

LEOTEK Electronics USA LLC

TEST REPORT

SCOPE OF WORK

Intertek Traffic Signal ITE Program Certification Testing
of 15yr 12" Clear and Tinted Red Arrows.

REPORT NUMBER

106155687CRT-001R

ISSUE DATE

30-May-2025

PAGES

20



©2025 INTERTEK

WARNING: This document may contain information subject to EARR99.
Diversion contrary to US law is prohibited.

Test Report			
Company Name	LEOTEK Electronics USA LLC	Test Location	Intertek Testing Services NA
Address	1955 Lundy Avenue	Lundy Avenue	3933 US Rt 11
	San Jose, CA 95131		Cortland, NY 13045
	USA		USA
Client Contact	Frank Saltani	Quote Number	Qu-01529103-0
Phone	408-380-1788 Ext. 202	Test Start Date	April 22, 2025
Email	frank@leotek.com	Completion Date	May 30, 2025

Standard(s)
ITE, Vehicle Arrow Traffic Signal Supplement, dated July 1, 2007

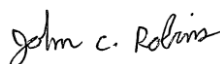
Spec	Test name	Clause	Tinted	Clear
			Result	
ITE	Conditioning	6.4.2	Pass	Pass
ITE	Mechanical Vibration	6.4.3.1	Pass**	
ITE	Temperature Cycling	6.4.3.2	Pass	Pass
ITE	Moisture Resistance	6.4.3.3	Pass**	
ITE	Luminous Intensity	6.4.4.1, 2,3,4	Pass	Pass
ITE	Luminance Uniformity	6.4.4.5	Pass	Pass
ITE	Chromaticity	6.4.4.6	Pass	Pass
ITE	Color Uniformity	6.4.4.7	Pass	Pass
ITE	Lens Abrasion	6.4.5.2	TBD	TBD
ITE	Current Consumption	6.4.6.1	Pass	Pass*
ITE	Low Voltage Turn Off	6.4.6.2	Pass***	
ITE	Turn-on/Turn-off Times	6.4.6.3	Pass***	
ITE	Transient Voltage Immunity	6.4.6.4	Pass***	
ITE	Electronic Noise	6.4.6.5	Pass***	
ITE	Power Factor	6.4.6.6	Pass	Pass*
ITE	Total Harmonic Distortion	6.4.6.7	Pass	Pass*
ITE	Load Switch Compatibility	6.4.7.1	Pass***	
ITE	Off State Voltage Decay	6.4.7.2	Pass***	
ITE	Failed State Impedance	6.4.8	Pass***	

*The client states the clear lens model is exactly the same as the tinted model with the exception of the lens. As a result, the electrical testing for the clear is covered by the tinted results.

**Covered under test report 106155687CRT-001Y

***Covered under Dialight test report 105771947CRT-002R

Results Key	
Pass	Compliant
Fail	Non-compliant
TBD	Compliance not determined
NT	Not tested in this project
NA	Test not applicable



John C. Robins
Engineer
Lighting



Christopher W. Metcalf
Engineering Supervisor
Lighting

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. Statement of Conformity – "Simple Acceptance" rule of ISO/IEC GUIDE 98-4:2012(E), also called "Shared Risk approach" of ILAC-G8:09/2019 guide.

Sample Information				
Date Rec.	Intertek ID	Description	Condition	Model No.
4/22/2025	CRT2504221030-006	12" Red Arrow Tinted 15yr	Engineering	See Below
4/22/2025	CRT2504221030-005	12" Red Arrow Clear 15yr	Engineering	See Below

*Client provided clear lenses.

Further Sample Description

Intertek Sample Number	Description	Model Number	Serial Number
CRT2504221030-006-1	12" Red Arrow Tinted 15yr	432-1314-001XOD15	A2503028073
CRT2504221030-006-2	12" Red Arrow Tinted 15yr	432-1314-001XOD15	A2503028074
CRT2504221030-006-3	12" Red Arrow Tinted 15yr	432-1314-001XOD15	A2503028075
CRT2504221030-005-1	12" Red Arrow Clear 15yr	432-1374-001XOD15	A2503028076
CRT2504221030-005-2	12" Red Arrow Clear 15yr	432-1374-001XOD15	A2503028077
CRT2504221030-005-3	12" Red Arrow Clear 15yr	432-1374-001XOD15	A2503028078

General Requirements

Intertek Sample Number	ETL Cert. Number	Label Identification	Lens Orientation	Color Coded Wires
CRT2504221030-006-1	NA	Pass	Pass	Red/White
CRT2504221030-006-2	NA	Pass	Pass	Red/White
CRT2504221030-006-3	NA	Pass	Pass	Red/White
CRT2504221030-005-1	NA	Pass	Pass	Red/White
CRT2504221030-005-2	NA	Pass	Pass	Red/White
CRT2504221030-005-3	NA	Pass	Pass	Red/White

General Requirements

Intertek Sample Number	600V / 20 AWG Min.	Wire Length $\geq$ 39"	Service Rating +105°C
CRT2504221030-006-1	600V / 18 AWG	Pass	Pass
CRT2504221030-006-2	600V / 18 AWG	Pass	Pass
CRT2504221030-006-3	600V / 18 AWG	Pass	Pass
CRT2504221030-005-1	600V / 18 AWG	Pass	Pass
CRT2504221030-005-2	600V / 18 AWG	Pass	Pass
CRT2504221030-005-3	600V / 18 AWG	Pass	Pass

Sample Modification Log	
Date	Modification description
4/22/25	AC Cable: Red/White_C-G000000016
	Wire Cover : C-A000000097
	Waterproof Plug: C-A000000094
	Back Cover: C-A000000096
	Heat Sink: C-A000000095
	Metal PCB:C-E000000013
	Connector: CNRP4-A2001WRBS04P
	LED: C24CRBPR0002
	Thermistor: C-F000000023
	2nd Lens: PPCTSL-LENS009B1
	SPS: .5y SPS_C-D000000001
	Power Clip_C-A000000092
	Fresnel Lens: PPCTSL-FL12C2
	Arrow Mask: PPCTSL-FM12C
	O-ring:12" PRBTSL-LG1206
	Gasket: 12" Gasket_PRBTSL-FG12T1
	Front Cover Tinted: C-B000000038
	Front Cover Clear: C-B000000035

Sample Information

Picture(s)



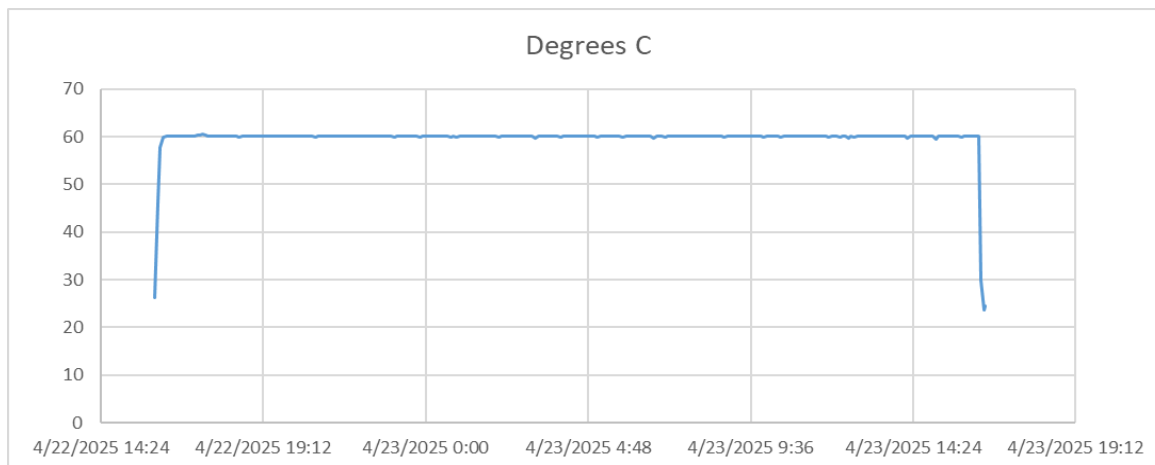
Note: The client supplied clear lenses for the modules, The clear lens model number is 432-1374-001XOD15.

Conditioning 6.4.2

The submitted LED signal modules were subjected to conditioning prior to the environmental tests. The samples were energized for a minimum of 24 hours, at 100% duty cycle in an ambient temperature of +60°C (+140°F). At the conclusion of the test, the modules shall be visually inspected for damage and checked for proper operation.

Results

Intertek Sample Number	Description	Visual Inspection		Operational Check	
		Pre	Post	Pre	Post
CRT2504221030-006-1	12" Red Arrow Tinted 15yr	Pass	Pass	Pass	Pass
CRT2504221030-006-2	12" Red Arrow Tinted 15yr	Pass	Pass	Pass	Pass
CRT2504221030-006-3	12" Red Arrow Tinted 15yr	Pass	Pass	Pass	Pass
CRT2504221030-005-1	12" Red Arrow Clear 15yr	Pass	Pass	Pass	Pass
CRT2504221030-005-2	12" Red Arrow Clear 15yr	Pass	Pass	Pass	Pass
CRT2504221030-005-3	12" Red Arrow Clear 15yr	Pass	Pass	Pass	Pass



Measured Voltage: 120.0 - 123.0 Vac

Complies: ☒ YES ☐ NO

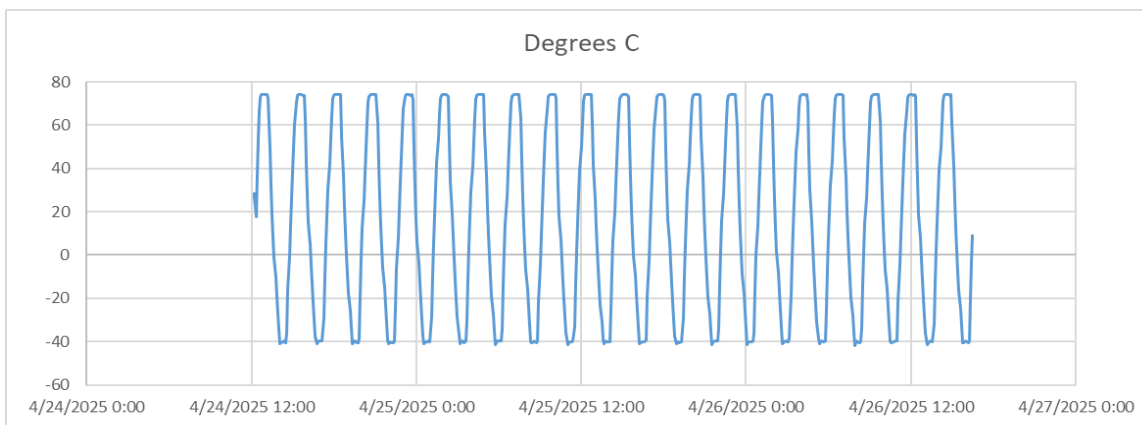
Tested By:	John Robins	Signature or initials:	<i>JR</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Test Equipment Used:	1,2	Completion Date:	23-Apr-2025
Amb (°C):	N/A	RH%	N/A

Temperature Cycling 6.4.3.2

The submitted tinted and clear LED signal modules were subjected to temperature cycling according to MIL-STD-883, Method 1010. Twenty cycles were performed with a 30 minute transfer time between temperature extremes and a 30 minute dwell time at the extremes. The temperature cycled between -40°C and +74°C. The samples were non-operating. At the conclusion of the test, the module shall be free of damage and moisture and be fully operational.

