

LEOTEK Electronics USA LLC

TEST REPORT

SCOPE OF WORK

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

REPORT NUMBER

106155687CRT-001R

ISSUE DATE

30-May-2025

PAGES

22



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Test Report			
Company Name	LEOTEK Electronics USA LLC	Test Location	Intertek Testing Services NA
Address	1955 Lundy Avenue	Address	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

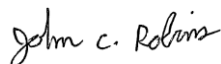
Spec	Test name	Clause	Tinted	Clear
			Result	
ITE	Conditioning	6.4.2	Pass	Pass
ITE	Mechanical Vibration	6.4.3.1	Pass	Pass*
ITE	Temperature Cycling	6.4.3.2	Pass	Pass
ITE	Moisture Resistance	6.4.3.3	Pass	Pass*
ITE	Luminous Intensity	6.4.4.1, 2,3,4	Pass	Pass
ITE	Luminance Uniformity	6.4.4.5	Pass	Pass
ITE	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 Dialight test report 105771947CRT-002Y

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

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Sample Information				
Date Rec.	Intertek ID	Description	Condition	Model No.
4/22/2025	CRT2504221030-004	12" Yellow Arrow Tinted 15yr	Engineering	See Below
4/22/2025	CRT2504221030-003	12" Yellow Arrow Clear 15yr	Engineering	See Below

Further Sample Description

Intertek Sample Number	Description	Model Number	Serial Number
CRT2504221030-004-1	12" Yellow Arrow Tinted 15yr	431-3334-901XOD15	A2503028049
CRT2504221030-004-2	12" Yellow Arrow Tinted 15yr	431-3334-901XOD15	A2503028050
CRT2504221030-004-3	12" Yellow Arrow Tinted 15yr	431-3334-901XOD15	A2503028051
CRT2504221030-003-1	12" Yellow Arrow Clear 15yr	431-3374-901XOD15	A2503028052
CRT2504221030-003-2	12" Yellow Arrow Clear 15yr	431-3374-901XOD15	A2503028053
CRT2504221030-003-3	12" Yellow Arrow Clear 15yr	431-3374-901XOD15	A2503028054

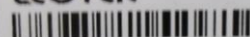
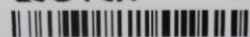
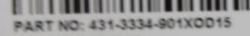
General Requirements

Intertek Sample Number	ETL Cert. Number	Label Identification	Lens Orientation	Color Coded Wires
CRT2504221030-004-1	NA	Pass	Pass	Yellow/White
CRT2504221030-004-2	NA	Pass	Pass	Yellow/White
CRT2504221030-004-3	NA	Pass	Pass	Yellow/White
CRT2504221030-003-1	NA	Pass	Pass	Yellow/White
CRT2504221030-003-2	NA	Pass	Pass	Yellow/White
CRT2504221030-003-3	NA	Pass	Pass	Yellow/White

General Requirements

Intertek Sample Number	600V / 20 AWG Min.	Wire Length $\geq$ 39"	Service Rating +105°C
CRT2504221030-004-1	600V / 18 AWG	Pass	Pass
CRT2504221030-004-2	600V / 18 AWG	Pass	Pass
CRT2504221030-004-3	600V / 18 AWG	Pass	Pass
CRT2504221030-003-1	600V / 18 AWG	Pass	Pass
CRT2504221030-003-2	600V / 18 AWG	Pass	Pass
CRT2504221030-003-3	600V / 18 AWG	Pass	Pass

Sample Modification Log	
Date	Modification description
4/22/25	AC Cable: Yellow/White_C-G000000017
	Wire Cover: C-A000000097
	Waterproof Plug: C-A000000094
	Back Cover: C-A000000096
	Heat Sink: C-A000000095
	Metal PCB: C-E000000013
	Connector: CNRP4-A2001WRBS04P
	LED: LEDLXA-NCSA219BT01
	Thermistor: C-F000000025
	2nd Lens: PPCTSL-LENS009B1
	SPS: _15y 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-B000000037
	Front Cover Clear: C-B000000035

Sample Information	
Picture(s)	
	
 LEOTEK®  PART NO: 431-3334-901XOD15 S/N: A2503028049 RATED VOLTAGE: 80~135 Vac, 60±3Hz POWER: 11.1W, 11.7VA MFG NO: C-T12YA000000004 LOT NO: X1T2530081 MFG DATE: Mar, 2025 MANUFACTURED IN CONFORMANCE WITH THE ITE PTCOI LIGHT EMITTING DIODE SIGNAL MODULE FOR SAFETY AND INSTALLATION INSTRUCTIONS SEE WWW.LEOTEK.COM MANUFACTURER: LEOTEK ELECTRONICS USA LLC.	 LEOTEK®  PART NO: 431-3334-901XOD15 S/N: A2503028052 RATED VOLTAGE: 80~135 Vac, 60±3Hz POWER: 11.1W, 11.7VA MFG NO: C-T12YA000000004 LOT NO: X1T2530081 MFG DATE: Mar, 2025 MANUFACTURED IN CONFORMANCE WITH THE ITE PTCOI LIGHT EMITTING DIODE SIGNAL MODULE FOR SAFETY AND INSTALLATION INSTRUCTIONS SEE WWW.LEOTEK.COM MANUFACTURER: LEOTEK ELECTRONICS USA LLC.
 LEOTEK®  PART NO: 431-3334-901XOD15 S/N: A2503028050 RATED VOLTAGE: 80~135 Vac, 60±3Hz POWER: 11.1W, 11.7VA MFG NO: C-T12YA000000004 LOT NO: X1T2530081 MFG DATE: Mar, 2025 MANUFACTURED IN CONFORMANCE WITH THE ITE PTCOI LIGHT EMITTING DIODE SIGNAL MODULE FOR SAFETY AND INSTALLATION INSTRUCTIONS SEE WWW.LEOTEK.COM MANUFACTURER: LEOTEK ELECTRONICS USA LLC.	 LEOTEK®  PART NO: 431-3334-901XOD15 S/N: A2503028053 RATED VOLTAGE: 80~135 Vac, 60±3Hz POWER: 11.1W, 11.7VA MFG NO: C-T12YA000000004 LOT NO: X1T2530081 MFG DATE: Mar, 2025 MANUFACTURED IN CONFORMANCE WITH THE ITE PTCOI LIGHT EMITTING DIODE SIGNAL MODULE FOR SAFETY AND INSTALLATION INSTRUCTIONS SEE WWW.LEOTEK.COM MANUFACTURER: LEOTEK ELECTRONICS USA LLC.
 LEOTEK®  PART NO: 431-3334-901XOD15 S/N: A2503028051 RATED VOLTAGE: 80~135 Vac, 60±3Hz POWER: 11.1W, 11.7VA MFG NO: C-T12YA000000004 LOT NO: X1T2530081 MFG DATE: Mar, 2025 MANUFACTURED IN CONFORMANCE WITH THE ITE PTCOI LIGHT EMITTING DIODE SIGNAL MODULE FOR SAFETY AND INSTALLATION INSTRUCTIONS SEE WWW.LEOTEK.COM MANUFACTURER: LEOTEK ELECTRONICS USA LLC.	 LEOTEK®  PART NO: 431-3334-901XOD15 S/N: A2503028054 RATED VOLTAGE: 80~135 Vac, 60±3Hz POWER: 11.1W, 11.7VA MFG NO: C-T12YA000000004 LOT NO: X1T2530081 MFG DATE: Mar, 2025 MANUFACTURED IN CONFORMANCE WITH THE ITE PTCOI LIGHT EMITTING DIODE SIGNAL MODULE FOR SAFETY AND INSTALLATION INSTRUCTIONS SEE WWW.LEOTEK.COM MANUFACTURER: LEOTEK ELECTRONICS USA LLC.

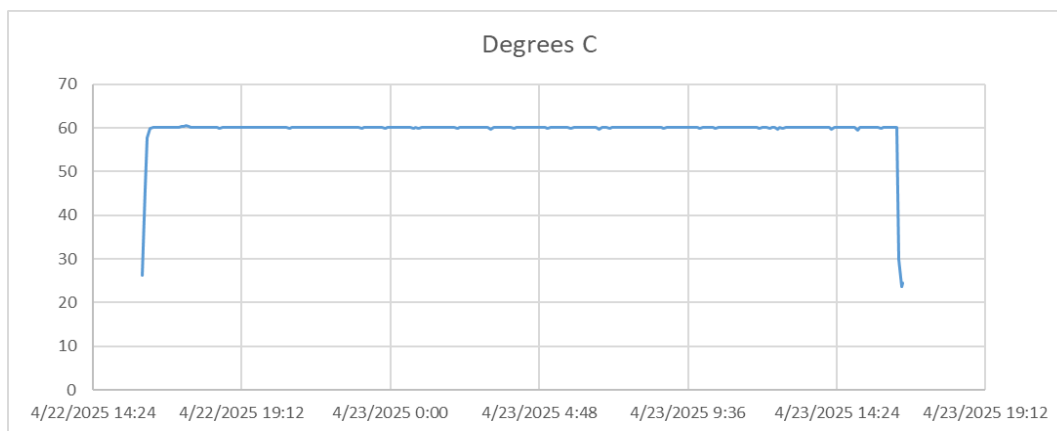
Note: The client supplied clear lenses for the modules, The clear lens model number is 431-3374-901XOD15.

