



BUREAU  
VERITAS

Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

# Test Report

Report No	EN2540-1
Client	Dermal Photonics Corporation Paul Dunleavy
Address	5 Elms Street, Suite 10 Danvers, MA 01923
Phone	603-264-3405
Items tested	NIRA LASER SYSTEM
FCC ID	2ADZENIRA
FRN	0024210494
Equipment Type	Part 15.247 Digitally Modulated
Equipment Code	DTS
FCC Rule Parts	47 CFR 15.247
Test Dates	October 9-10, 13, 22 and 30, 2014
Results	As detailed within this report
Prepared by	 Tuyen Truong A. – Test Engineer
Authorized by	 Christopher Reynolds – EMC Supervisor
Issue Date	<u>5/18/2015</u>
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 22 of this report.

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



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



## Contents

Contents.....	2
Summary.....	3
Test Methodology.....	4
Product Tested - Configuration Documentation .....	5
<i>Statement of Conformity</i> .....	6
Test Results .....	7
<i>Bandwidth</i> .....	7
Fundamental Emission Output Power .....	10
<i>Radiated Spurious Emissions</i> .....	13
Power Spectral Density.....	16
AC Line Conducted Emissions.....	19
<i>Duty Cycle Correction Calculation</i> .....	20
Measurement Uncertainty.....	21
Conditions Of Testing .....	22

Form Final Report REV 7-20-07 (DW)



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828

## Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.247. The product is the NIRA LASER SYSTEM. It is a digitally modulated transmitter that operates in the range 2402-2480MHz. Product was tested with an on board antenna with a gain of -3.5dBi.

We found that the products met the above requirements without modification. Paul Dunleavy from Dermal Photonics Corporation was present during the testing. The test sample was received in good condition.

Please note that EUT was only tested in Bluetooth Transmit mode with Battery powered. The client states that the device can only transmit in Battery mode (i.e. not while connected to the AC charger)

Issue No.	Reason for change	Date Issued
1	Original Release	April 23, 2015

page 3 of 23



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



### **Test Methodology**

Radiated emission and AC Line conducted testing were performed according to DTS guidance document 558074D01 v03r02 specified in FCC Guidance for performing compliance measurement on DTS operating under section 15.247, April 19, 2013 and ANSI C63.10 (2009) and C63.4 (2003). Radiated Emissions were maximized by rotating the device around its axes as well as varying the test antenna's height and polarity. The device antenna was not maximized separately.

Conducted emissions at the antenna port were not performed since the EUT antenna was permanently attached.

AC Main conducted emission was not performed with a  $50\Omega/50\mu\text{H}$  because the device shall only able to be used with battery powered and not while charging.

Low operating channel frequency = 2402MHz

Mid operating channel frequency = 2440MHz

High operating channel frequency = 2480MHz

The following bandwidths were used during radiated spurious and line conducted emissions.

<b>Frequency</b>	<b>RBW</b>	<b>VBW</b>
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-10GHz	1MHz	3MHz



**Product Tested - Configuration Documentation**

EUT Configuration												
<b>Work Order:</b> N2540												
<b>Company:</b> Dermal Photonics Corporation												
<b>Company Address:</b> 5 Elms Street, Suite 10 Danvers, MA 01923												
<b>Contact:</b> Paul Dunleavy												
<b>Person Present:</b> Felix Feldchtein												
EUT					MN	SN						
<b>EUT:</b>					100-000	016						
<b>EUT Description:</b> Nira Laser System												
<b>EUT Tx Frequency Range:</b> 2402 - 2480MHz												
Support Equipment:					MN	SN						
Acer laptop					AC/DC Power Brick	GTM41078-0605-USB	--					
* used for charging the EUT												
<b>EUT Ports:</b>												
Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out NEBS Type			
AC/DC Power	micro USB	1	1	USB	Yes	No	1m	>3m	Indoor			
Only used to charge the EUT / Set up												
<b>Software / Operating Mode Description:</b>												
EUT is set to run in Bluetooth mode; transmitting on Low, Middle or High channel from 2402 - 2480MHz range.												



## Statement of Conformity

The NIRA LASER SYSTEM has been found to conform to the following parts of 47 CFR and as detailed below:

Part 15	Comments
15.15(b)	There are no controls accessible to the user that varies the output power above specified limits.
15.19	The label is shown in the label exhibit.
15.21	Information to the user is shown in the instruction manual exhibit.
15.27	No special accessories are required for compliance.
15.31	The EUT was tested in accordance with the measurement standards in this section.
15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
15.203	EUT employs a permanently connected antenna.
15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.
15.207	Not Applicable. The client states that EUT only transmit while it is in battery powered.
15.247	The unit complies with the requirements of 15.247
15.247	Occupied Bandwidth measurements were made.