Results

Intertek Sample Number	Description	Visual Inspection	Operational Check
CRT2504221030-006-1	12" Red Arrow Tinted 15yr	Pass	Pass
CRT2504221030-006-2	12" Red Arrow Tinted 15yr	Pass	Pass
CRT2504221030-006-3	12" Red Arrow Tinted 15yr	Pass	Pass
CRT2504221030-005-1	12" Red Arrow Clear 15yr	Pass	Pass
CRT2504221030-005-2	12" Red Arrow Clear 15yr	Pass	Pass
CRT2504221030-005-3	12" Red Arrow Clear 15yr	Pass	Pass



Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	<i>JR</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Test Equipment Used:	1	Completion Date:	26-Apr-2025
Amb (°C):	N/A	RH%	N/A

Luminous Intensity 6.4.4.1 through 6.4.4.4

The intensity distribution tests on the submitted LED traffic signal modules were performed with the Intertek 25 meter Goniophotometer. The goniophotometer was in accordance with the goniometer described in Section 11.02 (Test Apparatus) of the Institute of Transportation Engineers' Vehicle Traffic Control Signal Heads Standard Test Method. The calibration of the goniophotometer is traceable to the National Institute of Standards and Technology. The LED modules were operated at 120 volts AC. The alignment of the LED module was performed in accordance with Section 11.03 (Alignment of Optical Unit for Test) of the Institute of Transportation Engineers' Vehicle Traffic Control Signal Heads Standard Test Method. The submitted LED signal modules were tested for maintained minimum luminous intensity at each of 112 points indicated in Table 3, of the referenced specification. These measurements were recorded at an ambient temperature of 25°C. The green LED signal modules were energized at nominal operating voltage, at a 100% duty cycle for 60 minutes.

A relative luminous intensity measurement is taken in a region from 0 to 7.5° down, and from 7.5° left to 7.5° right. The measurement is taken at 80 Vac, 120 Vac and 135 Vac. When the 80 Vac and 135 Vac factors are applied to the photometric data the units shall still meet the photometric requirements of each model.

A diminution factor was measured by using the submitted samples. The modules were mounted in a dual compartment temperature chamber with the lensed portion in one compartment and all portions behind the lens within the other compartment. At room ambient temperature (both inside and outside the chamber) and in calm air outside the chamber, the modules were energized per the conditions described above and a single on-axis reading (IA) taken and recorded. With the modules off, the chamber was heated to 74°C behind the lens and 49°C in front of the lens, and allowed to stabilize. Following stabilization, the modules were energized per the above cycle and the single on-axis reading (IH) taken and recorded. A diminution factor was calculated (IH/IA). The readings recorded initially were factored by the diminution factor.

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-006-1				Target Input voltage		Measured Input Voltage				0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Omni Arrow				80Vac		79.9	Vac		187.4		Candela	0.978		0.762
Color:	Red				120Vac		120.1	Vac		191.6		Candela	1.000		
Lens	Tinted				135Vac		135.1	Vac		194.4		Candela	1.015		
Photometric Test Distance: 25 meters															
Max	175.2	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C			
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1	
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Candela
27.5U	7.5	10.2	9.9	10.5	10.2	10.6	10.3	7.8	7.6	8.0	7.7	8.1	7.9	2.8	
27.5U	2.5	11.1	11.0	11.4	11.2	11.5	11.4	8.5	8.4	8.7	8.6	8.8	8.7	3.3	
22.5U	17.5	9.8	9.3	10.0	9.5	10.2	9.7	7.5	7.1	7.6	7.3	7.7	7.4	2.9	
22.5U	12.5	12.6	12.2	12.9	12.5	13.1	12.6	9.6	9.3	9.8	9.5	10.0	9.6	5.0	
22.5U	7.5	15.5	15.3	15.9	15.6	16.1	15.8	11.8	11.6	12.1	11.9	12.3	12.1	7.1	
22.5U	2.5	17.4	17.3	17.8	17.7	18.0	17.9	13.3	13.2	13.6	13.5	13.8	13.7	8.5	
17.5U	22.5	9.9	9.3	10.1	9.6	10.2	9.7	7.5	7.1	7.7	7.3	7.8	7.4	2.9	
17.5U	17.5	13.8	13.1	14.1	13.4	14.3	13.6	10.5	10.0	10.7	10.2	10.9	10.3	6.0	
17.5U	12.5	18.9	18.2	19.3	18.6	19.6	18.9	14.4	13.9	14.7	14.2	14.9	14.4	10.5	
17.5U	7.5	24.3	23.7	24.9	24.3	25.2	24.6	18.5	18.1	18.9	18.5	19.2	18.8	15.1	
17.5U	2.5	27.8	27.5	28.4	28.2	28.8	28.6	21.2	21.0	21.6	21.4	22.0	21.8	18.2	
12.5U	22.5	13.0	12.3	13.3	12.5	13.5	12.7	9.9	9.3	10.2	9.6	10.3	9.7	5.0	
12.5U	17.5	19.6	18.4	20.0	18.8	20.3	19.1	14.9	14.0	15.2	14.3	15.5	14.6	10.5	
12.5U	12.5	28.9	27.4	29.6	28.0	30.0	28.4	22.0	20.9	22.5	21.4	22.9	21.7	18.3	
12.5U	7.5	39.7	38.3	40.6	39.1	41.2	39.7	30.2	29.1	30.9	29.8	31.4	30.2	26.7	
12.5U	2.5	47.0	46.4	48.1	47.4	48.8	48.1	35.8	35.3	36.6	36.1	37.1	36.7	32.1	
7.5U	27.5	10.8	10.3	11.1	10.5	11.2	10.6	8.2	7.8	8.4	8.0	8.5	8.1	2.8	
7.5U	22.5	16.6	15.6	17.0	16.0	17.3	16.2	12.7	11.9	13.0	12.2	13.2	12.3	7.1	
7.5U	17.5	27.0	25.1	27.6	25.7	28.0	26.1	20.5	19.1	21.0	19.6	21.3	19.9	15.1	
7.5U	12.5	44.2	41.2	45.2	42.1	45.8	42.7	33.7	31.4	34.4	32.1	34.9	32.5	26.7	
7.5U	7.5	67.9	64.4	69.4	65.8	70.5	66.8	51.7	49.0	52.9	50.1	53.7	50.9	38.9	
7.5U	2.5	84.8	83.8	86.7	85.7	88.0	87.0	64.6	63.9	66.0	65.3	67.0	66.2	47.0	
2.5U	27.5	12.3	11.7	12.6	12.0	12.8	12.1	9.4	8.9	9.6	9.1	9.8	9.2	3.3	
2.5U	22.5	19.7	18.4	20.1	18.9	20.4	19.1	15.0	14.1	15.3	14.4	15.6	14.6	8.5	
2.5U	17.5	33.7	31.3	34.5	32.0	35.0	32.5	25.7	23.8	26.2	24.4	26.6	24.7	18.2	
2.5U	12.5	61.2	56.5	62.6	57.7	63.5	58.6	46.6	43.0	47.7	44.0	48.3	44.6	32.1	
2.5U	7.5	116.6	115.0	119.2	117.6	120.9	119.3	88.8	87.6	90.8	89.6	92.1	90.9	47.0	
2.5U	2.5	140.6	141.7	143.8	144.9	145.9	147.0	107.1	108.0	109.6	110.4	111.2	112.0	56.8	
2.5D	2.5	155.2	153.3	158.7	156.7	161.0	159.0	118.3	116.8	120.9	119.4	122.7	121.1	56.8	
2.5D	7.5	125.1	118.2	127.9	120.8	129.8	122.6	95.3	90.0	97.4	92.0	98.9	93.4	47.0	
2.5D	12.5	64.9	60.1	66.3	61.5	67.3	62.4	49.4	45.8	50.5	46.8	51.3	47.5	32.1	
2.5D	17.5	34.8	32.0	35.6	32.8	36.1	33.2	26.5	24.4	27.1	25.0	27.5	25.3	18.2	
2.5D	22.5	20.2	18.7	20.7	19.1	21.0	19.3	15.4	14.2	15.8	14.5	16.0	14.7	8.5	
2.5D	27.5	12.7	11.8	13.0	12.1	13.2	12.2	9.7	9.0	9.9	9.2	10.1	9.3	3.3	
7.5D	2.5	114.8	113.2	117.4	115.7	119.1	117.4	87.5	86.2	89.4	88.1	90.7	89.4	47.0	
7.5D	7.5	91.7	86.6	93.8	88.6	95.1	89.9	69.9	66.0	71.4	67.5	72.5	68.5	38.9	
7.5D	12.5	51.4	48.3	52.6	49.4	53.3	50.1	39.2	36.8	40.0	37.6	40.6	38.2	26.7	
7.5D	17.5	29.0	26.8	29.6	27.4	30.1	27.8	22.1	20.4	22.6	20.9	22.9	21.2	15.1	
7.5D	22.5	17.4	16.1	17.8	16.4	18.0	16.7	13.2	12.2	13.5	12.5	13.7	12.7	7.1	
7.5D	27.5	11.2	10.3	11.5	10.5	11.6	10.6	8.5	7.8	8.7	8.0	8.9	8.1	2.8	
12.5D	2.5	67.4	66.8	68.9	68.3	69.9	69.3	51.4	50.9	52.5	52.1	53.3	52.8	32.1	
12.5D	7.5	53.5	52.3	54.7	53.5	55.5	54.2	40.8	39.8	41.7	40.7	42.3	41.3	26.7	
12.5D	12.5	34.4	33.1	35.2	33.9	35.7	34.4	26.2	25.3	26.8	25.8	27.2	26.2	18.3	
12.5D	17.5	21.1	20.2	21.6	20.6	21.9	20.9	16.1	15.4	16.4	15.7	16.7	15.9	10.5	
12.5D	22.5	13.4	12.7	13.7	13.0	13.9	13.2	10.2	9.7	10.4	9.9	10.6	10.1	5.0	
17.5D	2.5	38.1	38.0	39.0	38.8	39.6	39.4	29.1	28.9	29.7	29.6	30.1	30.0	18.2	
17.5D	7.5	31.1	31.2	31.8	31.9	32.3	32.3	23.7	23.7	24.3	24.3	24.6	24.6	15.1	
17.5D	12.5	22.0	21.8	22.5	22.3	22.9	22.6	16.8	16.6	17.2	17.0	17.4	17.2	10.5	
17.5D	17.5	14.9	14.7	15.3	15.0	15.5	15.2	11.4	11.2	11.6	11.4	11.8	11.6	6.0	
17.5D	22.5	10.1	9.8	10.3	10.1	10.5	10.2	7.7	7.5	7.8	7.7	8.0	7.8	2.9	
22.5D	2.5	23.0	23.2	23.6	23.7	23.9	24.0	17.5	17.6	17.9	18.0	18.2	18.3	8.5	
22.5D	7.5	19.2	19.7	19.6	20.1	19.9	20.4	14.6	15.0	14.9	15.3	15.2	15.5	7.1	
22.5D	12.5	14.5	14.6	14.8	15.0	15.0	15.2	11.0	11.2	11.3	11.4	11.4	11.6	5.0	
22.5D	17.5	10.5	10.5	10.7	10.8	10.9	10.9	8.0	8.0	8.2	8.2	8.3	8.3	2.9	
27.5D	2.5	14.8	15.0	15.2	15.4	15.4	15.6	11.3	11.4	11.5	11.7	11.7	11.9	3.3	
27.5D	7.5	12.5	13.1	12.8	13.4	13.0	13.6	9.5	10.0	9.8	10.2	9.9	10.4	2.8	