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
CRT2504221030-004-1	12" Yellow Arrow Tinted 15yr	Pass	Pass	Pass	Pass
CRT2504221030-004-2	12" Yellow Arrow Tinted 15yr	Pass	Pass	Pass	Pass
CRT2504221030-004-3	12" Yellow Arrow Tinted 15yr	Pass	Pass	Pass	Pass
CRT2504221030-003-1	12" Yellow Arrow Clear 15yr	Pass	Pass	Pass	Pass
CRT2504221030-003-2	12" Yellow Arrow Clear 15yr	Pass	Pass	Pass	Pass
CRT2504221030-003-3	12" Yellow 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

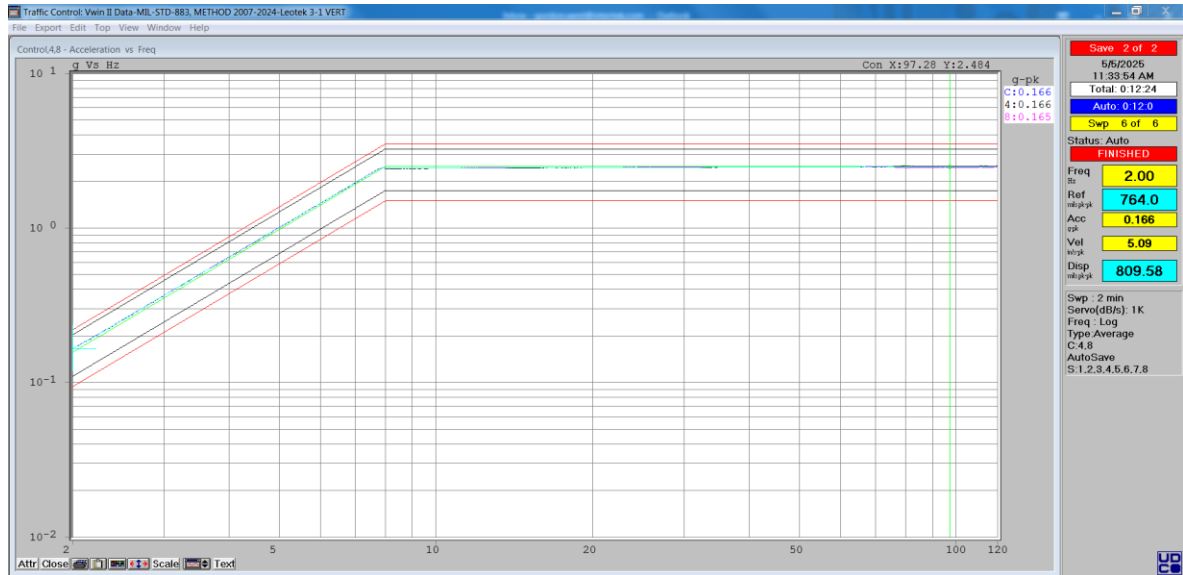
Mechanical Vibration 6.4.3.1

The submitted LED signal modules were securely mounted in traffic signal housings and vibrated along each axes for three 4 minute sweep cycles at a displacement of 0.764" from 2 to 8 Hz and 2.5 Gs from 8 to 120 Hz. Testing was conducted in accordance with MIL-STD-883, method 2007. At the conclusion of the test, the modules shall be visually inspected for damage and checked for proper operation.

Results

Intertek Sample Number	Description	x-axis lateral	y-axis horizontal	z-axis vertical	Visual Inspection	Operational Check
CRT2504221030-004-1	12" Yellow Arrow Tinted 15yr	X	X	X	Pass	Pass
CRT2504221030-004-2	12" Yellow Arrow Tinted 15yr	X	X	X	Pass	Pass
CRT2504221030-004-3	12" Yellow Arrow Tinted 15yr	X	X	X	Pass	Pass
CRT2504221030-003-1	12" Yellow Arrow Clear 15yr	X	X	X	Pass	Pass
CRT2504221030-003-2	12" Yellow Arrow Clear 15yr	X	X	X	Pass	Pass
CRT2504221030-003-3	12" Yellow Arrow Clear 15yr	X	X	X	Pass	Pass

Sample Vibration Plot



Complies: ☒ YES ☐ NO

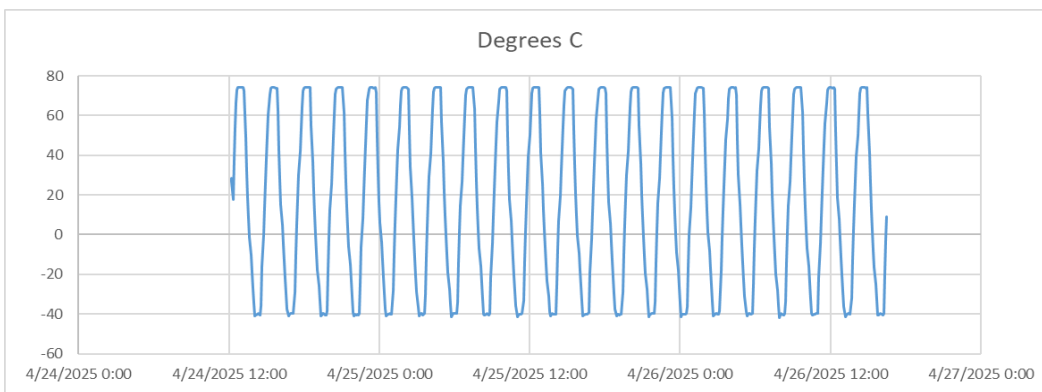
Tested By:	John Robins	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Test Equipment Used:	4,9,10,11,12,13	Completion Date:	5-May-2025
Amb (°C):	22.2	RH%	51.9

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
CRT2504221030-004-1	12" Yellow Arrow Tinted 15yr	Pass	Pass
CRT2504221030-004-2	12" Yellow Arrow Tinted 15yr	Pass	Pass
CRT2504221030-004-3	12" Yellow Arrow Tinted 15yr	Pass	Pass
CRT2504221030-003-1	12" Yellow Arrow Clear 15yr	Pass	Pass
CRT2504221030-003-2	12" Yellow Arrow Clear 15yr	Pass	Pass
CRT2504221030-003-3	12" Yellow Arrow Clear 15yr	Pass	Pass



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:	1			Completion Date:	26-Apr-2025
Amb (°C):	N/A	RH%	N/A		

Moisture Resistance 6.4.3.3

The submitted tinted and clear LED signal modules were subjected to the rain and blowing rain test per MIL-STD-810F, Test Method 506.4, Procedure I. The test was performed on standalone modules without a protective housing. The rainfall rate was 1.7 mm/min (4in/hr) and the droplet size shall predominantly be between 0.5mm and 4.5mm (0.02 to 0.18 in). The samples were oriented such that the lens is directed towards the wind source when at a zero rotation angle. The samples were rotated at a rate of 4 degrees per minute along the vertical axis, from an orientation of -60 to +60 degrees during the test. The duration of the test is 30 minutes, and the samples were energized throughout the test. The water temperature was $25^{\circ} \pm 5^{\circ}\text{C}$ ($77^{\circ} \pm 9^{\circ}\text{F}$) and the wind velocity was 80 km/hr (50 mph). 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
CRT2504221030-004-1	12" Yellow Arrow Tinted 15yr	Pass	Pass
CRT2504221030-004-2	12" Yellow Arrow Tinted 15yr	Pass	Pass
CRT2504221030-004-3	12" Yellow Arrow Tinted 15yr	Pass	Pass
CRT2504221030-003-1	12" Yellow Arrow Clear 15yr	Pass	Pass
CRT2504221030-003-2	12" Yellow Arrow Clear 15yr	Pass	Pass
CRT2504221030-003-3	12" Yellow Arrow Clear 15yr	Pass	Pass

Requirement: Signal Still Operational and No Moisture In The Housing

Intertek Sample Number	Sample Temp. at start ($^{\circ}\text{C}$)	Water Temperature $25\text{C} \pm 5\text{C}$			
		Start	10 minutes in.	20 minutes in.	30 minutes in.
CRT2504221030-004-1	46.3	27.7	27.7	27.6	27.9
CRT2504221030-004-2	47.5				
CRT2504221030-004-3	44.2				
CRT2504221030-003-1	44.8	28.6	28.2	28.0	28.0
CRT2504221030-003-2	44.6				
CRT2504221030-003-3	44.6				

