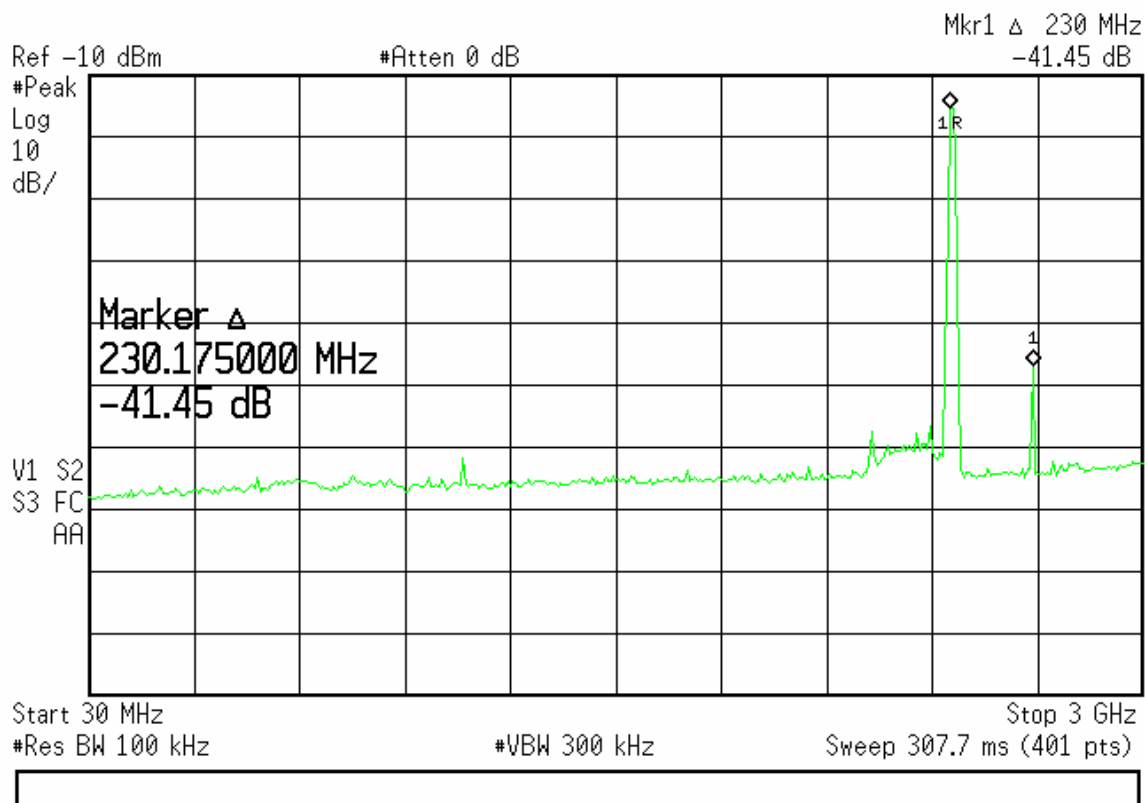
15.247(d)

"Radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz BW within the band that contains the highest level of desired power."

Conducted Spurious Emissions Operating mode: 802.11g
PCDAC 44, Ch11; 11mbps long
30-3000MHz

* Agilent 15:32:01 Dec 2, 2004

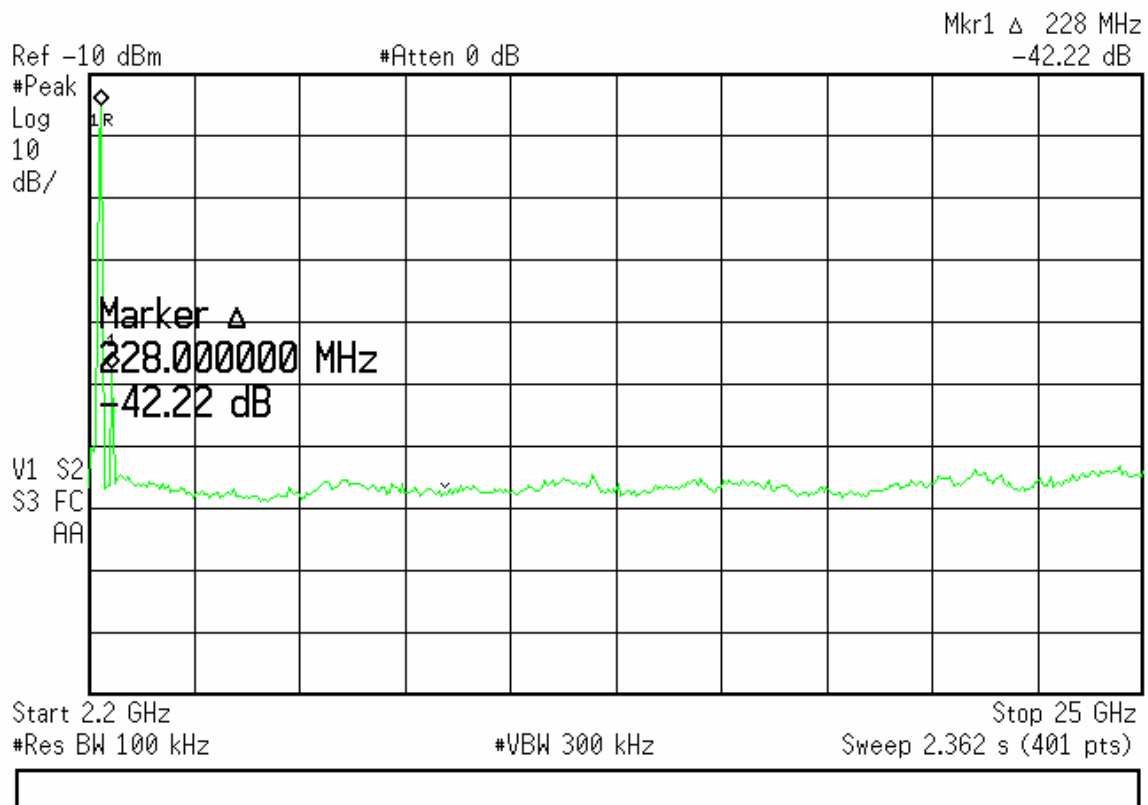
R L



3-25GHz

Agilent 15:33:23 Dec 2, 2004

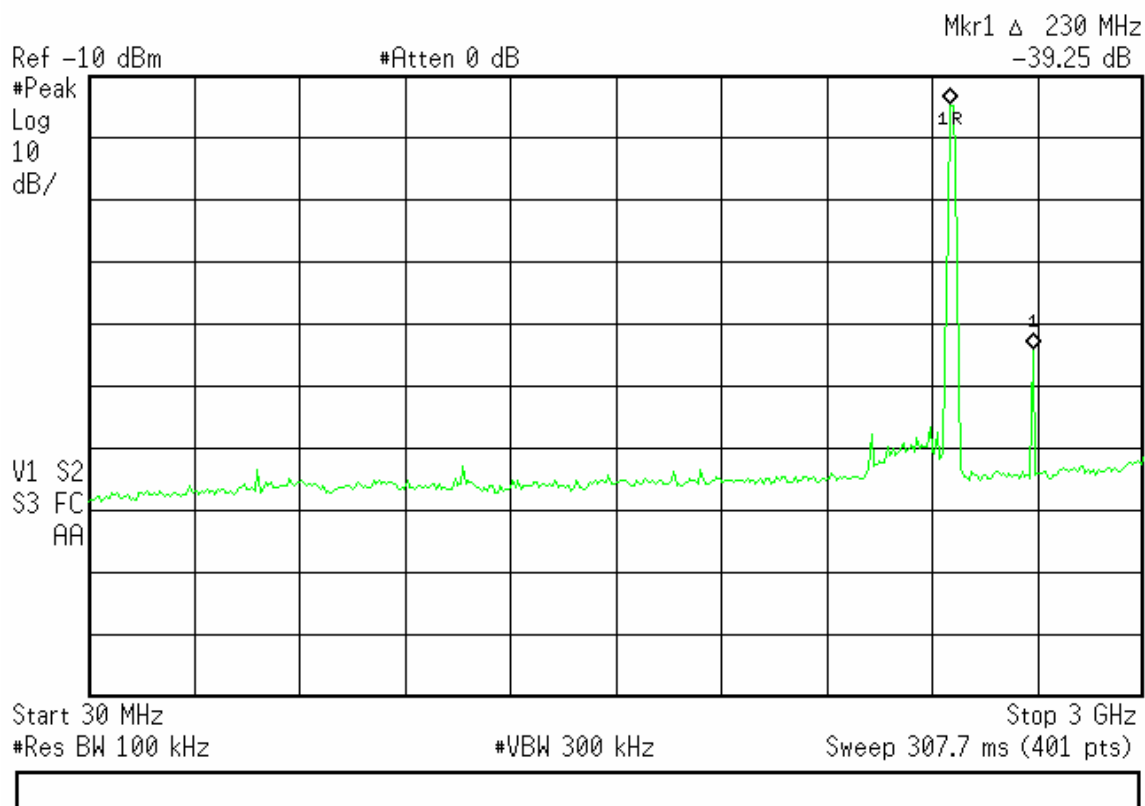
R L



Conducted Spurious Emissions Operating mode: 802.11b**PCDAC 44, Ch11; 11mbps short****30-3000MHz**

* Agilent 15:28:24 Dec 2, 2004

R L



3-25GHz

* Agilent 15:27:24 Dec 2, 2004

R L

Mkr1 Δ 228 MHz

-38.47 dB

Ref -10 dBm

#Atten 0 dB

#Peak

Log

10

dB/

V1 S2

S3 FC

AA

Start 2.2 GHz

#Res BW 100 kHz

#VBW 300 kHz

Stop 25 GHz

Sweep 2.362 s (401 pts)

Radiated Spurious Emissions

Radiated Emissions Table							Curtis-Straus LLC					
29-Nov-04			Company: Colubris Networks					Work Order: E1000				
Engineer: Mairaj Hussain			EUT Desc: CN 200									
Frequency Range: 30 - 2000MHz							Measurement Distance: 3 m					
Notes: Tx and Rx modes							EUT Max Freq: 5805MHz					
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	CISPR Class B			FCC Class B		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	46.5	35.7	24.9	11.2	0.8	22.8	40.5	-17.7	Pass	40.0	-17.2	Pass
h	180.0	36.0	24.6	9.6	1.8	22.8	40.5	-17.7	Pass	43.5	-20.7	Pass
v	270.0	53.1	24.3	13.4	2.3	44.5	47.5	-3.0	Pass	46.0	-1.5	Pass
h	360.0	39.4	24.1	15.4	2.7	33.4	47.5	-14.1	Pass	46.0	-12.6	Pass
h	450.0	37.2	24.0	17.3	3.2	33.7	47.5	-13.8	Pass	46.0	-12.3	Pass
h	809.9	32.0	23.9	20.7	4.6	33.4	47.5	-14.1	Pass	46.0	-12.6	Pass
c	900.0	39.0	23.9	21.5	4.9	41.5	47.5	-6.0	Pass	46.0	-4.5	Pass
Removed C578 and C579 from the board. Added full loop ferrite (steward pn: HFA187102-0A2) on the DC power at the power supply end.												
Table Result: Pass by -1.5 dB Worst Freq: 270.0 MHz												
Test Site: "T"		Pre-Amp: Orange		Cable: 65 ft RG8A/U		Analyzer: White		Antenna: Grn-Red				

Spurious Emissions										Curtis-Straus LLC		
Date: 09-Dec-04			Company: Colubris				Work Order: E1000					
Engineer: Mairaj Hussain			EUT Desc: CN 200									
Frequency Range: 1 - 25GHz							Measurement Distance: 3 m					
Notes: Operating at 2462MHz Tx and Rx modes * Spurious emissions in Restricted band							EUT Max Freq: 5785MHz					
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC Class B		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
*Havg	2360.0	42.2	24.2	29.6	1.9	49.5	---	---	---	54.0	-4.5	Pass
Hpk	2360.0	52.8	24.2	29.6	1.9	60.1	---	---	---	74.0	-13.9	Pass
Table Result: Pass by -4.5 dB Worst Freq: 2360.0 MHz												
Test Site: "A"		Pre-Amp: Or-Blk		Cable: 6 RG142LL		Analyzer: Orange		Antenna: Orange Horn				

Band edge data at the upper channel which falls at the edge of restricted band is given below.