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-006-2				Target Input voltage		Measured Input Voltage				0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Omni Arrow				80Vac		80.0		Vac		187 Candela		0.979		0.758
Color:	Red				120Vac		120.1		Vac		191 Candela		1.000		
Lens	Tinted				135Vac		135.1		Vac		193.3 Candela		1.012		
Photometric Test Distance: 25 meters															
Max. cd	175.2	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C			
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1	
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum	
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Candela	
27.5U	7.5	9.7	9.8	9.9	10.1	10.0	10.2	7.4	7.5	7.5	7.6	7.6	7.7	2.8	
27.5U	2.5	10.7	10.8	10.9	11.0	11.1	11.1	8.1	8.2	8.3	8.3	8.4	8.4	3.3	
22.5U	17.5	9.2	9.3	9.4	9.5	9.5	9.6	7.0	7.0	7.1	7.2	7.2	7.3	2.9	
22.5U	12.5	11.8	12.2	12.1	12.4	12.2	12.6	9.0	9.2	9.2	9.4	9.3	9.5	5.0	
22.5U	7.5	14.6	15.1	14.9	15.5	15.1	15.6	11.1	11.5	11.3	11.7	11.5	11.9	7.1	
22.5U	2.5	16.7	16.9	17.0	17.3	17.2	17.5	12.6	12.8	12.9	13.1	13.1	13.2	8.5	
17.5U	22.5	9.3	9.3	9.5	9.5	9.6	9.6	7.1	7.0	7.2	7.2	7.3	7.3	2.9	
17.5U	17.5	12.9	13.0	13.2	13.3	13.4	13.5	9.8	9.9	10.0	10.1	10.1	10.2	6.0	
17.5U	12.5	17.7	18.2	18.1	18.6	18.3	18.8	13.4	13.8	13.7	14.1	13.9	14.2	10.5	
17.5U	7.5	22.9	23.5	23.4	24.0	23.7	24.3	17.4	17.8	17.7	18.2	17.9	18.4	15.1	
17.5U	2.5	26.7	26.9	27.2	27.5	27.6	27.8	20.2	20.4	20.6	20.8	20.9	21.1	18.2	
12.5U	22.5	12.3	12.2	12.6	12.5	12.8	12.6	9.4	9.2	9.6	9.4	9.7	9.6	5.0	
12.5U	17.5	18.3	18.4	18.7	18.8	18.9	19.0	13.9	13.9	14.2	14.2	14.4	14.4	10.5	
12.5U	12.5	27.1	27.4	27.7	28.0	28.0	28.3	20.5	20.8	21.0	21.2	21.2	21.5	18.3	
12.5U	7.5	37.4	37.9	38.2	38.7	38.7	39.1	28.4	28.7	29.0	29.3	29.3	29.7	26.7	
12.5U	2.5	45.0	45.2	46.0	46.2	46.5	46.7	34.1	34.3	34.9	35.0	35.3	35.4	32.1	
7.5U	27.5	10.5	10.1	10.7	10.4	10.8	10.5	7.9	7.7	8.1	7.8	8.2	7.9	2.8	
7.5U	22.5	15.8	15.5	16.1	15.9	16.3	16.1	12.0	11.8	12.2	12.0	12.4	12.2	7.1	
7.5U	17.5	25.2	25.2	25.7	25.7	26.0	26.0	19.1	19.1	19.5	19.5	19.7	19.7	15.1	
7.5U	12.5	41.0	41.1	41.9	42.0	42.4	42.5	31.1	31.1	31.8	31.8	32.1	32.2	26.7	
7.5U	7.5	63.5	63.6	64.9	65.0	65.7	65.8	48.2	48.2	49.2	49.3	49.8	49.9	38.9	
7.5U	2.5	81.4	81.2	83.2	82.9	84.2	83.9	61.7	61.5	63.0	62.9	63.8	63.6	47.0	
2.5U	27.5	11.9	11.6	12.1	11.9	12.3	12.0	9.0	8.8	9.2	9.0	9.3	9.1	3.3	
2.5U	22.5	18.6	18.5	19.0	18.9	19.2	19.1	14.1	14.0	14.4	14.3	14.6	14.5	8.5	
2.5U	17.5	31.4	31.6	32.0	32.3	32.4	32.7	23.8	24.0	24.3	24.5	24.6	24.8	18.2	
2.5U	12.5	56.3	57.3	57.5	58.5	58.2	59.2	42.7	43.4	43.6	44.3	44.1	44.9	32.1	
2.5U	7.5	114.8	108.7	117.3	111.0	118.7	112.3	87.1	82.4	88.9	84.2	90.0	85.2	47.0	
2.5U	2.5	141.6	137.3	144.6	140.2	146.3	141.9	107.3	104.1	109.6	106.3	110.9	107.6	56.8	
2.5D	2.5	150.8	150.7	154.0	153.9	155.9	155.8	114.3	114.2	116.8	116.7	118.2	118.1	56.8	
2.5D	7.5	119.8	118.8	122.4	121.3	123.9	122.8	90.9	90.0	92.8	92.0	93.9	93.1	47.0	
2.5D	12.5	59.8	62.0	61.1	63.4	61.8	64.1	45.3	47.0	46.3	48.0	46.8	48.6	32.1	
2.5D	17.5	32.1	33.0	32.8	33.7	33.2	34.1	24.4	25.0	24.9	25.6	25.2	25.9	18.2	
2.5D	22.5	18.7	19.1	19.1	19.5	19.4	19.7	14.2	14.5	14.5	14.8	14.7	15.0	8.5	
2.5D	27.5	11.9	12.0	12.2	12.3	12.3	12.4	9.0	9.1	9.2	9.3	9.3	9.4	3.3	
7.5D	2.5	111.1	112.7	113.5	115.1	114.9	116.5	84.2	85.4	86.0	87.3	87.1	88.3	47.0	
7.5D	7.5	85.2	90.5	87.0	92.5	88.0	93.6	64.6	68.6	66.0	70.1	66.8	70.9	38.9	
7.5D	12.5	47.6	49.9	48.6	51.0	49.2	51.6	36.1	37.8	36.8	38.6	37.3	39.1	26.7	
7.5D	17.5	26.6	27.8	27.2	28.4	27.5	28.7	20.2	21.1	20.6	21.5	20.9	21.8	15.1	
7.5D	22.5	16.0	16.5	16.4	16.9	16.6	17.1	12.1	12.5	12.4	12.8	12.6	12.9	7.1	
7.5D	27.5	10.3	10.6	10.5	10.9	10.6	11.0	7.8	8.1	8.0	8.2	8.0	8.3	2.8	
12.5D	2.5	65.6	66.4	67.0	67.9	67.8	68.7	49.7	50.4	50.8	51.5	51.4	52.1	32.1	
12.5D	7.5	51.2	52.9	52.3	54.1	52.9	54.7	38.8	40.1	39.6	41.0	40.1	41.5	26.7	
12.5D	12.5	32.4	33.7	33.1	34.5	33.5	34.9	24.6	25.6	25.1	26.1	25.4	26.4	18.3	
12.5D	17.5	19.8	20.6	20.2	21.0	20.4	21.2	15.0	15.6	15.3	15.9	15.5	16.1	10.5	
12.5D	22.5	12.5	12.9	12.8	13.2	12.9	13.4	9.5	9.8	9.7	10.0	9.8	10.1	5.0	
17.5D	2.5	37.1	37.4	37.9	38.2	38.4	38.7	28.2	28.4	28.8	29.0	29.1	29.3	18.2	
17.5D	7.5	30.3	30.8	31.0	31.5	31.3	31.9	23.0	23.4	23.5	23.9	23.7	24.2	15.1	
17.5D	12.5	21.2	21.7	21.6	22.2	21.9	22.5	16.1	16.5	16.4	16.8	16.6	17.0	10.5	
17.5D	17.5	14.3	14.6	14.6	15.0	14.7	15.1	10.8	11.1	11.0	11.3	11.2	11.5	6.0	
17.5D	22.5	9.6	9.8	9.8	10.1	9.9	10.2	7.3	7.5	7.4	7.6	7.5	7.7	2.9	
22.5D	2.5	22.5	22.7	23.0	23.2	23.2	23.5	17.0	17.2	17.4	17.6	17.6	17.8	8.5	
22.5D	7.5	18.9	19.1	19.4	19.5	19.6	19.7	14.4	14.5	14.7	14.8	14.8	14.9	7.1	
22.5D	12.5	14.1	14.3	14.4	14.6	14.6	14.8	10.7	10.9	10.9	11.1	11.1	11.2	5.0	
22.5D	17.5	10.2	10.3	10.4	10.6	10.5	10.7	7.7	7.8	7.9	8.0	8.0	8.1	2.9	
27.5D	2.5	14.6	14.6	14.9	14.9	15.1	15.1	11.1	11.1	11.3	11.3	11.5	11.5	3.3	
27.5D	7.5	12.6	12.5	12.8	12.8	13.0	12.9	9.5	9.5	9.7	9.7	9.8	9.8	2.8	