* Water temperature is $^{\circ}\text{C}$

Recorded rainfall rate:	4.2	in/hr
Recorded wind velocity:	49 to 52	mph

Complies: ☒ YES ☐ NO

Tested By:	Rex Williams	Signature or initials:	<i>R.W.</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Test Equipment Used:	18,19,20,22,23	Completion Date:	16-May-2025
Amb ($^{\circ}\text{C}$):	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 25M 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 yellow LED signal modules were operated on a 12 ½ % duty cycle for 1 hour (5 second "on" / 35 seconds "off" duty cycle). A measurement was taken at the end of the duty cycle and the module was then operated at a 100% duty cycle until stabilized. A factor was generated to rate the stable data back to the end of the 12½% duty cycle. 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	CRT2504221030-004-1			Target Input voltage		Measured Input Voltage		0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor		
Module	12" Omni Arrow			80Vac		80.0 Vac		343.8 Candela		0.970		0.984		
Color:	Yellow			120Vac		120.1 Vac		354.6 Candela		1.000		5/35 Factor		
Lens	Tinted			135Vac		135.1 Vac		360.3 Candela		1.016		1.033		
Photometric Test Distance: 25M														
Max. cd	436.8	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 3
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	24.6	24.8	25.3	25.6	25.7	26.0	24.2	24.4	24.9	25.1	25.3	25.6	6.9
27.5U	2.5	26.9	27.0	27.7	27.8	28.2	28.3	26.5	26.6	27.3	27.4	27.7	27.8	8.2
22.5U	17.5	23.7	23.6	24.4	24.4	24.8	24.8	23.3	23.3	24.0	24.0	24.4	24.4	7.2
22.5U	12.5	29.9	30.5	30.8	31.5	31.3	32.0	29.4	30.1	30.3	31.0	30.8	31.5	12.4
22.5U	7.5	36.1	37.0	37.3	38.1	37.9	38.7	35.6	36.4	36.7	37.5	37.3	38.1	17.7
22.5U	2.5	40.7	40.9	42.0	42.2	42.7	42.9	40.1	40.3	41.3	41.6	42.0	42.2	21.2
17.5U	22.5	23.4	23.6	24.1	24.3	24.5	24.7	23.0	23.2	23.7	24.0	24.1	24.3	7.2
17.5U	17.5	32.3	32.7	33.3	33.7	33.8	34.2	31.8	32.1	32.8	33.2	33.3	33.7	15.0
17.5U	12.5	43.2	44.1	44.6	45.5	45.3	46.2	42.5	43.4	43.9	44.8	44.6	45.5	26.1
17.5U	7.5	54.9	56.4	56.6	58.2	57.5	59.1	54.0	55.5	55.7	57.3	56.6	58.2	37.7
17.5U	2.5	62.6	63.6	64.6	65.6	65.6	66.7	61.6	62.6	63.5	64.6	64.6	65.6	45.3
12.5U	22.5	29.5	29.7	30.5	30.6	31.0	31.1	29.1	29.2	30.0	30.1	30.5	30.6	12.4
12.5U	17.5	43.3	43.6	44.7	45.0	45.4	45.7	42.6	42.9	44.0	44.3	44.7	45.0	26.1
12.5U	12.5	62.6	63.5	64.5	65.5	65.6	66.5	61.6	62.5	63.5	64.4	64.5	65.5	45.7
12.5U	7.5	84.9	86.3	87.6	89.1	89.0	90.5	83.6	85.0	86.2	87.6	87.6	89.1	66.5
12.5U	2.5	101.4	102.8	104.6	106.0	106.3	107.7	99.8	101.2	103.0	104.3	104.6	106.0	80.1
7.5U	27.5	24.1	23.9	24.9	24.7	25.3	25.1	23.7	23.6	24.5	24.3	24.9	24.7	6.9
7.5U	22.5	36.1	35.8	37.2	36.9	37.8	37.5	35.5	35.2	36.6	36.3	37.2	36.9	17.7
7.5U	17.5	55.7	56.0	57.4	57.8	58.3	58.7	54.8	55.1	56.5	56.9	57.4	57.8	37.7
7.5U	12.5	88.3	88.9	91.1	91.7	92.5	93.2	86.9	87.5	89.6	90.3	91.1	91.7	66.5
7.5U	7.5	132.8	133.8	137.0	138.0	139.2	140.2	130.7	131.7	134.8	135.8	137.0	138.0	97.0
7.5U	2.5	168.5	168.8	173.8	174.1	176.6	176.9	165.9	166.1	171.1	171.4	173.8	174.1	117.1
2.5U	27.5	26.0	26.3	26.8	27.1	27.3	27.6	25.6	25.9	26.4	26.7	26.8	27.1	8.2
2.5U	22.5	39.9	40.3	41.2	41.6	41.9	42.2	39.3	39.7	40.6	40.9	41.2	41.6	21.2
2.5U	17.5	64.7	64.8	66.7	66.9	67.8	67.9	63.7	63.8	65.7	65.8	66.7	66.9	45.3
2.5U	12.5	110.5	111.6	114.0	115.2	115.8	117.0	108.8	109.9	112.2	113.3	114.0	115.2	80.1
2.5U	7.5	195.5	200.7	201.7	207.0	204.9	210.3	192.4	197.5	198.5	203.7	201.7	207.0	117.1
2.5U	2.5	266.1	267.2	274.5	275.6	278.9	280.0	261.9	263.0	270.2	271.2	274.5	275.6	141.6
2.5D	2.5	306.8	298.6	316.4	308.0	321.5	312.9	302.0	293.9	311.4	303.1	316.4	308.0	141.6
2.5D	7.5	190.6	191.5	196.6	197.5	199.7	200.7	187.6	188.5	193.5	194.4	196.6	197.5	117.1
2.5D	12.5	109.0	110.4	112.4	113.9	114.2	115.7	107.3	108.7	110.6	112.1	112.4	113.9	80.1
2.5D	17.5	63.5	63.6	65.5	65.6	66.5	66.7	62.5	62.6	64.4	64.6	65.5	65.6	45.3
2.5D	22.5	39.1	39.4	40.4	40.6	41.0	41.3	38.5	38.7	39.7	40.0	40.4	40.6	21.2
2.5D	27.5	25.7	25.7	26.5	26.5	26.9	26.9	25.3	25.3	26.1	26.1	26.5	26.5	8.2
7.5D	2.5	202.0	204.1	208.4	210.5	211.7	213.9	198.8	200.9	205.1	207.2	208.4	210.5	117.1
7.5D	7.5	140.4	142.6	144.8	147.0	147.1	149.4	138.2	140.3	142.5	144.7	144.8	147.1	97.0
7.5D	12.5	86.2	87.3	88.9	90.0	90.4	91.5	84.9	85.9	87.5	88.6	88.9	90.1	66.5
7.5D	17.5	52.9	53.7	54.5	55.4	55.4	56.3	52.1	52.8	53.7	54.5	54.5	55.4	37.7
7.5D	22.5	33.7	34.0	34.8	35.0	35.3	35.6	33.2	33.4	34.2	34.5	34.8	35.0	17.7
7.5D	27.5	22.5	22.6	23.2	23.3	23.6	23.7	22.2	22.2	22.9	22.9	23.2	23.3	6.9
12.5D	2.5	120.7	121.5	124.5	125.3	126.5	127.3	118.8	119.6	122.5	123.3	124.5	125.3	80.1
12.5D	7.5	92.0	93.6	94.9	96.6	96.5	98.1	90.6	92.2	93.4	95.1	94.9	96.6	66.5
12.5D	12.5	62.1	63.5	64.1	65.5	65.1	66.5	61.1	62.5	63.1	64.4	64.1	65.5	45.7
12.5D	17.5	41.1	41.6	42.4	42.9	43.1	43.6	40.5	40.9	41.7	42.2	42.4	42.9	26.1
12.5D	22.5	27.2	27.8	28.1	28.7	28.5	29.1	26.8	27.4	27.6	28.2	28.1	28.7	12.4
17.5D	2.5	72.4	72.6	74.7	74.9	75.9	76.1	71.2	71.5	73.5	73.7	74.7	74.9	45.3
17.5D	7.5	59.2	60.1	61.1	62.0	62.1	63.0	58.3	59.1	60.1	61.0	61.1	62.0	37.7
17.5D	12.5	43.5	44.1	44.9	45.5	45.6	46.2	42.8	43.4	44.2	44.7	44.9	45.5	26.1
17.5D	17.5	30.7	31.1	31.7	32.0	32.2	32.5	30.2	30.6	31.2	31.5	31.7	32.0	15.0
17.5D	22.5	21.4	21.8	22.1	22.5	22.5	22.9	21.1	21.5	21.8	22.2	22.1	22.5	7.2
22.5D	2.5	46.0	46.2	47.5	47.7	48.2	48.5	45.3	45.5	46.7	46.9	47.5	47.7	21.2
22.5D	7.5	39.0	39.6	40.3	40.9	40.9	41.5	38.4	39.0	39.6	40.2	40.3	40.9	17.7
22.5D	12.5	30.4	30.9	31.4	31.8	31.9	32.3	29.9	30.4	30.9	31.3	31.4	31.8	12.4
22.5D	17.5	22.6	23.1	23.3	23.8	23.6	24.2	22.2	22.7	22.9	23.5	23.3	23.8	7.2
27.5D	2.5	30.8	31.0	31.8	31.9	32.3	32.4	30.3	30.5	31.3	31.4	31.8	31.9	8.2
27.5D	7.5	26.8	27.1	27.6	28.0	28.1	28.4	26.3	26.7	27.2	27.5	27.6	28.0	6.9