## Test Results

### Bandwidth

#### LIMIT

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

### MEASUREMENTS / RESULTS

6dB Bandwidth		
Frequency (MHz)	Mode	6dB Bandwidth (KHz)
2402	DSSS	719.299
2440	DSSS	719.233
2480	DSSS	723.457
<b>Tested by:</b> Tuyen Truong		<b>Analyzer:</b> SA 1327
<b>Date:</b> 10/10/2014		<b>Attenuator:</b> PE7019-20
<b>Company:</b> Dermal Photonics Corporation		<b>Test Site:</b> Chamber 1
<b>EUT:</b> Nira Laser		<b>Environmental Conditions:</b> 24°C, 35%, 1001mBar
<b>Note:</b> PRBS9 37bytes Modulation		<b>RBW = 100KHz</b> <b>VBW = 300KHz</b>

Rev.10/2/2014										
<b>Spectrum Analyzers / Receivers /Preselectors</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>		
SA EMI Chamber (1327)	9kHz-13.2 GHz	E4405B	Agilent	MY45103416	1327	I	4/29/2015	4/29/2014		
<b>Radiated Emissions Sites</b>	<b>FCC Code</b>	<b>IC Code</b>	<b>VCCI Code</b>	<b>Range</b>		<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>		
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz		II	3/15/2015	3/15/2014		
<b>Antennas</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>		
Black Horn	1-18GHz	3115	EMCO	9703-5148	56	I	8/21/2015	8/21/2014		
<b>Cables</b>	<b>Range</b>		<b>Mfr</b>			<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>		
Asset #1505	9kHz - 18GHz		Florida RF			II	3/7/2015	3/7/2014		
Asset #1507	9kHz - 18GHz		Florida RF			II	2/23/2015	2/23/2014		
<b>Meteorological Meters</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>			
Weather Clock (Pressure Only)	BA928	Oregon Scienti	C3166-1	831	I	3/19/2016	3/19/2014			
TH A#1832	35519-044	ontrol Compa	130318277	1832	II	6/13/2015	6/13/2013			

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



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



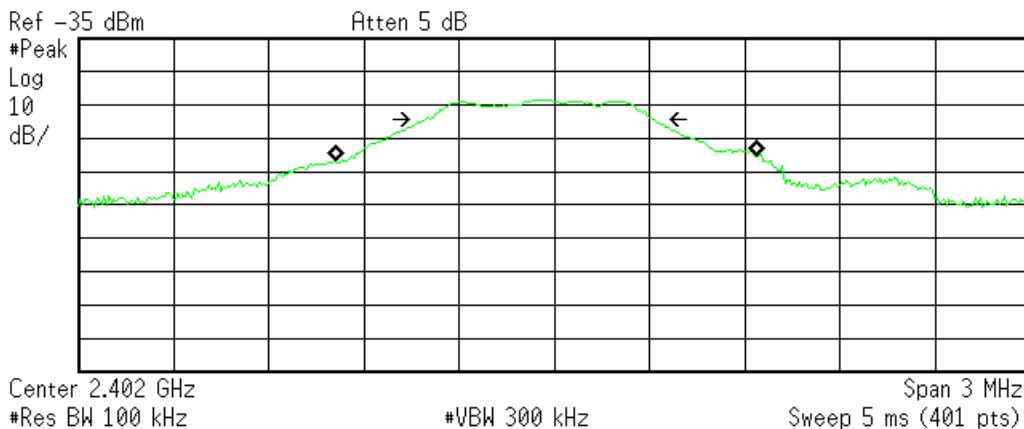
page 7 of 23

Testing Cert. No. 1627-01

**PLOT(s)**

⌘ Agilent 15:42:32 Oct 10, 2014

R T



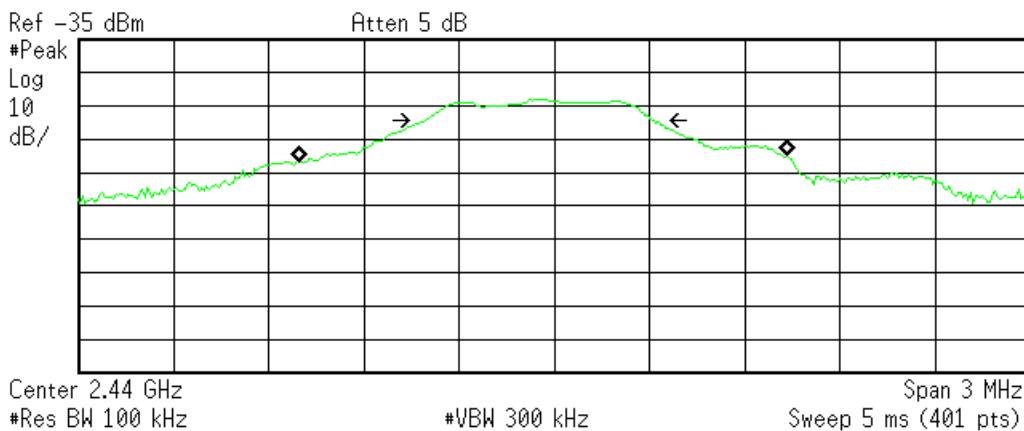
Transmit Freq Error      -26.790 kHz  
x dB Bandwidth      719.299 kHz