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-006-3					Target Input voltage		Measured Input Voltage			0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor	
Module	12" Omni Arrow					80Vac		80.0		Vac		186.8 Candela		0.985		0.780
Color:	Red					120Vac		120.1		Vac		189.7 Candela		1.000		
Lens	Tinted					135Vac		135.1		Vac		191.7 Candela		1.011		
Photometric Test Distance: 25 meters																
Max. cd	175.2	25°C			25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C			
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1		
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum	
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Candela	
27.5U	7.5	9.8	9.7	10.0	9.9	10.1	10.0	7.7	7.6	7.8	7.7	7.9	7.8		2.8	
27.5U	2.5	10.8	10.7	10.9	10.9	11.1	11.0	8.4	8.4	8.5	8.5	8.6	8.6		3.3	
22.5U	17.5	9.4	9.1	9.6	9.3	9.7	9.4	7.4	7.1	7.5	7.2	7.5	7.3		2.9	
22.5U	12.5	12.1	12.1	12.3	12.3	12.4	12.4	9.5	9.4	9.6	9.6	9.7	9.7		5.0	
22.5U	7.5	15.0	15.1	15.2	15.3	15.4	15.5	11.7	11.8	11.9	12.0	12.0	12.1		7.1	
22.5U	2.5	17.0	17.0	17.2	17.3	17.4	17.5	13.2	13.3	13.4	13.5	13.6	13.6		8.5	
17.5U	22.5	9.6	9.1	9.8	9.3	9.9	9.4	7.5	7.1	7.6	7.2	7.7	7.3		2.9	
17.5U	17.5	13.3	12.9	13.6	13.2	13.7	13.3	10.4	10.1	10.6	10.3	10.7	10.4		6.0	
17.5U	12.5	18.3	18.1	18.6	18.4	18.8	18.6	14.3	14.1	14.5	14.4	14.7	14.5		10.5	
17.5U	7.5	23.7	23.7	24.1	24.1	24.3	24.3	18.5	18.5	18.8	18.8	19.0	19.0		15.1	
17.5U	2.5	27.4	27.4	27.8	27.8	28.1	28.1	21.3	21.3	21.7	21.7	21.9	21.9		18.2	
12.5U	22.5	12.7	12.1	12.9	12.2	13.1	12.4	9.9	9.4	10.1	9.5	10.2	9.6		5.0	
12.5U	17.5	19.0	18.3	19.3	18.6	19.5	18.8	14.8	14.3	15.1	14.5	15.2	14.6		10.5	
12.5U	12.5	28.2	27.5	28.7	27.9	29.0	28.2	22.0	21.5	22.3	21.8	22.6	22.0		18.3	
12.5U	7.5	39.0	38.4	39.6	39.0	40.0	39.4	30.4	29.9	30.8	30.4	31.2	30.7		26.7	
12.5U	2.5	46.5	46.3	47.3	47.0	47.7	47.5	36.3	36.1	36.8	36.6	37.2	37.0		32.1	
7.5U	27.5	10.7	10.0	10.8	10.1	11.0	10.2	8.3	7.8	8.5	7.9	8.5	8.0		2.8	
7.5U	22.5	16.3	15.4	16.6	15.7	16.7	15.8	12.7	12.0	12.9	12.2	13.0	12.3		7.1	
7.5U	17.5	26.3	25.1	26.7	25.5	27.0	25.8	20.5	19.6	20.8	19.9	21.0	20.1		15.1	
7.5U	12.5	43.1	41.5	43.8	42.1	44.3	42.6	33.6	32.3	34.2	32.8	34.5	33.2		26.7	
7.5U	7.5	67.3	65.3	68.3	66.3	69.0	67.0	52.5	50.9	53.3	51.7	53.8	52.3		38.9	
7.5U	2.5	85.3	84.1	86.7	85.4	87.6	86.3	66.5	65.6	67.6	66.6	68.3	67.3		47.0	
2.5U	27.5	12.2	11.5	12.4	11.7	12.5	11.8	9.5	9.0	9.6	9.1	9.7	9.2		3.3	
2.5U	22.5	19.2	18.3	19.5	18.6	19.7	18.8	15.0	14.3	15.2	14.5	15.4	14.7		8.5	
2.5U	17.5	32.7	31.5	33.2	31.9	33.6	32.3	25.5	24.5	25.9	24.9	26.2	25.2		18.2	
2.5U	12.5	59.3	57.4	60.2	58.3	60.8	58.9	46.2	44.7	46.9	45.4	47.4	45.9		32.1	
2.5U	7.5	118.3	108.3	120.1	110.0	121.4	111.2	92.2	84.5	93.6	85.8	94.6	86.7		47.0	
2.5U	2.5	143.4	138.1	145.6	140.2	147.1	141.7	111.8	107.6	113.5	109.3	114.7	110.5		56.8	
2.5D	2.5	153.3	151.5	155.7	153.9	157.3	155.5	119.6	118.2	121.4	120.0	122.7	121.3		56.8	
2.5D	7.5	122.2	118.0	124.1	119.8	125.4	121.1	95.3	92.0	96.8	93.4	97.8	94.4		47.0	
2.5D	12.5	61.9	61.3	62.8	62.3	63.5	63.0	48.2	47.8	49.0	48.6	49.5	49.1		32.1	
2.5D	17.5	33.2	32.6	33.7	33.1	34.1	33.4	25.9	25.4	26.3	25.8	26.6	26.1		18.2	
2.5D	22.5	19.3	18.8	19.7	19.1	19.9	19.3	15.1	14.6	15.3	14.9	15.5	15.0		8.5	
2.5D	27.5	12.3	11.8	12.5	12.0	12.7	12.1	9.6	9.2	9.8	9.4	9.9	9.5		3.3	
7.5D	2.5	111.8	111.8	113.5	113.5	114.7	114.7	87.1	87.1	88.5	88.5	89.4	89.4		47.0	
7.5D	7.5	86.3	86.6	87.6	87.9	88.5	88.8	67.3	67.5	68.3	68.5	69.0	69.3		38.9	
7.5D	12.5	48.5	48.5	49.3	49.3	49.8	49.8	37.8	37.8	38.4	38.4	38.8	38.8		26.7	
7.5D	17.5	27.3	27.1	27.7	27.5	28.0	27.8	21.3	21.1	21.6	21.5	21.8	21.7		15.1	
7.5D	22.5	16.5	16.2	16.7	16.5	16.9	16.6	12.8	12.6	13.0	12.8	13.2	13.0		7.1	
7.5D	27.5	10.6	10.4	10.7	10.5	10.9	10.6	8.2	8.1	8.4	8.2	8.5	8.3		2.8	
12.5D	2.5	65.4	65.5	66.4	66.5	67.1	67.2	51.0	51.1	51.8	51.9	52.3	52.4		32.1	
12.5D	7.5	51.3	51.5	52.1	52.3	52.7	52.8	40.0	40.1	40.6	40.7	41.1	41.2		26.7	
12.5D	12.5	32.7	32.8	33.2	33.3	33.6	33.7	25.5	25.6	25.9	26.0	26.2	26.2		18.3	
12.5D	17.5	20.1	20.0	20.4	20.4	20.6	20.6	15.7	15.6	15.9	15.9	16.1	16.0		10.5	
12.5D	22.5	12.7	12.7	12.9	12.9	13.0	13.0	9.9	9.9	10.1	10.0	10.2	10.1		5.0	
17.5D	2.5	37.1	37.2	37.7	37.8	38.1	38.2	28.9	29.0	29.4	29.5	29.7	29.8		18.2	
17.5D	7.5	30.3	30.5	30.7	30.9	31.1	31.3	23.6	23.7	24.0	24.1	24.2	24.4		15.1	
17.5D	12.5	21.2	21.4	21.5	21.7	21.8	21.9	16.5	16.7	16.8	16.9	17.0	17.1		10.5	
17.5D	17.5	14.3	14.4	14.6	14.6	14.7	14.8	11.2	11.2	11.4	11.4	11.5	11.5		6.0	
17.5D	22.5	9.6	9.7	9.8	9.8	9.9	9.9	7.5	7.5	7.6	7.7	7.7	7.7		2.9	
22.5D	2.5	22.7	22.7	23.1	23.1	23.3	23.3	17.7	17.7	18.0	18.0	18.2	18.2		8.5	
22.5D	7.5	18.9	19.1	19.2	19.4	19.4	19.6	14.8	14.9	15.0	15.1	15.2	15.3		7.1	
22.5D	12.5	14.2	14.3	14.4	14.5	14.5	14.6	11.0	11.1	11.2	11.3	11.3	11.4		5.0	
22.5D	17.5	10.2	10.3	10.3	10.4	10.4	10.5	7.9	8.0	8.1	8.1	8.1	8.2		2.9	
27.5D	2.5	14.8	15.0	15.1	15.2	15.2	15.4	11.6	11.7	11.7	11.8	11.9	12.0		3.3	
27.5D	7.5	12.6	12.7	12.8	12.9	12.9	13.1	9.8	9.9	9.9	10.1	10.0	10.2		2.8	