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-004-2				Target Input voltage		Measured Input Voltage			0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor		
Module	12" Omni Arrow				80Vac		80.0		Vac		328.4		Candela	0.969		0.985
Color:	Yellow				120Vac		120.1		Vac		339.0		Candela	1.000		5/35 Factor
Lens	Tinted				135Vac		135.1		Vac		346.7		Candela	1.023		1.086
Photometric Test Distance: 25M																
Max. cd	436.8	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 3		
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	27.4	27.5	28.3	28.4	28.9	29.0	27.0	27.1	27.9	28.0	28.5	28.6	6.9		
27.5U	2.5	29.8	29.6	30.8	30.6	31.5	31.3	29.4	29.2	30.3	30.1	31.0	30.8	8.2		
22.5U	17.5	26.1	26.3	26.9	27.1	27.5	27.8	25.7	25.9	26.5	26.7	27.1	27.3	7.2		
22.5U	12.5	32.9	33.5	34.0	34.6	34.8	35.3	32.4	33.0	33.5	34.0	34.3	34.8	12.4		
22.5U	7.5	39.8	40.3	41.1	41.7	42.1	42.6	39.2	39.7	40.5	41.0	41.4	42.0	17.7		
22.5U	2.5	44.4	44.5	45.8	45.9	46.9	47.0	43.7	43.8	45.1	45.2	46.1	46.3	21.2		
17.5U	22.5	25.7	25.8	26.5	26.7	27.1	27.3	25.3	25.4	26.1	26.3	26.7	26.9	7.2		
17.5U	17.5	35.1	35.4	36.2	36.5	37.0	37.4	34.5	34.9	35.7	36.0	36.5	36.8	15.0		
17.5U	12.5	47.0	47.9	48.5	49.4	49.6	50.6	46.3	47.2	47.8	48.7	48.9	49.8	26.1		
17.5U	7.5	59.6	60.6	61.5	62.5	62.9	63.9	58.7	59.6	60.6	61.6	62.0	63.0	37.7		
17.5U	2.5	68.5	68.5	70.7	70.7	72.3	72.3	67.5	67.4	69.7	69.6	71.2	71.2	45.3		
12.5U	22.5	32.2	32.4	33.2	33.4	34.0	34.2	31.7	31.9	32.7	32.9	33.5	33.7	12.4		
12.5U	17.5	46.9	47.5	48.4	49.0	49.5	50.2	46.2	46.8	47.7	48.3	48.8	49.4	26.1		
12.5U	12.5	67.7	68.7	69.9	70.9	71.5	72.5	66.7	67.7	68.8	69.8	70.4	71.4	45.7		
12.5U	7.5	91.7	92.6	94.6	95.6	96.8	97.8	90.3	91.2	93.2	94.2	95.3	96.3	66.5		
12.5U	2.5	109.4	109.2	113.0	112.7	115.5	115.3	107.8	107.6	111.2	111.0	113.8	113.5	80.1		
7.5U	27.5	26.0	26.2	26.9	27.1	27.5	27.7	25.6	25.8	26.5	26.7	27.1	27.3	6.9		
7.5U	22.5	38.8	39.3	40.0	40.5	41.0	41.5	38.2	38.7	39.4	39.9	40.3	40.8	17.7		
7.5U	17.5	60.2	61.2	62.1	63.1	63.5	64.6	59.2	60.2	61.2	62.2	62.5	63.6	37.7		
7.5U	12.5	94.6	96.2	97.6	99.3	99.8	101.5	93.1	94.7	96.1	97.8	98.3	100.0	66.5		
7.5U	7.5	141.1	142.9	145.6	147.5	149.0	150.8	139.0	140.7	143.4	145.3	146.7	148.6	97.0		
7.5U	2.5	179.3	178.7	185.1	184.4	189.3	188.6	176.6	175.9	182.3	181.6	186.4	185.7	117.1		
2.5U	27.5	28.2	28.7	29.1	29.6	29.7	30.3	27.7	28.2	28.6	29.1	29.3	29.8	8.2		
2.5U	22.5	43.1	44.0	44.5	45.5	45.5	46.5	42.4	43.4	43.8	44.8	44.8	45.8	21.2		
2.5U	17.5	69.8	71.6	72.1	74.0	73.7	75.6	68.8	70.6	71.0	72.8	72.6	74.5	45.3		
2.5U	12.5	118.8	121.7	122.6	125.7	125.4	128.5	117.0	119.9	120.8	123.8	123.5	126.6	80.1		
2.5U	7.5	206.3	213.8	213.0	220.7	217.8	225.7	203.2	210.6	209.8	217.3	214.5	222.3	117.1		
2.5U	2.5	282.2	283.2	291.3	292.4	297.9	299.0	277.9	278.9	286.9	287.9	293.4	294.5	141.6		
2.5D	2.5	331.0	320.2	341.7	330.5	349.4	338.0	326.0	315.3	336.5	325.5	344.1	332.9	141.6		
2.5D	7.5	203.9	212.3	210.5	219.2	215.3	224.2	200.8	209.1	207.3	215.8	212.0	220.8	117.1		
2.5D	12.5	117.8	122.7	121.6	126.6	124.4	129.5	116.1	120.8	119.8	124.7	122.5	127.6	80.1		
2.5D	17.5	68.9	71.2	71.1	73.5	72.7	75.2	67.9	70.1	70.0	72.4	71.6	74.1	45.3		
2.5D	22.5	42.5	43.8	43.8	45.2	44.8	46.2	41.8	43.1	43.2	44.5	44.1	45.5	21.2		
2.5D	27.5	27.6	28.5	28.5	29.4	29.2	30.1	27.2	28.1	28.1	29.0	28.7	29.7	8.2		
7.5D	2.5	217.6	224.6	224.6	231.9	229.7	237.1	214.3	221.2	221.2	228.4	226.2	233.6	117.1		
7.5D	7.5	151.3	158.3	156.2	163.5	159.7	167.2	149.0	155.9	153.8	161.0	157.3	164.6	97.0		
7.5D	12.5	94.3	98.8	97.3	102.0	99.5	104.3	92.8	97.3	95.8	100.4	98.0	102.7	66.5		
7.5D	17.5	58.1	60.6	60.0	62.6	61.3	64.0	57.2	59.7	59.1	61.6	60.4	63.0	37.7		
7.5D	22.5	36.9	38.3	38.0	39.5	38.9	40.4	36.3	37.7	37.5	38.9	38.3	39.8	17.7		
7.5D	27.5	24.5	25.4	25.3	26.2	25.9	26.8	24.1	25.0	24.9	25.8	25.5	26.4	6.9		
12.5D	2.5	131.8	135.4	136.1	139.8	139.2	143.0	129.8	133.4	134.0	137.7	137.1	140.8	80.1		
12.5D	7.5	100.6	105.2	103.8	108.6	106.2	111.1	99.1	103.6	102.3	107.0	104.6	109.4	66.5		
12.5D	12.5	68.4	71.9	70.6	74.2	72.2	75.9	67.4	70.8	69.6	73.1	71.1	74.7	45.7		
12.5D	17.5	45.1	47.2	46.5	48.7	47.6	49.9	44.4	46.5	45.8	48.0	46.8	49.1	26.1		
12.5D	22.5	30.0	31.3	31.0	32.3	31.7	33.1	29.6	30.9	30.5	31.9	31.2	32.6	12.4		
17.5D	2.5	81.1	82.0	83.7	84.6	85.6	86.5	79.9	80.7	82.4	83.3	84.3	85.2	45.3		
17.5D	7.5	65.8	68.0	67.9	70.2	69.5	71.8	64.8	67.0	66.9	69.1	68.4	70.7	37.7		
17.5D	12.5	48.2	50.4	49.7	52.0	50.9	53.2	47.5	49.6	49.0	51.2	50.1	52.4	26.1		
17.5D	17.5	34.0	35.6	35.1	36.7	35.9	37.5	33.5	35.0	34.5	36.1	35.3	37.0	15.0		
17.5D	22.5	23.8	24.9	24.6	25.7	25.2	26.3	23.5	24.5	24.2	25.3	24.8	25.9	7.2		
22.5D	2.5	51.6	52.1	53.2	53.8	54.4	55.0	50.8	51.3	52.4	52.9	53.6	54.1	21.2		
22.5D	7.5	43.5	45.0	45.0	46.4	46.0	47.5	42.9	44.3	44.3	45.7	45.3	46.7	17.7		
22.5D	12.5	33.8	35.2	34.9	36.3	35.7	37.2	33.3	34.7	34.4	35.8	35.1	36.6	12.4		
22.5D	17.5	25.3	26.4	26.1	27.3	26.7	27.9	24.9	26.0	25.7	26.8	26.3	27.4	7.2		
27.5D	2.5	34.4	34.8	35.5	35.9	36.3	36.7	33.9	34.2	35.0	35.3	35.7	36.1	8.2		
27.5D	7.5	29.8	30.7	30.8	31.7	31.5	32.4	29.4	30.3	30.3	31.2	31.0	32.0	6.9		