Band Edge							Curtis-Straus LLC						
Date: 16-Dec-04			Company: Colubris Networks				Work Order: E1000						
Engineer: Mairaj Hussain			EUT Desc: CN200										
Measurement Distance: 3 m													
Notes: PCDAC at 44													
Antenna Polarization (H / V)		Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC Class B		
								Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
11g; CH11; 2462MHz; DR54mbps													
Hpk		2483.5	58.0	24.2	30.0	2.0	65.8				74.0	-8.2	Pass
Hpk		2485.8	55.3	24.2	30.0	2.0	63.1				74.0	-10.9	Pass
Havg		2483.5	36.8	24.2	30.0	2.0	44.6				54.0	-9.4	Pass
Havg		2485.5	32.0	24.2	30.0	2.0	39.8				54.0	-14.2	Pass
11b; CH112462MHz; DR 11mbps													
Hpk		2483.5	39.8	24.2	30.0	2.0	47.6				54.0	-6.4	Pass
Hpk		2484.3	51.0	24.2	30.0	2.0	58.8				74.0	-15.2	Pass
Hpk		2490.1	49.9	24.2	30.0	2.0	57.7				74.0	-16.3	Pass
Havg		2490.1	24.2	24.2	30.0	2.0	32.0				54.0	-22.0	Pass
Havg		2483.3	27.0	24.2	30.0	2.0	34.8				54.0	-19.2	Pass
Table Result: Pass by -6.4 dB Worst Freq: 2483.5 MHz													
Test Site: "T"		Pre-Amp: Or-Blk		Cable: 6 RG142LL		Analyzer: White		Antenna: Orange Horn					

Sample Calculation:

Adjusted Reading = Reading – Pre Amp_(factor) + Antenna_(factor) + Cable_(factor)

15.407(a)(1) & (6)

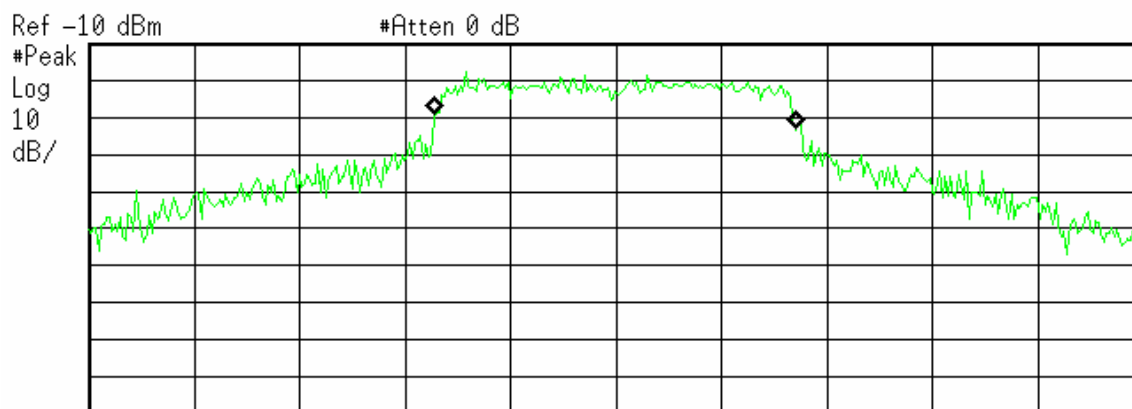
FCC 15.407(a)(1) & (6)										
Work Order: E1000 Company: Colubris Networks EUT: CN 200										
Engineer: Mairaj Hussain					Date: 11/30/2004 and 12/08/04					
Site: T		Spectrum analyzer:			Orange		Cable: #7			
Note: 20dB pad used					PC DAC at 44					
Band 5.15-5.25GHz							Limits			
Channel/Data Rate		26dB BW (MHz)	OCC BW (MHz)	Peak Power (dBm)	PPSD (dBm)	Peak Ex (dB)		Peak Power (dBm)	PPSD (dBm)	Pk Excu (less than)
CH DR	44									
	6 mbps	31.6	17	13.54	2.62	10		17	4	13dB
	18 mbps	26.7	16.8	15	3.4	10.8		17	4	13dB
	36 mbps	29.1	16.7	13.3	2.43	10.6		17	4	13dB
CH DR	54 mbps	25	16.8	13.42	2.54	10.8		17	4	13dB
	48									
	6 mbps	26.9	16.7	13.4	2.7	10.1		17	4	13dB
	18 mbps	26.3	16.7	14.4	3.5	10.5		17	4	13dB
CH DR	36 mbps	26.8	16.78	13.71	2.81	11.1		17	4	13dB
	54 mbps	27.1	16.8	13.41	2.56	10.9		17	4	13dB
	36									
	6 mbps	29.6	17.1	12.6	1.9	10.6		17	4	13dB
CH DR	18 mbps	29.7	16.8	13.34	3	9.9		17	4	13dB
	36 mbps	32	17.1	12.43	1.8	11.1		17	4	13dB
	54 mbps	33.6	16.87	12.48	1.7	11.4		17	4	13dB
	Note: Above readings include factors for 20dB pad and cable loss(1.8dB)									

Sample BW plot

CH36; DR 6 mbps

* Agilent 14:45:14 Nov 30, 2004

R L

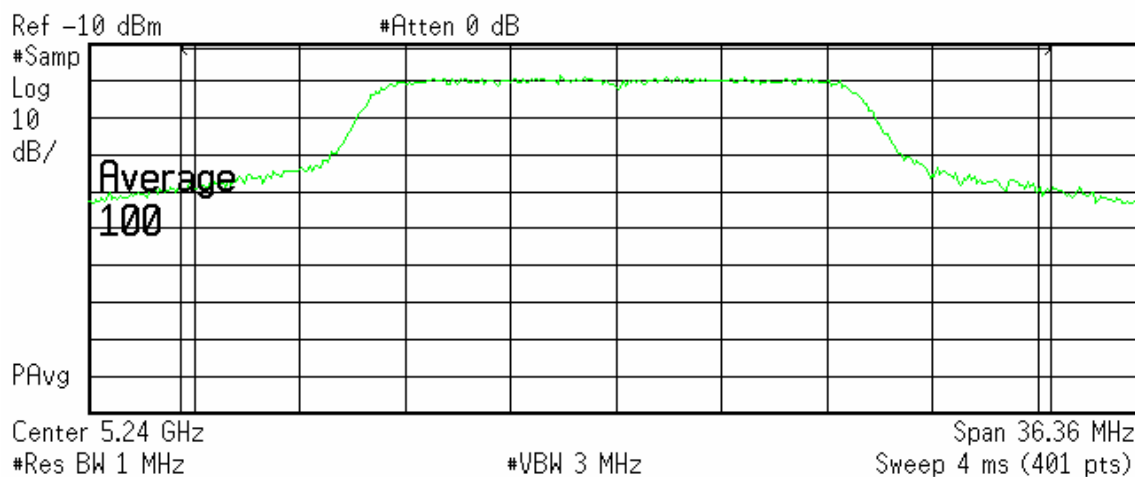
**Occupied Bandwidth**
17.1007 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -14.075 kHz
x dB Bandwidth 29.653 MHz*

Sample PoP plot**CH 48; 5240 MHz**

DR 6 mbps

* Agilent 13:49:13 Nov 30, 2004

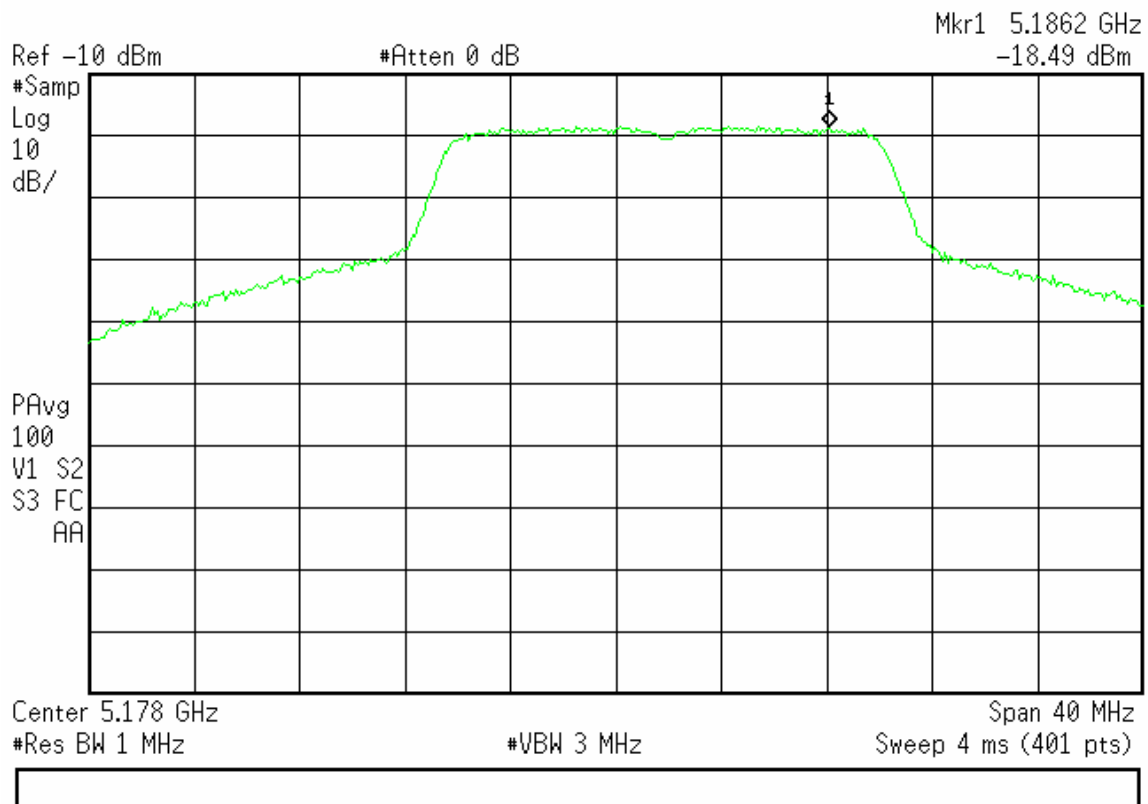
R L

**Channel Power****-8.40 dBm /30.0000 MHz****Power Spectral Density****-83.17 dBm/Hz**

Sample PPSD Plot
CH36; DR 54 mbps

* Agilent 10:20:33 Nov 30, 2004

R L



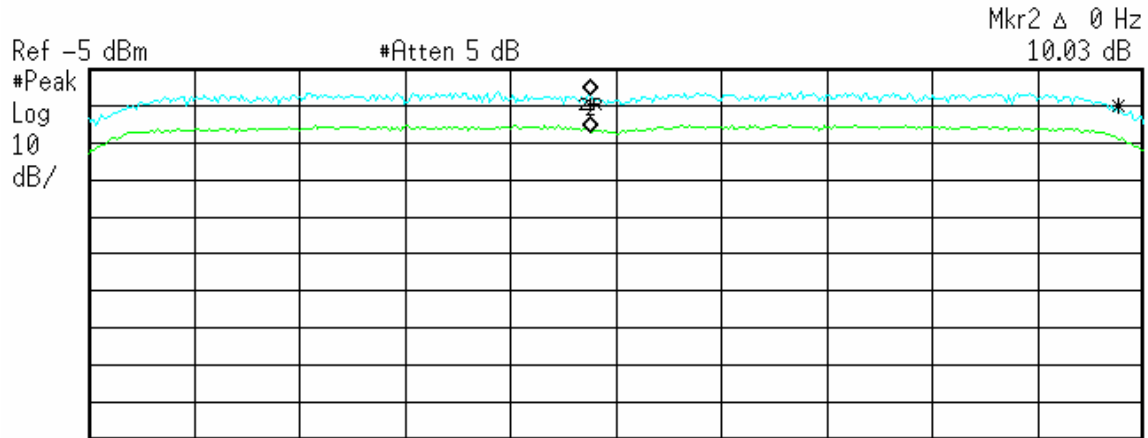
Sample Peak Excursion Plot

CH 44; 5220 MHz

DR 6 mbps

Agilent 14:03:07 Dec 8, 2004

R L



Center 5.22 GHz Span 17.3 MHz
#Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.21957 GHz	-22.25 dBm
2R	(2)	Freq	5.21957 GHz	-22.25 dBm
2Δ	(2)	Freq	0 Hz	10.03 dB