C:\temp.gif file saved

## Low Channel – 6dB Bandwidth

⌘ Agilent 15:49:20 Oct 10, 2014

R T



Transmit Freq Error      -33.733 kHz  
x dB Bandwidth      719.233 kHz

C:\temp.gif file saved

## Mid Channel – 6dB Bandwidth

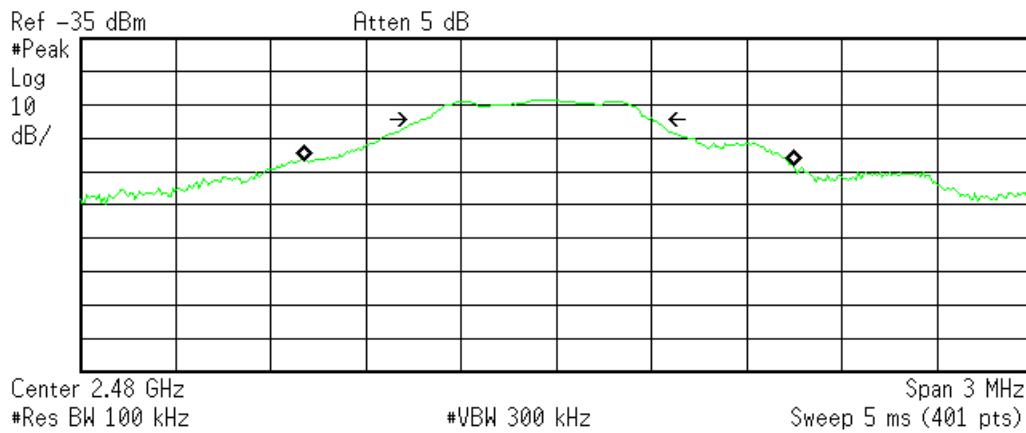


Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



\* Agilent 15:27:38 Oct 10, 2014

R T



Transmit Freq Error      -21.618 kHz  
x dB Bandwidth      723.457 kHz

C:\temp.gif file saved

High Channel – 6 dB Bandwidth



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



page 9 of 23

## Fundamental Emission Output Power

### LIMIT

Conducted Output Power

1 Watt

[15.247(b) (3)]

## MEASUREMENTS / RESULTS

Peak Output Power Table															
Date: 10/9/2014 & 10/30/2014	Company: Dermal Photonics Corporation							Work Order: N2540							
Engineer: Tuyen Truong	EUT Desc: Nira Laser							EUT Operating Voltage/Frequency: Battery Powered							
Temp: 24°C	Humidity: 35%							Measurement Distance: 3 m							
Notes: Maximum antenna gain = -3.5dBi						TX Frequency Range: 2402 - 2480MHz									
FCC 15.247															
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dB <sub>UV</sub> )	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dB <sub>UV</sub> /m)	Adjusted Reading (dBm)	Antenna Gain (dBm)	Conducted Reading (dBm)	Limit (dBm)	Margin (dB)				
h	2402.0	54.4	0.0	28.6	4.9	87.9	-7.3	-3.5	-3.8	30.0	-33.8				
h	2440.0	53.5	0.0	28.7	5.0	87.2	-8.0	-3.5	-4.5	30.0	-34.5				
h	2480.0	54.0	0.0	28.8	5.1	87.9	-7.3	-3.5	-3.8	30.0	-33.8				
Table Result: Pass by -33.8 dB															
Test Site: EMI Chamber 1 / Safety Analyzer: Asset #1327 / Brown			Cable 1: Asset #1505 Preamp: none			Cable 2: Asset #1507 Antenna: Black Horn / Yellow Horn			Cable 3: 1787 Antenna: Preselector: ---						
Worst Freq: 2402.0 MHz															

Rev. 10/29/2014

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	5/12/2015	5/12/2014
SA EMI Chamber (1327)	9kHz-13.2 GHz	E4405B	Agilent	MY45103416	1327	I	4/29/2015	4/29/2014
Cables	Range	Mfr				Cat	Calibration Due	Calibrated on
Asset #1787	9kHz - 18GHz	Florida RF				II	3/14/2015	3/14/2014
Asset #1505	9kHz - 18GHz	Florida RF				II	3/7/2015	3/7/2014
Asset #1507	9kHz - 18GHz	Florida RF				II	2/23/2015	2/23/2014
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Yellow Horn	1-18GHz	3115	EMCO	9608-4898	37	I	7/28/2015	7/28/2014
Black Horn	1-18GHz	3115	EMCO	9703-5148	56	I	8/21/2015	8/21/2014
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz		II	3/15/2015	3/15/2014
Meteorological Meters	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
Weather Clock (Pressure Only)	BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014	
TH A#1832	35519-044	Control Company	130318277	1832	II	6/13/2015	6/13/2013	