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-004-3				Target Input voltage		Measured Input Voltage			0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Omni Arrow				80Vac		80.0 Vac			355.4 Candela		0.979		0.974
Color:	Yellow				120Vac		120.1 Vac			363.1 Candela		1.000		5/35 Factor
Lens	Tinted				135Vac		135.0 Vac			373.3 Candela		1.028		0.951
Photometric Test Distance: 25M														
Max. cd	436.8	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 3
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	24.1	24.3	24.6	24.8	25.3	25.5	23.4	23.6	24.0	24.1	24.6	24.8	6.9
27.5U	2.5	26.2	26.2	26.7	26.8	27.5	27.5	25.5	25.5	26.0	26.1	26.7	26.8	8.2
22.5U	17.5	22.8	23.0	23.3	23.5	24.0	24.2	22.2	22.4	22.7	22.9	23.3	23.5	7.2
22.5U	12.5	28.9	29.4	29.5	30.0	30.3	30.8	28.1	28.6	28.7	29.2	29.5	30.0	12.4
22.5U	7.5	34.9	35.5	35.7	36.3	36.7	37.3	34.0	34.6	34.7	35.3	35.7	36.3	17.7
22.5U	2.5	39.0	39.3	39.9	40.2	41.0	41.3	38.0	38.3	38.8	39.1	39.9	40.2	21.2
17.5U	22.5	22.5	22.5	22.9	23.0	23.6	23.6	21.9	21.9	22.3	22.4	23.0	23.0	7.2
17.5U	17.5	30.7	31.0	31.4	31.6	32.3	32.5	29.9	30.2	30.6	30.8	31.4	31.7	15.0
17.5U	12.5	41.2	42.0	42.1	42.9	43.3	44.1	40.1	40.9	41.0	41.8	42.2	42.9	26.1
17.5U	7.5	52.4	53.2	53.5	54.4	55.0	55.9	51.0	51.8	52.1	52.9	53.6	54.4	37.7
17.5U	2.5	60.2	60.5	61.5	61.8	63.2	63.6	58.6	58.9	59.9	60.2	61.6	61.9	45.3
12.5U	22.5	28.2	28.3	28.8	28.9	29.6	29.7	27.5	27.5	28.1	28.1	28.9	28.9	12.4
12.5U	17.5	41.3	41.5	42.2	42.4	43.3	43.5	40.2	40.4	41.0	41.2	42.2	42.4	26.1
12.5U	12.5	59.8	60.2	61.1	61.5	62.8	63.2	58.2	58.6	59.4	59.9	61.1	61.6	45.7
12.5U	7.5	81.2	81.9	82.9	83.7	85.3	86.0	79.1	79.7	80.8	81.5	83.0	83.7	66.5
12.5U	2.5	96.8	97.2	98.9	99.3	101.6	102.1	94.2	94.7	96.3	96.7	99.0	99.4	80.1
7.5U	27.5	22.8	22.8	23.3	23.3	23.9	24.0	22.2	22.2	22.6	22.7	23.3	23.4	6.9
7.5U	22.5	34.1	34.2	34.8	35.0	35.8	36.0	33.2	33.3	33.9	34.1	34.9	35.0	17.7
7.5U	17.5	53.3	53.5	54.5	54.7	56.0	56.2	51.9	52.1	53.0	53.3	54.5	54.8	37.7
7.5U	12.5	84.5	84.9	86.3	86.7	88.8	89.1	82.3	82.6	84.1	84.4	86.4	86.8	66.5
7.5U	7.5	126.8	127.2	129.6	130.0	133.2	133.6	123.5	123.9	126.2	126.5	129.7	130.1	97.0
7.5U	2.5	160.6	161.2	164.1	164.7	168.7	169.3	156.4	157.0	159.8	160.4	164.3	164.9	117.1
2.5U	27.5	24.7	24.9	25.2	25.5	25.9	26.2	24.0	24.3	24.6	24.8	25.2	25.5	8.2
2.5U	22.5	38.1	38.4	38.9	39.2	40.0	40.3	37.1	37.4	37.9	38.2	39.0	39.2	21.2
2.5U	17.5	62.5	62.7	63.9	64.1	65.6	65.9	60.9	61.1	62.2	62.4	63.9	64.1	45.3
2.5U	12.5	107.7	107.7	110.1	110.1	113.2	113.2	104.9	104.9	107.2	107.2	110.2	110.2	80.1
2.5U	7.5	191.0	194.1	195.1	198.3	200.6	203.9	186.0	189.0	190.0	193.1	195.3	198.5	117.1
2.5U	2.5	260.9	261.4	266.6	267.1	274.1	274.6	254.1	254.5	259.6	260.0	266.9	267.4	141.6
2.5D	2.5	311.8	301.7	318.5	308.3	327.5	316.9	303.6	293.8	310.2	300.2	318.9	308.6	141.6
2.5D	7.5	191.6	191.8	195.7	195.9	201.2	201.4	186.5	186.7	190.6	190.7	195.9	196.1	117.1
2.5D	12.5	108.0	108.4	110.4	110.7	113.5	113.9	105.2	105.5	107.5	107.8	110.5	110.9	80.1
2.5D	17.5	62.0	62.2	63.3	63.6	65.1	65.4	60.3	60.6	61.6	61.9	63.4	63.7	45.3
2.5D	22.5	37.7	38.0	38.6	38.8	39.6	39.9	36.8	37.0	37.5	37.8	38.6	38.9	21.2
2.5D	27.5	24.3	24.6	24.8	25.2	25.5	25.9	23.7	24.0	24.2	24.5	24.9	25.2	8.2
7.5D	2.5	203.6	205.9	208.0	210.4	213.8	216.3	198.2	200.5	202.5	204.8	208.2	210.6	117.1
7.5D	7.5	140.3	141.8	143.4	144.9	147.4	149.0	136.7	138.1	139.6	141.1	143.5	145.1	97.0
7.5D	12.5	85.9	86.6	87.7	88.5	90.2	91.0	83.6	84.3	85.4	86.2	87.8	88.6	66.5
7.5D	17.5	52.0	52.6	53.2	53.7	54.7	55.2	50.7	51.2	51.8	52.3	53.2	53.8	37.7
7.5D	22.5	32.7	33.0	33.4	33.7	34.4	34.6	31.9	32.1	32.5	32.8	33.5	33.7	17.7
7.5D	27.5	21.6	21.8	22.0	22.3	22.6	22.9	21.0	21.2	21.4	21.7	22.0	22.3	6.9
12.5D	2.5	121.3	122.4	124.0	125.0	127.5	128.5	118.2	119.2	120.7	121.7	124.1	125.2	80.1
12.5D	7.5	91.9	93.2	93.9	95.2	96.6	97.9	89.5	90.8	91.5	92.7	94.0	95.3	66.5
12.5D	12.5	61.8	62.7	63.1	64.1	64.9	65.9	60.2	61.1	61.5	62.4	63.2	64.1	45.7
12.5D	17.5	40.2	40.9	41.1	41.7	42.2	42.9	39.2	39.8	40.0	40.6	41.1	41.8	26.1
12.5D	22.5	26.6	27.0	27.1	27.5	27.9	28.3	25.9	26.2	26.4	26.8	27.2	27.6	12.4
17.5D	2.5	72.5	73.1	74.1	74.7	76.2	76.8	70.6	71.2	72.2	72.8	74.2	74.8	45.3
17.5D	7.5	58.8	60.0	60.1	61.3	61.8	63.0	57.3	58.4	58.5	59.7	60.2	61.3	37.7
17.5D	12.5	42.9	43.7	43.8	44.7	45.0	45.9	41.7	42.6	42.6	43.5	43.8	44.7	26.1
17.5D	17.5	30.1	30.7	30.7	31.4	31.6	32.2	29.3	29.9	29.9	30.5	30.7	31.4	15.0
17.5D	22.5	21.0	21.3	21.4	21.8	22.0	22.4	20.4	20.8	20.9	21.2	21.4	21.8	7.2
22.5D	2.5	45.5	46.1	46.5	47.1	47.8	48.5	44.3	44.9	45.2	45.9	46.5	47.2	21.2
22.5D	7.5	38.4	39.3	39.3	40.2	40.4	41.3	37.4	38.3	38.2	39.1	39.3	40.2	17.7
22.5D	12.5	29.7	30.4	30.4	31.1	31.2	32.0	29.0	29.6	29.6	30.3	30.4	31.1	12.4
22.5D	17.5	22.2	22.7	22.6	23.1	23.3	23.8	21.6	22.1	22.0	22.5	22.7	23.2	7.2
27.5D	2.5	30.1	30.6	30.8	31.3	31.6	32.1	29.3	29.8	30.0	30.4	30.8	31.3	8.2
27.5D	7.5	26.0	26.9	26.6	27.5	27.4	28.2	25.4	26.2	25.9	26.7	26.6	27.5	6.9

