

LEOTEK Electronics USA LLC

TEST REPORT

SCOPE OF WORK

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

REPORT NUMBER

106115934CRT-001Y

ISSUE DATE

3-Apr-2025

PAGES

19

DOCUMENT CONTROL NUMBER

NA
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Test Report			
Company Name	LEOTEK Electronics USA LLC	Test Location	Intertek Testing Services NA
Address	1955 Lundy Avenue San Jose, CA 95131	Address	3933 US Rt 11 Cortland, NY 13045 USA
Client Contact	Frank Saltani	Quote Number	Qu-01514892-2
Phone	408-380-1788 Ext. 202	Test Start Date	February 27, 2025
Email	frank@leotek.com	Completion Date	April 2, 2025

Standard(s)
ITE, Circular Signal Supplement, dated June 27, 2005.

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	Pass	Pass
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 106115934CRT-001R.

***Covered under Dialight test report 105772891CRT-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

John C. Robins
Engineer
Lighting

Christopher W. Metcalf

Christopher W. Metcalf
Engineering Supervisor
Lighting

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Sample Information				
Date Rec.	Intertek ID	Description	Condition	Model No.
2/17/25	CRT2502170837-003	15yr 12" Yellow Tinted/Clear Ball	Engineering	See Below

Note: Clear lenses provided.

Further Sample Description

Intertek Sample Number	Description	Model Number	Serial Number
CRT2502170837-003-1	12 Yellow Ball Tinted	433-3230-901XL15	A2412011730
CRT2502170837-003-2	12 Yellow Ball Tinted	433-3230-901XL15	A2412011731
CRT2502170837-003-3	12 Yellow Ball Tinted	433-3230-901XL15	A2412011732
CRT2502170837-003-4	12"Yellow Ball Clear	433-3270-901XL15	A2412011733
CRT2502170837-003-5	12"Yellow Ball Clear	433-3270-901XL15	A2412011734
CRT2502170837-003-6	12"Yellow Ball Clear	433-3270-901XL15	A2412011735

General Requirements

Intertek Sample Number	ETL Cert. Number	Label Identification	Lens Orientation	Color Coded Wires
CRT2502170837-003-1	NA	Pass	Pass	yellow/white
CRT2502170837-003-2	NA	Pass	Pass	yellow/white
CRT2502170837-003-3	NA	Pass	Pass	yellow/white
CRT2502170837-003-4	NA	Pass	Pass	yellow/white
CRT2502170837-003-5	NA	Pass	Pass	yellow/white
CRT2502170837-003-6	NA	Pass	Pass	yellow/white

General Requirements

Intertek Sample Number	600V / 20 AWG Min.	Wire Length $\geq$ 39"	Service Rating +105°C
CRT2502170837-003-1	600V / 18 AWG	Pass	Pass
CRT2502170837-003-2	600V / 18 AWG	Pass	Pass
CRT2502170837-003-3	600V / 18 AWG	Pass	Pass
CRT2502170837-003-4	600V / 18 AWG	Pass	Pass
CRT2502170837-003-5	600V / 18 AWG	Pass	Pass
CRT2502170837-003-6	600V / 18 AWG	Pass	Pass

Sample Modification Log	
Date	Modification description
2/21/25	AC Cable: Yellow/White C-G000000017
	Wire Cover : C-A000000097
	Waterproof Plug
	Back Cover: C-A000000096
	Heat Sink: C-A000000095
	Metal PCB: C-E000000013
	Connector: CNRP4-A2001WRBS04P
	LED:LEDLXA-NCSA219BT01
	Thermistor: C-F000000023
	2nd Lens: PPCTSL-LENS009B1
	SPS: _15y SPS_C-D000000001
	Power Clip_C-A000000092
	Fresnel Lens: PPCTSL-FL08A
	O-ring: _12" PRBTSL-LG1206
	Gasket:_12" Gasket_PRBTSL-FG12T1
	Front Cover Tinted:PPCTSL-FC12YV1Z
	Front Cover Clear: PPCTSL-FC12WV1Z

Picture(s)



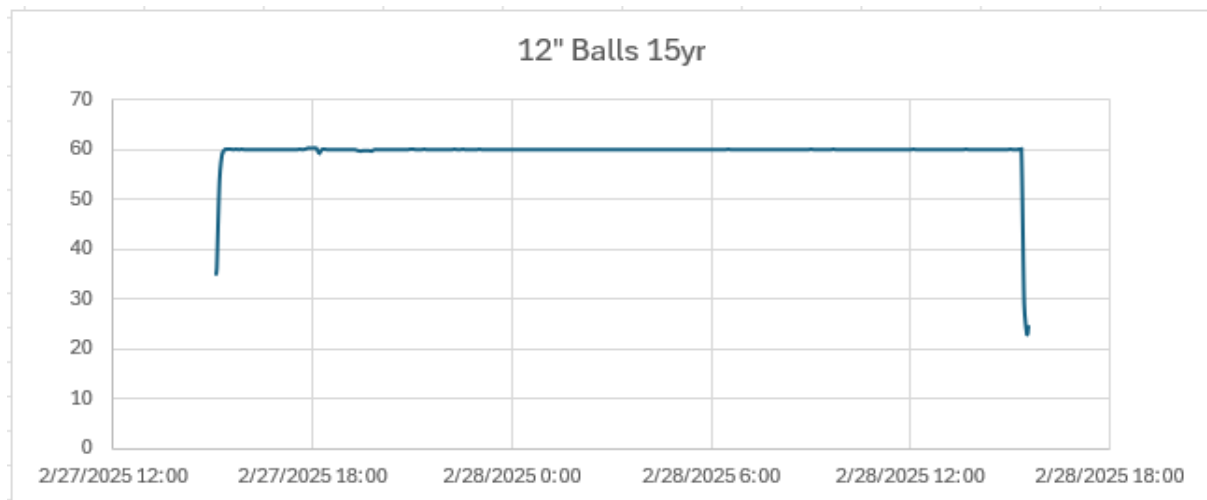
Note: The client supplied clear lenses for the modules, The clear lens model number is 433-3270-901XL15.

