



Test Report: 5R46150.1


Applicant: Nanoptix Inc.
699 Champlain Street
Dieppe, New Brunswick
Canada
E1A 1P6

Equipment Under Test: Spill Proof Cuts

Model Number: SPC

In Accordance With: **FCC 47 CFR Part 15, Subpart B**
Verification

Tested By: Nemko Canada Inc.
303 River Road, R.R. 5
Ottawa, Ontario K1V 1H2



Authorized By: David Duchesne, EMC Specialist

Date: 30 June 2005

Total Number of Pages: 16

 Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B
	Test Report No: 5R46150.1
	Equipment (EUT): Spill Proof Cuts

Table of Contents

Measurement Uncertainty 3

Lab Environmental Conditions 3

Declaration..... 4

Summary of Test Results 5

Engineering Considerations 7

General Information Regarding the Equipment Under Test (EUT) 8

Equipment Configuration 9


Radiated Disturbance 10

Conducted Disturbance at Mains Port 12

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 Nemko Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B
	Test Report No: 5R46150.1
	Equipment (EUT): Spill Proof Cuts

Measurement Uncertainty

Accuracy of Measurement		
Measurement uncertainty was calculated using the methods described in CISPR 16-4 <i>Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements</i> and Nemko Canada Inc. procedure EMC/MUC/001 <i>Uncertainty in EMC Measurements</i> .		
Test Specific Measurement Uncertainty		
Measurement	Test Specification	U _{lab}
Conducted disturbance	9kHz – 150kHz	4.0dB
	150kHz – 30MHz	3.6dB
Radiated disturbance	30MHz – 200MHz Horizontal polarization	4.7dB
	200MHz – 1000MHz Horizontal polarization	4.7dB
	30MHz – 200MHz Vertical polarization	4.9dB
	200MHz – 1000MHz Vertical polarization	4.9dB

Lab Environmental Conditions

Lab Conditions
Ambient Temperature: 15°C to 35°C, Relative Humidity: 30% to 60%, Atmospheric Pressure: 86kPa (860mbar) to 106kPa (1 060mbar)

 Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B	
	Test Report No: 5R46150.1	
	Equipment (EUT): Spill Proof Cuts	

Declaration

Product Name: Spill Proof Cuts


Model No: SPC

Trademark: 


Serial No: SPC000011


Name of Applicant: Nanoptix Inc.


Name of Manufacturer: Nanoptix Inc.

 Nemko Canada Inc., Ottawa, Ontario Canada	TEST RESULT	
	PASS	FAIL
In the configuration tested, the EUT complied with the requirements of: FCC 47 CFR Part 15, Subpart B for Class A, Digital Devices.	X	

Note: See Summary of Test Results and Engineering Considerations for full details.

Tested by:  _____ 30 June 2005
Signature Date
Daniel Hynes, EMC Specialist

Reviewed by:  _____ 30 June 2005
Signature Date
David Duchesne, EMC Specialist



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The tests included in this report are within the scope of this accreditation.

 Nemko Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B
	Test Report No: 5R46150.1
	Equipment (EUT): Spill Proof Cuts

Summary of Test Results

General

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15, Subpart B for Digital Devices.

These tests were conducted using measurement procedures of ANSI C63.4-2001.

The equipment was tested for conducted emissions from 0.15MHz to 30MHz using a 50 microhenry line impedance stabilization network (L.I.S.N.) as described in ANSI C63.4-2001. Peripheral equipment was also operated through a 50 microhenry L.I.S.N.

Limits For Conducted Disturbance At The Mains Ports: Paragraph No. 15.107 for Class A


Frequency Range MHz	Limits dB(μ V)		Result (Pass/Fail)
	Quasi-Peak	Average	
0.15 to 0.50	79	66	Pass
0.50 to 30	73	60	

Limits For Conducted Disturbance At The Mains Ports: Paragraph No. 15.107 for Class B

Frequency Range MHz	Limits dB(μ V)		Result (Pass/Fail)
	Quasi-Peak	Average	
0.15 to 0.50	66 to 56	56 to 46	N/A
0.5 to 5	56	46	
5 to 30	60	50	

Notes

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50MHz.