15.407(a)(3)

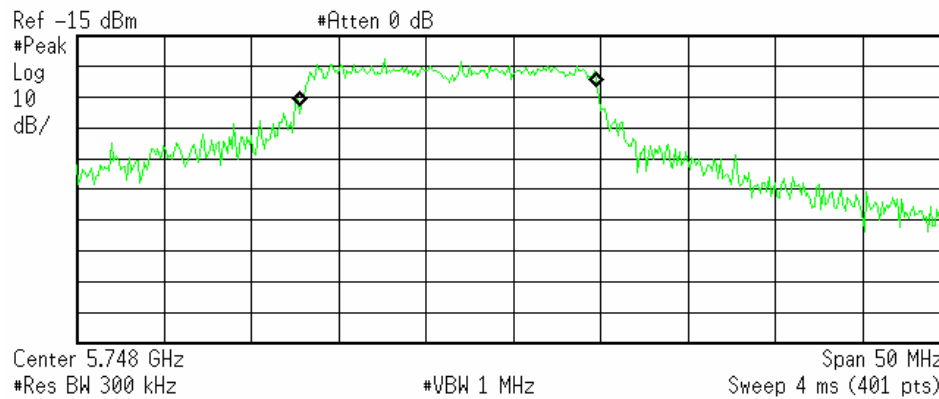
-26dB Bandwidth and Occupied Bandwidth			
Work Order: E1000 Company: Colubris Date: 12-10-13-04 Engineer: Mairaj Hussain EUT: CN200			
Analyzer: Orange		Cable: #6	
CH	DR mbps	-26dB BW (MHz)	OCC BW (MHz)
149	6	24.2	17
	18	26.6	16.9
	36	16.8	16.9
	54	25.6	16.6
153	6	29.7	17.8
	18	27.4	16.9
	36	28.3	16.6
	54	28.7	16.8
161	6	27.8	17
	18	27.7	16.8
	36	27.3	16.8
	54	27.4	17.1

Sample BW Plot

CH149; DR 6mbps

* Agilent 16:04:42 Dec 10, 2004

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Occupied Bandwidth
17.0812 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -3.766 MHz
x dB Bandwidth 24.201 MHz*

15.407(a)(3) 5.725 - 5.825 GHz Band Peak Output Power Readings

Work Order: E1000

Company: Colubris

Date: 12-10-13-04

Engineer: Mairaj Hussain

Analyzer: Orange

Cable: #6

PCDAC set at: 30

Note: FCC Public Notice DA 02-2138; Method 1

CH	Data rate (mbps)	Center Frequency (MHz)	Channel Power (dBm)	Cab Factor (dB)	Pad (dB)	Adjusted Reading (dBm)	Limit (dBm)	Margin (dB)
149	6	5745	-14.8	3.3	20	8.5	30	-21.5
	18	5745	-14.8	3.3	20	8.5	30	-21.5
	36	5745	-14.1	3.3	20	9.2	30	-20.8
	54	5745	-14.9	3.3	20	8.4	30	-21.6
153	6	5765	-14	3.3	20	9.3	30	-20.7
	18	5765	-13.3	3.3	20	10	30	-20.0
	36	5765	-13.8	3.3	20	9.5	30	-20.5
	54	5765	-13.8	3.3	20	9.5	30	-20.5
161	6	5805	-12.3	3.3	20	11	30	-19
	18	5805	-13.2	3.3	20	10.1	30	-19.9
	36	5805	-12.4	3.3	20	10.9	30	-19.1
	54	5805	-12.6	3.3	20	10.7	30	-19.3

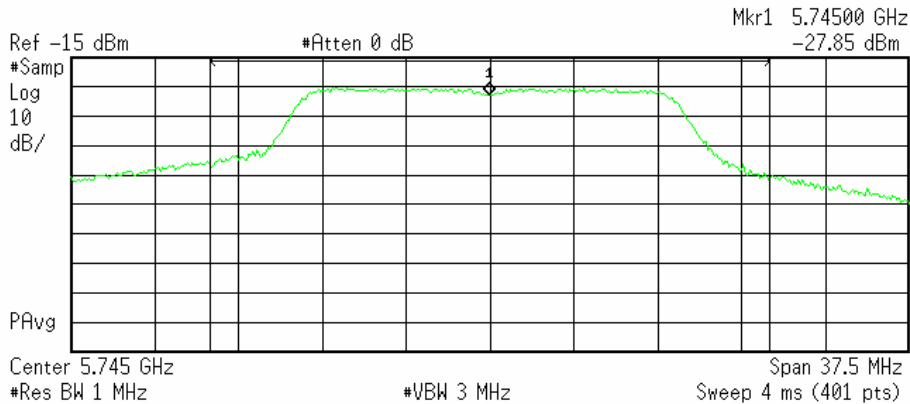
Sample Peak out put power plot

PCDAC at 30

CH149; DR 6mbps

Agilent 16:09:58 Dec 10, 2004

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Channel Power

-14.83 dBm /25.0000 MHz

Power Spectral Density

-88.81 dBm/Hz

**15.407(a)(3) 5.725 - 5.825 GHz Band
Peak Power Spectral Density**

Work Order: E1000
Company: Colubris
Date: 12-10-13-04
Engineer: Mairaj Hussain

Analyzer: Oeange **Cable:** #6

Note: FCC Public Notice DA 02-2138; Method 2
PCDAC set at 30

CH	Data rate (mbps)	Center Frequenc (MHz)	PPSD (dBm)	Cab Factor (dB)	Pad (dB)	Adjusted Reading (dBm)	Limit (dBm)	Margin (dB)
149	6	5745	-25.6	3.3	20	-2.3	17	-19.3
	18	5745	-25.2	3.3	20	-1.9	17	-18.9
	36	5745	-25.3	3.3	20	-2	17	-19
	54	5745	-25.3	3.3	20	-2	17	-19
153	6	5765	-25.8	3.3	20	-2.5	17	-19.5
	18	5765	-24.2	3.3	20	-0.9	17	-17.9
	36	5765	-24.3	3.3	20	-1	17	-18
	54	5765	-24.3	3.3	20	-1	17	-18
161	6	5805	-23.5	3.3	20	-0.2	17	-17.2
	18	5805	-23.8	3.3	20	-0.5	17	-17.5
	36	5805	-23.8	3.3	20	-0.5	17	-17.5
	54	5805	-23.6	3.3	20	-0.3	17	-17.3

Sample PPSD plot

CH149; DR 18mbps

* Agilent 09:25:59 Dec 13, 2004

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Mkr1 5.738375 GHz
-25.2 dBm

Ref -10 dBm

#Atten 0 dB



Center 5.745 GHz

#Res BW 1 MHz

#VBW 3 MHz

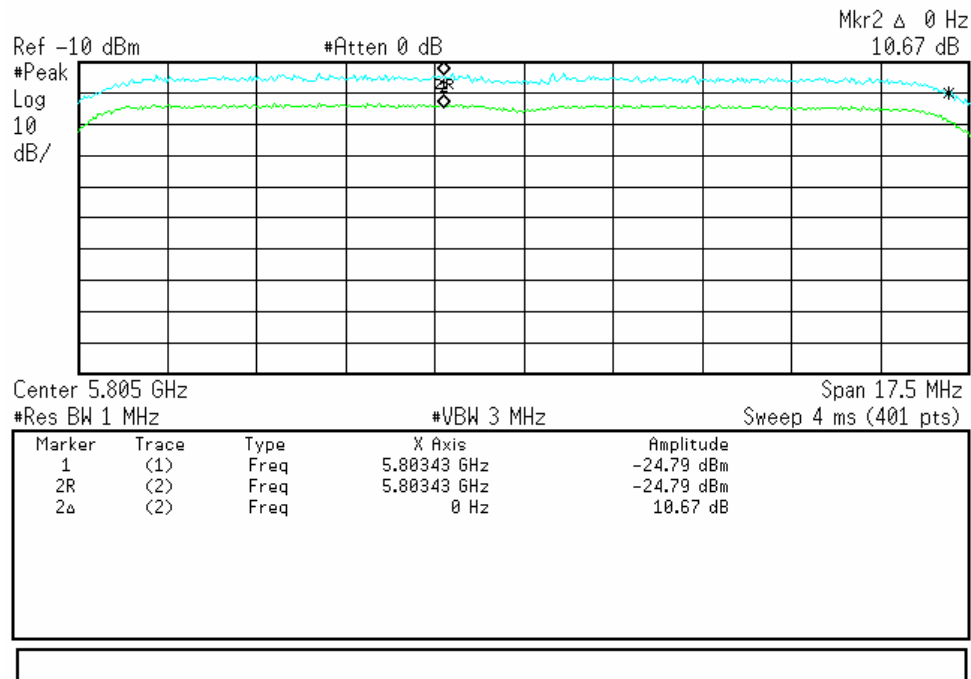
Span 50 MHz
Sweep 4 ms (401 pts)

15.407(a)(3) 5.725 - 5.825 GHz Band Peak Excursion				
Work Order: E1000 Company: Colubris Date: 12-10-13-04 Engineer: Mairaj Hussain				
Note: FCC Public Notice DA 02-2138				
Analyzer: Oeange Cable: #6				
CH	Data rate (mbps)	Excu Frequenc (MHz)	Peak Excursion (dBm)	Limit (dBm)
149	6	5754	11.26	13
	18	5739	11.28	13
	36	5751.2	10.5	13
	54	5744.7	11.1	13
153	6	5756.1	11.5	13
	18	5765..4	10.6	13
	36	5773.9	11.3	13
	54	5773	11.4	13
161	6	5804	10.5	13
	18	5805.7	10.1	13
	36	5803.4	10.7	13
	54	5804.6	10.5	13

Sample Peak excursion plot
CH161; DR 36mbps

Agilent 13:28:57 Dec 13, 2004

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14.407(b)(1)

Band Edge 15.407(b)(1)						Curtis-Straus LLC			
Date: 20-Dec-04			Company: Colubris Networks			Work Order: E1000			
Engineer: Mairaj Hussain			EUT Desc: CN200						
Notes: RBW: 1MHz; VBW: 3MHz									
Channel/ Data Rate	Frequency (MHz)	Reading (dBm)	Antenna Gain (dBi)	Cable Factor (dB)	Attenuator (dB)	Adjusted EIRP	FCC 15.407(b)(1)		
						(dBm)	Limit (dBm)	Margin (dB)	Result (Pass/Fail)
36/6mbps	5150.0	-61.8	2.5	3.0	20.0	-36.3	-27.0	-9.3	Pass
36/6mbps	5148.6	-60.0	2.5	3.0	20.0	-34.5	-27.0	-7.5	Pass
36/54mbps	5150.0	-61.8	2.5	3.0	20.0	-36.3	-27.0	-9.3	Pass
36/5mbps	5145.9	-60.4	2.5	3.0	20.0	-34.9	-27.0	-7.9	Pass
Cable: 6 RG142LL Analyzer: Orange Antenna: Yellow Horn									

14.407(b)(4)

For spurious emissions below 1GHz please see table under section 15.247(d).