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	
CRT2502170837-003-1	12 Yellow Ball Tinted	Pass	Pass	Pass	Pass
CRT2502170837-003-2	12 Yellow Ball Tinted	Pass	Pass	Pass	Pass
CRT2502170837-003-3	12 Yellow Ball Tinted	Pass	Pass	Pass	Pass
CRT2502170837-003-4	12"Yellow Ball Clear	Pass	Pass	Pass	Pass
CRT2502170837-003-5	12"Yellow Ball Clear	Pass	Pass	Pass	Pass
CRT2502170837-003-6	12"Yellow Ball Clear	Pass	Pass	Pass	Pass



Measured Voltage: 120 - 122 Vac

Complies: ☒ YES ☐ NO

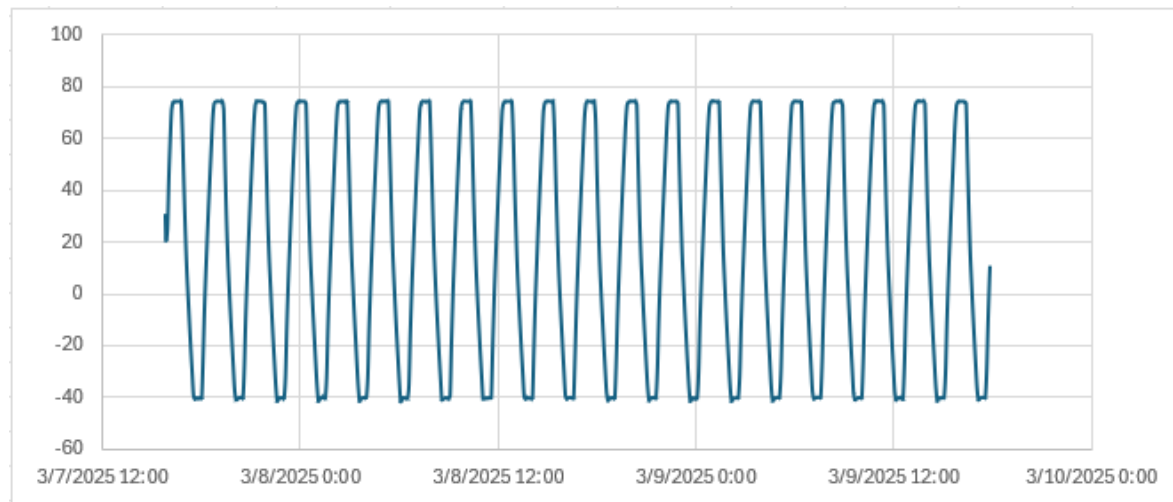
Tested By:	John Robins	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	1,2	Completion Date:	28-Feb-2025
Amb (°C):	NA	RH%	NA

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
CRT2502170837-003-1	12 Yellow Ball Tinted	Pass	Pass
CRT2502170837-003-2	12 Yellow Ball Tinted	Pass	Pass
CRT2502170837-003-3	12 Yellow Ball Tinted	Pass	Pass
CRT2502170837-003-4	12"Yellow Ball Clear	Pass	Pass
CRT2502170837-003-5	12"Yellow Ball Clear	Pass	Pass
CRT2502170837-003-6	12"Yellow Ball Clear	Pass	Pass



Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	1	Completion Date:	9-Mar-2025
Amb (°C):	NA	RH%	NA