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-003-1			Target Input voltage		Measured Input Voltage		0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor		
Module	12" Omni Arrow			80Vac		80.0 Vac		355.4 Candela		0.965		0.987		
Color:	Yellow			120Vac		120.1 Vac		368.2 Candela		1.000		5/35 Factor		
Lens	Clear			135Vac		135.1 Vac		370.1 Candela		1.005		0.931		
Photometric Test Distance: 25M														
Max. cd	436.8	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 3
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	26.2	26.6	27.1	27.6	27.3	27.7	25.9	26.3	26.8	27.2	26.9	27.4	6.9
27.5U	2.5	28.6	28.9	29.6	29.9	29.8	30.1	28.2	28.5	29.3	29.5	29.4	29.7	8.2
22.5U	17.5	25.3	25.8	26.3	26.8	26.4	26.9	25.0	25.5	25.9	26.4	26.1	26.6	7.2
22.5U	12.5	32.1	33.1	33.3	34.3	33.5	34.5	31.7	32.7	32.9	33.9	33.0	34.0	12.4
22.5U	7.5	38.9	40.2	40.3	41.7	40.5	41.9	38.4	39.7	39.8	41.1	40.0	41.3	17.7
22.5U	2.5	43.7	44.3	45.3	45.9	45.5	46.2	43.2	43.8	44.7	45.4	45.0	45.6	21.2
17.5U	22.5	25.3	25.6	26.2	26.5	26.4	26.6	25.0	25.3	25.9	26.2	26.0	26.3	7.2
17.5U	17.5	34.7	35.4	35.9	36.6	36.1	36.8	34.2	34.9	35.5	36.2	35.7	36.4	15.0
17.5U	12.5	46.5	47.9	48.1	49.6	48.4	49.9	45.9	47.3	47.5	49.0	47.8	49.3	26.1
17.5U	7.5	58.9	60.9	61.1	63.1	61.4	63.4	58.2	60.1	60.3	62.3	60.6	62.6	37.7
17.5U	2.5	67.7	68.6	70.2	71.1	70.5	71.5	66.9	67.8	69.3	70.2	69.6	70.6	45.3
12.5U	22.5	32.1	32.6	33.3	33.8	33.5	33.9	31.7	32.2	32.9	33.3	33.1	33.5	12.4
12.5U	17.5	46.8	48.0	48.5	49.7	48.7	50.0	46.2	47.4	47.9	49.1	48.1	49.4	26.1
12.5U	12.5	67.2	69.3	69.6	71.8	70.0	72.2	66.3	68.5	68.7	70.9	69.1	71.3	45.7
12.5U	7.5	90.8	93.6	94.0	97.0	94.5	97.5	89.6	92.5	92.9	95.8	93.3	96.3	66.5
12.5U	2.5	108.4	109.9	112.3	113.9	112.9	114.5	107.0	108.5	110.9	112.4	111.4	113.0	80.1
7.5U	27.5	26.2	26.1	27.1	27.1	27.3	27.2	25.8	25.8	26.8	26.7	26.9	26.9	6.9
7.5U	22.5	38.9	39.4	40.3	40.9	40.6	41.1	38.5	38.9	39.8	40.3	40.0	40.5	17.7
7.5U	17.5	60.0	62.1	62.2	64.3	62.5	64.7	59.3	61.3	61.4	63.5	61.7	63.9	37.7
7.5U	12.5	93.5	97.1	96.8	100.6	97.3	101.2	92.3	95.9	95.6	99.4	96.1	99.9	66.5
7.5U	7.5	138.7	144.2	143.7	149.4	144.4	150.2	136.9	142.4	141.9	147.6	142.6	148.3	97.0
7.5U	2.5	175.4	178.3	181.7	184.7	182.7	185.7	173.2	176.1	179.5	182.4	180.4	183.3	117.1
2.5U	27.5	28.4	28.5	29.5	29.5	29.6	29.6	28.1	28.1	29.1	29.1	29.2	29.3	8.2
2.5U	22.5	43.5	44.5	45.1	46.1	45.3	46.3	42.9	43.9	44.5	45.5	44.7	45.7	21.2
2.5U	17.5	69.6	72.4	72.1	75.0	72.5	75.4	68.7	71.5	71.2	74.0	71.5	74.4	45.3
2.5U	12.5	116.6	123.3	120.8	127.7	121.4	128.4	115.1	121.7	119.2	126.1	119.9	126.8	80.1
2.5U	7.5	194.0	209.6	201.0	217.1	202.1	218.2	191.6	206.9	198.5	214.4	199.5	215.5	117.1
2.5U	2.5	264.8	271.0	274.4	280.8	275.8	282.3	261.5	267.6	270.9	277.3	272.3	278.7	141.6
2.5D	2.5	311.0	302.7	322.2	313.6	323.9	315.2	307.1	298.9	318.2	309.6	319.8	311.2	141.6
2.5D	7.5	198.0	211.2	205.1	218.8	206.2	219.9	195.5	208.5	202.5	216.0	203.6	217.2	117.1
2.5D	12.5	116.0	123.7	120.2	128.2	120.8	128.9	114.6	122.2	118.7	126.6	119.3	127.2	80.1
2.5D	17.5	68.8	72.0	71.2	74.6	71.6	75.0	67.9	71.1	70.3	73.7	70.7	74.1	45.3
2.5D	22.5	42.7	43.9	44.3	45.5	44.5	45.8	42.2	43.4	43.7	44.9	43.9	45.2	21.2
2.5D	27.5	28.0	28.2	29.0	29.2	29.2	29.3	27.6	27.8	28.6	28.8	28.8	29.0	8.2
7.5D	2.5	213.9	221.1	221.6	229.0	222.7	230.2	211.2	218.3	218.8	226.2	219.9	227.3	117.1
7.5D	7.5	149.5	160.1	154.8	165.8	155.6	166.7	147.6	158.0	152.9	163.7	153.7	164.6	97.0
7.5D	12.5	93.6	99.9	97.0	103.5	97.5	104.1	92.5	98.7	95.8	102.2	96.3	102.8	66.5
7.5D	17.5	58.0	61.4	60.0	63.6	60.4	63.9	57.2	60.6	59.3	62.8	59.6	63.1	37.7
7.5D	22.5	36.9	38.4	38.3	39.8	38.5	40.0	36.5	37.9	37.8	39.3	38.0	39.5	17.7
7.5D	27.5	24.5	25.1	25.4	26.0	25.5	26.1	24.2	24.7	25.1	25.6	25.2	25.8	6.9
12.5D	2.5	131.3	134.7	136.0	139.6	136.7	140.3	129.6	133.0	134.3	137.8	135.0	138.5	80.1
12.5D	7.5	100.4	105.6	104.0	109.4	104.5	110.0	99.1	104.3	102.7	108.0	103.2	108.6	66.5
12.5D	12.5	68.3	72.7	70.7	75.3	71.1	75.7	67.4	71.7	69.8	74.3	70.2	74.7	45.7
12.5D	17.5	44.9	47.8	46.6	49.6	46.8	49.8	44.4	47.2	46.0	48.9	46.2	49.2	26.1
12.5D	22.5	29.7	31.2	30.8	32.3	31.0	32.4	29.4	30.8	30.4	31.9	30.6	32.0	12.4
17.5D	2.5	80.1	81.3	83.0	84.2	83.4	84.7	79.1	80.3	81.9	83.2	82.3	83.6	45.3
17.5D	7.5	65.1	68.0	67.5	70.5	67.8	70.8	64.3	67.1	66.6	69.6	67.0	69.9	37.7
17.5D	12.5	47.7	50.7	49.4	52.5	49.7	52.8	47.1	50.1	48.8	51.9	49.1	52.1	26.1
17.5D	17.5	33.5	35.4	34.7	36.6	34.9	36.8	33.1	34.9	34.3	36.2	34.5	36.4	15.0
17.5D	22.5	23.3	24.6	24.2	25.5	24.3	25.6	23.0	24.3	23.9	25.2	24.0	25.3	7.2
22.5D	2.5	50.6	51.3	52.4	53.2	52.6	53.4	49.9	50.7	51.7	52.5	52.0	52.8	21.2
22.5D	7.5	42.8	44.6	44.4	46.3	44.6	46.5	42.3	44.1	43.8	45.7	44.1	45.9	17.7
22.5D	12.5	33.2	34.9	34.4	36.1	34.6	36.3	32.8	34.4	34.0	35.7	34.1	35.9	12.4
22.5D	17.5	24.6	26.1	25.5	27.0	25.7	27.1	24.3	25.7	25.2	26.7	25.3	26.8	7.2
27.5D	2.5	33.5	33.7	34.7	34.9	34.8	35.1	33.0	33.3	34.2	34.5	34.4	34.7	8.2
27.5D	7.5	29.0	30.0	30.0	31.1	30.2	31.2	28.6	29.6	29.7	30.7	29.8	30.8	6.9

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-003-2				Target Input voltage		Measured Input Voltage				0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor		
Module	12" Omni Arrow				80Vac		80.0		Vac		361.2		Candela		0.961	0.972	
Color:	Yellow				120Vac		120.1		Vac		375.9		Candela		1.000		5/35 Factor
Lens	Clear				135Vac		135.1		Vac		379.8		Candela		1.010		0.869
Photometric Test Distance: 25M																	
Max. cd	436.8	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 3			
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	Right	Candela	
27.5U	7.5	24.1	24.7	25.1	25.8	25.4	26.0	23.4	24.1	24.4	25.0	24.6	25.3	6.9			
27.5U	2.5	26.4	26.7	27.5	27.8	27.8	28.1	25.7	26.0	26.8	27.0	27.0	27.3	8.2			
22.5U	17.5	23.3	23.9	24.2	24.9	24.5	25.2	22.6	23.3	23.6	24.2	23.8	24.5	7.2			
22.5U	12.5	29.6	30.7	30.8	31.9	31.1	32.3	28.8	29.8	29.9	31.0	30.3	31.4	12.4			
22.5U	7.5	36.0	37.2	37.5	38.8	37.9	39.2	35.0	36.2	36.4	37.7	36.8	38.1	17.7			
22.5U	2.5	40.5	41.1	42.1	42.8	42.6	43.2	39.3	40.0	40.9	41.6	41.4	42.0	21.2			
17.5U	22.5	23.3	23.6	24.2	24.6	24.4	24.8	22.6	22.9	23.5	23.9	23.8	24.1	7.2			
17.5U	17.5	31.9	32.9	33.2	34.3	33.6	34.6	31.0	32.0	32.3	33.3	32.6	33.7	15.0			
17.5U	12.5	43.1	44.8	44.9	46.6	45.3	47.1	41.9	43.5	43.6	45.3	44.1	45.7	26.1			
17.5U	7.5	54.8	56.6	57.1	58.9	57.7	59.6	53.3	55.1	55.5	57.3	56.0	57.9	37.7			
17.5U	2.5	63.2	63.9	65.8	66.5	66.4	67.2	61.4	62.1	63.9	64.7	64.6	65.3	45.3			
12.5U	22.5	29.6	30.0	30.8	31.2	31.1	31.6	28.7	29.2	29.9	30.4	30.2	30.7	12.4			
12.5U	17.5	43.3	44.4	45.1	46.2	45.6	46.7	42.1	43.2	43.9	44.9	44.3	45.4	26.1			
12.5U	12.5	62.7	64.6	65.3	67.2	65.9	67.9	61.0	62.8	63.5	65.3	64.1	66.0	45.7			
12.5U	7.5	84.9	87.0	88.4	90.6	89.3	91.5	82.6	84.6	85.9	88.0	86.8	88.9	66.5			
12.5U	2.5	101.6	102.6	105.7	106.7	106.8	107.8	98.7	99.7	102.7	103.8	103.8	104.8	80.1			
7.5U	27.5	23.8	24.0	24.8	24.9	25.0	25.2	23.1	23.3	24.1	24.2	24.3	24.5	6.9			
7.5U	22.5	35.8	36.4	37.3	37.9	37.7	38.3	34.8	35.4	36.2	36.9	36.6	37.2	17.7			
7.5U	17.5	55.8	57.3	58.1	59.6	58.7	60.2	54.3	55.7	56.5	58.0	57.1	58.6	37.7			
7.5U	12.5	87.8	90.2	91.3	93.9	92.3	94.8	85.3	87.7	88.8	91.2	89.7	92.2	66.5			
7.5U	7.5	131.0	133.7	136.3	139.1	137.7	140.6	127.3	130.0	132.5	135.3	133.8	136.7	97.0			
7.5U	2.5	165.5	166.5	172.3	173.3	174.0	175.1	160.9	161.9	167.5	168.5	169.2	170.2	117.1			
2.5U	27.5	25.8	26.2	26.8	27.2	27.1	27.5	25.1	25.4	26.1	26.5	26.4	26.8	8.2			
2.5U	22.5	39.8	40.7	41.4	42.4	41.8	42.8	38.7	39.6	40.2	41.2	40.6	41.6	21.2			
2.5U	17.5	64.6	66.7	67.2	69.4	67.9	70.1	62.8	64.8	65.3	67.5	66.0	68.2	45.3			
2.5U	12.5	109.5	113.2	113.9	117.9	115.1	119.1	106.4	110.1	110.8	114.6	111.9	115.8	80.1			
2.5U	7.5	186.5	193.2	194.1	201.0	196.1	203.1	181.3	187.8	188.7	195.4	190.6	197.4	117.1			
2.5U	2.5	252.2	254.9	262.5	265.3	265.2	268.0	245.2	247.8	255.2	257.9	257.8	260.5	141.6			
2.5D	2.5	288.7	283.9	300.5	295.4	303.6	298.5	280.7	276.0	292.1	287.2	295.1	290.1	141.6			
2.5D	7.5	186.5	192.8	194.1	200.7	196.1	202.8	181.3	187.5	188.7	195.1	190.6	197.1	117.1			
2.5D	12.5	108.5	112.7	112.9	117.3	114.1	118.5	105.5	109.6	109.8	114.1	110.9	115.2	80.1			
2.5D	17.5	63.4	65.7	66.0	68.4	66.7	69.1	61.7	63.9	64.2	66.5	64.8	67.2	45.3			
2.5D	22.5	39.0	40.2	40.6	41.8	41.0	42.2	37.9	39.0	39.5	40.6	39.9	41.0	21.2			
2.5D	27.5	25.2	25.8	26.2	26.9	26.5	27.1	24.5	25.1	25.5	26.1	25.8	26.4	8.2			
7.5D	2.5	198.5	201.3	206.6	209.5	208.7	211.6	193.0	195.7	200.8	203.6	202.9	205.7	117.1			
7.5D	7.5	140.0	143.6	145.7	149.4	147.2	150.9	136.1	139.6	141.6	145.2	143.1	146.7	97.0			
7.5D	12.5	87.4	90.1	91.0	93.8	91.9	94.7	85.0	87.6	88.5	91.2	89.4	92.1	66.5			
7.5D	17.5	53.6	55.3	55.8	57.5	56.3	58.1	52.1	53.7	54.2	55.9	54.8	56.5	37.7			
7.5D	22.5	33.7	34.7	35.1	36.1	35.4	36.5	32.8	33.8	34.1	35.1	34.4	35.5	17.7			
7.5D	27.5	22.1	22.7	23.0	23.7	23.2	23.9	21.5	22.1	22.3	23.0	22.6	23.3	6.9			
12.5D	2.5	121.3	121.8	126.3	126.8	127.6	128.1	118.0	118.5	122.8	123.3	124.0	124.5	80.1			
12.5D	7.5	93.5	95.0	97.3	98.8	98.3	99.8	90.9	92.3	94.6	96.1	95.6	97.1	66.5			
12.5D	12.5	63.6	64.9	66.2	67.6	66.9	68.3	61.8	63.1	64.3	65.7	65.0	66.4	45.7			
12.5D	17.5	41.6	42.6	43.3	44.4	43.8	44.8	40.5	41.5	42.1	43.1	42.6	43.6	26.1			
12.5D	22.5	27.4	28.1	28.5	29.2	28.8	29.5	26.6	27.3	27.7	28.4	28.0	28.7	12.4			
17.5D	2.5	73.7	73.7	76.7	76.7	77.5	77.5	71.6	71.7	74.6	74.6	75.3	75.4	45.3			
17.5D	7.5	60.7	60.9	63.2	63.4	63.8	64.0	59.0	59.2	61.4	61.6	62.1	62.3	37.7			
17.5D	12.5	44.5	44.9	46.3	46.7	46.8	47.2	43.3	43.6	45.0	45.4	45.5	45.9	26.1			
17.5D	17.5	31.1	31.6	32.3	32.8	32.6	33.2	30.2	30.7	31.4	31.9	31.7	32.3	15.0			
17.5D	22.5	21.6	21.9	22.5	22.8	22.7	23.0	21.0	21.3	21.9	22.1	22.1	22.4	7.2			
22.5D	2.5	46.6	46.5	48.4	48.4	48.9	48.9	45.3	45.2	47.1	47.1	47.6	47.6	21.2			
22.5D	7.5	39.9	39.7	41.5	41.4	41.9	41.8	38.7	38.6	40.3	40.2	40.7	40.6	17.7			
22.5D	12.5	30.9	31.0	32.2	32.2	32.5	32.6	30.0	30.1	31.3	31.3	31.6	31.6	12.4			
22.5D	17.5	22.9	23.0	23.8	24.0	24.1	24.2	22.3	22.4	23.2	23.3	23.4	23.5	7.2			
27.5D	2.5	30.8	30.7	32.1	31.9	32.4	32.3	30.0	29.8	31.2	31.0	31.5	31.4	8.2			
27.5D	7.5	27.0	26.8	28.1	27.9	28.4	28.2	26.3	26.1	27.3	27.1	27.6	27.4	6.9			