Radiated Spurious Emissions Table										Curtis-Straus LLC			
Date: 10-Dec-04				Company: Colubris				Work Order: E1000					
Engineer: Mairaj Hussain				EUT Desc: CN200									
Frequency Range: 1 - 40MHz								Measurement Distance: 3 m					
Notes: Recheck failing spurious emissions with new radio sample PDAC at 30; operating at 5765MHz								RBW:1MHz VBW:3MHz, 30Hz					
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC Class B			
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	
Havg	4979.0	36.0	22.5	35.7	2.8	52.0				54.0	-2.0	Pass	
Hpk	4979.0	45.0	22.5	35.7	2.8	61.0				74.0	-13.0	Pass	
Hpk	5020.0	32.3	22.5	35.8	2.8	48.4				54.0	-5.6	Pass	
Table Result: Pass by -2.0 dB Worst Freq: 4979.0 MHz													
Test Site: "F"		Pre-Amp: Or-Blk HF PA		Cable: 6 RG142LL Microflex # 9		Analyzer: Orange		Antenna: Orange Horn HF Horn 26.6-40GHz Mixer					

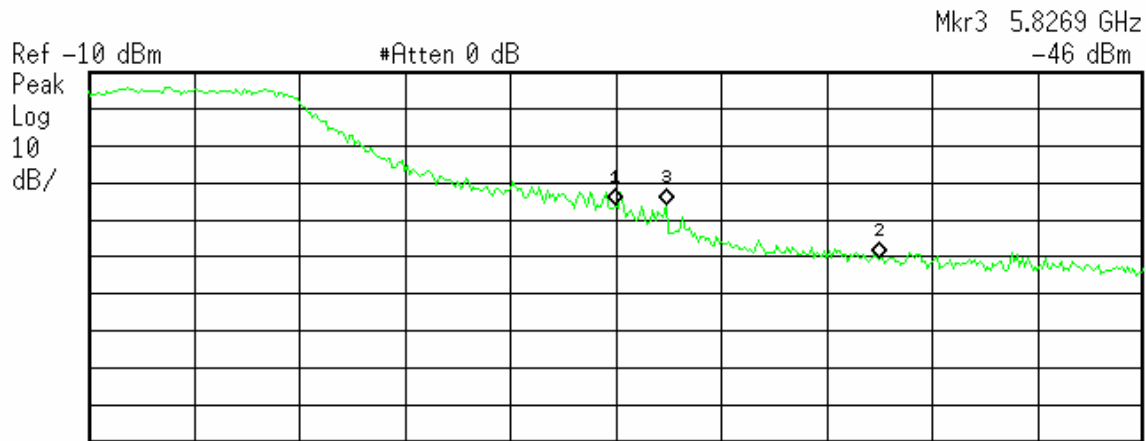
Band Edge15.407(b)(4)							
Date: 10-Dec-04				Company: Colubris			
Engineer: Mairaj Hussain				EUT Desc: CN200			
Work Order: E1000							
cable # 6		Orange	Spectrum Analyzer		RBW: 1MHz; VBW: 3MHZ		
Channel	Frequency (MHz)	Reading (dBm)	Cab. Factor (dB)	Pad (dB)	Ant gain (dBi)	Adj Reading (dBm)	Limit (dBm)
149	5725	-43.3	3.3	20	2.5	-17.5	-17
	5715	-53.3	3.3	20	2.5	-27.5	-27
	5723	-44.2	3.3	20	2.5	-18.4	-17
161	5825	-45.8	3.3	20	2.5	-20	-17
	5835	-60.4	3.3	20	2.5	-34.6	-27
	5826.9	-46	3.3	20	2.5	-20.2	-17

Sample band edge plot

PCDAC set at 30; Operating at 5805MHz; CH161

* Agilent 15:06:29 Dec 10, 2004

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Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.8250 GHz	-45.83 dBm
2	(1)	Freq	5.8350 GHz	-60.47 dBm
3	(1)	Freq	5.8269 GHz	-46 dBm

Upper Channel Band edge

Spurious emissions while running at 5.18GHz, lower UNI band.

Radiated Emissions Table							Curtis-Straus LLC					
Date: 09-Dec-04			Company: Colubris Networks				Work Order: E1000					
Engineer: Mairaj Hussain			EUT Desc: CN200									
Frequency Range: 1 - 40 GHz							Measurement Distance: 3 m					
Notes: Operating at 5.18GHz (Tx/Rx modes checked)				RBW: 1MHz; VBW: 30Hz & 3MHz			EUT Max Freq: 5785MHz					
No other spurious emissions found above 18GHz												
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	FCC 15.407(b)			FCC Class B		
									EIRP	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
Hpk	4319.0	47.0	23.0	34.3	2.7	61.0			-34.2	-27	-7.2	Pass
HpkBand edge	5150.0	45.0	22.5	36.0	2.9	61.4			Pass	74.0	-12.6	Pass
Havg	5150.0	34.0	22.5	36.0	2.9	50.4			Pass	54.0	-3.6	Pass
Havg	5147.5	34.8	22.5	36.0	2.9	51.2			Pass	54.0	-2.8	Pass
Hpk	5147.5	37.4	22.5	36.0	2.9	53.8			Pass	74.0	-20.2	Pass
Hpk	5960.0	41.0	22.7	36.8	3.4	58.5			-36.7	-27.0	-9.7	Pass
Test Site: "A"			Pre-Amp: Or-Blk		Cable: 6 RG142LL Microflex #7		Analyzer: Orange			Antenna: Orange Horn HF horn 26.5-40GHz mixer		

IC Peak Excursion and PPSD Data

<i>RSS 210 Issue 5</i>					
Work Order: E1000 Company: Colubris Networks Date: 12-10-13-04 Engineer: Mairaj Hussain					
Peak Excursion					
CH	DR (mbps)	Peak Excursion (dB)	6.2.2(q1)(iv)(b)		
			Limit (dB)	Reduction in PPSD limit (dB)	
36	6	10.6	3	7.6	
	18	9.9	3	6.9	
	36	11.1	3	8.1	
	54	11.4	3	8.4	
44	6	10	3	7	
	18	10.8	3	7.8	
	36	10.6	3	7.6	
	54	10.8	3	7.8	
48	6	10.1	3	7.1	
	18	10.5	3	7.5	
	36	11.1	3	8.1	
	54	10.9	3	7.9	
Peak Power Spectral Density					
CH	DR	PPSD (dBm)	6.2.2(q1)(iii)		
			Adjusted PPSD	Margin	Result
			(dBm)	(dB)	(Pass/Fail)
36	6	-2.3	9.4	-11.7	Pass
	18	-1.9	10.1	-12	Pass
	36	-2	8.9	-10.9	Pass
	54	-2	8.6	-10.6	Pass
44	6	-2.5	10	-12.5	Pass
	18	-0.9	9.2	-10.1	Pass
	36	-1	9.4	-10.4	Pass
	54	-1	9.2	-10.2	Pass
48	6	-0.2	9.9	-10.1	Pass
	18	-0.5	9.5	-10	Pass
	36	-0.5	8.9	-9.4	Pass
	54	-0.3	9.1	-9.4	Pass

RSS 210 Issue 5**Work Order:** E1000**Company:** Colubris Networks**Date:** 12-10-13-04**Engineer:** Mairaj Hussain**Peak Excursion**

CH	DR	Excursion Frequency	Peak Excursion	6.2.2(q1)(iv)(b)	
				Limit	Reduction in PPSD limit
	(mbps)	(MHz)	(dB)	(dB)	(dB)
149	6	5754	11.26	3	8.26
	18	5739	11.28	3	8.28
	36	5751.2	10.5	3	7.5
	54	5744.7	11.1	3	8.1
153	6	5756.1	11.5	3	8.5
	18	5765.4	10.6	3	7.6
	36	5773.9	11.3	3	8.3
	54	5773	11.4	3	8.4
161	6	5804	10.5	3	7.5
	18	5805.7	10.1	3	7.1
	36	5803.4	10.7	3	7.7
	54	5804.6	10.5	3	7.5

Peak Power Spectral Density

CH	DR	Center Frequency	PPSD	6.2.2(q1)(iii)		
				Adjusted PPSD Limit	Margin	Result
		(MHz)	(dBm)	(dBm)	(dB)	(Pass/Fail)
149	6	5745	-2.3	8.74	-11.04	Pass
	18	5745	-1.9	8.72	-10.62	Pass
	36	5745	-2	9.5	-11.5	Pass
	54	5745	-2	8.9	-10.9	Pass
153	6	5765	-2.5	8.5	-11	Pass
	18	5765	-0.9	9.4	-10.3	Pass
	36	5765	-1	8.7	-9.7	Pass
	54	5765	-1	8.6	-9.6	Pass
161	6	5805	-0.2	9.5	-9.7	Pass
	18	5805	-0.5	9.9	-10.4	Pass
	36	5805	-0.5	9.3	-9.8	Pass
	54	5805	-0.3	9.5	-9.8	Pass

15.407(g)

Frequency Stability			Curtis-Straus LLC	
Engineer: Evan Gould			Company: Colubris	
Date: 12/15/2004			EUT: CN200	
Analyzer: Green			Work Order: E1000	
Cable: 142LL#6				
Note: Nominal values are taken at 20°C, 5VDC				
Temperature	Supply Voltage	Channel	Center Frequency	Frequency Delta
(°C)	(VDC)	(#)	(Hz)	(Hz)
-10	5	36	5179990586	30162
-10	5	149	5744988504	34039
20	4.25	36	5179961599	1175
20	4.25	149	5744955065	600
20	5	36	5179960424	0
20	5	149	5744954465	0
20	5.75	36	5179960510	86
20	5.75	149	5744954428	-37
60	5	36	5179994638	34214
60	5	149	5745046453	91988

AC Line Conducted Emission Measurements

AC Mains Conducted Emissions											Curtis-Straus LLC	
Date: 20-Dec-04			Company: Colubris Networks						Work Order: E1000			
Engineer: Mairaj Hussain			EUT Desc: EMI2						Test Site: EMI2			
Notes:												
LISN(s): Red Yellow-Black												
Range: 0.15-30Mhz			Other Equipment: ---				Spectrum Analyzer: Blue					
Frequency (MHz)	Q.P. Readings		Ave. Readings		Impedance Factor (dB)	---		FCC/CISPR B		FCC/CISPR B		Overall Result (Pass/Fail)
	QP1 (dBµV)	QP2 (dBµV)	AV1 (dBµV)	AV2 (dBµV)		Limit (dBµV)	Margin dB	qp Limit (dBµV)	qp Margin dB	AVE Limit (dBµV)	AVE Margin dB	
0.16	24.7	24.0			20.0	---	---	65.5	-20.8	55.5	-10.8	Pass
0.22	21.6	26.0			20.0	---	---	62.8	-16.8	52.8	-6.8	Pass
0.28	16.0	15.8			20.0	---	---	60.8	-24.8	50.8	-14.8	Pass
0.33	17.8	18.5			20.0	---	---	59.4	-20.9	49.4	-10.9	Pass
0.56	12.0	13.5			20.0	---	---	56.0	-22.5	46.0	-12.5	Pass
0.96	12.0	10.5			20.0	---	---	56.0	-24.0	46.0	-14.0	Pass
4.10	9.6	7.7			20.0	---	---	56.0	-26.4	46.0	-16.4	Pass
9.87	11.5	11.2			20.0	---	---	60.0	-28.5	50.0	-18.5	Pass
Table Result:		Pass	by	-6.80 dB		Worst Freq:					0.22 MHz	

AC line conduct emissions were also performed with power over ether net option. Below is the data obtained for conducted emissions with this option.