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



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



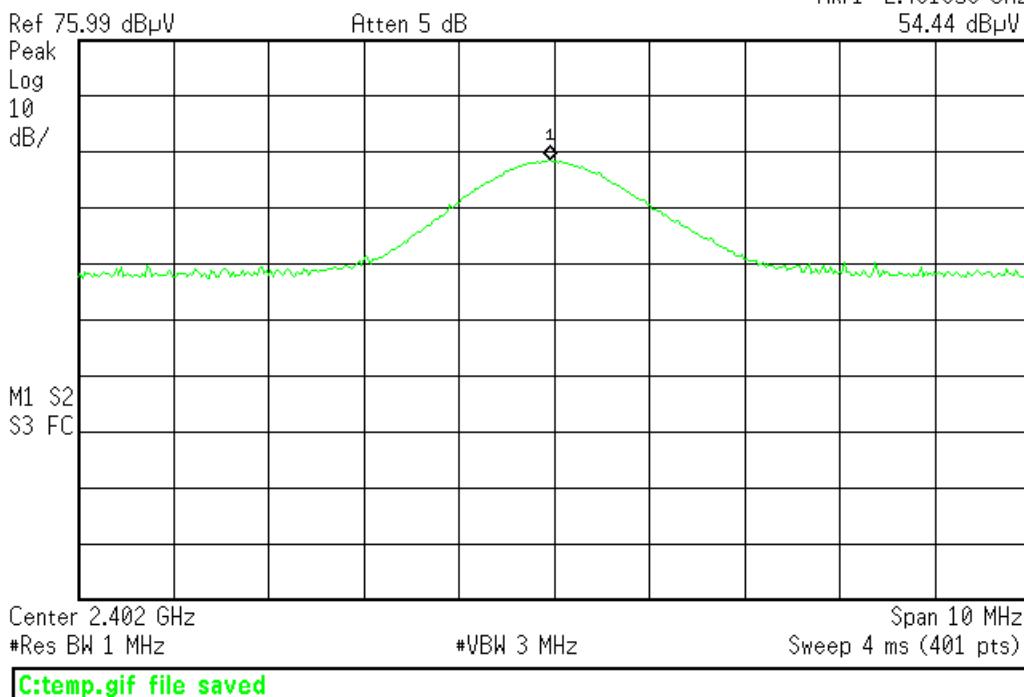
page 10 of 23

Testing Cert. No. 1627-01

## PLOTS

\* Agilent 09:56:22 Oct 9, 2014

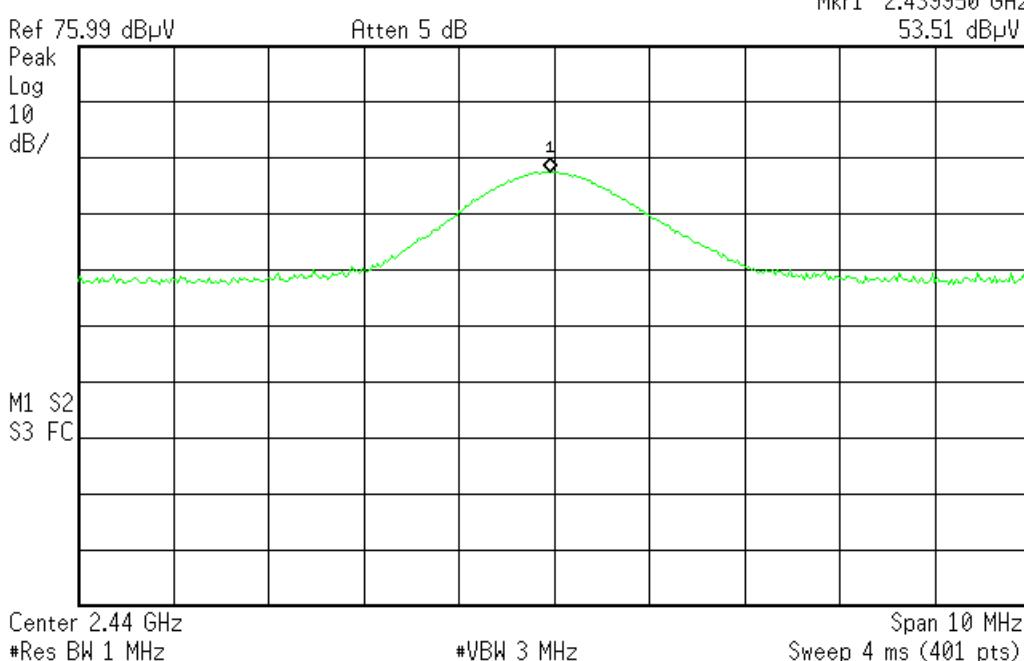
R T

Mkr1 2.401950 GHz  
54.44 dB $\mu$ V

Low Channel – Channel Power

\* Agilent 10:27:17 Oct 9, 2014

R T

Mkr1 2.439950 GHz  
53.51 dB $\mu$ V

Mid Channel – Channel Power

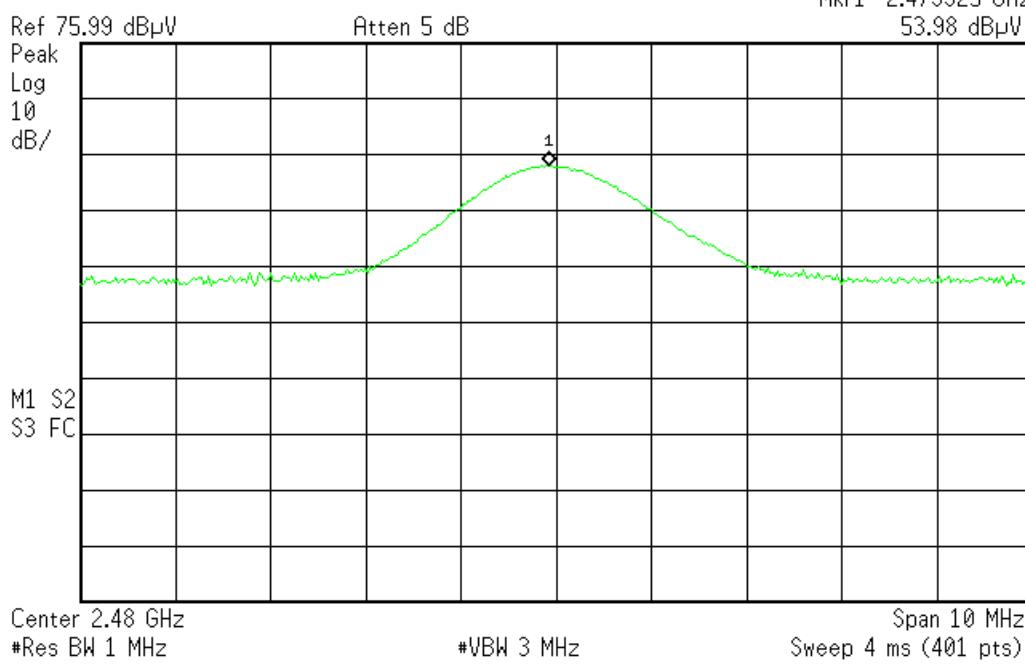


Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



\* Agilent 10:51:37 Oct 9, 2014

R T

Mkr1 2.479925 GHz  
53.98 dB $\mu$ V

C:\temp.gif file saved

High Channel – Channel Power



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



page 12 of 23

## Radiated Spurious Emissions

### LIMITS

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

### MEASUREMENTS / RESULTS

#### Radiated Emissions Table

Date: 13-Oct-14		Company: Dermal Photonics Corporation		Work Order: N2540								
Engineer: Tuyen Truong		EUT Desc: Nira Laser		EUT Operating Voltage/Frequency: Battery Powered								
Temp: 21°C		Humidity: 30%		Pressure: 1016mBar								
Frequency Range: 30-1000MHz					Measurement Distance: 3 m							
Notes: EUT Tx Freq: 2402-2480MHz												
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dB $\mu$ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dB $\mu$ V/m)	---			FCC 15.209		
							Limit (dB $\mu$ V/m)	Margin (dB)	Result (Pass/Fail)	Limit (dB $\mu$ V/m)	Margin (dB)	Result (Pass/Fail)
v	45.3	31.8	25.4	10.1	0.6	17.1	---	---	---	40.0	-22.9	Pass
h	97.0	41.8	25.4	9.2	0.8	26.4	---	---	---	43.5	-17.1	Pass
v	118.1	32.8	25.4	14.1	1.0	22.5	---	---	---	43.5	-21.0	Pass
v	153.4	35.4	25.4	12.2	1.1	23.3	---	---	---	43.5	-20.2	Pass
v	336.0	31.2	25.5	14.0	1.6	21.3	---	---	---	46.0	-24.7	Pass
h	416.0	35.0	25.5	16.2	1.8	27.5	---	---	---	46.0	-18.5	Pass
<b>Table Result:</b> Pass by -17.1 dB						<b>Worst Freq:</b> 97.0 MHz						
Test Site: EMI Chamber 1	Cable 1: Asset #1505			Cable 2: Asset #1507			Cable 3: ---					
Analyzer: Asset #1327	Preamp: Red-White			Antenna: Red-Black			Preselector: ---					

Rev.10/10/2014

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1327)	9kHz-13.2 GHz	E4405B	Agilent	MY45103416	1327	I	4/29/2015	4/29/2014