 Nemko Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B
	Test Report No: 5R46150.1
	Equipment (EUT): Spill Proof Cuts

Summary of Test Results, continued

Limits For Radiated Disturbance: Paragraph No. 15.109		
Frequency Range MHz	Limits For Radiated Disturbance At A Measuring Distance Of 10 Meters Class A	
	Quasi-Peak Limits dB (µV/m)	Result (Pass/Fail)
30 - 88	39.1	Pass
88 - 216	43.5	
216 - 960	46.4	
Above 960	49.5	
Frequency Range MHz	Limits For Radiated Disturbance At A Measuring Distance Of 3 Meters Class B	
	Quasi-Peak Limits dB (µV/m)	Result (Pass/Fail)
30 - 88	40.0	N/A
88 - 216	43.5	
216 - 960	46.0	
Above 960	54.0	
Notes		
1. The lower limit shall apply at the transition frequency.		
2. Additional provisions may be required for cases where interference occurs.		
The spectrum was investigated from 30MHz up to the frequency shown in the following table based on the highest operating frequency used in the EUT		
The highest operational frequency used in the EUT was 192MHz.		
Highest Frequency Generated or Used in the Device Which the Device Operates or Tunes (MHz)	Upper Frequency of Measurement Range (MHz)	
Below 1.075	30	
1.705 – 108	1000	
108 – 500	2000	
500 – 1000	5000	
Above 1000	5 th harmonic of the highest frequency or 40GHz, whichever is lower.	

 Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B
	Test Report No: 5R46150.1
	Equipment (EUT): Spill Proof Cuts

Engineering Considerations

Product Modification	
To achieve compliance the following change(s) were made during compliance testing: None	
Justification	
None	
Deviations	
The following deviations from, additions to, or exclusions from the test specification have been made: None	
Test Report Revision History	
Issue #	Details of changes made to test report
-	Original Report Issued
N/A	N/A

 Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B
	Test Report No: 5R46150.1
	Equipment (EUT): Spill Proof Cuts

General Information Regarding the Equipment Under Test (EUT)

Date Received In Laboratory:	June 1, 2005
Nemko Identification Number:	Refer to Nemko Canada receiving report.
EUT Mains Input Voltage and Frequency	
Voltage: 100-240VAC Frequency: 50-60Hz	
Description & Theory of Operation	
The EUT is a thermal printer with cutter for point of sale applications.	
EUT Clock and Operational Frequencies	
0.052MHz, 0.1MHz, 6.25MHz, 12MHz, 48MHz, 96MHz, 192MHz	
Exercise/Monitoring method	
The EUT was tested while printing a ticket continuously every 3 seconds.	
Software Version	
Firmware version: 0.25B	

 Nemko Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B
	Test Report No: 5R46150.1
	Equipment (EUT): Spill Proof Cuts

Equipment Configuration

Equipment Configuration List

Item	Description	Identification: (M/N #, S/N #, P/N #, Rev.)
(A)	Spill Proof Cuts	M/N # SPC, S/N # SPC000011