AC Mains Conducted Emissions											Curtis-Straus LLC	
Date: 20-Jan-05			Company: Colubris Networks						Work Order: E1000			
Engineer: Ozgur Ozturk			EUT Desc: CN200						Test Site: EMI3			
Notes: AC side of PowerDsine 3001 power over ethernet adapter												
LISN(s): Orange												
Range: 0.15-30Mhz			Other Equipment: ---					Spectrum Analyzer: Red				
Frequency (MHz)	Q.P. Readings		Ave. Readings		Impedance Factor (dB)	FCC B Applicable until July 12, 2004		FCC/CISPR B		FCC/CISPR B		Overall Result (Pass/Fail)
	QP1 (dBµV)	QP2 (dBµV)	AV1 (dBµV)	AV2 (dBµV)		Limit (dBµV)	Margin dB	qp Limit (dBµV)	qp Margin dB	AVE Limit (dBµV)	AVE Margin dB	
3.55	19.6	16.7			20.0	47.9	-8.3	56.0	-16.4	46.0	-6.4	Pass
7.64	14.8	15.8			20.0	47.9	-12.1	60.0	-24.2	50.0	-14.2	Pass
17.95	16.7	16.1			20.0	47.9	-11.2	60.0	-23.3	50.0	-13.3	Pass
21.24	18.7	19.1			20.0	47.9	-8.8	60.0	-20.9	50.0	-10.9	Pass
23.29	19.6	20.2			20.0	47.9	-7.8	60.0	-19.9	50.0	-9.9	Pass
24.19	21.4	21.5			20.0	47.9	-6.4	60.0	-18.5	50.0	-8.5	Pass
Table Result: Pass by -6.37 dB Worst Freq: 24.19 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]

Test Equipment Used

REV. 07-DEC-2004

SPECTRUM ANALYZERS / RECEIVERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	9kHz-1.8GHz	8591E	HP	3441A03559	00024	26-MAY-2005
WHITE	9kHz-22GHz	8593E	HP	3547U01252	00022	04-MAR-2005
BLUE	9kHz-1.8GHz	8591E	HP	3223A00227	00070	03-NOV-2005
YELLOW	9kHz-2.9GHz	8594E	HP	3523A01958	00100	11-AUG-2005
GREEN	9kHz-26.5GHz	8593E	HP	3829A03618	00143	02-AUG-2005
BLACK	9kHz-12.8GHz	8596E	HP	3710A00944	00337	18-AUG-2005
YELLOW-BLACK	20Hz-40.0MHz	3585A	HP	2504A05219	00030	08-OCT-2005
TELECOM 3583A	20Hz-40.0MHz	3585A	HP	1750A02762	01067	03-SEP-2005
ORANGE	9kHz-26.5GHz	E4407B	HP	US39440975	00394	05-NOV-2005
EMI TEST RECEIVER	20-1000MHz	ESVS30	R&S	827957/001	01098	27-OCT-2005

LISNS/MEASUREMENT PROBES	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	956348	00753	02-APR-2005
BLUE	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	956349	00752	02-APR-2005
YELLOW-BLACK	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	984735	00248	02-APR-2005
ORANGE	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	903707	00754	02-APR-2005
GOLD	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	984734	00247	02-APR-2005
WHITE-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972019	00678	02-APR-2005
BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972017	00675	02-APR-2005
RED-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972016	00677	02-APR-2005
BLUE-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972018	00676	02-APR-2005
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	24-NOV-2005
GREEN CURRENT TRANSFORMER	40Hz-20MHz	150	PEARSON	10226	00793	03-APR-2005
CISPR LINE PROBE	150kHz- 30MHz	N/A	C-S	01	00805	20-DEC-2004
CISPR TELCO VOLTAGE PROBE	10kHz-30MHz	CS A/C-10	C-S	CS01	00296	28-SEP-2005
CISPR 22 TELCO ISN	9kHz-30MHz	FCC-TLISN-T4	FISCHER	20115	00746	26-OCT-2006

OPEN AREA TEST SITE (OATS)	FCC CODE	IC CODE	VCCI CODE	CALIBRATION DUE
SITE F	93448	IC 2762-F	R-1688	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-1801	01-MAY-2006
EMI 2	93448	N/A	C-1802	01-MAY-2006
EMI 3	93448	N/A	C-1803	01-MAY-2006
BUBBLE (HP FACILITY)	N/A	N/A	C-1556	16-MAY-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	N/A
MIXER / HORN	26.5-40 GHz	11970A/28-442- 6	HP/ATM	2332A01695/A046903-01	1087	23-AUG-2005
MIXER / HORN	26.5-40 GHz	11970A/28-442- 6	HP/ATM	3003A07825/A046903-01	1086	23-AUG-2005
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-JAN-2005
MIXER / HORN	140-220 GHz	MO5HW/A	OML	G21206-1	00812	05-JAN-2005
DIPLEXER		DPL.26	OML	N/A	00813	05-JAN-2005

ABSORBING CLAMPS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
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FISCHER CLAMP	30-1000MHz	F-201-23MM	FISCHER	10	00081	16-JAN-2006
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PREAMPS / ATTENUATORS / FILTERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	0.10-2000MHz	ZFL-1000-LN	C-S	N/A	00798	31-MAR-2005
BLUE	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00759	26-JUL-2005
BLUE-BLACK	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00800	31-MAR-2005
GREEN	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00802	27-FEB-2005
BLACK	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00799	27-FEB-2005
ORANGE	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00765	27-FEB-2005
WHITE	1-20GHz	SMC-12A	C-S	426643	00760	21-JUL-2005
YELLOW-BLACK	1-20GHz	SMC-12A	C-S	535055	00801	21-JUL-2005
ORANGE-BLACK	1-20GHz	SMC-12A	C-S	637367	00761	21-JUL-2005
HF (YELLOW)	18-26.5GHz	AFS4-18002650-60-8P-4	C-S	467559	00758	20-JUL-2005
HIGH PASS FILTER	1-18 GHz	SPA-F-55204	K&L	36	00817	06-JAN-2006
LOW PASS FILTER	1-9 GHz	11SL10-4100/X4400-O/O	K&L	4	00816	06-JAN-2006
HF 20dB ATTENUATOR	0.03-20 GHz	PE 7019-20	PASTERNAK	01	00791	21-MAY-2005
LOW FREQ LPF	10-100kHz	L200K1G1	MICROWAVE CIRCUITS	4460-01 DC0432	1019	30-AUG-2005
LOW FREQ LPF	10-100kHz	L200K1G1	MICROWAVE CIRCUITS	4777-01 DC0434	1088	30-AUG-2005

ANTENNAS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
GREEN BILOG	30-2000MHz	CBL6112B	CHASE	2742	00620	06-APR-2006
GREEN-BLACK BILOG	30-2000MHz	CBL6112B	CHASE	2412	00127	06-JAN-2006
GREEN-RED BILOG	30-2000MHz	CBL6112B	CHASE	2435	00990	06-APR-2006
BLUE-WHITE BILOG	30-2000MHz	3142B	EMCO	1527	TELOGY RENTAL	03-AUG-2006
RED BILOG	30-1000MHz	3143	EMCO	1270	00042	17-MAR-2005
BLUE BILOG	30-1000MHz	3143	EMCO	1271	00803	17-MAR-2005
GRAY BILOG	26-2000MHz	3141	EMCO	9703-1038	00066	19-MAY-2005(EMI) / 21-JUN-2005(RFI)
YELLOW-BLACK BILOG	20-2000MHz	CBL6140A	CHASE	1112	00126	19-MAY-2005(EMI) / 25-JUN-2005(RFI)
RED-WHITE BILOG	30-2000MHz	JB1	SUNOL	A091604-1	01105	28-SEP-2005
RED-BLACK BILOG	30-2000MHz	JB1	SINOL	A091604-2	01106	28-SEP-2005
YELLOW HORN	1-18GHz	3115	EMCO	9608-4898	00037	22-MAY-2005(EMI) / 29-NOV-2005 (RFI)
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 (RENTAL)	10kHz-30MHz	PLA-130/A	ARA	1009	TELOGY	11-FEB-2006
SMALL LOOP	9kHz-30MHz	PLA-130/A	ARA	1024	00755	23-FEB-2006
LARGE LOOP	20Hz-5MHz	6511	EMCO	9704-1154	00067	12-NOV-2005
ACTIVE MONOPOLE	30Hz-30MHz	3301B	EMCO	3824	00068	05-MAY-2005
INDUCTION COIL	50-60Hz	1000-4-8	C-S	N/A	00778	13-SEP-2006
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

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

ESD GENERATORS	MN	MFR	SN	ASSET	CALIBRATION DUE
GREEN	NSG435	SCHAFFNER	000839	00763	02-DEC-2004
RED	NSG435	SCHAFFNER	001625	00762	09-JAN-2005
YELLOW	930D	ETS	201	00673	16-JUN-2005

BEST EMC-2	MN	MFR	SN	ASSET	CALIBRATION DUE
BLUE	711-1100	SCHAFFNER	199824-002SC	00117	28-JUL-2005 (SURGE/D+/I/EFT)
RED	711-1100	SCHAFFNER	200122-074SC	00623	24-JUN-2005 (SURGE) / 28-JUL-2005 (D+) / 03-DEC-2005 (EFT)

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

CHAMBERS AND STRIPLINE		MN	MFR	SN	ASSET	CALIBRATION DUE
RFI 1 CHAMBER	3 METER COMPACT		PANASHIELD	N/A	00797	25-JUN-2005
RFI 2 CHAMBER	04' x 07' SHIELDING SYSTEM		LINDGREN	13329	00795	21-JUN-2005
RFI 3 STRIPLINE	N/A		C-S	N/A	00796	22-JUL-2005
ENVIRONMENTAL (SAFETY)	SGTH-31S		B-M-A INC.	2245	00321	31-DEC-2004

AMPLIFIERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	0.5-1000MHZ	10W1000B	AR	18708	00032	23-JUN-2005
GREEN	0.5-1000MHZ	10W1000B	AR	23423	00123	01-JUN-2005
BLUE	0.01-250MHZ	75A250	AR	19165	00039	19-JAN-2005(CRFI) / 23-JUN-2005 (RFI)
BLACK	0.01-250MHZ	75A250	AR	23411	00122	22-JUN-2005(CRFI) / 25-JUN-2005(RFI)
ORANGE	0.01-250MHZ	75A250	AR	26827	00367	19-JAN-2005(CRFI) / 02-JUN-2005(RFI)
HP489A	1.0-2.0GHZ	HP489A	HP	449-00762	00971	28-SEP-2005
HUGHES 10W	1.0-2.0GHZ	1177H09	HUGHES	143	RENTAL	29-NOV-2005
HP491C	2.0-4.0GHZ	HP491C	HP	449-00638	00764	29-NOV-2005
HUGHES 10W	4.0-8.0GHZ	1177H02	HUGHES	092	RENTAL	23-NOV-2005
HP493A #1	4.0-8.0GHZ	HP493A	HP	17140224 2	00085	28-SEP-2005
HP493A #2	4.0-8.0GHZ	HP493A	HP	449-00562	00771	28-SEP-2005
HP495A	7.0-12.0GHZ	HP495A	HP	904-00237	00086	29-NOV-2005

FIELD PROBES	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	0.01-1000MHZ	HI-4422	HOLADAY	90369	00031	11-OCT-2005
GREEN	0.01-1000MHZ	HI-4422	HOLADAY	97363	00136	05-AUG-2005
BLUE	0.01-1000MHZ	HI-4422	HOLADAY	95696	01100	27-OCT-2005

SIGNAL GENERATORS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	0.09-2000MHZ	HP8648B	HP	3847U02192	00366	15-JAN-2005
BLUE	0.1-1000MHZ	HP8648A	HP	3426A00548	00034	20-JUL-2005
GREEN	0.09-2000MHZ	HP8648B	HP	3623A02072	00125	12-OCT-2005
ORANGE	0.1-1000MHZ	HP8648B	HP	3537A01210	00025	26-MAY-2005
BLACK (TELECOM)	15MHZ	HP33120A	HP	US36004674	00766	21-OCT-2005
YELLOW	15MHZ	HP33120A	HP	US36014119	00249	26-MAY-2005
BLUE-WHITE	0.1HZ-13MHZ	HP3312A	HP	1432A07632	00775	09-MAR-2005
SWEeper	0.01-20.0GHZ	HP83752A	HP	3610A01133	00087	04-APR-2005
AM/FM STEREO SIG. GEN.	0.1-170MHZ	LG3236	LEADER	3687301	00959	03-SEP-2005

BULK INJECTION CLAMPS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
GREEN	0.01-100MHZ	95236-1	ETS	50215	00118	22-JUN-2005
RED	0.01-100MHZ	95236-1	ETS	34026	1020	07-JUL-2005