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz		II	3/15/2015	3/15/2014
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-White	0.009-2000MHz	ZFL-1000-LN	CS	N/A	1258	II	7/3/2015	7/3/2014
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-Black BiLog	30-2000MHz	JB1	Sunol	A091604-2	1106	I	1/28/2015	1/28/2013
Cables	Range	Mfr				Cat	Calibration Due	Calibrated on
Asset #1505	9kHz - 18GHz	Florida RF				II	3/7/2015	3/7/2014
Asset #1507	9kHz - 18GHz	Florida RF				II	2/23/2015	2/23/2014
Meteorological Meters	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
Weather Clock (Pressure Only)	BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014	
TH A#1832	35519-044	Control Company	130318277	1832	II	6/13/2015	6/13/2013	

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



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828

page 13 of 23



**Radiated Emissions Table**

Date: 13-Oct-14	Company: Dermal Photonics Corporation	Work Order: N2540												
Engineer: Tuyen Truong	EUT Desc: Nira Laser	EUT Operating Voltage/Frequency: Battery Powered												
Temp: 21°C	Humidity: 30%	Pressure: 1016mBar												
<b>Frequency Range:</b> 1-18GHz		<b>Measurement Distance:</b> 3 m(1-6GHz) and 1m (6-18GHz)												
<b>Notes:</b> Duty Cycle Correction Factor applied (worst case -20dB)		<b>EUT Tx Freq:</b> 2402-2480MHz												
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dB $\mu$ V)	Average Reading (dB $\mu$ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dB $\mu$ V/m)	Adjusted Avg Reading (dB $\mu$ V/m)	FCC 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average		
									Limit (dB $\mu$ V/m)	Margin (dB)	Result (Pass/Fail)	Limit (dB $\mu$ V/m)	Margin (dB)	Result (Pass/Fail)

h	4804	41.02	21.02	17	32.9	6.6	63.5	43.5	74	-10.5	Pass	54	-10.5	Pass
h	4880	37.46	17.46	16.8	33.1	6.8	60.6	40.6	74	-13.4	Pass	54	-13.4	Pass
h	4960.0	38.1	18.1	16.9	33.3	6.8	61.3	41.3	74.0	-12.7	Pass	54.0	-12.7	Pass
h	7206.0	44.47	24.47	15.7	37.5	7.6	73.9	53.9	83.5	-9.6	Pass	63.5	-9.6	Pass
h	7440.0	39.85	19.85	15.5	37.9	7.8	70.1	50.1	83.5	-13.4	Pass	63.5	-13.4	Pass
h	7320.0	40.01	20.01	15.6	37.9	7.8	70.1	50.1	83.5	-13.4	Pass	63.5	-13.4	Pass