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-005-1				Target Input voltage		Measured Input Voltage			0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor		
Module	12" Omni Arrow				80Vac		80.0			Vac		147.7 Candela		0.985		0.766
Color:	Red				120Vac		120.1			Vac		149.9 Candela		1.000		
Lens	Clear				135Vac		135.0			Vac		150.8 Candela		1.006		
Photometric Test Distance: 25 meters																
Max. cd	175.2	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C				
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1		
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum	
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Candela	
27.5U	7.5	11.9	11.8	12.1	12.0	12.2	12.1	9.1	9.0	9.3	9.2	9.3	9.2	9.3	2.8	
27.5U	2.5	12.9	12.9	13.1	13.1	13.2	13.1	9.9	9.8	10.0	10.0	10.1	10.1	10.1	3.3	
22.5U	17.5	11.6	11.4	11.8	11.6	11.9	11.7	8.9	8.8	9.1	8.9	9.1	9.0	9.0	2.9	
22.5U	12.5	14.7	14.6	14.9	14.8	15.0	14.9	11.2	11.2	11.4	11.3	11.5	11.4	11.4	5.0	
22.5U	7.5	17.6	17.7	17.9	17.9	18.0	18.0	13.5	13.5	13.7	13.7	13.8	13.8	13.8	7.1	
22.5U	2.5	19.6	19.6	19.9	19.9	20.0	20.0	15.0	15.0	15.2	15.2	15.3	15.3	15.3	8.5	
17.5U	22.5	11.7	11.5	11.9	11.7	12.0	11.8	9.0	8.8	9.1	8.9	9.2	9.0	9.0	2.9	
17.5U	17.5	16.0	15.8	16.3	16.1	16.4	16.2	12.3	12.1	12.5	12.3	12.5	12.4	12.4	6.0	
17.5U	12.5	21.3	21.3	21.7	21.6	21.8	21.7	16.3	16.3	16.6	16.5	16.7	16.6	16.6	10.5	
17.5U	7.5	26.8	26.8	27.2	27.2	27.3	27.4	20.5	20.5	20.8	20.8	20.9	21.0	21.0	15.1	
17.5U	2.5	30.3	30.3	30.7	30.8	30.9	31.0	23.2	23.2	23.5	23.6	23.7	23.7	23.7	18.2	
12.5U	22.5	15.2	14.9	15.4	15.1	15.5	15.2	11.6	11.4	11.8	11.6	11.9	11.6	11.6	5.0	
12.5U	17.5	22.0	21.7	22.3	22.0	22.4	22.2	16.8	16.6	17.1	16.9	17.2	17.0	17.0	10.5	
12.5U	12.5	31.2	30.9	31.7	31.4	31.9	31.6	23.9	23.7	24.3	24.1	24.4	24.2	24.2	18.3	
12.5U	7.5	41.4	41.2	42.0	41.8	42.2	42.1	31.7	31.6	32.2	32.0	32.4	32.2	32.2	26.7	
12.5U	2.5	48.3	48.3	49.0	49.1	49.3	49.4	37.0	37.0	37.6	37.6	37.8	37.8	37.8	32.1	
7.5U	27.5	12.6	12.3	12.8	12.5	12.9	12.6	9.7	9.5	9.8	9.6	9.9	9.7	9.7	2.8	
7.5U	22.5	18.8	18.5	19.1	18.8	19.2	18.9	14.4	14.2	14.6	14.4	14.7	14.5	14.5	7.1	
7.5U	17.5	28.9	28.7	29.4	29.1	29.5	29.3	22.2	21.9	22.5	22.3	22.6	22.4	22.4	15.1	
7.5U	12.5	44.6	44.2	45.3	44.8	45.5	45.1	34.1	33.8	34.7	34.3	34.9	34.5	34.5	26.7	
7.5U	7.5	64.3	64.0	65.2	64.9	65.6	65.3	49.2	49.0	49.9	49.7	50.2	50.0	50.0	38.9	
7.5U	2.5	78.6	78.5	79.8	79.6	80.2	80.1	60.2	60.1	61.1	61.0	61.5	61.3	61.3	47.0	
2.5U	27.5	14.1	13.8	14.3	14.1	14.4	14.1	10.8	10.6	11.0	10.8	11.0	10.8	10.8	3.3	
2.5U	22.5	21.7	21.4	22.0	21.7	22.2	21.9	16.6	16.4	16.9	16.6	17.0	16.7	16.7	8.5	
2.5U	17.5	34.9	34.6	35.5	35.1	35.7	35.3	26.8	26.5	27.1	26.9	27.3	27.1	27.1	18.2	
2.5U	12.5	58.0	57.7	58.9	58.6	59.2	58.9	44.4	44.2	45.1	44.9	45.3	45.1	45.1	32.1	
2.5U	7.5	96.8	96.2	98.2	97.7	98.8	98.2	74.1	73.7	75.2	74.8	75.7	75.2	75.2	47.0	
2.5U	2.5	119.0	118.7	120.8	120.5	121.5	121.2	91.2	90.9	92.5	92.3	93.1	92.8	92.8	56.8	
2.5D	2.5	128.9	129.0	130.8	130.9	131.6	131.7	98.7	98.8	100.2	100.2	100.8	100.8	100.8	56.8	
2.5D	7.5	102.3	103.2	103.8	104.7	104.4	105.3	78.3	79.0	79.5	80.2	80.0	80.7	80.7	47.0	
2.5D	12.5	61.1	61.5	62.1	62.4	62.4	62.7	46.8	47.1	47.5	47.8	47.8	48.1	48.1	32.1	
2.5D	17.5	36.0	35.8	36.5	36.4	36.8	36.6	27.6	27.5	28.0	27.9	28.2	28.0	28.0	18.2	
2.5D	22.5	22.1	21.7	22.4	22.0	22.5	22.1	16.9	16.6	17.1	16.9	17.3	17.0	17.0	8.5	
2.5D	27.5	14.3	14.1	14.5	14.3	14.6	14.3	11.0	10.8	11.1	10.9	11.2	11.0	11.0	3.3	
7.5D	2.5	103.6	103.6	105.1	105.1	105.7	105.7	79.3	79.3	80.5	80.5	81.0	81.0	81.0	47.0	
7.5D	7.5	82.4	83.4	83.6	84.6	84.1	85.1	63.1	63.9	64.0	64.8	64.4	65.2	65.2	38.9	
7.5D	12.5	51.3	51.7	52.0	52.5	52.4	52.8	39.3	39.6	39.9	40.2	40.1	40.4	40.4	26.7	
7.5D	17.5	31.2	31.1	31.7	31.6	31.9	31.8	23.9	23.9	24.3	24.2	24.4	24.4	24.4	15.1	
7.5D	22.5	19.6	19.3	19.9	19.6	20.0	19.7	15.0	14.8	15.2	15.0	15.3	15.1	15.1	7.1	
7.5D	27.5	12.9	12.7	13.1	12.9	13.2	13.0	9.9	9.7	10.0	9.9	10.1	9.9	9.9	2.8	
12.5D	2.5	67.0	67.1	68.0	68.1	68.4	68.5	51.3	51.4	52.1	52.1	52.4	52.4	52.4	32.1	
12.5D	7.5	54.3	54.7	55.1	55.5	55.5	55.9	41.6	41.9	42.2	42.5	42.5	42.8	42.8	26.7	
12.5D	12.5	37.2	37.5	37.7	38.1	38.0	38.3	28.5	28.7	28.9	29.2	29.1	29.3	29.3	18.3	
12.5D	17.5	24.1	24.3	24.5	24.7	24.6	24.8	18.5	18.6	18.8	18.9	18.9	19.0	19.0	10.5	
12.5D	22.5	15.9	15.9	16.1	16.1	16.2	16.2	12.2	12.2	12.4	12.3	12.4	12.4	12.4	5.0	
17.5D	2.5	41.1	41.2	41.7	41.9	42.0	42.1	31.5	31.6	31.9	32.1	32.1	32.2	32.2	18.2	
17.5D	7.5	34.5	34.8	35.0	35.3	35.2	35.6	26.4	26.7	26.8	27.1	27.0	27.2	27.2	15.1	
17.5D	12.5	25.5	25.8	25.8	26.2	26.0	26.3	19.5	19.7	19.8	20.0	19.9	20.2	20.2	10.5	
17.5D	17.5	17.8	18.0	18.1	18.3	18.2	18.4	13.6	13.8	13.8	14.0	13.9	14.1	14.1	6.0	
17.5D	22.5	12.4	12.5	12.6	12.7	12.7	12.8	9.5	9.6	9.6	9.7	9.7	9.8	9.8	2.9	
22.5D	2.5	25.9	26.1	26.3	26.5	26.5	26.6	19.9	20.0	20.2	20.3	20.3	20.4	20.4	8.5	
22.5D	7.5	22.2	22.7	22.6	23.0	22.7	23.2	17.0	17.4	17.3	17.6	17.4	17.7	17.7	7.1	
22.5D	12.5	17.4	17.7	17.6	18.0	17.7	18.1	13.3	13.6	13.5	13.8	13.6	13.9	13.9	5.0	
22.5D	17.5	13.0	13.3	13.2	13.5	13.3	13.5	10.0	10.2	10.1	10.3	10.2	10.4	10.4	2.9	
27.5D	2.5	17.1	17.3	17.4	17.5	17.5	17.6	13.1	13.2	13.3	13.4	13.4	13.5	13.5	3.3	
27.5D	7.5	15.0	15.4	15.2	15.7	15.3	15.8	11.5	11.8	11.7	12.0	11.7	12.1	12.1	2.8	