CDN NETWORKS	RANGE	MN	MFR	ASSET	CALIBRATION DUE
BLACK	0.10-100MHZ	20A M-2	C-S	00783	22-JUN-2005
BLUE	0.10-100MHZ	15A M-3	C-S	00806	22-JUN-2005
ORANGE	0.10-100MHZ	15A M-2	C-S	00786	22-JUN-2005
RED	0.10-100MHZ	15A M-3	C-S	00780	22-JUN-2005
WHITE	0.10-100MHZ	15A M-3	C-S	00782	22-JUN-2005
YELLOW-BLACK	0.10-100MHZ	15A M-3	C-S	00784	22-JUN-2005
BLUE-BLACK	0.10-100MHZ	15A M-3	C-S	00781	22-JUN-2005
GREEN	0.10-100MHZ	30A M-3	C-S	00779	22-JUN-2005
YELLOW	0.10-100MHZ	30A M-5	C-S	00804	22-JUN-2005
BLUE-WHITE	0.10-100MHZ	15A M-5	C-S	00788	22-JUN-2005
YELLOW (RES)	0.10-100MHZ	100Ω RESISTOR NWK	C-S	00810	28-SEP-2005
GREEN (RES)	0.10-100MHZ	100Ω RESISTOR NWK	C-S	00785	09-MAR-2005

OSCILLOSCOPES		MN	MFR	SN	ASSET	CALIBRATION DUE
OSCILLOSCOPE 100MHZ	TDS 220	TEKTRONIX		B068748	00885	02-JUN-2005
OSCILLOSCOPE 100MHZ (SAFETY)	TDS 340	TEKTRONIX		B012357	00737	05-OCT-2005
OSCILLOSCOPE 100MHZ (TELECOM)	54645A	HP		US36320452	00103	02-JUL-2005

POWER SUPPLIES	MN	MFR	SN	ASSET	CALIBRATION DUE
10001I/2 AC POWER SYSTEM	(2) 500I	CALIFORNIA INSTRUMENTS	HK53687/HK53688	00376	16-JUL-2005

RMS VOLTMETERS/CURRENT CLAMP	MN	MNFR	SN	ASSET	CALIBRATION DUE
TRUE-RMS MULTIMETER	79III	FLUKE	71700298	00769	21-OCT-2005
TRUE-RMS MULTIMETER	177	FLUKE	83390024	00973	08-MAR-2005
TRUE-RMS MULTIMETER (REFERENCE)	177	FLUKE	83390025	00974	08-MAR-2005
TRUE-RMS MULTIMETER (TELECOM)	177	FLUKE	83430419	00975	08-MAR-2005
TRUE-RMS CLAMP METER (SAFETY)	36	FLUKE	68805882	00700	05-MAR-2005

SURGE GENERATORS	MN	MFR	SN	ASSET	CALIBRATION DUE
TRANSIENT WAVEFORM MONITOR	TWM-5	CDI	003982	00323	17-JUN-2005
UNIVERSAL SURGE GENERATOR	M5	CDI	003966	00324	09-JUN-2005
THREE PHASE COUPLING NWK	3CN	CDI	003455	00325	09-JUN-2005
1.2x50US PLUGIN MODULE	1.2x50US PLUGIN	CDI	N/A	00842	09-JUN-2005
10x160US PLUGIN MODULE	10x160US PLUGIN	C-S	N/A	00843	09-JUN-2005
10x560US PLUGIN MODULE	10x560US PLUGIN	C-S	N/A	00841	09-JUN-2005
10x700US PLUGIN MODULE W/ EXTENSION BOX	10x700US PLUGIN	C-S	N/A	00844/845	23-JUN-2005
PSURGE CONTROLLER MODULE	PSURGE 8000	HAEFELY	150267	00879	11-JUN-2005
COUPLING/DECOUPLING MODULE	PSD 900	HAEFELY	149213	00880	11-JUN-2005
IMPULSE MODULE	PIM 900	HAEFELY	149202	00881	11-JUN-2005
HIGH VOLTAGE CAP NWK 5kVDC, 18μF	CS-HVCC	C-S	01	00772	28-SEP-2006
NEBS SURGE GENERATOR	N/A	C-S	N/A	00088	17-JUN-2005
2x10US SURGE GENERATOR	2x10US	C-S	N/A	00846	23-JUN-2005
10x700US SURGE GENERATOR	10x700US	C-S	N/A	00847	17-JUN-2005
12 PAIR SURGE RESISTOR MODULE	N/A	C-S	N/A	00768	28-SEP-2005

POWER/NOISE METERS	MN	MFR	SN	ASSET	CALIBRATION DUE
POWER METER	435B	HP	2445A11012	00773	07-APR-2005
POWER METER	437B	HP	2912A01367	01099	27-OCT-2005
POWER SENSOR	8481A	HP	2702A61351	00774	07-APR-2005
PSOPHOMETER	2429	BRUEL & KJAER	1237642	00585	18-FEB-2005
TRANSMISSION LINE TESTER (DBRNC)	185T	AMREL	998658	00823	08-MAR-2005

OVERVOLTAGE CHAMBERS	MN	MFR	SN	ASSET	CALIBRATION DUE
72kW POWER FAULT SIMULATOR	OV1	C-S	N/A	00792	31-MAR-2005
POWER FAULT SIMULATOR	OV2	C-S	N/A	00116	31-MAR-2005

DIPLOE TAPE MEASURES	MN	MFR	SN	ASSET	CALIBRATION DUE
26FT TAPE #1	2338CME	LUFKIN	C3166-1	00776	26-FEB-2005
26FT TAPE #2	2338CME	LUFKIN	C3166-2	00777	26-FEB-2005

METEOROLOGICAL METERS	MN	MFR	SN	ASSET	CALIBRATION DUE
TEMP./HUMIDITY/ATM. PRESSURE GAUGE	7400 PERCEPTION II	DAVIS	N/A	00965	19-JAN-2005
TEMPERATURE /HUMIDITY GAUGE	THG-912	HUGER	4000562	00789	08-JAN-2005

TRACEABLE CLOCKS	MN	MFR	SN	ASSET	CALIBRATION DUE
5003	5003	CONTROL COMPANY	99026940	00808	09-JAN-2005

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

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

Terms And Conditions

Paragraph 1. SERVICES. LABORATORY will:

- 1.1 Use the degree of care and skill ordinarily exercised by and consistent with the standards of the profession.
- 1.2 Perform all technical services in substantial accordance with the generally accepted laboratory principles and practices.
- 1.3 Retain all pertinent records relating to the services performed for a period of three (3) years following submission of the report describing such services, during which period the records will be made available to CLIENT upon reasonable request.

Paragraph 2. CLIENT'S RESPONSIBILITIES. CLIENT or his authorized representative will:

- 2.1 Provide LABORATORY with all plans, schematics, specifications, addenda, change orders, drawings and other information for the proper performance of technical services.
- 2.2 Designate a person to act as CLIENT's representative with respect to LABORATORY's services to be performed on behalf of the CLIENT; such person or firm to have complete authority to transmit instructions, receive information and data, interpret and define CLIENT's policies and decisions with respect to the LABORATORY's work on behalf of the CLIENT and to order, at CLIENT's expense, such technical services as may be required.
- 2.3 Designate a person who is authorized to receive copies of LABORATORY's reports.
- 2.4 Undertake the following:
 - (a) Secure and deliver to LABORATORY, without cost to LABORATORY, preliminary representative samples of the equipment proposed to require technical services, together with any relevant data.
 - (b) Furnish such labor and equipment needed by LABORATORY to handle samples at the LABORATORY and to facilitate the specified technical services.

Paragraph 3. GENERAL CONDITIONS:

- 3.1 LABORATORY, by the performance of services covered hereunder, does not in any way assume any of those duties or responsibilities customarily vested in the CLIENT, its employees, or any other party, agency or authority.
- 3.2 LABORATORY shall not be responsible for acts of omissions of any other party or parties involved in the design, manufacture or maintenance of the equipment or the failure of any employee, contractor or subcontractor to undertake any aspect of equipment's design, manufacture or maintenance.
- 3.3 LABORATORY is not authorized to revoke, alter, release, enlarge or release any requirement of the equipment's design, manufacture or maintenance unless specifically authorized by CLIENT or his authorized representative.
- 3.4 THE ONLY WARRANTY MADE BY LABORATORY IN CONNECTION WITH ITS SERVICE PERFORMED HEREUNDER IS THAT IT WILL USE THAT DEGREE OF CARE AND SKILL AS SET FORTH IN PARAGRAPH 1 ABOVE. NO OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE OR INTENDED FOR SERVICES PROVIDED HEREUNDER.
- 3.5 Where the LABORATORY indicates that additional testing is advisable to obtain more valid or useful data, and where such testing has not been authorized, CLIENT agrees to view such test reports as inconclusive and preliminary.
- 3.6 The LABORATORY will supply technical service and prepare a report based solely on the sample submitted to the LABORATORY by the CLIENT. The CLIENT understands that application of the data to other devices is highly speculative and should be applied with extreme caution.
- 3.7 The LABORATORY agrees to exercise ordinary care in receiving, preserving and shipping (F.O.B. Littleton, MA) any sample to be tested, but assumes no responsibility for damages, either direct or consequential, which arise from loss, damage or destruction of the samples due to the act of examination, modification or testing, or technical services or circumstances beyond LABORATORY's control.
- 3.8 The LABORATORY will hold samples for thirty (30) days after tests are completed, or until the CLIENT's outstanding debts to the LABORATORY are satisfied, whichever is later.
- 3.9 The CLIENT recognizes that generally accepted error variances apply and agrees to consider such error variances in its use of test data.
- 3.10 It is agreed between LABORATORY and CLIENT that no distribution of any tests, reports or analysis other than that described below shall be made to any third party without the prior written consent of both parties unless such distribution is mandated by operation of law. It is agreed that tests, reports, or analysis results may be disclosed to third party auditors of the laboratory at the laboratory facility in the course of accreditation maintenance audits. No reference to reports or technical services of the LABORATORY shall be made in any advertising or promotional literature without the express written permission of the LABORATORY.
- 3.11 The CLIENT acknowledges that all employees of LABORATORY operate under employment contracts with the LABORATORY and CLIENT agrees not to solicit employment of such employees or to solicit information related to other clients from said employees.
- 3.12 In recognition of the relative risks and benefits of the project to both CLIENT and LABORATORY, the risks have been allocated such that the CLIENT agrees, to the fullest extent permitted by law, to limit the liability of the LABORATORY to the CLIENT for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, including attorneys' fees and costs and expert witness fees and costs, so that the total aggregate liability of the LABORATORY to the CLIENT shall not exceed \$100,000, or the LABORATORY'S total fee for services rendered on this project, whichever is greater. It is intended that this limitation apply to any and all liability or cause of action however alleged or arising, unless otherwise prohibited by law.

Paragraph 4. INSURANCE:

- 4.1 LABORATORY shall secure and maintain throughout the full period of the services provided to the CLIENT adequate insurance to protect it from claims under applicable Workmen's Compensation Acts and also shall maintain one million dollars of general liability coverage to cover claims for bodily injury, death or property damage as may arise from the performance of its services.

- 4.2 The CLIENT hereby warrants that it has sufficient insurance to protect its employees adequately under applicable Workmen's Compensation Acts and for bodily injury, death, or property damage.
- 4.3 No insurance of whatever kind or type, which may be carried by either party is to be considered as in any way limiting any other party's responsibility for damages resulting from their operations or for furnishing work and materials.

Paragraph 5. PAYMENT:

- 5.1 CLIENT shall pay to LABORATORY such fees for services as previously agreed, orally or in writing, within 30 days of presentment of a bill for such services performed. In the event CLIENT ordered, orally or in writing, services but such services were not assigned a rate for billing, such services shall be billed at the LABORATORY's reasonable and customary rate.
- 5.2 CLIENT shall be responsible for all shipping, customs and other expenses related to services provided by LABORATORY to the CLIENT, and shall fully insure any test sample or other equipment provided to LABORATORY by the CLIENT.
- 5.3 Amounts overdue from CLIENT to LABORATORY shall be charged interest at a rate of 1½% per month.

Paragraph 6. ISO/IEC GUIDE 17025 ADDITIONS:

- 6.1 CLIENT agrees that this test report will not be reproduced except in full, without written approval from the LABORATORY.
- 6.2 CLIENT agrees that this test report shall not be used to claim product endorsement by A2LA or ANSI or any agency of the U.S. Government.
- 6.3 CLIENT agrees that test results presented herein relate only to the sample tested by the LABORATORY.