**Table Result:**

Pass by -9.6 dB

**Worst Freq:** 7206.0 MHz

Test Site: EMI Chamber 1

Cable 1: Asset #1505

Cable 2: Asset #1507

Analyzer: Rental SA#2

Preamp: Brown / 1517

Antenna: Black Horn

Cable 3: ---

Preselector: ---

Rev. 10/10/2014

Spectrum Analyzers / Receivers/Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental SA #2 (1860)	9kHz-26.5 GHz	E7405A	Agilent	MY45104916	1860	I	6/4/2015	
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz		II	3/15/2015	3/15/2014
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown 1517 HF Preamp	1-10GHz 1-20GHz	CS CS	CS	N/A N/A	1523 1517	II II	4/10/2015 9/9/2015	9/9/2014
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Black Horn	1-18GHz	3115	EMCO	9703-5148	56	I	8/21/2015	8/21/2014
Cables	Range	Mfr		Cat	Calibration Due	Calibrated on		
Asset #1505	9kHz - 18GHz	Florida RF		II	3/7/2015	3/7/2014		
Asset #1507	9kHz - 18GHz	Florida RF		II	2/23/2015	2/23/2014		
Meteorological Meters	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
Weather Clock (Pressure Only) TH A#1832	BA928 35519-044	Oregon Scientific Control Company	C3166-1 130318277	831 1832	I II	3/19/2016 6/13/2015	3/19/2014 6/13/2013	

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

**Radiated Emissions Table**

Date: 13-Oct-14	Company: Dermal Photonics Corporation	Work Order: N2540								
Engineer: Tuyen Truong	EUT Desc: Nira Laser	EUT Operating Voltage/Frequency: Battery Powered								
Temp: 21°C	Humidity: 30%	Pressure: 1016mBar								
<b>Frequency Range:</b> 18-25GHz		<b>Measurement Distance:</b> 1 m								
<b>Notes:</b>		<b>EUT Tx Freq:</b> 2402-2480MHz								
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dB $\mu$ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dB $\mu$ V/m)		FCC 15.209		
								Limit (dB $\mu$ V/m)	Margin (dB)	Result (Pass/Fail)

No Emissions Found in This Range							
----------------------------------	--	--	--	--	--	--	--

**Table Result:** --- by --- dB**Worst Freq:** --- MHz

Test Site: EMI Chamber 1

Cable 1: EMIR-HIGH-13

Cable 2: ---

Cable 3: ---

Analyzer: Rental SA#2

Preamp: 18-26.5GHz

Antenna: HF(White) Hom

Preselector: ---



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



Rev.10/10/2014

<b>Spectrum Analyzers / Receivers /Preselectors</b> Rental SA #2 (1860)	Range 9kHz-26.5 GHz	MN E7405A	Mfr Agilent	SN MY45104916	Asset 1860	Cat I	Calibration Due 6/4/2015	Calibrated on
<b>Radiated Emissions Sites</b> EMI Chamber 1	FCC Code 719150	IC Code 2762A-6	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/15/2015	Calibrated on 3/15/2014
<b>Preamps /Couplers Attenuators / Filters</b> HF (Yellow)	Range 18-26.5GHz	MN AFS4-18002650-60-8P-4	Mfr CS	SN 467559	Asset 1266	Cat I	Calibration Due 6/27/2015	Calibrated on 6/27/2014
<b>Antennas</b> HF (White) Horn	Range 18-26.5GHz	MN 801-WLM	Mfr Waveline	SN 758	Asset 758	Cat III	Calibration Due Verify before Use	Calibrated on date of test
<b>Cables</b> REMI-High-13	Range 9kHz - 26.5GHz		Mfr C-S			Cat II	Calibration Due 2/12/2015	Calibrated on 2/12/2014
<b>Meteorological Meters</b> Weather Clock (Pressure Only) TH A#1832	MN BA928 35519-044	Mfr Oregon Scientific Control Company	SN C3166-1 130318277	Asset 831 1832	Cat I II	Calibration Due 3/19/2016 6/13/2015	Calibrated on 3/19/2014 6/13/2013	

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

**Radiated Emissions Table**

Date: 13-Oct-14	Company: Dermal Photonics Corporation	Work Order: N2540												
Engineer: Tuyen Truong	EUT Desc: Nira Laser	EUT Operating Voltage/Frequency: Battery Powered												
Temp: 21°C	Humidity: 30%	Pressure: 1016mBar												
Frequency Range: Radiated Band Edges		Measurement Distance: 3 m												
Notes: * Performed Marker Delta method per ANSI 63.10		EUT TX Freq: 2.402-2.480GHz												
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dB <sub>µ</sub> V)	Average Reading (dB <sub>µ</sub> V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dB <sub>µ</sub> V/m)	Adjusted Avg Reading (dB <sub>µ</sub> V/m)	FCC 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average		
									Limit (dB <sub>µ</sub> V/m)	Margin (dB)	Result (Pass/Fail)	Limit (dB <sub>µ</sub> V/m)	Margin (dB)	Result (Pass/Fail)
h*	2400.0	28.73	16.8	18.3	28.6	4.9	43.9	32.0	74.0	-30.1	Pass	54.0	-22.0	Pass
h	2483.5	44.05	31.9	18.4	28.8	5.1	59.6	47.4	74.0	-14.4	Pass	54.0	-6.6	Pass
h, peak, noise floor	2390.0	34.9	34.9	18.3	28.5	4.9	50.0	50.0	74.0	-24.0	Pass	54.0	-4.0	Pass

**Table Result:** Pass by -4.0 dB**Worst Freq:** 2390.0 MHzTest Site: EMI Chamber 1  
Analyzer: Rental SA#2Cable 1: Asset #1505  
Preamp: BrownCable 2: Asset #1507  
Antenna: Black HornCable 3: ---  
Preselector: ---