EUT Ports

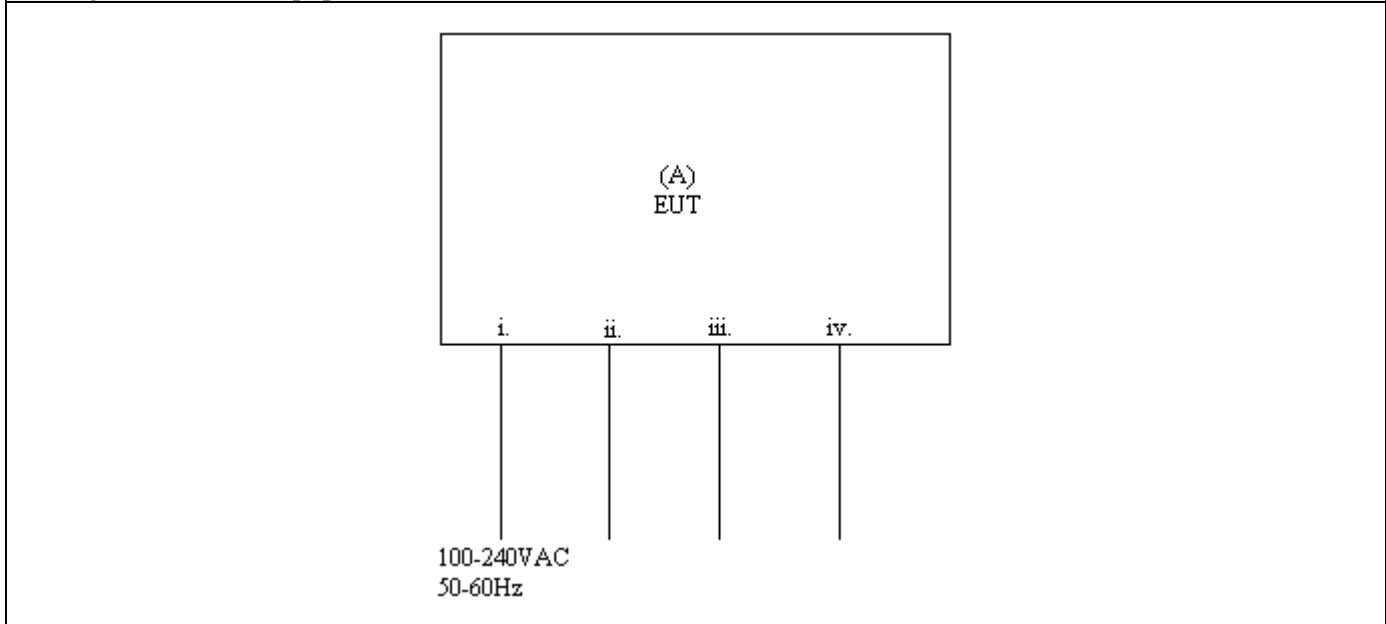
Item	Description	Indoor/Outdoor	Type (See Legend)	Qty
i.	AC Mains	Indoor	1	1
ii.	USB	Indoor	4	1
iii.	Serial (DB25)	Indoor	4	1
iv.	Cash Drawer (RJ11)	Indoor	4	1

Inter-Connection Cables


Item	Description	Shielded	Ferrite	Length (m)
(1)	North American 3 Conductor Power Cable	No	No	2
(2)	Standard USB Cable	Yes	No	5
(3)	DB25 to DB9 Serial Cable (RS232)	Yes	No	3
(4)	4 Conductor RJ11 Cable	No	No	1

Legend:
 1 = AC Power Input/Output, 2 = DC Power Input/Output, 3 = Telecom, 4 = Non-telecom I/O, 5 = Maintenance, 6 = Fiber Optic

Configuration of the Equipment Under Test (EUT)



Notes
 None

 Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B
	Test Report No: 5R46150.1
	Equipment (EUT): Spill Proof Cuts

Radiated Disturbance


Test Date: June 2, 2005 & June 27, 2005											
Engineer's Name: Daniel Hynes											
Tested as per: Table Top											
Mains Input Voltage: 120VAC						Mains Input Frequency: 60Hz					
Enclosure Investigation Data											
Test Distance (meters): 10						Dome: Almonte					
Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Amp.
288.0010	BL	V	27.1	13.6	N/A	2.2	42.9	46.4	3.5	Q-Peak	N/A
65.7590	BL	V	22.5	6.8	N/A	1.0	30.2	39.1	8.9	Q-Peak	N/A
480.0016	BL	H	12.7	17.3	N/A	2.8	32.8	46.4	13.6	Q-Peak	N/A
192.0006	BL	V	16.5	10.2	N/A	1.7	28.4	43.5	15.1	Q-Peak	N/A
96.0002	BL	V	17.3	9.7	N/A	1.2	28.2	43.5	15.3	Q-Peak	N/A
287.5282	BL	V	15.1	13.6	N/A	2.2	30.9	46.4	15.5	Q-Peak	N/A
384.0013	BL	V	12.5	15.5	N/A	2.4	30.4	46.4	16.0	Q-Peak	N/A
400.0014	BL	V	9.9	16.4	N/A	2.6	28.9	46.4	17.5	Q-Peak	N/A
368.0010	BL	V	10.7	15.3	N/A	2.4	28.4	46.4	18.0	Q-Peak	N/A
432.0015	BL	H	8.7	17.2	N/A	2.5	28.4	46.4	18.0	Q-Peak	N/A
Legend: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole Detector Legend: Q-Peak = 120kHz RBW, Average = 1.0MHz RBW											
Notes											
None											
Deviations											
Refer to Engineering Considerations.											
Test Result											
Final Test Result: Pass											