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-005-2			Target Input voltage		Measured Input Voltage				0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Omni Arrow			80Vac		80.0		Vac		144.3 Candela		0.982		0.758
Color:	Red			120Vac		120.1		Vac		147.0 Candela		1.000		
Lens	Clear			135Vac		135.1		Vac		149.4 Candela		1.016		
Photometric Test Distance: 25 meters														
Max. cd	175.2	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C		
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Candela
27.5U	7.5	11.6	11.4	11.9	11.6	12.0	11.8	8.8	8.6	9.0	8.8	9.1	8.9	2.8
27.5U	2.5	12.5	12.4	12.8	12.7	13.0	12.9	9.5	9.4	9.7	9.6	9.8	9.8	3.3
22.5U	17.5	11.5	10.9	11.7	11.1	11.9	11.3	8.7	8.3	8.9	8.4	9.0	8.6	2.9
22.5U	12.5	14.4	13.9	14.7	14.2	15.0	14.4	10.9	10.5	11.1	10.7	11.3	10.9	5.0
22.5U	7.5	17.3	16.9	17.6	17.2	17.9	17.5	13.1	12.8	13.3	13.1	13.5	13.3	7.1
22.5U	2.5	19.0	18.9	19.4	19.2	19.7	19.6	14.4	14.3	14.7	14.6	14.9	14.8	8.5
17.5U	22.5	11.7	10.9	11.9	11.1	12.1	11.3	8.9	8.3	9.0	8.4	9.2	8.6	2.9
17.5U	17.5	15.9	15.0	16.2	15.3	16.5	15.5	12.1	11.4	12.3	11.6	12.5	11.8	6.0
17.5U	12.5	21.1	20.2	21.5	20.5	21.8	20.9	16.0	15.3	16.3	15.6	16.5	15.8	10.5
17.5U	7.5	26.2	25.5	26.7	26.0	27.2	26.4	19.9	19.4	20.3	19.7	20.6	20.0	15.1
17.5U	2.5	29.4	29.1	30.0	29.6	30.4	30.1	22.3	22.0	22.7	22.4	23.1	22.8	18.2
12.5U	22.5	15.2	14.0	15.5	14.3	15.8	14.5	11.5	10.6	11.7	10.8	11.9	11.0	5.0
12.5U	17.5	22.0	20.4	22.4	20.8	22.7	21.1	16.7	15.5	17.0	15.8	17.2	16.0	10.5
12.5U	12.5	31.0	29.1	31.6	29.6	32.1	30.1	23.5	22.0	23.9	22.4	24.3	22.8	18.3
12.5U	7.5	40.6	38.9	41.4	39.7	42.1	40.3	30.8	29.5	31.4	30.1	31.9	30.5	26.7
12.5U	2.5	46.9	46.2	47.8	47.1	48.6	47.8	35.6	35.0	36.2	35.7	36.8	36.3	32.1
7.5U	27.5	12.7	11.7	13.0	11.9	13.2	12.1	9.6	8.9	9.8	9.0	10.0	9.2	2.8
7.5U	22.5	19.0	17.5	19.4	17.8	19.7	18.1	14.4	13.2	14.7	13.5	14.9	13.7	7.1
7.5U	17.5	29.3	26.9	29.8	27.4	30.3	27.8	22.2	20.4	22.6	20.7	23.0	21.1	15.1
7.5U	12.5	44.7	41.3	45.5	42.0	46.3	42.7	33.9	31.3	34.5	31.9	35.1	32.4	26.7
7.5U	7.5	63.5	59.8	64.7	61.0	65.7	61.9	48.1	45.3	49.0	46.2	49.8	46.9	38.9
7.5U	2.5	76.3	74.7	77.7	76.1	78.9	77.4	57.8	56.6	58.9	57.7	59.8	58.6	47.0
2.5U	27.5	14.3	13.1	14.5	13.4	14.8	13.6	10.8	10.0	11.0	10.1	11.2	10.3	3.3
2.5U	22.5	22.0	20.2	22.5	20.6	22.8	20.9	16.7	15.3	17.0	15.6	17.3	15.8	8.5
2.5U	17.5	35.6	32.5	36.2	33.1	36.8	33.6	27.0	24.6	27.5	25.1	27.9	25.5	18.2
2.5U	12.5	58.8	53.6	59.9	54.7	60.9	55.5	44.6	40.7	45.4	41.4	46.1	42.1	32.1
2.5U	7.5	96.8	89.5	98.6	91.2	100.2	92.6	73.3	67.8	74.7	69.1	75.9	70.2	47.0
2.5U	2.5	115.0	113.4	117.2	115.5	119.1	117.4	87.2	85.9	88.8	87.5	90.3	89.0	56.8
2.5D	2.5	126.9	123.9	129.3	126.2	131.4	128.3	96.2	93.9	98.0	95.6	99.6	97.2	56.8
2.5D	7.5	103.9	97.1	105.8	98.9	107.5	100.5	78.7	73.6	80.2	74.9	81.5	76.2	47.0
2.5D	12.5	62.6	57.6	63.7	58.7	64.8	59.6	47.4	43.6	48.3	44.5	49.1	45.2	32.1
2.5D	17.5	36.9	33.8	37.6	34.5	38.2	35.0	27.9	25.6	28.5	26.1	28.9	26.5	18.2
2.5D	22.5	22.5	20.7	22.9	21.0	23.3	21.4	17.0	15.7	17.3	15.9	17.6	16.2	8.5
2.5D	27.5	14.6	13.4	14.8	13.7	15.1	13.9	11.0	10.2	11.2	10.4	11.4	10.5	3.3
7.5D	2.5	103.1	101.3	105.0	103.2	106.7	104.9	78.1	76.8	79.6	78.2	80.9	79.5	47.0
7.5D	7.5	85.0	79.2	86.6	80.6	88.0	82.0	64.4	60.0	65.6	61.1	66.7	62.1	38.9
7.5D	12.5	52.6	49.1	53.6	50.0	54.5	50.8	39.9	37.2	40.6	37.9	41.3	38.5	26.7
7.5D	17.5	32.0	29.7	32.6	30.2	33.2	30.7	24.3	22.5	24.7	22.9	25.1	23.3	15.1
7.5D	22.5	19.9	18.5	20.3	18.8	20.7	19.1	15.1	14.0	15.4	14.3	15.7	14.5	7.1
7.5D	27.5	13.1	12.2	13.4	12.5	13.6	12.7	10.0	9.3	10.1	9.4	10.3	9.6	2.8
12.5D	2.5	67.0	66.3	68.3	67.6	69.4	68.7	50.8	50.3	51.7	51.2	52.6	52.0	32.1
12.5D	7.5	55.1	53.2	56.1	54.2	57.0	55.1	41.8	40.3	42.5	41.1	43.2	41.8	26.7
12.5D	12.5	38.1	36.1	38.8	36.8	39.4	37.4	28.8	27.4	29.4	27.9	29.9	28.3	18.3
12.5D	17.5	24.7	23.3	25.2	23.7	25.6	24.1	18.7	17.6	19.1	18.0	19.4	18.3	10.5
12.5D	22.5	16.2	15.3	16.6	15.6	16.8	15.8	12.3	11.6	12.5	11.8	12.7	12.0	5.0
17.5D	2.5	41.2	40.9	42.0	41.7	42.7	42.4	31.2	31.0	31.8	31.6	32.3	32.1	18.2
17.5D	7.5	34.9	34.2	35.6	34.8	36.2	35.4	26.5	25.9	27.0	26.4	27.4	26.8	15.1
17.5D	12.5	25.9	25.1	26.4	25.6	26.8	26.0	19.6	19.0	20.0	19.4	20.3	19.7	10.5
17.5D	17.5	18.2	17.5	18.5	17.9	18.8	18.1	13.8	13.3	14.0	13.5	14.3	13.7	6.0
17.5D	22.5	12.7	12.1	12.9	12.4	13.1	12.6	9.6	9.2	9.8	9.4	9.9	9.5	2.9
22.5D	2.5	26.0	25.9	26.5	26.4	26.9	26.9	19.7	19.7	20.1	20.0	20.4	20.4	8.5
22.5D	7.5	22.5	22.4	22.9	22.8	23.3	23.2	17.1	17.0	17.4	17.3	17.7	17.6	7.1
22.5D	12.5	17.6	17.4	18.0	17.7	18.3	18.0	13.4	13.2	13.6	13.4	13.8	13.6	5.0
22.5D	17.5	13.2	12.9	13.5	13.2	13.7	13.4	10.0	9.8	10.2	10.0	10.4	10.2	2.9
27.5D	2.5	17.2	17.2	17.5	17.6	17.8	17.8	13.0	13.1	13.3	13.3	13.5	13.5	3.3
27.5D	7.5	15.2	15.2	15.5	15.5	15.7	15.8	11.5	11.6	11.7	11.8	11.9	12.0	2.8