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2504221030-003-3				Target Input voltage		Measured Input Voltage				0, 0 Lum. Intensity		Vac Variation Factor		MMLI Factor	
Module	12" Omni Arrow				80Vac		80.0		Vac		349.9 Candela		0.978		0.990	
Color:	Yellow				120Vac		120.1		Vac		357.6 Candela		1.000		5/35 Factor	
Lens	Clear				135Vac		135.1		Vac		364.4 Candela		1.019		0.998	
Photometric Test Distance: 25M																
Max. cd	436.8	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 3		
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	27.4	27.4	28.0	28.0	28.5	28.5	27.1	27.1	27.7	27.7	28.2	28.2	6.9		
27.5U	2.5	29.8	29.8	30.4	30.5	31.0	31.1	29.5	29.5	30.1	30.2	30.7	30.7	8.2		
22.5U	17.5	26.5	26.7	27.1	27.3	27.6	27.8	26.2	26.5	26.8	27.0	27.3	27.5	7.2		
22.5U	12.5	33.9	34.3	34.6	35.1	35.3	35.8	33.5	34.0	34.2	34.7	34.9	35.4	12.4		
22.5U	7.5	41.1	41.8	42.0	42.7	42.8	43.5	40.7	41.3	41.6	42.3	42.4	43.1	17.7		
22.5U	2.5	46.1	46.5	47.2	47.5	48.1	48.4	45.7	46.0	46.7	47.0	47.6	47.9	21.2		
17.5U	22.5	26.3	26.5	26.9	27.1	27.4	27.6	26.0	26.2	26.6	26.8	27.1	27.3	7.2		
17.5U	17.5	36.7	37.0	37.5	37.8	38.2	38.5	36.3	36.6	37.1	37.4	37.8	38.1	15.0		
17.5U	12.5	49.6	50.5	50.7	51.6	51.7	52.6	49.1	50.0	50.2	51.1	51.1	52.1	26.1		
17.5U	7.5	63.2	64.5	64.6	65.9	65.9	67.2	62.6	63.9	64.0	65.3	65.2	66.5	37.7		
17.5U	2.5	72.9	73.3	74.5	75.0	76.0	76.4	72.2	72.6	73.8	74.2	75.2	75.6	45.3		
12.5U	22.5	33.7	33.9	34.4	34.7	35.1	35.3	33.4	33.6	34.1	34.3	34.7	35.0	12.4		
12.5U	17.5	49.8	50.5	50.8	51.6	51.8	52.6	49.2	49.9	50.3	51.0	51.3	52.0	26.1		
12.5U	12.5	72.3	73.8	73.9	75.4	75.3	76.8	71.6	73.0	73.2	74.6	74.5	76.0	45.7		
12.5U	7.5	98.5	100.1	100.7	102.3	102.6	104.3	97.5	99.1	99.7	101.2	101.6	103.2	66.5		
12.5U	2.5	117.9	118.9	120.5	121.5	122.8	123.8	116.7	117.6	119.2	120.2	121.5	122.5	80.1		
7.5U	27.5	27.0	27.1	27.5	27.7	28.1	28.2	26.7	26.8	27.3	27.4	27.8	27.9	6.9		
7.5U	22.5	40.9	41.4	41.8	42.3	42.6	43.1	40.5	40.9	41.4	41.8	42.2	42.6	17.7		
7.5U	17.5	64.4	65.3	65.8	66.7	67.1	68.0	63.7	64.6	65.1	66.0	66.4	67.2	37.7		
7.5U	12.5	101.8	103.6	104.0	105.9	106.0	107.9	100.7	102.5	102.9	104.8	104.9	106.8	66.5		
7.5U	7.5	152.0	154.8	155.3	158.2	158.3	161.2	150.4	153.2	153.7	156.6	156.6	159.5	97.0		
7.5U	2.5	192.3	194.1	196.5	198.3	200.3	202.1	190.3	192.0	194.5	196.3	198.2	200.0	117.1		
2.5U	27.5	29.3	29.4	30.0	30.1	30.6	30.7	29.0	29.1	29.7	29.8	30.2	30.3	8.2		
2.5U	22.5	45.6	46.0	46.6	47.0	47.5	47.9	45.1	45.5	46.1	46.5	47.0	47.4	21.2		
2.5U	17.5	74.7	75.6	76.3	77.2	77.8	78.7	73.9	74.8	75.5	76.4	76.9	77.9	45.3		
2.5U	12.5	127.0	128.8	129.8	131.7	132.2	134.2	125.6	127.5	128.4	130.3	130.8	132.8	80.1		
2.5U	7.5	217.9	224.8	222.7	229.8	226.9	234.1	215.6	222.5	220.4	227.4	224.6	231.7	117.1		
2.5U	2.5	292.4	296.1	298.8	302.6	304.5	308.4	289.4	293.0	295.7	299.5	301.3	305.2	141.6		
2.5D	2.5	321.8	318.5	328.9	325.5	335.1	331.7	318.4	315.2	325.5	322.1	331.6	328.2	141.6		
2.5D	7.5	213.7	217.3	218.4	222.1	222.5	226.3	211.5	215.0	216.1	219.8	220.2	223.9	117.1		
2.5D	12.5	125.5	127.1	128.3	129.9	130.7	132.3	124.2	125.7	126.9	128.5	129.3	130.9	80.1		
2.5D	17.5	73.6	74.3	75.2	75.9	76.6	77.3	72.8	73.5	74.4	75.1	75.8	76.5	45.3		
2.5D	22.5	45.0	45.1	46.0	46.1	46.9	47.0	44.5	44.7	45.5	45.7	46.4	46.5	21.2		
2.5D	27.5	28.9	28.9	29.6	29.5	30.1	30.1	28.6	28.6	29.3	29.2	29.8	29.8	8.2		
7.5D	2.5	225.3	228.5	230.3	233.6	234.7	238.0	223.0	226.2	227.9	231.1	232.2	235.5	117.1		
7.5D	7.5	160.1	162.9	163.6	166.5	166.7	169.7	158.4	161.2	161.9	164.8	165.0	167.9	97.0		
7.5D	12.5	100.2	101.9	102.4	104.1	104.4	106.1	99.2	100.8	101.3	103.0	103.3	105.0	66.5		
7.5D	17.5	61.6	62.4	63.0	63.7	64.2	64.9	61.0	61.7	62.3	63.1	63.5	64.3	37.7		
7.5D	22.5	38.9	38.9	39.7	39.8	40.5	40.5	38.4	38.5	39.3	39.4	40.0	40.1	17.7		
7.5D	27.5	25.5	25.4	26.0	26.0	26.5	26.5	25.2	25.1	25.7	25.7	26.2	26.2	6.9		
12.5D	2.5	138.3	139.7	141.3	142.7	144.0	145.5	136.9	138.2	139.9	141.2	142.5	143.9	80.1		
12.5D	7.5	106.4	108.4	108.7	110.8	110.8	112.9	105.2	107.3	107.6	109.6	109.6	111.7	66.5		
12.5D	12.5	72.4	73.9	74.0	75.6	75.4	77.0	71.6	73.2	73.2	74.8	74.6	76.2	45.7		
12.5D	17.5	47.5	48.2	48.6	49.3	49.5	50.2	47.0	47.7	48.1	48.8	49.0	49.7	26.1		
12.5D	22.5	31.3	31.5	32.0	32.2	32.6	32.9	31.0	31.2	31.6	31.9	32.2	32.5	12.4		
17.5D	2.5	83.9	84.8	85.7	86.6	87.4	88.3	83.0	83.9	84.8	85.7	86.4	87.4	45.3		
17.5D	7.5	68.6	70.0	70.2	71.5	71.5	72.9	67.9	69.3	69.4	70.8	70.7	72.1	37.7		
17.5D	12.5	50.2	51.4	51.4	52.5	52.3	53.5	49.7	50.9	50.8	52.0	51.8	53.0	26.1		
17.5D	17.5	35.1	35.9	35.9	36.6	36.6	37.3	34.8	35.5	35.5	36.3	36.2	36.9	15.0		
17.5D	22.5	24.3	24.8	24.9	25.4	25.3	25.9	24.1	24.6	24.6	25.1	25.1	25.6	7.2		
22.5D	2.5	52.6	53.0	53.8	54.2	54.8	55.2	52.0	52.5	53.2	53.6	54.2	54.6	21.2		
22.5D	7.5	44.5	45.6	45.5	46.6	46.4	47.5	44.1	45.1	45.1	46.1	45.9	47.0	17.7		
22.5D	12.5	34.6	35.5	35.4	36.3	36.1	37.0	34.3	35.1	35.0	35.9	35.7	36.6	12.4		
22.5D	17.5	25.7	26.3	26.2	26.8	26.7	27.3	25.4	26.0	26.0	26.6	26.5	27.1	7.2		
27.5D	2.5	34.3	34.7	35.1	35.5	35.8	36.1	34.0	34.3	34.7	35.1	35.4	35.8	8.2		
27.5D	7.5	29.9	30.7	30.6	31.4	31.1	32.0	29.6	30.4	30.2	31.1	30.8	31.7	6.9		