A2LA Accreditation

<u>SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999</u> CURTIS-STRAUS¹ 527 Great Road Littleton, MA 01460 Barry Quinlan Phone: 978-486-8880 ELECTRICAL Valid until: July 31, 2005 1627-01 Certificate Number: In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following <u>Electromagnetic Compatibility (EMC), Telecommunications, and Product Safety tests:</u> 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 <table><tr><th>EMC Standards</th><th>Title</th></tr><tr><td>Emissions CISPR 22 1997 with amendments 1 and 2 disturbance CNS13438 1994 interference EN55022:1994 and 1998 disturbance SABS CISPR 22:1997 Canada ICES-003 1997 AS/NZS 3548 1995 of information CISPR 11 1990, 1997, 1999 medical</td><td>Limits and methods of measurement of radio characteristics of information technology equipment. Limits and methods of measurement of radio characteristics of information technology equipment. Limits and methods of measurement of radio characteristics of information technology equipment. Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement Digital apparatus Australian/New Zealand Standard Limits and methods measurement of radio disturbance characteristics of technology equipment Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and (ISM) radio-frequency equipment.</td></tr></table> ¹ Note: This accreditation covers testing performed at the laboratory listed above and the satellite facility located at 168 Ayer Rd, Littleton, MA 01460 Page (A2LA Cert. No. 1627-01) 10/31/03 1 of 11		EMC Standards	Title	Emissions CISPR 22 1997 with amendments 1 and 2 disturbance CNS13438 1994 interference EN55022:1994 and 1998 disturbance SABS CISPR 22:1997 Canada ICES-003 1997 AS/NZS 3548 1995 of information CISPR 11 1990, 1997, 1999 medical	Limits and methods of measurement of radio characteristics of information technology equipment. Limits and methods of measurement of radio characteristics of information technology equipment. Limits and methods of measurement of radio characteristics of information technology equipment. Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement Digital apparatus Australian/New Zealand Standard Limits and methods measurement of radio disturbance characteristics of technology equipment Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and (ISM) radio-frequency equipment.	EN 55011 1991, 1998 radio- SABS CISPR 11:1997 equipment – methods of Canada ICES-001 1998 CNS13803 AS/NZS 2064: 1997 disturbance radio- CSA C108.8 – M1983 and CISPR 13:1996, 1998, 2001 and EN 55013: 1990, 2001 equipment: limits and of EN 55013 Amend 12 1994 equipment. SABS CISPR 13: 1996 and CNS 13439 methods of AS/NZS 1053: 1999 and CISPR 14 1993 <i>(except discontinuous disturbances)</i> appliances for apparatus. EN 55014 1993, 1997 <i>(except discontinuous disturbances)</i> appliances for electric AS/NZS 1044: 1995 <i>(except discontinuous disturbances)</i> appliances for electric <i>Immunity</i> CNS13783-1 SABS CISPR 14-1 1993 Emission – SABS CISPR 14-2 1997 + A1:2001 Immunity - (A2LA Cert. No. 1627-01) 10/31/03 Page 2 of 11 Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) frequency equipment. Industrial, scientific and medical (ISM) radio-frequency Electromagnetic disturbance characteristics Limits and measurement Industrial, scientific and medical radio frequency generators Industrial, Scientific and Medical Instrument Limits and methods of measurement of electromagnetic characteristics of industrial, scientific and medical (ISM) frequency equipment. Electromagnetic Emission from Data Processing Equipment Electronic Office Machines Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers associated equipment. Sound and television broadcast receivers and associated Electromagnetic compatibility. Part 1: Specification for methods of measurement of radio disturbance characteristics broadcast receivers and associated equipment. Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated Amendment 12 Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers associated equipment. Broadcast receiver and associated equipment Limits and measurement of radio interference characteristics of sound television broadcast receivers and associated equipment. Limits and methods of measurement of radio disturbance characteristics of electrical motor- operated and thermal household and similar purposes, electric tools and electric apparatus. Limits and methods of measurement of radio disturbance characteristics of electrical motor- operated and thermal household and similar purposes, electric tools and similar apparatus. Limits and methods of measurement of radio disturbance characteristics of electrical motor- operated and thermal household and similar purposes, electric tools and similar apparatus. Household Electrical Appliances Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 1: Product family standard Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 2: Product family standard
EMC Standards	Title					
Emissions CISPR 22 1997 with amendments 1 and 2 disturbance CNS13438 1994 interference EN55022:1994 and 1998 disturbance SABS CISPR 22:1997 Canada ICES-003 1997 AS/NZS 3548 1995 of information CISPR 11 1990, 1997, 1999 medical	Limits and methods of measurement of radio characteristics of information technology equipment. Limits and methods of measurement of radio characteristics of information technology equipment. Limits and methods of measurement of radio characteristics of information technology equipment. Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement Digital apparatus Australian/New Zealand Standard Limits and methods measurement of radio disturbance characteristics of technology equipment Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and (ISM) radio-frequency equipment.					
CISPR 14-2 1996, 1997 + A1:2001 and CISPR 20: 1995, 2002 with amendment 3 characteristics (<i>associated group only</i>) associated EN 55020: 1995, 2002 (<i>associated group only</i>) CISPR 24 characteristics – SABS CISPR 24 1997 characteristics – AS/NZS 3200.1.2: 1995 Equipment <i>European Union Basic EMC Standards</i> EN 61000-4-2: 1995, 1999, 2001 and discharge EN 61000-4-3:1997, 1998, 2002 and AS/NZS 61000.4.3 1999 frequency, EN 61000-4-4 1995 and EN 61000-4-5 1995 Section 5: AS/NZS 61000.4.5 1999 EN 61000-4-6 1996 AS/NZS 61000.4.6 1999 conducted EN 61000-4-8 1994 and magnetic EN 61000-4-11 1994 Section 11: ENV 61000-2-2 1993 Environment, conducted supply <i>EU Product Family Standards</i> EN 50081-1 1992 Part 1: EN 50081-2 1993	Immunity requirements for household appliances, tools and similar apparatus. Limits and methods of measurement of immunity of sound and television broadcast receivers and equipment. Electromagnetic immunity of broadcast receivers and Associated equipment. Information technology equipment – Immunity Limits and methods of measurement Information technology equipment – Immunity Limits and methods of measurement Approval and test specification – Medical electrical – General requirements for safety – Collateral Standard: Electromagnetic compatibility – Requirements and tests. Electromagnetic compatibility (EMC). Part 4: Testing measurement techniques. Section 2: Electrostatic immunity test – Basic EMC Publication Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 3: Radiated, radio-electromagnetic field immunity test Electromagnetic compatibility (EMC). Part 4: Testing measurement techniques. Section 4: Electrical fast transient/burst immunity test – Basic EMC publication (EMC) Part 4: Testing and measurement techniques. Surge immunity test. Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 6: Immunity to disturbances, induced by radio-frequency fields. Electromagnetic compatibility (EMC). Part 4: Testing measurement techniques. Section 8: Power frequency field immunity test. (EMC) Part 4: Testing and measurement techniques. Voltage dips, short interruptions and voltage Variations immunity tests. Electromagnetic compatibility (EMC). Part 2: Section 2: Compatibility levels for low-frequency disturbances and signaling in public low-voltage power systems (IEC 1000-2-2:1990) Electromagnetic capability – Generic emission standard. Residential, commercial and light industry. (I.S.) Electromagnetic compatibility – Generic emission	EN 61000-6-1: 1997, 2001 standards- industrial EN 61000-6-2: 1998, 2001 standards- EN 50091-2 1996 2: EMC EN 55024 1998 Characteristics – Limits EN 55103-1 1997 audio, apparatus for EN 55103-2 1997 audio, (<i>excluding Annex A3</i>) professional use. EN 61326 1998 use – EN 61547 1996 EN 50130-4 1996 Product family intruder and EN 55104 1995 household standard. EN 50083-2 1995 Part 2: EN 60601-1-2: 1993, 2002 safety – IEC 1800-3 1995 EMC product EN 60555 Part 2 1987 appliances and EN 60555 Part 3 1987 appliances and EN 61000-3-2: 1995, 2000 2: Limits AS/NZS 61000.3.2 1998 EN 61000-3-3 1995 2: AS/NZS 61000.3.3 1999 supply ETS 300 386-1 1994 network requirements Part 1: Electromagnetic Compatibility (EMC)- Part 6: Generic Section 1: Immunity for residential, commercial and light-environment Electromagnetic Compatibility (EMC)- Part 6: Generic Section 2: Immunity for industrial environments Specification for Uninterruptible Power Systems (UPS). Part requirements Information technology equipment – Immunity and methods of measurement. Electromagnetic Compatibility – Product family standard for video, audio-visual and entertainment lighting control professional use. Part 1: Emission Electromagnetic Compatibility – Product family standard for video, audio-visual and entertainment lighting control Part 2: Immunity Electrical equipment for measurement, control and laboratory EMC requirements Equipment for general lighting purposes – EMC immunity Alarm Systems. Part 4: Electromagnetic compatibility. standard: Immunity requirements for components of fire, social alarm systems. Electromagnetic compatibility immunity – requirements for appliances, tools and similar apparatus. Product family standard. Cabled distribution systems for television and sound signals. Electromagnetic compatibility for equipment. Medical electrical equipment Part 1: general requirements for Section 2: Collateral standard: Electromagnetic compatibility requirements and tests Adjustable speed electrical power drive systems. Part 3: standard including specific test methods. Disturbances in supply systems caused by household similar electrical equipment. Part 2: Harmonics Disturbances in supply systems caused by household similar electrical equipment. Part 3: Voltage fluctuations. Electromagnetic compatibility (EMC). Part 3: Limits Section for harmonic current emissions Electromagnetic compatibility (EMC). Part 3: Limits Section Limitation of voltage fluctuations and flicker in low-voltage systems. Equipment Engineering (EE); Public telecommunication equipment electro-magnetic compatibility (EMC) Product family overview, compliance criteria and test levels				