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-005-3					Target Input voltage		Measured Input Voltage			0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor		
Module	12" Omni Arrow					80Vac		80.0			Vac		141.0		Candela	0.986	0.741
Color:	Red					120Vac		120.0			Vac		143.0		Candela	1.000	
Lens	Clear					135Vac		135.1			Vac		145.2		Candela	1.016	
Photometric Test Distance: 25 meters																	
Max. cd	175.2	25°C			25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C				
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1			
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum		
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Candela		
27.5U	7.5	11.5	11.5	11.6	11.6	11.8	11.8	8.5	8.5	8.6	8.6	8.8	8.8	8.8	2.8		
27.5U	2.5	12.4	12.4	12.6	12.6	12.8	12.8	9.2	9.2	9.3	9.4	9.5	9.5	9.5	3.3		
22.5U	17.5	11.1	11.2	11.2	11.4	11.4	11.5	8.2	8.3	8.3	8.4	8.4	8.6	8.6	2.9		
22.5U	12.5	14.0	14.2	14.2	14.4	14.4	14.6	10.4	10.5	10.5	10.7	10.7	10.9	10.9	5.0		
22.5U	7.5	16.9	17.1	17.1	17.4	17.4	17.7	12.5	12.7	12.7	12.9	12.9	13.1	13.1	7.1		
22.5U	2.5	18.8	18.9	19.1	19.2	19.4	19.5	13.9	14.0	14.1	14.2	14.4	14.5	14.5	8.5		
17.5U	22.5	11.1	11.4	11.3	11.5	11.4	11.7	8.2	8.4	8.3	8.5	8.5	8.7	8.7	2.9		
17.5U	17.5	15.1	15.6	15.4	15.8	15.6	16.0	11.2	11.6	11.4	11.7	11.6	11.9	11.9	6.0		
17.5U	12.5	20.2	20.8	20.5	21.1	20.8	21.5	15.0	15.5	15.2	15.7	15.5	15.9	15.9	10.5		
17.5U	7.5	25.5	26.1	25.9	26.5	26.3	26.9	18.9	19.4	19.2	19.6	19.5	19.9	19.9	15.1		
17.5U	2.5	29.1	29.3	29.5	29.8	29.9	30.2	21.5	21.8	21.9	22.1	22.2	22.4	22.4	18.2		
12.5U	22.5	14.3	14.8	14.5	15.0	14.7	15.2	10.6	11.0	10.8	11.1	10.9	11.3	11.3	5.0		
12.5U	17.5	20.7	21.5	21.0	21.8	21.3	22.2	15.3	16.0	15.6	16.2	15.8	16.4	16.4	10.5		
12.5U	12.5	29.4	30.6	29.8	31.1	30.3	31.6	21.8	22.7	22.1	23.0	22.5	23.4	23.4	18.3		
12.5U	7.5	39.4	40.5	39.9	41.1	40.5	41.7	29.2	30.0	29.6	30.5	30.1	30.9	30.9	26.7		
12.5U	2.5	46.5	47.0	47.2	47.7	47.9	48.4	34.5	34.9	35.0	35.4	35.5	35.9	35.9	32.1		
7.5U	27.5	11.9	12.3	12.1	12.5	12.3	12.7	8.8	9.1	9.0	9.3	9.1	9.4	9.4	2.8		
7.5U	22.5	17.7	18.5	18.0	18.8	18.3	19.1	13.2	13.7	13.3	13.9	13.5	14.1	14.1	7.1		
7.5U	17.5	27.3	28.7	27.7	29.1	28.1	29.5	20.2	21.3	20.5	21.6	20.8	21.9	21.9	15.1		
7.5U	12.5	42.0	44.3	42.6	45.0	43.3	45.7	31.2	32.9	31.6	33.3	32.1	33.8	33.8	26.7		
7.5U	7.5	61.1	63.8	61.9	64.7	62.9	65.7	45.3	47.3	45.9	48.0	46.6	48.7	48.7	38.9		
7.5U	2.5	76.0	77.2	77.1	78.3	78.3	79.6	56.3	57.3	57.1	58.1	58.0	59.0	59.0	47.0		
2.5U	27.5	13.4	13.9	13.5	14.1	13.8	14.3	9.9	10.3	10.0	10.4	10.2	10.6	10.6	3.3		
2.5U	22.5	20.5	21.5	20.8	21.8	21.1	22.2	15.2	16.0	15.4	16.2	15.6	16.4	16.4	8.5		
2.5U	17.5	32.9	35.0	33.4	35.5	33.9	36.1	24.4	26.0	24.7	26.3	25.1	26.7	26.7	18.2		
2.5U	12.5	54.6	58.6	55.4	59.5	56.2	60.4	40.5	43.5	41.1	44.1	41.7	44.8	44.8	32.1		
2.5U	7.5	90.9	96.1	92.2	97.5	93.6	99.0	67.4	71.3	68.4	72.3	69.4	73.4	73.4	47.0		
2.5U	2.5	116.1	117.1	117.7	118.8	119.5	120.7	86.1	86.9	87.3	88.1	88.6	89.5	89.5	56.8		
2.5D	2.5	126.3	128.4	128.1	130.2	130.1	132.2	93.7	95.2	95.0	96.5	96.5	98.0	98.0	56.8		
2.5D	7.5	96.9	103.9	98.3	105.4	99.8	107.0	71.9	77.1	72.9	78.2	74.0	79.4	79.4	47.0		
2.5D	12.5	57.8	62.5	58.6	63.4	59.5	64.4	42.8	46.3	43.4	47.0	44.1	47.7	47.7	32.1		
2.5D	17.5	34.0	36.2	34.5	36.7	35.0	37.3	25.2	26.8	25.5	27.2	25.9	27.6	27.6	18.2		
2.5D	22.5	20.9	21.8	21.2	22.1	21.5	22.5	15.5	16.2	15.7	16.4	15.9	16.7	16.7	8.5		
2.5D	27.5	13.6	14.1	13.8	14.3	14.1	14.5	10.1	10.4	10.3	10.6	10.4	10.8	10.8	3.3		
7.5D	2.5	101.3	103.0	102.7	104.5	104.3	106.1	75.1	76.4	76.2	77.5	77.3	78.7	78.7	47.0		
7.5D	7.5	78.4	84.7	79.6	85.9	80.8	87.2	58.2	62.8	59.0	63.7	59.9	64.7	64.7	38.9		
7.5D	12.5	48.6	52.3	49.2	53.0	50.0	53.9	36.0	38.8	36.5	39.3	37.1	39.9	39.9	26.7		
7.5D	17.5	29.6	31.3	30.0	31.8	30.5	32.3	21.9	23.2	22.3	23.6	22.6	23.9	23.9	15.1		
7.5D	22.5	18.6	19.3	18.8	19.6	19.1	19.9	13.8	14.3	14.0	14.5	14.2	14.7	14.7	7.1		
7.5D	27.5	12.4	12.7	12.5	12.8	12.7	13.0	9.2	9.4	9.3	9.5	9.4	9.7	9.7	2.8		
12.5D	2.5	65.4	66.4	66.3	67.4	67.4	68.4	48.5	49.2	49.2	49.9	50.0	50.7	50.7	32.1		
12.5D	7.5	51.9	55.0	52.6	55.8	53.5	56.7	38.5	40.8	39.0	41.4	39.6	42.0	42.0	26.7		
12.5D	12.5	35.2	37.7	35.7	38.3	36.3	38.9	26.1	28.0	26.5	28.4	26.9	28.8	28.8	18.3		
12.5D	17.5	22.8	24.3	23.2	24.7	23.5	25.1	16.9	18.0	17.2	18.3	17.4	18.6	18.6	10.5		
12.5D	22.5	15.1	15.8	15.3	16.1	15.6	16.3	11.2	11.7	11.4	11.9	11.6	12.1	12.1	5.0		
17.5D	2.5	40.1	40.7	40.7	41.3	41.3	42.0	29.8	30.2	30.2	30.6	30.6	31.1	31.1	18.2		
17.5D	7.5	33.1	34.9	33.5	35.4	34.1	35.9	24.5	25.9	24.9	26.2	25.2	26.6	26.6	15.1		
17.5D	12.5	24.3	25.9	24.6	26.3	25.0	26.7	18.0	19.2	18.2	19.5	18.5	19.8	19.8	10.5		
17.5D	17.5	16.9	18.1	17.1	18.3	17.4	18.6	12.5	13.4	12.7	13.6	12.9	13.8	13.8	6.0		
17.5D	22.5	11.8	12.5	12.0	12.7	12.2	12.8	8.8	9.2	8.9	9.4	9.0	9.5	9.5	2.9		
22.5D	2.5	25.2	25.7	25.6	26.1	26.0	26.5	18.7	19.1	19.0	19.4	19.3	19.7	19.7	8.5		
22.5D	7.5	21.4	22.7	21.7	23.0	22.1	23.3	15.9	16.8	16.1	17.0	16.4	17.3	17.3	7.1		
22.5D	12.5	16.7	17.8	16.9	18.0	17.2	18.3	12.4	13.2	12.5	13.4	12.7	13.6	13.6	5.0		
22.5D	17.5	12.4	13.3	12.6	13.4	12.8	13.6	9.2	9.8	9.3	10.0	9.5	10.1	10.1	2.9		
27.5D	2.5	16.7	17.1	16.9	17.3	17.2	17.6	12.4	12.7	12.6	12.8	12.7	13.0	13.0	3.3		
27.5D	7.5	14.5	15.4	14.7	15.7	14.9	15.9	10.7	11.4	10.9	11.6	11.0	11.8	11.8	2.8		

Complies:	☒ YES	☐ NO
Tested By:	Matthew Benninger	Signature or initials:
Engineer:	John Robins	Signature or initials:
Reviewed By:	cwm	Signature or initials:
Test Equipment Used:	9,10,11,12	Completion Date:
Amb (°C):	22	RH%
		42

Luminance Uniformity

Luminance measurements were taken at nine locations across the signal face. A spot size of 0.5 inch was used. The luminance meter was translated from side to side and up and down remaining normal to the sample surface. The measurements were used to determine luminance uniformity. The measurements were taken after operating on the same duty cycle used during the photometric test.

Results

The ratio between the maximum and the minimum luminance was less than 10 to 1. Data follows.