Radiated Disturbance Test Equipment Used						
CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Receiver	Rohde & Schwarz	ESVS-30	FA001445	July 07/04	July 07/05
1 Year	Bilog	Schaffner	CBL6112B	FA001503	July 09/04	July 09/05
Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use						

Radiated Disturbance, continued

Radiated Disturbance Setup Photos



 Nemko Canada Inc., Ottawa, Ontario Canada	Reference Standard: FCC 47 CFR Part 15, Subpart B
	Test Report No: 5R46150.1
	Equipment (EUT): Spill Proof Cuts

Conducted Disturbance at Mains Port

Test Date: June 2, 2005								
Engineer's Name: Daniel Hynes								
Tested as per: Table Top								
Mains Input Voltage: 120VAC					Mains Input Frequency: 60Hz			
Spectrum plots for each frequency band can be found at the back of this section. *All plots were generated with a peak detector.								
Port Investigation Data								
Port under test: AC mains								
Results: Refer to Plots of this section and tables.								
Conductor	Frequency (MHz)	Detector	Emission Level (dBuV)	LISN Loss (dB)	Cable Loss (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
Neutral	0.1658	Quasi Peak	56.4	0.10	0.00	56.50	79.0	22.5
		Average	49.2	0.10	0.00	49.30	66.0	16.7
Notes								
None								
Deviations								
Refer to Engineering Considerations.								
Test Result								
Final Test Result: Pass								

Conducted Disturbance at Mains Test Equipment Used						
CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	LISN	Tegam	95300-50	FA000736	Feb 09/ 05	Feb 09/ 06
1 Year	LISN	Tegam	95300-50	FA000737	Feb 09/ 05	Feb 09/ 06
1 Year	Spectrum Analyzer	Hewlett-Packard	8566B	FA001432	May 18/05	May 18/06
1 Year	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001432	May 18/05	May 18/06
1 Year	Transient Limiter	Hewlett-Packard	1194 7A	FA001150	May 25/05	May 25/06
1 Year	Receiver	Rohde & Schwarz	ESHS 10	FA001929	April 20/05	April 20/06