Rev.10/10/2014

<b>Spectrum Analyzers / Receivers /Preselectors</b> SA EMI Chamber (1327)	Range 9kHz-13.2 GHz	MN E4405B	Mfr Agilent	SN MY45103416	Asset 1327	Cat I	Calibration Due 4/29/2015	Calibrated on
<b>Radiated Emissions Sites</b> EMI Chamber 1	FCC Code 719150	IC Code 2762A-6	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/15/2015	Calibrated on 3/15/2014
<b>Preamps /Couplers Attenuators / Filters</b> Brown	Range 1-10GHz	MN CS	Mfr CS	SN N/A	Asset 1523	Cat II	Calibration Due 4/10/2015	Calibrated on 4/10/2014
<b>Antennas</b> Black Horn	Range 1-18GHz	MN 3115	Mfr EMCO	SN 9703-5148	Asset 56	Cat I	Calibration Due 8/21/2015	Calibrated on 8/21/2014
<b>Cables</b> Asset #1505 Asset #1507	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 3/7/2015 2/23/2015	Calibrated on 3/7/2014 2/23/2014
<b>Meteorological Meters</b> Weather Clock (Pressure Only) TH A#1832	MN BA928 35519-044	Mfr Oregon Scientific Control Company	SN C3166-1 130318277	Asset 831 1832	Cat I II	Calibration Due 3/19/2016 6/13/2015	Calibrated on 3/19/2014 6/13/2013	

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



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



page 15 of 23



## Power Spectral Density

### LIMIT

...the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.  
[15.247(e)]

### MEASUREMENTS / RESULTS

Radiated Emissions Table (Power Spectral Density)																					
Date: 10-Oct-14	Company: Dermal Photonics Corporation									Work Order: N2540											
Engineer: Tuyen Truong	EUT Desc: Nira Laser									EUT Operating Voltage/Frequency: Battery Powered											
Temp: 21°C	Humidity: 35%									Pressure: 1001mBar											
Frequency Range: Fundamental Frequencies												Measurement Distance: 1 m									
Notes:																					
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dB $\mu$ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dB $\mu$ V/m)	Adjusted Reading (dBm)	Antenna Gain (dB)	Adjusted Conducted Reading (dBm)	FCC 15.247											
h	2402.0	53.8	0.0	28.6	4.9	87.3	-7.9	-3.5	-4.4	8.0	-12.4	Pass									
h	2440.0	53.8	0.0	28.7	5.0	87.5	-7.7	-3.5	-4.2	8.0	-12.2	Pass									
h	2480.0	53.5	0.0	28.8	5.1	87.4	-7.8	-3.5	-4.3	8.0	-12.3	Pass									
<b>Table Result:</b> Pass by -12.2 dB																					
Test Site: EMI Chamber 1 Analyzer: Asset #1327				Cable 1: Asset #1505 Preamp: none				Cable 2: Asset #1507 Antenna: Black Horn				Cable 3: --- Preselector: ---									

Rev.10/2/2014

Spectrum Analyzers / Receivers /Preselectors SA EMI Chamber (1327)	Range 9kHz-13.2 GHz	MN E4405B	Mfr Agilent	SN MY45103416	Asset 1327	Cat I	Calibration Due 4/29/2015	Calibrated on 4/29/2014
Radiated Emissions Sites EMI Chamber 1	FCC Code 719150	IC Code 2762A-6	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/15/2015	Calibrated on 3/15/2014
Antennas Black Horn	Range 1-18GHz	MN 3115	Mfr EMCO	SN 9703-5148	Asset 56	Cat I	Calibration Due 8/21/2015	Calibrated on 8/21/2014
Cables Asset #1505 Asset #1507	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II	Calibration Due 3/7/2015 2/23/2015	Calibrated on 3/7/2014 2/23/2014
Meteorological Meters Weather Clock (Pressure Only) TH A#1832	MN BA928 35519-044	Mfr Oregon Scienti Control Compa	SN C3166-1 130318277	Asset 831 1832	Cat I II	Calibration Due 3/19/2016 6/13/2015	Calibrated on 3/19/2014 6/13/2013	