12" Red Arrow Tinted			
Sample	CRT2504221030-006-1	CRT2504221030-006-2	CRT2504221030-006-3
Location	Luminance	Luminance	Luminance
1	14801	14855	16047
2	13459	13923	13378
3	12602	13340	12063
4	14206	15913	12133
5	14565	18952	11624
6	15754	19964	14669
7	13765	12793	13402
8	11738	12078	12132
9	9492	9931	9779
Average	13376	14639	12803
Intensity Ratio	1.7	2.0	1.6

12" Red Arrow Clear			
Sample	CRT2504221030-005-1	CRT2504221030-005-2	CRT2504221030-005-3
Location	Luminance	Luminance	Luminance
1	12669	12190	12011
2	12370	11284	11666
3	11330	11160	10650
4	11805	11228	12326
5	12749	11676	10773
6	14111	12817	14247
7	12509	11949	12797
8	10695	10555	11851
9	8712	8893	9721
Average	11883	11306	11782
Intensity Ratio	1.6	1.4	1.5

Luminance measurements are in cd/m2

Same 60 minute warm-up used for luminous intensity

Test distance is 9.5 feet with ¼ degree aperture using the PR 740

Measured Voltage:	120.0 - 120.3	Vac
-------------------	---------------	-----

Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	<i>JR</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Test Equipment Used:	12,13,14,15	Completion Date:	29-May-2025
Amb (°C):	22.9	RH%	52.5

Chromaticity 6.4.4.6

The chromaticity measurements were performed on the submitted LED Traffic Signal Modules with the spectroradiometer. The samples were operated at nominal input voltage and ambient temperature during the measurements. The measurements were taken from 380-780nm in 2nm increments.

The chromaticity measurements were taken at nine locations across the signal face. A spot size of 0.5 inch was used with the samples operating on the same duty cycle used during the photometric test. The spectro-radiometer was translated from side to side and up and down remaining normal to the sample surface. The average of the measurements are recorded.

Results

		Chromaticity Coordinates	
Color	Sample	x	y
Red (Tinted)	CRT2504221030-006-1	0.698	0.302
	CRT2504221030-006-2	0.698	0.302
	CRT2504221030-006-3	0.698	0.302

		Chromaticity Coordinates	
Color	Sample	x	y
Red (Clear)	CRT2504221030-005-1	0.696	0.303
	CRT2504221030-005-2	0.696	0.303
	CRT2504221030-005-3	0.696	0.303

The chromaticity measurements pass the requirements of the referenced specification.

Measured Voltage:	120.0 - 120.3	Vac
-------------------	---------------	-----

Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	<i>JR</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Test Equipment Used:	12,13,14,15	Completion Date:	29-May-2025
Amb (°C):	22.9	RH%	52.5

Color Uniformity 6.4.4.7

Three samples of each model were tested. Nine color measurements were taken at different locations on the traffic signal face. The measurements were taken after operating on the same duty cycle used during the photometric test.

Results

12" Red Arrow Tinted									
Sample	CRT2504221030-006-1			CRT2504221030-006-2			CRT2504221030-006-3		
Location	x	y	Dominant	x	y	Dominant	x	y	Dominant
1	0.698	0.302	624	0.698	0.302	624	0.698	0.302	624
2	0.698	0.302	624	0.698	0.302	624	0.698	0.302	624
3	0.698	0.302	624	0.698	0.302	623	0.698	0.302	624
4	0.698	0.302	624	0.698	0.302	624	0.698	0.302	624
5	0.698	0.302	623	0.698	0.302	624	0.698	0.302	624
6	0.698	0.302	624	0.698	0.302	624	0.698	0.302	624
7	0.698	0.302	624	0.698	0.302	624	0.698	0.302	624
8	0.698	0.302	624	0.698	0.302	623	0.698	0.302	624
9	0.698	0.302	624	0.697	0.302	623	0.698	0.302	624
Average	0.698	0.302	624	0.698	0.302	624	0.698	0.302	624

12" Red Arrow Clear									
Sample	CRT2504221030-005-1			CRT2504221030-005-2			CRT2504221030-005-3		
Location	x	y	Dominant	x	y	Dominant	x	y	Dominant
1	0.696	0.303	623	0.696	0.303	623	0.696	0.303	623
2	0.696	0.303	623	0.696	0.303	623	0.696	0.303	623
3	0.696	0.303	623	0.696	0.303	623	0.696	0.303	623
4	0.696	0.303	623	0.696	0.303	623	0.696	0.304	623
5	0.696	0.304	623	0.696	0.304	623	0.696	0.304	623
6	0.696	0.304	623	0.696	0.303	623	0.696	0.304	623
7	0.696	0.304	623	0.696	0.304	623	0.696	0.304	623
8	0.696	0.304	623	0.696	0.304	623	0.696	0.304	623
9	0.696	0.304	623	0.696	0.304	623	0.696	0.304	623
Average	0.696	0.303	623	0.696	0.303	623	0.696	0.303	623

Measured Voltage: 120.0 - 120.3 Vac

Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	JR
Engineer:	John Robins	Signature or initials:	JR
Reviewed By:	cwm	Signature or initials:	cwm
Test Equipment Used:	12,13,14,15	Completion Date:	29-May-2025
Amb (°C):	22.9	RH%	52.5

Lens Abrasion Resistance 6.4.5.2

A lens was mounted in the abrasion test fixture with the lens facing upwards. An abrading pad was cycled back and forth (1 cycle) for twelve cycles at $10\text{cm} \pm 2\text{cm}$ per second over the test surface of the lens. The abrading pad shall not be less than $2.5\text{cm} \pm 0.1\text{cm}$ square, constructed of 0000 steel wool rubber cemented to a rigid base shaped to the contour of the lens. The "grain" of the pad was perpendicular to the direction of motion. The abrading pad support was equal in size to the pad and the center of the support surface was within $\pm 2\text{mm}$ of parallel to the lens surface. The density of the abrading pad was such that when the pad was mounted to its support and is resting unweight on the lens, the base of the pad was no closer than 3.2mm to the lens at its closest point. When mounted on its support and resting on the lens, the abrading pad was weighted such that a pad pressure of $14\text{kPa} \pm 1\text{kPa}$ exists at the center and perpendicular to the face of the lens. A pivot was used to follow the contour of the lens.

Results

A single intensity point was measured before and after the abrasion. In all samples tested the abraded lens intensity measurement was at least 90% of the un-abraded lens intensity measurement.

12" Red Arrow Tinted			
Sample	Pre Abrasion	Post Abrasion	Percentage
CRT2504221030-006-1	191.6	188.4	98.3
CRT2504221030-006-2	191	190.3	99.6
CRT2504221030-006-3	189.7	174.9	92.2

measurements in cd

12" Red Arrow Clear			
Sample	Pre Abrasion	Post Abrasion	Percentage
CRT2504221030-005-1	149.9	141.2	94.2
CRT2504221030-005-2	147	142	96.6
CRT2504221030-005-3	143	138.2	96.6

measurements in cd

Measured Voltage:	120.03	Vac		
Measured Weight:	8	lbs		
Abrasion Pad	4	Sq. In		
Pad Pressure	2.1	psi	14.5	Kpa

Complies: ☒ YES ☐ NO

Tested By:	Matthew Benninger	Signature or initials:	<i>WP</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Test Equipment Used:	9,10,11,12,16	Completion Date:	30-May-2025
Amb (°C):	21	RH%	45

Current Consumption 6.4.6.1

Three samples were measured for current flow in amperes. The measured current values are supplied for comparison of Product Quality Assurance current measurements on production modules. Current measurements were taken at start up.

Results

Measurements are in (mA)

12" Red Arrow			
Sample	-40°C	25°C	74°C
CRT2504221030-006-1	54.6	55.6	66.2
CRT2504221030-006-2	54.6	55.3	65.8
CRT2504221030-006-3	55.3	56.3	67.3

Label lists 7.3VA

The current consumption was not in excess of 120% of the design qualification current values for an ambient temperature of 25°C.

Measured Voltage:	120.0 - 120.3	Vac
-------------------	---------------	-----

Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	<i>JR</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Test Equipment Used:	1,3,5	Completion Date:	20-May-2025
Amb (°C):	N/A	RH%	N/A

Power Factor & Total Harmonic Distortion 6.4.6.6 & 6.4.6.7

Three tinted samples of each model were measured for power factor and total harmonic distortion. A commercially available power analyzer was used to perform these measurements.

Results

12" Red Arrow						
Sample	Voltage	Current (mA)	Power (W)	Power Factor	THD V%	THD I%
CRT2504221030-006-1	120.0	58.4	6.9	0.98	0.94	7.0
CRT2504221030-006-2	120.0	57.9	6.8	0.98	1.03	7.1
CRT2504221030-006-3	120.0	59.3	7.0	0.98	1.07	7.1
Requirement	NA	NA	NA	≥ 0.90	≤ 20%	≤ 20%

Measurements taken after a minimum 60 minute warmup.

Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	<i>JR</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Test Equipment Used:	3,4,5	Completion Date:	5-May-2025
Amb (°C):	27.9	RH%	46

Equipment list				
#	Intertek ID No.	Description	Manufacturer	Calibration Due
1	H204	Thermal Chamber	Thermotron	12-Jun-2025
2	M207	Multimeter	Fluke	14-Oct-2025
3	A206	Current Transformer	Pearson	1-Jun-2025
4	L176	Thermometer	Testo	19-Jul-2025
5	M297	Power Analyzer	Yokogawa	29-May-2025
6	O045	Optometer	UDT	11-Apr-2026
7	H138	Thermal Chamber	Despatch	Used with cal'd Equip.
8	T1546	Digital Thermometer	Dickson	9-May-2025
9	O109	Goniometer	Optroniks	4-Mar-2026
10	L235	25M Detector	Gooch and Housego	19-Apr-2026
11	O091	Power Analyzer	Yokogawa	11-Jun-2025
12	L252	Hygrometer	Testo	3-Jun-2025
13	M226	Multimeter	Fluke	7-Oct-2025
14	O757	Spectra Scan PR740	Photo Research	28-Jun-2025
15	L188	Distance Meter	Fluke	6-Dec-2025
16	F545	Scale	Amatek	15-Oct-2025
Note: For measurement uncertainty, refer to the calibration certificates for all the test equipment located in the equipment files				