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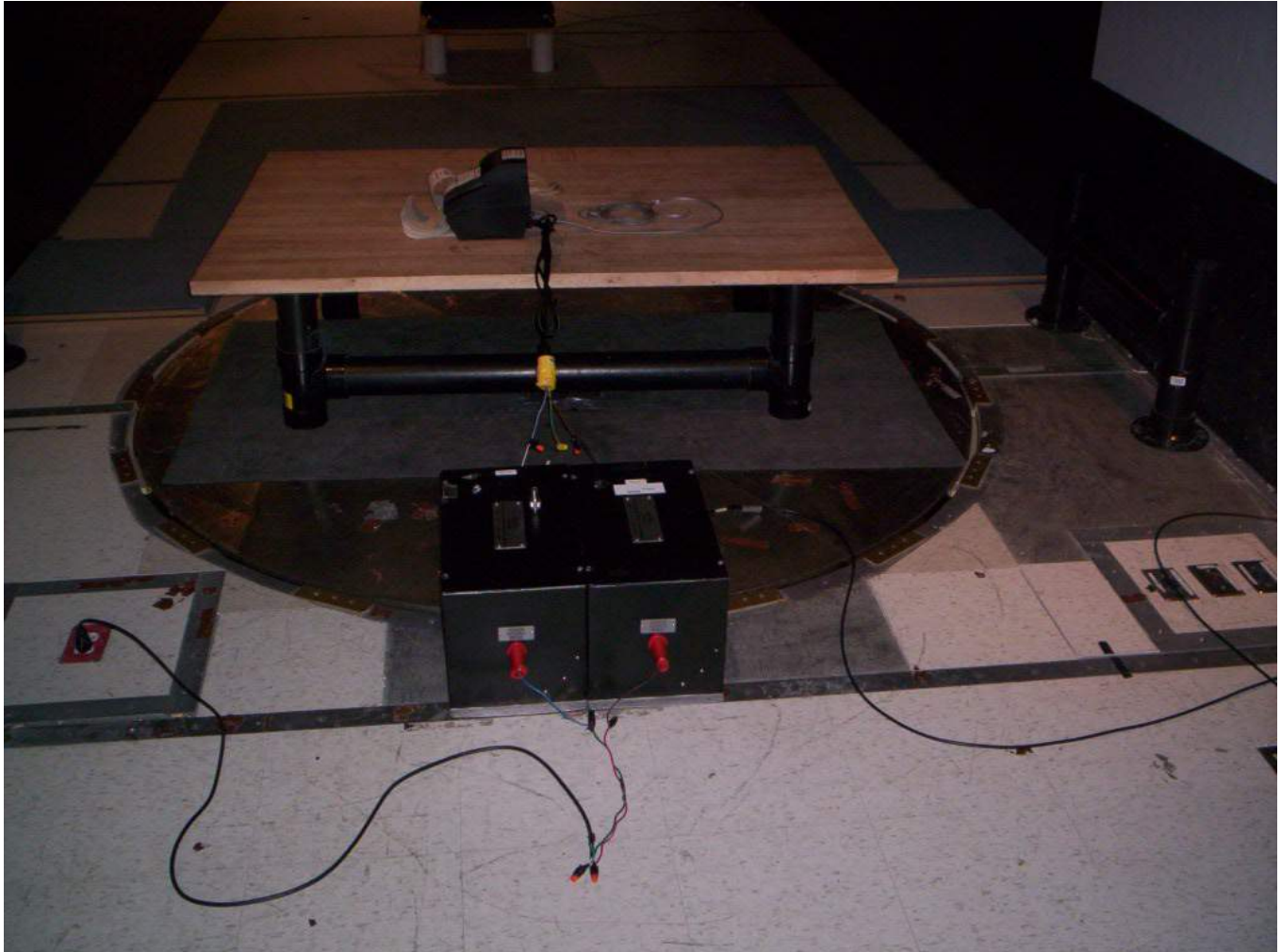
Reference Standard: FCC 47 CFR Part 15, Subpart B