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



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



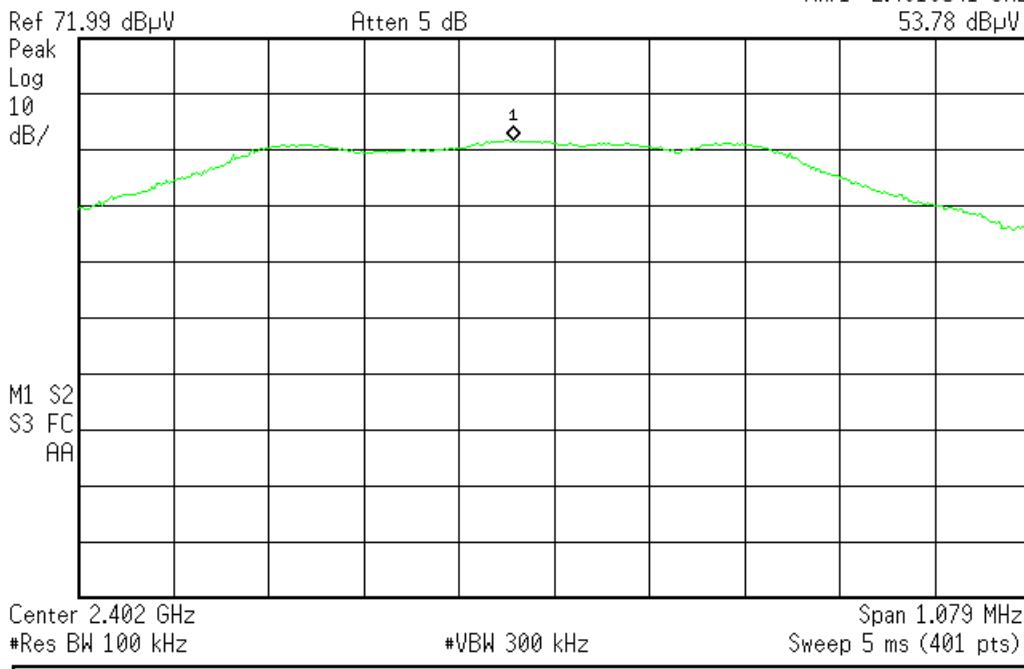
page 16 of 23

Testing Cert. No. 1627-01

## PLOTS

\* Agilent 15:44:14 Oct 10, 2014

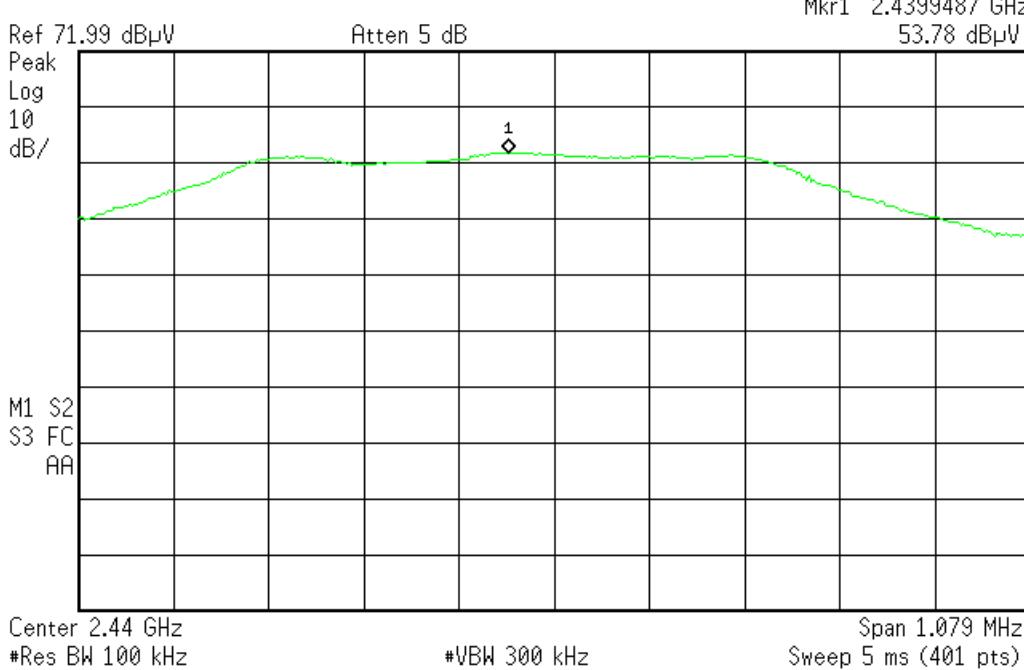
R T

Mkr1 2.4019541 GHz  
53.78 dB $\mu$ V

Channel Low – PSD

\* Agilent 15:50:53 Oct 10, 2014

R T

Mkr1 2.4399487 GHz  
53.78 dB $\mu$ V

Channel Mid – PSD



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



\* Agilent 15:29:53 Oct 10, 2014

R T

Mkr1 2.4799566 GHz  
53.54 dB $\mu$ VRef 71.99 dB $\mu$ V

Atten 5 dB

Peak  
Log  
10  
dB/M1 S2  
S3 FC  
AACenter 2.48 GHz  
#Res BW 100 kHz

#VBW 300 kHz

Span 1.085 MHz  
Sweep 5 ms (401 pts)

C:\temp.gif file saved

Channel High – PSD



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



page 18 of 23

## AC Line Conducted Emissions

### LIMITS

Frequency of emission (MHz)	Quasi-peak limit (dB $\mu$ V)	Average limit (dB $\mu$ V)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

### MEASUREMENTS / RESULTS

Client states that the EUT only transmit when it is battery powered (i.e. not while connected to an AC charger.)



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



page 19 of 23

## Duty Cycle Correction Calculation

### MEASUREMENTS / CALCULATIONS

Engineer	Tuyen Truong
Date	N/A
Site	N/A
Environmental Conditions	N/A

DCCF = 20dB

Please see client letter of attestation.



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



page 20 of 23

## Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz) NIST CISPR	5.6dB 4.6dB	N/A 5.2dB (Ucispr)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions NIST CISPR	3.9dB 3.6dB	N/A 3.6dB (Ucispr)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency (@ 2.4GHz)	$3.23 \times 10^{-8}$	$1 \times 10^{-7}$
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		



## Conditions Of Testing

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

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



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



page 22 of 23

Testing Cert. No. 1627-01

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

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND INrecognition of the relative risks and benefits to Client and the Company associated with the testing services contemplated hereby, the risks have been allocated such that under no circumstances whatsoever shall the liability of the Company to Client or any third party in respect of any claim for loss, damage or expense, of whatsoever nature or magnitude, and howsoever arising, exceed an amount equal to five (5) times the amount of the fees paid to the Company for the specific services which gave rise to such claim or U.S.\$10,000, whichever is the lesser amount.

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

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

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request. Rev.160009121(2)\_#684340 v14CS



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS  
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



page 23 of 23