standard. Part EN 50082-1 1992, 1998 standard. Part EN 50082-2 1995 (A2LA Cert. No. 1627-01) 10/31/03 3 of 11	2: Industrial environment Electromagnetic compatibility – Generic emission 1: Residential, commercial and light industry Electromagnetic compatibility – Generic immunity Standard. Part 2: Industrial environment Page	(A2LA Cert. No. 1627-01) 10/31/03 Page 4 of 11	
ETS EN 300 386-2 1997, 1998, matters ETS EN 300 386 2000 v1.2.1, 2001 v1.3.1 Electromagnetic family ETS 300 132-1 1996 at the Operated by sources ETS 300 132-2 1996 at the Operated by ETR 283 1997 Interface A distributions. <i>EU radio standards</i> (ETS) EN 300 385 v1.2.1: 1998, 1999 matters standard for EN 300 330 v1.2.1: 1998, 1999 matters characteristics kHz to 25 range 9 kHz ETS 300 328 1996 transmission for data band and ETS EN 300 440 v1.2.1 1999 matters and test 40 GHz EN 301 893:2002 (draft) v1.2.1 Essential ETS 300 836-1:1998 Performance Conformance Radio EN301 489-17:2002 Matters v1.2.1 standard for conditions for high (A2LA Cert. No. 1627-01) 10/31/03 5 of 11	Electromagnetic compatibility and radio spectrum (ERM); Telecommunication network equipment; compatibility (EMC) requirements; Part 2: Product standard. Equipment Engineering (EE); Power supply interface input to telecommunications equipment; Part 1: alternating current (ac) derived from direct current (dc) Equipment Engineering (EE); Power supply interface input to telecommunications equipment; Part 2: direct current (dc) Equipment Engineering (EE); Transient voltages at on telecommunications direct current (DC) power Electromagnetic compatibility and Radio spectrum (ERM); Electromagnetic Compatibility (EMC) fixed radio links and ancillary equipment (ETS) Electromagnetic compatibility and Radio spectrum (ERM); Short range devices (SRD); Technical and test methods for radio equipment in the range 9 MHz and inductive loop systems in the frequency to 30 MHz Radio Equipment and Systems (RES); Wideband systems; Technical characteristics and test conditions transmission equipment operating in the 2.4 GHz ISM using spread spectrum modulation techniques Electromagnetic compatibility and Radio spectrum (ERM); Short range devices; Technical characteristics methods for radio equipment to be used in the 1 GHz to frequency range Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering requirements of article 3.2 of the R&TTE Directive Broadband Radio Access Networks (BRAN); High Radio Local Area Network (HIPERLAN) Type 1; testing specification; Part 1: Radio Type approval and Frequency (RF) conformance test specification Electromagnetic compatibility and Radio spectrum (ERM); Electromagnetic Compatibility (EMC) radio equipment and services; Part 17: Specific 2.4 GHz wideband transmission systems and 5 GHz performance RLAN equipment Page	EN 300 328-2:2001 (ERM); v1.2.1 equipment essential EN 301 489-1:2002 (ERM); equipment EN 60669-2-1:2002 installations – Part <i>Canada Radio Standards</i> Canadian GL-36 1995 Devices in the Canadian RSS-119 1999, 2000 Issue 6 and Canadian RSS-134 1996 & 2000, Issue 1 communications Rev 1 Canadian RSS-210 2000 Issue 3, Issue 5 RFS29 1998 Zealand) <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. 47 CFR FCC Unlicensed Personal Scope Communications System (PCS) devices 47 CFR FCC Unlicensed National Scope Information Infrastructure devices and low power transmitters using spread spectrum techniques. 47 CFR FCC Personal mobile Scope Radio Services in the following FCC Rule Parts 22, 24, 25, 27. 47 CFR FCC General Mobile Radio Scope Services in the following FCC Rule Parts 22, 74, 90, 95, 97. 47 CFR FCC Maritime and Aviation Scope Radio Services in 47 CFR Parts 80 and 87 47 CFR FCC Microwave Radio Services Scope in 47 CFR Parts 21, 74 and 101. Electromagnetic compatibility and Radio spectrum Matters Wideband Transmission systems; Data transmission operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques; Part 2: Harmonized EN covering requirements under article 3.2 of the R&TTE Directive Electromagnetic compatibility and Radio spectrum Matters Electromagnetic Compatibility (EMC) standard for radio and services; Part 1: Common technical requirements Switches for household and similar fixed electrical 2-1: Particular requirements – Electronic switches Industry Canada – technical requirements for low power 2400 – 2483.5 MHz band. Industry Canada – Land mobile and fixed radio Transmitters receivers, 27.41 to 960.0 MHz Industry Canada – 900 MHz narrowband personal services Industry Canada – Low power license-exempt radio 2001 communication devices Specification for Restricted Radiation Radio Apparatus (New Scope A1 Scope A2 A3 A4 B1 B2 B3 B4 (A2LA Cert. No. 1627-01) 10/31/03 of 11	Page 6
FCC/OST MP-5 1986 Of scientific GR-1089-CORE: 1997, 1999 issue 2/ safety – 2002 Issue 3 equipment. <i>ANSI EMC Standards</i> ANSI C63.4: 1992, 1999, 2001 measurement of electronic ANSI C63.5 1988 compatibility – <i>IEEE EMC Standards</i> IEEE C62.41: 1980, 1991 voltage <i>Swedish EMC Standards</i> BAKOM 3336.3 1995 (EMC & S) document <i>South African EMC standards other than CISPR equivalents</i> SABS 1718-1: 1996 Gaming <i>Japanese VCCI Standards</i> VCCI V-3/99.05 1999 VCCI V-4/99.05 1999 Test	FCC (Federal Communications Commission) methods measurement of radio noise emissions from industrial, and medical equipment. Belcore electromagnetic compatibility and electrical Generic criteria for network telecommunications American National Standard for methods of radio-noise emissions for low-voltage electrical and equipment in the range of 9 kHz to 40GHz. American National Standard for electromagnetic radiated emissions measurements in electromagnetic interference (EMI) control – calibration of antennas. IEEE recommended practice on surge voltages in low- AC power circuits Electromagnetic compatibility and electrical safety for wired terminal equipment. Harmonization information over the OFCOM requirements. Technical Requirements Instruction for Test Conditions for Requirement under	TIA/EIA-IS-968 Technical Telephone TIA/EIA-IS-883 Supplemental Detection TIA-968-A Technical Telephone T1.TRQ.6-2001 Telephone Canada VDSL Methods for Issue 1 January 2003 AS/ACIF S002-2001 Telephone AS/ACIF S016-2001 hierarchical AS/ACIF S031-2001 AS/ACIF S038-2001 AS/ACIF S043-2001 Metallic ITU-T G.703 interfaces HKTA 2028 the PTNs in kbit/s HKTA 2029 the PTNs in Telecommunications Telephone Terminal Equipment Requirements for Connection of Terminal Equipment to the Network Telecommunications Telephone Terminal Equipment Technical Requirements for Connection of Stutter Dial Tone Devices and ADSL Modems to the Telephone Network Telecommunications Telephone Terminal Equipment Requirements for Connection of Terminal Equipment to the Network Technical Requirements for SHDSL, HDSL2, HDSL4 Digital Subscriber Line Terminal Equipment to Prevent Harm to the Network Industry Terminal Attachment Program Requirements and Test Very-High-Bit-Rate Digital Subscriber Line (VDSL) Terminal Equipment Analogue interworking and non-interference requirements for Customer Equipment for connection to the Public Switched Network Requirements for Customer Equipment for connection to digital interfaces Requirements for ISDN Basic Access Interface Requirements for ISDN Primary Rate Access Interface Requirements for Customer Equipment for Connection to a Local Loop Interface of a Telecommunications Network — Part 1: General Part 2: Broadband Part 3: DC, Low Frequency AC and Voiceband Physical/electrical characteristics of hierarchical Digital Network connection specification for connection of CPE to Hong Kong using digital leased circuits at data rate of 1544 Network connection specification for connection of CPE to Hong Kong using digital leased circuits at data rate of 2048	

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 (<i>excluding volume control</i>); Protocol analysis and Jitter testing. Telecom Standards FCC 47 CFR Part 68 Telephone Terminal TCB Scope CS-03 Issue 8 1996 through amendment 5 and TIA/EIA TSB31-B 1998 Guidelines (Feb) (A2LA Cert. No. 1627-01) 10/31/03 of 11	kbit/s TBR 1 : 1995 connected to CCITT Recommendation including, TBR 2 : 1997 to for rates up to 1 Recommendations (A2LA Cert. No. 1627-01) 8 of 11 Attachment requirements for terminal equipment to be circuit switched data networks and leased circuits using a Recommendation X.21 interface, or at an interface physically, functionally and electrically compatible with CCITT X.21 but operating at any data signaling rate up to, and 1 984 kbit/s Attachment requirements for Data Terminal Equipment (DTE) connect to Packet Switched Public Data Networks (PSPDNs) CCITT Recommendation X.25 interfaces at data signaling 920 kbit/s utilizing interfaces derived from CCITT X.21 and X.21 bit 10/31/03 Page 8 of 11
TBR 3 : 1995 + Amdt : 1997 Attachment ISDN TBR 4 : 1995 + Amdt : 1997 Attachment ISDN TBR 012 : 1993 + Amdt : 1996 Provision unstructured terminal TBR 013 : 1996 digital requirements for TBR 21 : 1998 pan- (excluding TE network TBR 24 : 1997 D34S); interface <i>Australia</i> TS 002 : 1997 Requirements for TS 016 : 1997 Connected to TS 031 : 1997 TS 038 : 1997 AS/ACIF S043.2:2001 a Network – Part 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; Over voltage/power cross tests (<i>excluding x-ray tests</i>). Product Safety Standards <i>Specific Product Safety Standards</i> IEC 950 1991 Includes equipment. UL 1950 1998 CSA C22.2 No.950-95 UL 60950 2000 (A2LA Cert. No. 1627-01) 10/31/03 of 11	Integrated Services Digital Network (ISDN); requirements for terminal equipment to connect to an using ISDN basic access Integrated Services Digital Network (ISDN); requirements for terminal equipment to connect to an using ISDN primary rate access Business Telecommunications (BT); Open Network (ONP) technical requirements; 2 048 kbit/s digital leased line (D2048U) Attachment requirements for equipment Business Telecommunications (BTC); 2 048 kbit/s structured leased lines (D2048S); Attachment terminal equipment interface Terminal Equipment (TE); Attachment requirements for European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE supporting the voice telephony service) in which addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signaling Business Telecommunications (BTC); 34 Mbit/s digital Unstructured and structured leased lines (D34U) and Attachment requirements for terminal equipment Analogue Interworking and Non interference Customer Equipment Connected to the Public Switched Telephone Network General Requirements for Customer Equipment Hierarchical Digital Interfaces Requirements for ISDN Basic Access Interface Requirements for ISDN Primary Rate Access Interface Requirements for Customer Equipment for connection to metallic loop interface of a Telecommunications 2 Broadband IEC 60950 2000 EN 60950 1997, 1998, 2000 IEC 60950-1 2001 UL 60950-1 2003 CSA C22.2 No. 60950-00 CSA C22.2 No. 60950-1 03 AS/NZS 3260 1993 technology AS/NZS 3260 Supp 1 1996 technology Alphabetical 3260:1993) ACA TS 001 1997 for UL 1459 1995 IEC 1010-1 1990 measurement, control IEC 61010-1 1993 EN 61010-1 1993, 2001 measurement, control IEC 61010-1 2001 UL 61010B-1 2003 UL 3101-1 1993 requirements. CAN/CSA 1010-1 1999 (<i>Including AM 2</i>) UL 3111-1 1996 requirements. UL 3121-1 1995 IEC 60601-1 1995 for safety. EN 60601-1 1995 (<i>Including AM 2</i>) UL 2601-1 1997 for safety. IEC 60065 1998, 2000 requirements ANSI/UL 6500: 1998 CAN/CSA 60065-00 AS/NZS 3250 1995 AS/NZS 60065 2000 Equipment for Canadian C22.2 No. 1-94 (1-98) and 1994, 1998 EN 60065 1994 apparatus IEC 60825 1990 EN 60825-1 1994 requirements IEC 60825-1 2001 IEC 60825-2 2000-5 communication IEC 60825-4 1997-11 IEC 60335-1 1995 (<i>Including AM2 – 1997 & AM 12 – 1997</i>) Part 1: General requirements EN 60335-1 2001 UL 60335-1 1998 CAN/CSA E335-1 1994 (A2LA Cert. No. 1627-01) 10/31/03 of 11 Safety of information technology equipment Safety of information technology equipment, including Electrical business equipment. Approval and test specification – Safety of information equipment including electrical business Equipment. Approval and test specification – Safety of information equipment including electrical business equipment – reference index to IEC 950 (Supplement to AS/NZS Australian Communications Authority – Safety requirements customer equipment. Telephone Equipment Safety requirements for electrical equipment for and laboratory use, Part 1: General requirements. Safety requirements for electrical equipment for and laboratory use, Part 1: General requirements. Electrical equipment for laboratory use Part 1: General requirements. Electrical measuring and test equipment. Part 1: General requirements. Medical electrical equipment. Part 1: General requirements for safety. Medical electrical equipment Medical electrical equipment. Part 1: General Requirements for safety. Audio, video and similar electronic apparatus – Safety requirements Audio/video and musical instrument apparatus for Household, commercial and similar general use Australian/New Zealand Standard – Approval and test Specification – Mains operated electronic and related household and similar general use Audio, video and similar electronic equipment. Consumer and commercial products Safety requirements for main operated electronic and related for household and similar general use. Radiation safety of laser products, equipment Classification, requirements and user's guide Safety of laser products Part 1: equipment Classification, and user's guide. Safety of laser products – Part 2: Safety of optical systems Safety of laser products – Part 4: Laser guards Safety of household and similar electrical appliances Page 10 of 11
UL 61010A-1 : 2002 EN 61010-1 : 2001 measurement, requirements AS/NZS 60950 : 2000 Environmental² Environmental Standards GB-63-CORE ETS 300 019 (vibration up to 1000Hz)	Electrical equipment for laboratory use; part 1: General requirements Safety requirements for electrical equipment for control, and laboratory use - Part 1: General Safety information technology equipment NEBS Requirements: Physical Protection Environmental conditions and environmental tests For telecommunications equipment

_____ ² Environmental testing is performed at the satellite facility located at 168 Ayer Rd, Littleton, MA 01460 (A2LA Cert. No. 1627-01) 10/31/03 11 of 11	
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