Test Report No: 5R46150.1

Equipment (EUT): Spill Proof Cuts

Conducted Disturbance at Mains, continued

Conducted Disturbance at Mains Setup Photos





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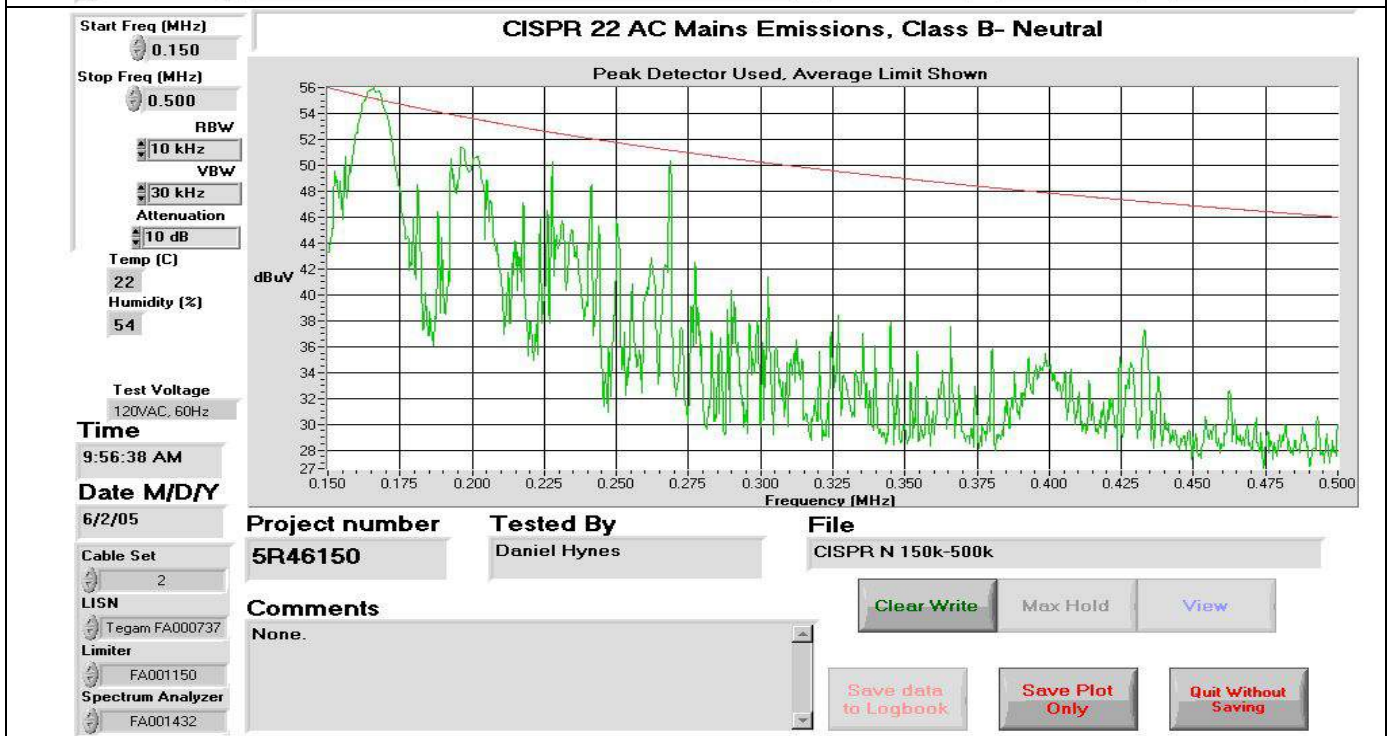
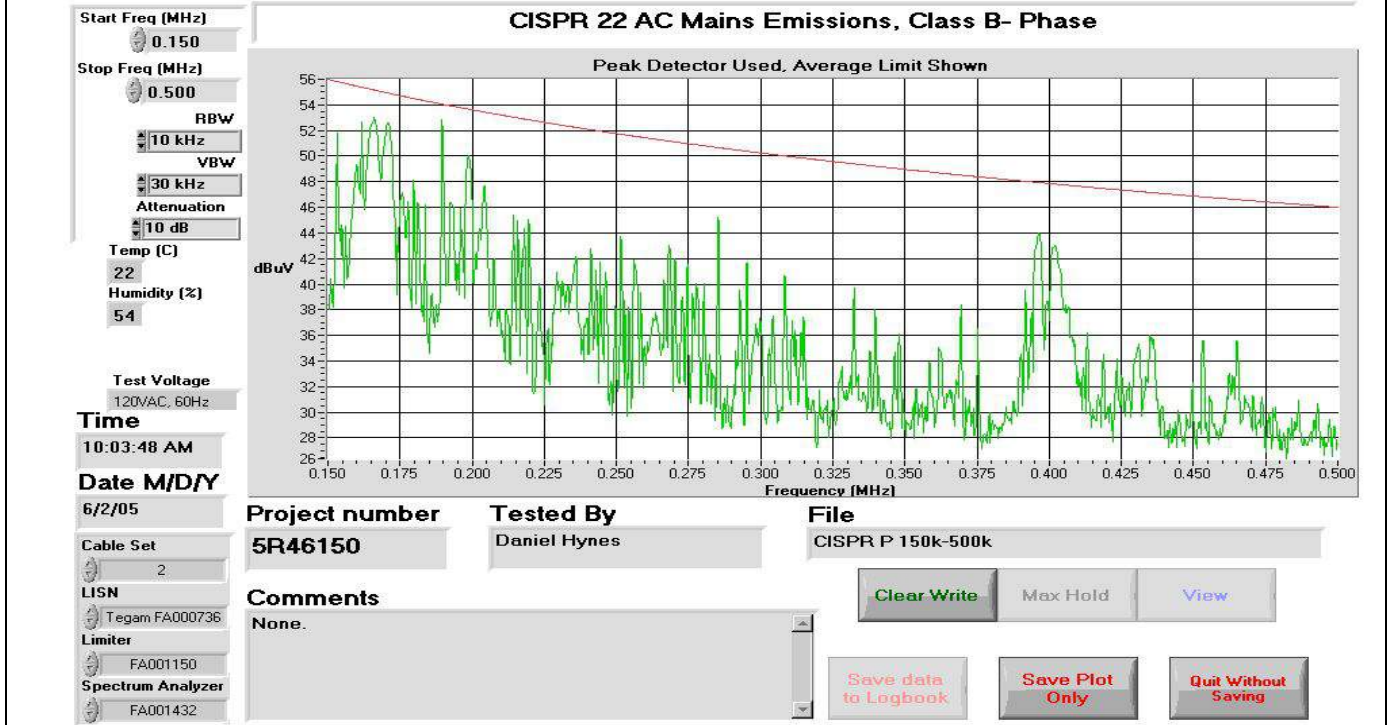
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Test Report No: 5R46150.1