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 78 points indicated in Table 1, 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	CRT2502170837-003-1					Target Input voltage		Measured Input Voltage		H, V Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Ball					80Vac		80.1	Vac	1047.0	Candela	0.968	0.957	
Color:	Yellow					120Vac		120.1	Vac	1082.0	Candela	1.000	5/35 Factor	
Lens Type:	Tinted					135Vac		135.1	Vac	1113.0	Candela	1.029	1.009	
Photometric Test Distance: 25 meters														
Max	2730	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
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Table 1
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Minimum
12.5U	2.5	181	182	187	188	192	194	173	174	179	180	184	185	91
12.5U	7.5	155	159	160	164	165	169	148	152	153	157	158	161	73
7.5U	2.5	320	327	330	338	340	348	306	313	316	324	325	333	173
7.5U	7.5	263	278	272	287	280	295	252	266	260	274	268	282	137
7.5U	12.5	190	207	196	214	202	220	181	198	187	204	193	210	100
2.5U	2.5	651	666	673	688	692	708	623	637	644	659	662	677	373
2.5U	7.5	517	551	534	569	549	585	494	527	511	544	525	560	309
2.5U	12.5	352	390	364	403	374	414	337	373	348	385	358	396	209
2.5U	17.5	220	247	227	256	234	263	211	237	218	245	224	252	118
2.5U	22.5	120	135	124	139	128	143	115	129	119	133	122	137	64
2.5D	2.5	1419	1450	1467	1499	1509	1542	1358	1388	1403	1434	1443	1475	892
2.5D	7.5	1133	1211	1171	1252	1204	1287	1084	1159	1120	1197	1152	1232	728
2.5D	12.5	776	858	802	887	825	912	743	821	767	849	789	873	501
2.5D	17.5	479	534	495	552	509	568	458	511	473	528	487	543	291
2.5D	22.5	255	286	264	296	271	304	244	274	252	283	259	291	155
2.5D	27.5	107	137	111	142	114	146	103	131	106	136	109	139	82
7.5D	2.5	1640	1650	1695	1705	1743	1754	1569	1578	1621	1631	1668	1678	701
7.5D	7.5	1332	1362	1377	1408	1416	1448	1275	1304	1317	1347	1355	1386	582
7.5D	12.5	925	954	956	986	984	1014	885	913	915	943	941	970	391
7.5D	17.5	579	588	598	608	615	625	554	563	572	581	589	598	228
7.5D	22.5	318	315	329	325	338	335	304	301	314	311	323	320	118
7.5D	27.5	142	150	146	155	150	159	135	143	140	148	144	152	64
12.5D	2.5	760	752	785	777	808	799	727	720	751	744	773	765	273
12.5D	7.5	619	612	640	633	658	651	592	586	612	606	630	623	218
12.5D	12.5	430	425	444	439	457	452	411	407	425	420	437	432	155
12.5D	17.5	272	268	281	277	289	285	260	257	269	265	276	273	91
12.5D	22.5	155	148	160	153	165	157	148	142	153	146	158	151	46
12.5D	27.5	79	78	82	81	84	83	76	75	78	77	80	79	27
17.5D	2.5	290	290	299	299	308	308	277	277	286	287	295	295	127
17.5D	7.5	239	244	246	252	254	259	228	233	236	241	243	248	100
17.5D	12.5	171	177	177	183	182	189	164	170	169	175	174	180	73
17.5D	17.5	116	120	120	124	124	128	111	115	115	119	118	122	36
17.5D	22.5	76	78	79	81	81	83	73	75	75	77	77	79	18
22.5D	2.5	205	207	212	214	218	220	197	198	203	204	209	210	91
22.5D	7.5	168	173	173	178	178	183	161	165	166	171	171	176	73
22.5D	12.5	120	125	124	129	128	133	115	119	119	123	122	127	55
22.5D	17.5	84	86	87	89	89	92	81	83	83	85	86	88	27
27.5D	2.5	132	133	136	137	140	141	126	127	131	131	134	135	64
27.5D	7.5	109	111	113	114	116	118	104	106	108	110	111	113	46

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-003-2				Target Input voltage		Measured Input Voltage			H, V Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Ball				80Vac		80.0	Vac		1028.0	Candela	0.969		0.960
Color:	Yellow				120Vac		120.0	Vac		1061.0	Candela	1.000		5/35 Factor
Lens Type:	Tinted				135Vac		135.1	Vac		1081.0	Candela	1.019		1.020
Photometric Test Distance: 25 meters														
Max	2730	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
12.5U	2.5	181	183	187	189	190	192	174	175	179	181	183	184	91
12.5U	7.5	155	160	160	165	163	168	149	153	154	158	157	161	73
7.5U	2.5	318	327	329	337	335	343	306	314	316	324	322	330	173
7.5U	7.5	262	278	270	287	275	292	252	267	260	275	265	281	137
7.5U	12.5	188	207	194	213	198	217	181	199	187	205	190	209	100
2.5U	2.5	645	663	666	684	678	697	619	636	639	657	651	669	373
2.5U	7.5	510	550	527	568	536	579	490	529	506	546	515	556	309
2.5U	12.5	347	391	358	404	365	411	333	376	344	388	351	395	209
2.5U	17.5	217	250	224	258	228	263	208	240	215	247	219	252	118
2.5U	22.5	118	137	121	141	124	144	113	131	117	136	119	138	64
2.5D	2.5	1414	1449	1460	1496	1487	1524	1358	1392	1402	1436	1428	1463	892
2.5D	7.5	1123	1215	1159	1254	1181	1277	1078	1167	1113	1204	1134	1227	728
2.5D	12.5	768	864	793	892	808	908	738	830	761	856	776	872	501
2.5D	17.5	473	540	489	558	498	568	455	519	469	536	478	546	291
2.5D	22.5	250	291	259	300	263	306	241	279	248	288	253	293	155
2.5D	27.5	106	139	109	144	111	146	102	134	105	138	107	141	82
7.5D	2.5	1649	1660	1702	1713	1734	1745	1583	1594	1634	1645	1665	1676	701
7.5D	7.5	1341	1372	1384	1416	1410	1443	1288	1318	1329	1360	1355	1385	582
7.5D	12.5	932	959	962	990	981	1009	896	921	924	951	942	969	391
7.5D	17.5	583	590	601	609	613	620	560	566	578	585	589	596	228
7.5D	22.5	321	316	331	326	337	333	308	304	318	313	324	319	118
7.5D	27.5	143	150	147	155	150	158	137	144	142	149	144	152	64
12.5D	2.5	767	757	791	781	806	796	736	727	760	750	774	764	273
12.5D	7.5	625	615	645	634	658	646	601	590	620	609	632	621	218
12.5D	12.5	435	427	449	441	458	449	418	410	431	423	440	431	155
12.5D	17.5	276	268	285	276	291	282	265	257	274	265	279	270	91
12.5D	22.5	159	148	164	153	167	156	153	142	157	147	160	150	46
12.5D	27.5	81	78	84	81	85	82	78	75	80	78	82	79	27
17.5D	2.5	291	291	300	301	306	306	280	280	289	289	294	294	127
17.5D	7.5	241	246	248	254	253	258	231	236	239	243	243	248	100
17.5D	12.5	173	179	179	185	182	188	166	172	172	178	175	181	73
17.5D	17.5	118	122	122	126	124	128	113	117	117	121	119	123	36
17.5D	22.5	77	79	80	82	81	83	74	76	76	79	78	80	18
22.5D	2.5	207	209	214	216	218	220	199	201	205	207	209	211	91
22.5D	7.5	169	175	175	181	178	184	162	168	168	174	171	177	73
22.5D	12.5	122	127	125	131	128	134	117	122	121	126	123	128	55
22.5D	17.5	85	87	88	90	90	92	82	84	85	87	86	88	27
27.5D	2.5	133	134	138	138	140	141	128	129	132	133	135	135	64
27.5D	7.5	110	112	113	116	115	118	105	108	109	111	111	113	46