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:	14,15,16,17	Completion Date:	19-May-2025
Amb (°C):	21	RH%	43

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" Yellow Arrow Tinted			
Sample	CRT2504221030-004-1	CRT2504221030-004-2	CRT2504221030-004-3
Location	Luminance	Luminance	Luminance
1	24412	22410	23413
2	27363	26035	28502
3	20557	17833	19385
4	27575	26047	27776
5	17455	17943	22490
6	39407	35006	35945
7	35590	31737	33251
8	27899	25693	22946
9	17040	16712	14966
Average	26366	24380	25408
Intensity Ratio	2.3	2.1	2.4

12" Yellow Arrow Clear			
Sample	CRT2504221030-003-1	CRT2504221030-003-2	CRT2504221030-003-3
Location	Luminance	Luminance	Luminance
1	23635	31007	25628
2	29734	31239	28749
3	23800	24063	22182
4	35835	26184	28634
5	25374	18247	21345
6	43043	39867	42379
7	38839	35188	35298
8	29356	27009	26369
9	18712	15227	15707
Average	29814	27559	27366
Intensity Ratio	2.3	2.6	2.7

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 - 120.1	Vac
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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
Yellow (Tinted)	CRT2504221030-004-1	0.571	0.426
	CRT2504221030-004-2	0.572	0.426
	CRT2504221030-004-3	0.573	0.425

		Chromaticity Coordinates	
Color	Sample	x	y
Yellow (Clear)	CRT2504221030-003-1	0.551	0.442
	CRT2504221030-003-2	0.552	0.441
	CRT2504221030-003-3	0.552	0.441

The chromaticity measurements pass the requirements of the referenced specification.

Measured Voltage:	120.0 - 120.3	Vac
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Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
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" Yellow Arrow Tinted									
Sample	CRT2504221030-004-1			CRT2504221030-004-2			CRT2504221030-004-3		
Location	x	y	Dominant	x	y	Dominant	x	y	Dominant
1	0.576	0.422	590	0.574	0.424	590	0.574	0.424	590
2	0.572	0.425	590	0.573	0.425	590	0.575	0.423	590
3	0.571	0.427	590	0.572	0.426	590	0.574	0.424	590
4	0.571	0.426	590	0.572	0.426	590	0.573	0.424	590
5	0.570	0.428	589	0.572	0.426	590	0.574	0.424	590
6	0.571	0.427	589	0.572	0.426	590	0.574	0.424	590
7	0.571	0.426	590	0.572	0.426	590	0.574	0.424	590
8	0.571	0.427	590	0.572	0.426	590	0.572	0.425	590
9	0.570	0.428	589	0.571	0.427	589	0.571	0.427	590
Average	0.571	0.426	590	0.572	0.426	590	0.573	0.425	590

12" Yellow Arrow Clear									
Sample	CRT2504221030-003-1			CRT2504221030-003-2			CRT2504221030-003-3		
Location	x	y	Dominant	x	y	Dominant	x	y	Dominant
1	0.552	0.441	587	0.560	0.434	588	0.554	0.439	587
2	0.552	0.441	587	0.554	0.439	587	0.555	0.439	587
3	0.551	0.442	587	0.553	0.441	587	0.553	0.441	587
4	0.553	0.440	587	0.551	0.442	587	0.552	0.441	587
5	0.554	0.439	587	0.549	0.444	686	0.552	0.442	587
6	0.551	0.442	587	0.551	0.441	587	0.552	0.441	587
7	0.550	0.442	587	0.551	0.441	587	0.552	0.441	587
8	0.549	0.443	587	0.550	0.442	587	0.551	0.442	587
9	0.548	0.445	586	0.549	0.444	586	0.550	0.443	587
Average	0.551	0.442	587	0.552	0.441	598	0.552	0.441	587

Measured Voltage:	120.0 - 120.3	Vac
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Complies:	☒ YES	☐ NO
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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

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" Yellow Arrow Tinted			
Sample	Pre Abrasion	Post Abrasion	Percentage
CRT2504221030-004-1	354.6	341.0	96.2
CRT2504221030-004-2	339.0	320.4	94.5
CRT2504221030-004-3	363.1	341.8	94.1

measurements in cd

12" Yellow Arrow Clear			
Sample	Pre Abrasion	Post Abrasion	Percentage
CRT2504221030-003-1	368.2	345.4	93.8
CRT2504221030-003-2	375.9	358.0	95.2
CRT2504221030-003-3	357.6	342.4	95.7

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>MB</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Test Equipment Used:	14,15,16,17,21	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" Yellow Arrow			
Sample	-40°C	25°C	74°C
CRT2504221030-004-1	84.5	90.2	106.1
CRT2504221030-004-2	84.1	89.7	106.4
CRT2504221030-004-3	86.5	92.1	106.8

Label lists 11.7VA

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
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Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Test Equipment Used:	1,3,5	Completion Date:	9-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" Yellow Arrow						
Sample	Voltage	Current (mA)	Power (W)	Power Factor	THD V%	THD I%
CRT2504221030-004-1	120.0	90.5	10.8	0.99	0.92	4.5
CRT2504221030-004-2	120.0	89.9	10.7	0.99	0.98	4.7
CRT2504221030-004-3	120.0	91.8	10.9	0.99	0.90	4.6
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:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Test Equipment Used:	1,3,5	Completion Date:	13-May-2025
Amb (°C):	22.4	RH%	46.5

Equipment list				
#	Intertek ID No.	Description	Model Number	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	L250	Signal Conditioner	PCB Piezotronics	16-Dec-2025
10	V393	Vibration Controller	Unholtz-Dickie	28-May-2025
11	M299	Accelerometer	PCB Piezotronics	8-Jul-2025
12	L242	Accelerometer	PCB Piezotronics	26-Feb-2026
13	M284	Accelerometer	PCB Piezotronics	26-Feb-2026
14	O109	Goniometer	Optroniks	4-Mar-2026
15	L235	25M Detector	Gooch and Housego	19-Apr-2026
16	O091	Power Analyzer	Yokogawa	11-Jun-2025
17	L252	Hygrometer	Testo	3-Jun-2025
18	N1316	Digital Stopwatch 14-649-9	Fisher Scientific	19-Mar-2026
19	N1324	TC Thermometer 53 II	Fluke	15-Jul-2025
20	L224	IR Thermometer	Fluke	10-Oct-2025
21	F545	Scale	Amatek	15-Oct-2025
22	N1154	Rain Gauge	Cole Parmer	14-Feb-2026
23	Y255	Anemometer	Pacer Instruments	20-Sep-2025
Note: For measurement uncertainty, refer to the calibration certificates for all the test equipment located in the equipment files				