Equipment (EUT): Spill Proof Cuts

Conducted Disturbance at Mains, continued

Conducted Disturbance at Mains Plots





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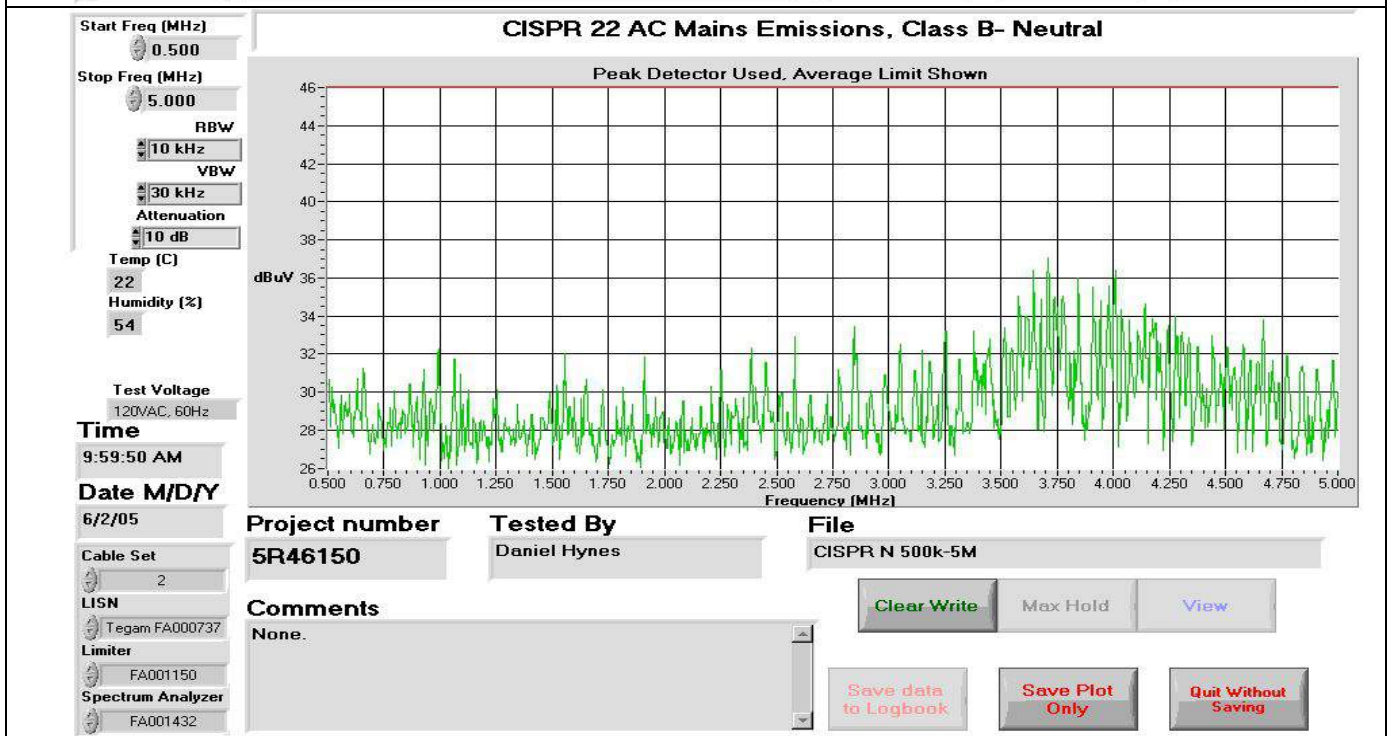
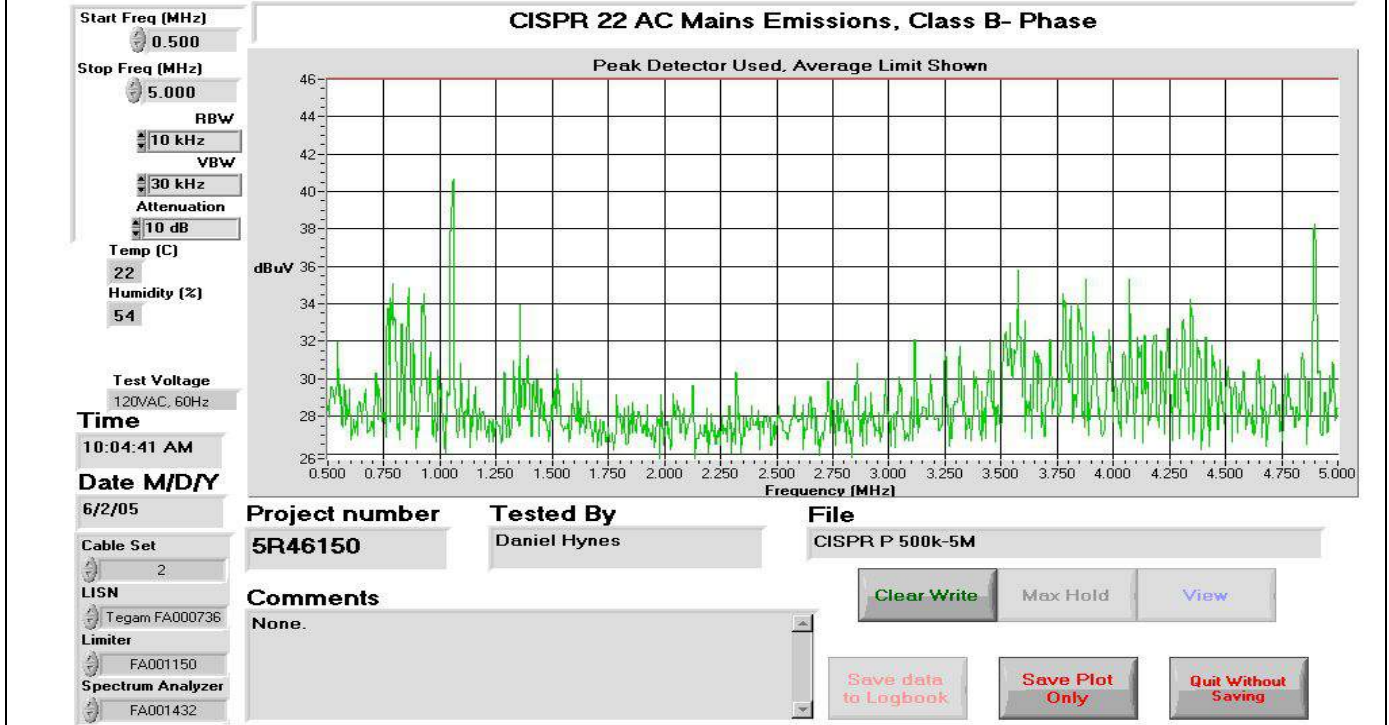
Reference Standard: FCC 47 CFR Part 15, Subpart B

Test Report No: 5R46150.1

Equipment (EUT): Spill Proof Cuts

Conducted Disturbance at Mains, continued

Conducted Disturbance at Mains Plots, continued





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Reference Standard: FCC 47 CFR Part 15, Subpart B

Test Report No: 5R46150.1

Equipment (EUT): Spill Proof Cuts

Conducted Disturbance at Mains, continued

Conducted Disturbance at Mains Plots, continued