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-003-3				Target Input voltage		Measured Input Voltage		H, V Lum. Intensity		Vac Variation Factor		MMLI Factor	
Module	12" Ball				80Vac		79.9 Vac		1040.0 Candela		0.980		0.948	
Color:	Yellow				120Vac		120.1 Vac		1061.0 Candela		1.000		5/35 Factor	
Lens Type:	Tinted				135Vac		135.1 Vac		1074.0 Candela		1.012		1.030	
Photometric Test Distance: 25 meters														
Max	2730	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
12.5U	2.5	187	189	191	193	193	195	178	179	181	183	183	185	91
12.5U	7.5	161	165	164	168	166	170	152	156	156	160	157	162	73
7.5U	2.5	322	329	328	336	332	340	305	312	311	318	315	322	173
7.5U	7.5	265	279	270	285	273	288	251	265	256	270	259	273	137
7.5U	12.5	190	207	194	211	196	214	180	196	184	200	186	203	100
2.5U	2.5	657	674	671	688	679	696	624	639	636	652	644	660	373
2.5U	7.5	522	559	533	570	539	577	495	530	505	541	511	547	309
2.5U	12.5	355	396	362	404	367	409	337	376	344	383	348	388	209
2.5U	17.5	223	255	228	260	231	264	212	242	216	247	219	250	118
2.5U	22.5	121	139	124	142	125	144	115	132	118	135	119	136	64
2.5D	2.5	1450	1476	1479	1506	1497	1524	1375	1400	1403	1428	1420	1446	892
2.5D	7.5	1153	1233	1176	1257	1191	1273	1093	1169	1115	1193	1129	1207	728
2.5D	12.5	788	873	804	890	814	901	747	828	762	844	772	855	501
2.5D	17.5	487	548	497	559	503	566	462	520	471	530	477	536	291
2.5D	22.5	258	292	263	298	267	301	245	277	250	282	253	286	155
2.5D	27.5	109	139	112	142	113	144	104	132	106	135	107	136	82
7.5D	2.5	1614	1616	1647	1649	1667	1669	1531	1533	1562	1564	1581	1583	701
7.5D	7.5	1316	1330	1343	1356	1359	1373	1248	1261	1274	1286	1289	1302	582
7.5D	12.5	917	927	935	945	947	957	870	879	887	896	898	907	391
7.5D	17.5	575	570	586	582	593	589	545	541	556	552	563	559	228
7.5D	22.5	317	304	324	311	328	314	301	289	307	295	311	298	118
7.5D	27.5	142	146	145	149	147	151	135	139	138	141	139	143	64
12.5D	2.5	736	724	751	739	761	748	698	687	713	701	721	709	273
12.5D	7.5	603	589	615	601	623	609	572	559	584	570	591	577	218
12.5D	12.5	423	410	432	418	437	424	402	389	410	397	415	402	155
12.5D	17.5	270	259	276	264	279	267	256	245	261	250	265	254	91
12.5D	22.5	156	144	159	147	161	149	148	137	151	139	153	141	46
12.5D	27.5	80	77	82	78	83	79	76	73	78	74	79	75	27
17.5D	2.5	288	288	294	294	297	297	273	273	279	278	282	282	127
17.5D	7.5	239	244	244	249	247	252	226	231	231	236	234	239	100
17.5D	12.5	173	178	176	182	179	184	164	169	167	172	169	175	73
17.5D	17.5	119	122	121	124	122	126	112	115	115	118	116	119	36
17.5D	22.5	78	80	79	81	80	82	74	76	75	77	76	78	18
22.5D	2.5	207	209	211	213	214	216	196	198	200	202	203	204	91
22.5D	7.5	169	175	173	179	175	181	161	166	164	169	166	172	73
22.5D	12.5	122	127	124	129	126	131	115	120	118	122	119	124	55
22.5D	17.5	86	87	87	89	88	90	81	83	83	84	84	85	27
27.5D	2.5	130	131	132	133	134	135	123	124	126	126	127	128	64
27.5D	7.5	107	110	109	112	111	114	102	104	104	106	105	108	46

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-003-4				Target Input voltage		Measured Input Voltage		H, V Lum. Intensity		Vac Variation Factor		MMLI Factor	
Module	12" Ball				80Vac		80.0 Vac		1119.0 Candela		0.979		0.963	
Color:	Yellow				120Vac		120.1 Vac		1143.0 Candela		1.000		5/35 Factor	
Lens Type:	Clear				135Vac		135.1 Vac		1163.0 Candela		1.017		1.012	
Photometric Test Distance: 25 meters														
Max	2730	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
12.5U	2.5	198	200	203	205	206	208	191	193	195	197	198	201	91
12.5U	7.5	169	175	173	179	176	182	163	168	166	172	169	175	73
7.5U	2.5	341	349	348	356	354	362	328	336	335	343	341	349	173
7.5U	7.5	279	296	285	302	290	308	269	285	275	291	280	296	137
7.5U	12.5	201	221	205	226	209	230	193	213	197	217	201	221	100
2.5U	2.5	694	714	709	730	721	742	668	687	682	702	694	714	373
2.5U	7.5	550	596	562	608	572	619	530	573	541	586	550	596	309
2.5U	12.5	375	424	383	433	389	440	361	408	368	417	375	424	209
2.5U	17.5	235	274	240	280	245	285	227	264	231	270	236	274	118
2.5U	22.5	128	150	130	154	133	156	123	145	125	148	128	150	64
2.5D	2.5	1537	1569	1570	1603	1597	1631	1479	1511	1511	1543	1537	1570	892
2.5D	7.5	1221	1316	1247	1344	1269	1368	1175	1267	1200	1294	1221	1316	728
2.5D	12.5	837	936	855	956	870	972	805	900	823	920	837	936	501
2.5D	17.5	517	590	528	602	538	613	498	568	509	580	518	590	291
2.5D	22.5	274	316	280	323	285	329	264	304	269	311	274	316	155
2.5D	27.5	116	151	118	155	120	157	111	146	114	149	116	151	82
7.5D	2.5	1711	1712	1748	1749	1778	1779	1647	1648	1682	1683	1712	1713	701
7.5D	7.5	1397	1414	1427	1444	1452	1469	1345	1361	1374	1390	1398	1414	582
7.5D	12.5	976	988	997	1010	1014	1027	939	951	959	972	976	989	391
7.5D	17.5	611	612	624	625	635	636	588	589	601	601	611	612	228
7.5D	22.5	338	328	345	335	351	341	325	316	332	323	338	328	118
7.5D	27.5	151	159	155	162	157	165	146	153	149	156	151	159	64
12.5D	2.5	778	767	794	784	808	797	748	738	765	754	778	767	273
12.5D	7.5	636	624	650	637	661	648	613	600	626	613	637	624	218
12.5D	12.5	445	434	455	443	463	451	429	418	438	427	446	434	155
12.5D	17.5	284	275	291	281	296	286	274	265	280	271	285	275	91
12.5D	22.5	164	153	168	157	171	159	158	148	162	151	165	153	46
12.5D	27.5	85	82	86	84	88	85	81	79	83	81	85	82	27
17.5D	2.5	305	306	312	313	317	318	294	295	300	301	305	306	127
17.5D	7.5	252	259	258	265	262	269	243	249	248	255	253	259	100
17.5D	12.5	183	189	187	193	190	197	176	182	180	186	183	189	73
17.5D	17.5	125	130	128	132	130	135	121	125	123	127	125	130	36
17.5D	22.5	83	85	84	87	86	89	79	82	81	84	83	85	18
22.5D	2.5	221	223	226	228	230	232	213	215	217	219	221	223	91
22.5D	7.5	180	187	184	191	187	195	173	180	177	184	180	187	73
22.5D	12.5	129	135	132	138	134	141	125	130	127	133	129	135	55
22.5D	17.5	91	94	93	96	95	97	88	90	90	92	91	94	27
27.5D	2.5	139	140	142	143	144	145	134	135	137	138	139	140	64
27.5D	7.5	114	118	117	120	119	122	110	113	112	116	114	118	46

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-003-5				Target Input voltage		Measured Input Voltage			H, V Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Ball				80Vac		80.0		Vac		1087.0	Candela	0.981	0.949
Color:	Yellow				120Vac		120.1		Vac		1108.0	Candela	1.000	5/35 Factor
Lens Type:	Clear				135Vac		135.1		Vac		1130.0	Candela	1.020	1.015
Photometric Test Distance: 25 meters														
Max	2730	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
12.5U	2.5	191	192	194	196	198	200	181	182	185	186	188	190	91
12.5U	7.5	164	167	167	170	170	174	155	159	158	162	161	165	73
7.5U	2.5	338	346	344	352	351	359	321	328	327	334	333	341	173
7.5U	7.5	277	294	283	300	288	306	263	279	268	284	274	290	137
7.5U	12.5	200	219	204	223	208	227	190	208	194	212	198	216	100
2.5U	2.5	679	696	692	710	706	724	645	661	657	674	670	687	373
2.5U	7.5	539	577	549	588	560	599	512	547	521	558	532	569	309
2.5U	12.5	369	409	376	417	384	425	350	388	357	396	364	403	209
2.5U	17.5	231	261	236	266	241	271	220	247	224	252	228	257	118
2.5U	22.5	127	142	129	145	132	148	120	135	123	137	125	140	64
2.5D	2.5	1486	1524	1514	1554	1544	1585	1410	1447	1438	1475	1466	1505	892
2.5D	7.5	1186	1276	1209	1300	1233	1326	1126	1211	1148	1234	1170	1259	728
2.5D	12.5	815	906	831	924	847	942	774	860	789	877	804	894	501
2.5D	17.5	506	570	516	581	526	593	481	542	490	552	500	563	291
2.5D	22.5	269	305	274	311	280	317	256	290	260	295	266	301	155
2.5D	27.5	114	147	116	150	119	153	108	139	111	142	113	145	82
7.5D	2.5	1754	1772	1787	1807	1823	1843	1665	1683	1697	1715	1731	1749	701
7.5D	7.5	1426	1470	1453	1498	1482	1528	1354	1395	1380	1422	1407	1451	582
7.5D	12.5	992	1034	1011	1054	1031	1074	941	981	960	1000	979	1020	391
7.5D	17.5	620	637	632	650	644	663	588	605	600	617	612	629	228
7.5D	22.5	343	343	349	350	356	357	325	326	332	332	338	339	118
7.5D	27.5	152	163	155	166	158	169	144	155	147	158	150	161	64
12.5D	2.5	823	813	839	829	855	845	781	772	796	787	812	803	273
12.5D	7.5	667	662	680	675	694	688	633	628	646	641	658	653	218
12.5D	12.5	462	461	471	470	480	480	438	438	447	447	456	455	155
12.5D	17.5	293	289	299	295	305	300	279	274	284	280	290	285	91
12.5D	22.5	168	160	171	163	174	166	159	152	162	155	165	158	46
12.5D	27.5	85	84	87	86	89	88	81	80	83	82	84	83	27
17.5D	2.5	311	311	317	317	323	324	295	296	301	301	307	307	127
17.5D	7.5	257	262	262	267	267	272	244	249	249	254	254	259	100
17.5D	12.5	184	191	188	195	192	199	175	181	178	185	182	188	73
17.5D	17.5	125	130	128	132	130	135	119	123	121	125	124	128	36
17.5D	22.5	83	84	84	86	86	87	79	80	80	81	82	83	18
22.5D	2.5	223	225	227	229	232	234	212	213	216	217	220	222	91
22.5D	7.5	182	187	185	191	189	195	173	178	176	181	179	185	73
22.5D	12.5	131	136	134	139	136	141	124	129	127	132	129	134	55
22.5D	17.5	92	94	94	95	95	97	87	89	89	91	91	92	27
27.5D	2.5	144	145	147	148	150	151	137	138	140	141	142	143	64
27.5D	7.5	119	121	122	123	124	125	113	115	116	117	118	119	46

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-003-6				Target Input voltage		Measured Input Voltage				H, V Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Ball				80Vac		80.0	Vac		1085.0	Candela	0.989		0.965	
Color:	Yellow				120Vac		120.0	Vac		1097.0	Candela	1.000		5/35 Factor	
Lens Type:	Clear				135Vac		135.1	Vac		1115.0	Candela	1.016		1.029	
Photometric Test Distance: 25 meters															
Max	2730	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	
12.5U	2.5	192	195	194	197	198	200	186	188	188	190	191	193	91	
12.5U	7.5	163	171	165	173	168	176	158	165	159	167	162	169	73	
7.5U	2.5	344	353	347	357	353	363	332	340	335	344	341	350	173	
7.5U	7.5	281	301	284	304	289	309	272	290	275	293	279	298	137	
7.5U	12.5	203	226	206	228	209	232	196	218	198	220	202	224	100	
2.5U	2.5	681	709	689	717	700	728	657	684	665	692	676	703	373	
2.5U	7.5	535	598	541	604	550	614	517	577	522	583	531	593	309	
2.5U	12.5	359	430	363	435	369	442	347	415	350	419	356	426	209	
2.5U	17.5	223	279	225	282	229	287	215	269	217	272	221	277	118	
2.5U	22.5	120	154	121	156	123	158	116	149	117	150	119	153	64	
2.5D	2.5	1495	1551	1511	1568	1536	1594	1443	1497	1459	1513	1483	1538	892	
2.5D	7.5	1174	1320	1187	1334	1207	1356	1133	1274	1146	1288	1165	1309	728	
2.5D	12.5	796	954	805	964	818	980	768	920	776	931	789	946	501	
2.5D	17.5	488	604	493	611	501	621	471	583	476	590	484	599	291	
2.5D	22.5	258	328	261	331	266	337	249	316	252	320	256	325	155	
2.5D	27.5	107	159	109	161	110	163	104	153	105	155	106	158	82	
7.5D	2.5	1821	1839	1842	1859	1872	1890	1758	1775	1777	1794	1807	1824	701	
7.5D	7.5	1485	1521	1501	1538	1526	1563	1433	1468	1449	1484	1473	1509	582	
7.5D	12.5	1037	1065	1048	1077	1066	1095	1001	1028	1012	1040	1028	1057	391	
7.5D	17.5	650	650	657	657	668	668	627	627	634	634	644	645	228	
7.5D	22.5	360	346	364	350	370	356	347	334	351	338	357	344	118	
7.5D	27.5	159	166	161	168	164	171	154	160	155	162	158	165	64	
12.5D	2.5	883	865	892	875	907	889	852	835	861	844	875	858	273	
12.5D	7.5	727	696	735	704	747	716	702	672	710	680	721	691	218	
12.5D	12.5	509	479	515	484	523	492	492	462	497	467	505	475	155	
12.5D	17.5	326	294	330	298	335	303	315	284	318	287	324	292	91	
12.5D	22.5	189	161	191	163	194	165	182	155	184	157	188	160	46	
12.5D	27.5	95	85	96	86	97	87	91	82	92	83	94	84	27	
17.5D	2.5	324	325	327	328	333	334	312	313	316	317	321	322	127	
17.5D	7.5	268	274	271	277	275	282	258	265	261	268	266	272	100	
17.5D	12.5	192	201	194	203	198	206	186	194	188	196	191	199	73	
17.5D	17.5	131	135	132	137	134	139	126	130	127	132	130	134	36	
17.5D	22.5	85	88	86	89	87	90	82	85	83	86	84	87	18	
22.5D	2.5	229	233	231	235	235	239	221	225	223	227	227	231	91	
22.5D	7.5	184	196	186	199	189	202	178	190	180	192	182	195	73	
22.5D	12.5	133	143	134	145	137	147	128	138	130	140	132	142	55	
22.5D	17.5	94	97	95	98	97	100	91	94	92	95	93	96	27	
27.5D	2.5	149	151	150	153	153	155	143	146	145	147	147	150	64	
27.5D	7.5	122	128	123	129	125	131	118	123	119	125	121	127	46	

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:	10,11,12,13,15,16,17	Completion Date:	1-Apr-2025
Amb (°C):	20	RH%	38

Luminance Uniformity

Luminance measurements were taken at nine locations across the signal face. A spot size of one 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 Ball Tinted			
Sample	CRT2502170837-003-1	CRT2502170837-003-2	CRT2502170837-003-3
Location	Luminance	Luminance	Luminance
1	17956	18762	18703
2	29828	34959	33841
3	32129	31948	33654
4	27052	25319	24974
5	17524	17479	13465
6	28495	30462	28473
7	42025	42906	39125
8	23829	22683	24638
9	11666	12205	13227
Average	25612	26303	25567
Intensity Ratio	3.6	3.5	3.0

12" Yellow Ball Clear			
Sample	CRT2502170837-003-4	CRT2502170837-003-5	CRT2502170837-003-6
Location	Luminance	Luminance	Luminance
1	21244	17216	10427
2	33396	32928	21322
3	35453	32302	29984
4	28892	27887	37266
5	17910	14080	28241
6	29143	30104	10001
7	42641	40389	26655
8	25172	24518	24058
9	14447	11928	12491
Average	27589	25706	22272
Intensity Ratio	3.0	3.4	3.7

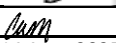
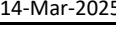
Luminance measurements are in cd/m²

Same 60 minute warm-up used for luminous intensity

Test distance is 19 feet with ¼ degree aperture using the PR 740

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

Tested By:	Brittany James	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	2, 3, 4, 5	Completion Date:	14-Mar-2025
Amb (°C):	26.2	RH%	19.2

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 one 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

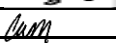
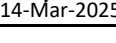
		Chromaticity Coordinates	
Color	Sample	x	y
Yellow (Tinted)	CRT2502170837-003-1	0.575	0.423
	CRT2502170837-003-2	0.574	0.423
	CRT2502170837-003-3	0.574	0.424

		Chromaticity Coordinates	
Color	Sample	x	y
Yellow (Clear)	CRT2502170837-003-4	0.563	0.432
	CRT2502170837-003-5	0.561	0.433
	CRT2502170837-003-6	0.561	0.433

The chromaticity measurements meet the requirements of the referenced specification.

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

Tested By:	Brittany James	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	2, 3, 4, 5	Completion Date:	14-Mar-2025
Amb (°C):	26.2	RH%	19.2

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

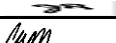
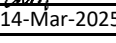
12" Yellow Ball Tinted									
Sample	CRT2502170837-003-1			CRT2502170837-003-2			CRT2502170837-003-3		
Location	x	y	Dominant	x	y	Dominant	x	y	Dominant
1	0.575	0.423	590	0.575	0.423	590	0.574	0.423	590
2	0.576	0.422	590	0.576	0.422	590	0.575	0.422	590
3	0.574	0.424	590	0.573	0.424	590	0.574	0.424	590
4	0.576	0.422	590	0.575	0.422	590	0.575	0.423	590
5	0.575	0.422	590	0.575	0.422	590	0.575	0.422	590
6	0.578	0.419	591	0.578	0.420	591	0.577	0.421	591
7	0.577	0.420	591	0.577	0.421	591	0.575	0.422	590
8	0.572	0.425	590	0.572	0.426	590	0.571	0.426	590
9	0.569	0.428	589	0.568	0.429	589	0.568	0.430	589
Average	0.575	0.423	590	0.574	0.423	590	0.574	0.424	590

12" Yellow Ball Clear									
Sample	CRT2502170837-003-4			CRT2502170837-003-5			CRT2502170837-003-6		
Location	x	y	Dominant	x	y	Dominant	x	y	Dominant
1	0.563	0.432	589	0.562	0.433	588	0.553	0.440	587
2	0.563	0.431	589	0.563	0.432	589	0.558	0.435	588
3	0.562	0.432	589	0.560	0.434	588	0.560	0.434	588
4	0.565	0.430	589	0.563	0.432	589	0.567	0.428	589
5	0.565	0.430	589	0.563	0.432	589	0.566	0.429	589
6	0.567	0.429	589	0.566	0.430	589	0.561	0.433	588
7	0.565	0.430	589	0.565	0.430	589	0.561	0.433	588
8	0.559	0.435	588	0.557	0.436	588	0.560	0.434	588
9	0.556	0.438	588	0.555	0.438	587	0.563	0.432	589
Average	0.563	0.432	589	0.561	0.433	588	0.561	0.433	588

The color uniformity measurements meet the requirements of the referenced specification.

Measured Voltage:	120.0 - 120.3	Vac
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Complies:	☒ YES	☐ NO
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Tested By:	Brittany James	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	2, 3, 4, 5	Completion Date:	14-Mar-2025
Amb (°C):	26.2	RH%	19.2

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 Ball Tinted			
Sample	Pre Abrasion	Post Abrasion	Percentage
CRT2502170837-003-1	1082	1044	96.5%
CRT2502170837-003-2	1061	1034	97.5%
CRT2502170837-003-3	1061	1021	96.2%

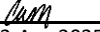
measurements in cd

12" Yellow Ball Clear			
Sample	Pre Abrasion	Post Abrasion	Percentage
CRT2502170837-003-4	1143	1118	97.8%
CRT2502170837-003-5	1108	1110	100.2%
CRT2502170837-003-6	1097	1023	93.3%

measurements in cd

Measured Voltage:	120.05	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:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	10,11,12,13,14	Completion Date:	2-Apr-2025
Amb (°C):	19	RH%	42

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 Ball			
Sample	-40°C	25°C	74°C
CRT2502170837-003-1	73.1	73.2	79.6
CRT2502170837-003-2	72.8	73.0	79.6
CRT2502170837-003-3	72.8	72.4	78.8

Label lists 9.5VA

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:	
Equipment Used:	1,7,9	Completion Date:	27-Mar-2025
Amb (°C):	NA	RH%	NA

Power Factor & Total Harmonic Distortion 6.4.6.6 & 6.4.6.7

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

Results

12" Yellow Ball						
Sample	Voltage	Current (mA)	Power (W)	Power Factor	THD V%	THD I%
CRT2502170837-003-1	120.2	73.2	8.7	0.99	1.35	5.9
CRT2502170837-003-2	120.1	73.2	8.7	0.99	1.30	5.4
CRT2502170837-003-3	120.1	72.6	8.6	0.99	1.33	5.6
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:	
Equipment Used:	7,8,9	Completion Date:	11-Mar-2025
Amb (°C):	26.3	RH%	21.6

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	O757	Spectra Scan PR740	Photo Research	30-Apr-2025
4	D589	Digital Multimeter	Fluke	22-Apr-2025
5	L282	Hygro-Thermometer	Testo	5-Apr-2025
6	L268	Tape Measure	Crescent	9-Dec-2027
7	A206	Current Transformer	Pearson	01-Jun-2025
8	L176	Thermometer	Testo	19-Jul-2025
9	M297	Power Analyzer	Yokogawa	29-May-2025
10	O109	Goniometer	Optroniks	04-Mar-2026
11	L235	25M Photocell	Instrument Systems	17-Apr-2025
12	L254	Hygrometer	Testo	03-Jun-2025
13	O091	Power Analyzer	Yokogawa	11-Jun-2025
14	F363A	Push Pull Meter	Imada	08-May-2025
15	H138	Thermal Chamber	Despatch	Used with cal'd Equip.
16	T1546	Digital Thermometer	Dickson	09-May-2025
17	O756	Flex Optometer	UDT	29-Mar-2025
Note: For measurement uncertainty, refer to the calibration certificates for all the test equipment located in the equipment files				