



Photometric Test Report

Relevant Standards

- IES LM-79-2008
- ANSI C82.77-2002
- UL1598-2008/ UL1993-2012

Prepared For **MaxLite Inc**

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Catalog Number
TRK22D23

Project Number
4788381111

Report Number
4788381111_1

Test Date
10/18/2017-10/25/2017

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3/1/2018

Prepared By

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1.0 Test Summary

DLC Technical Requirements v4.2

Requirement Category	Test Method	Requirements	Test value	Results (Fail/Pass)
Minimum Light Output (lm)	IES LM-79-2008	2000	2957.46	Pass
Minimum Lamp Output (lm)	IES LM-79-2008	N/A	N/A	N/A
Spacing Criteria (0-180°)	IES LM-79-2008	1.0-2.0	1.22	Pass
Spacing Criteria (90-270°)	IES LM-79-2008	1.0-2.0	1.3	Pass
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	72%	75.80%	Pass
Zonal Lumen Requirement 2	IES LM-79-2008	N/A	N/A	N/A
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	121.25lm/W	129.70	Pass
Minimum Lamp Efficacy (lm/ft)	IES LM-79-2008	N/A	N/A	N/A
Allowable CCTs* (K)	IES LM-79-2008	≤5000	5116	Pass
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥80	83.33	Pass
L70 Lumen maintenance (hours)	IES LM-80-2015 IES TM-21-2011	≥50000	≥50000	Pass
L90 Lumen maintenance (hours)	IES LM-80-2015 IES TM-21-2011	≥36000	≥36000	Pass
Power Factor	ANSI C82.77-2002	≥0.9	0.9459	Pass
Total Harmonic Distortion (A%)	ANSI C82.77-2002	≤20%	11.16%	Pass
In-Situ Temperature Measurement Test for LED (°C)	UL1598-2008/ UL1993-2012	≤105	36.8	Pass
In-Situ Temperature Measurement Test for Driver (°C)	UL1598-2008/ UL1993-2012	85	37.2	Pass
Minimum Luminaire Warranty (years)	N/A	5	5	Pass

*Defined by ANSI C78.377-2011‡

‡ANSI C78.377-2015 also referred to for Duv and (x,y) chromaticity coordinates tolerances for indoor categories.



2.0 Test List

Test Item	Test	Test Date	Model Number	Tests Conducted By
1	Integrating Sphere Test for the Lower CCT	10/19/2017	TRK22D2335	Elvis Wu
2	Integrating Sphere Test for the Higher CCT	10/18/2017	TRK22D2350	Elvis Wu
3	Goniophotometer Test	10/19/2017	TRK22D2335	Elvis Wu
4	THD and PF Test	10/19/2017	TRK22D2335	Elvis Wu
5	In-Situ Temperature Measurement Test	10/25/2017	TRK22D2335	Elvis Wu

Remark (if any)

1. UL test equipment information is recorded on Meter Use in UL's Aurora database.



3.0 Production Description

Luminaire Description: Integrated Retrofit Kits for 2x2 Luminaires

Model Number: TRK22D2335

Rated Voltage: 120-277V

Frequency: 50/60Hz

LED Package: SPMWH1228xxxxxxxx

Family Model and Variation: TRK22D2350

Housing Model Number: Lithonia 2GT8 2 17 A12 MVOLT GEB10IS

Photos of Luminaire Characteristics

Model Number	CCT	Light Output (lm)	Power (W)	Luminous efficacy (lm/W)
TRK22D2335	3500K	2967	23	129
TRK22D2340	4000K	2990	23	130
TRK22D2350	5000K	3013	23	131





4.0 LM-79 Measurement and Test Results

Model No.	TRK22D2335	Sample ID.	1209803
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

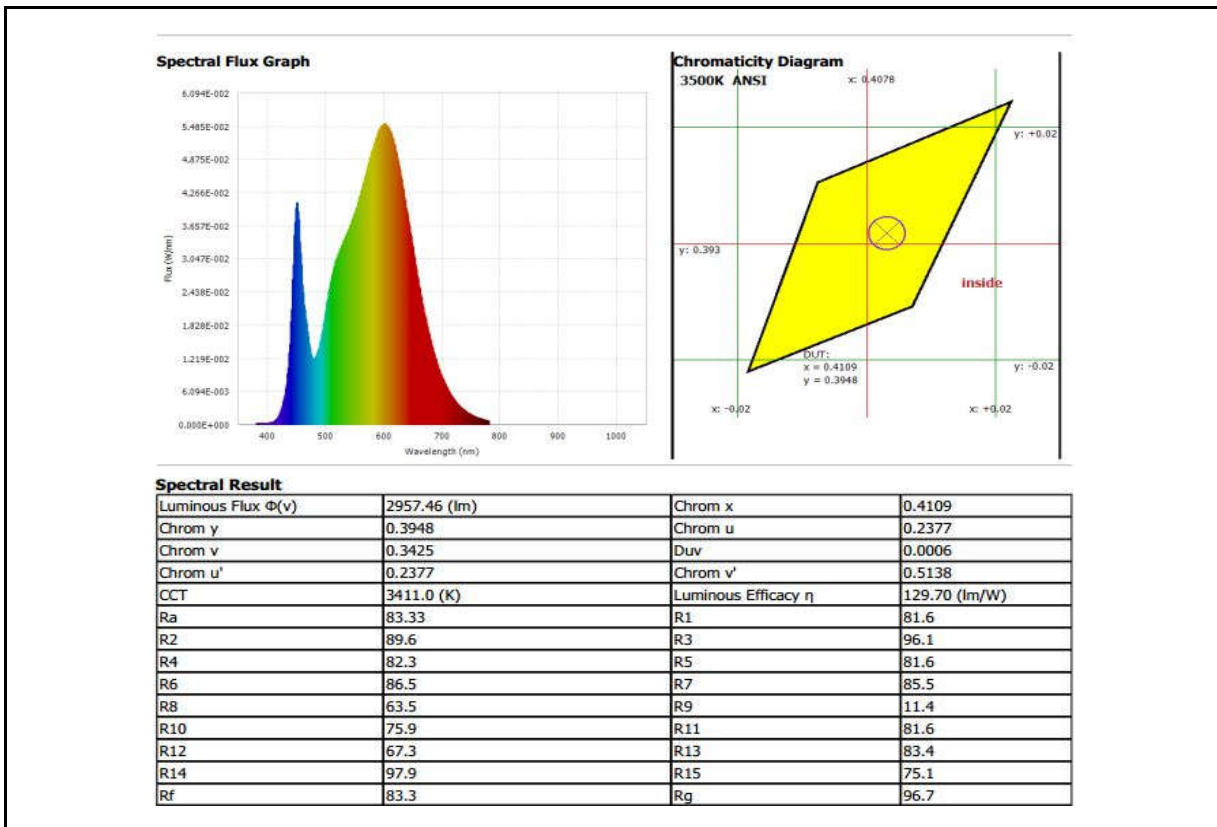
1. The sample was tested according to the IES LM-79-2008 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.
 2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° C. The reference standard lamp is rated current 2.6A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.
 3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD
25.1	119.98	60	0.192	22.802	0.9917	10.93%

Test Results

CCT (K)	CRI (Ra)	Duv	Luminous Flux (lm)	Luminous Efficacy (lm/W)	Luminous Efficacy (lm/ft)
3411	83.33	0.0006	2957.46	129.70	N/A





4.0 LM-79 Measurement and Test Results

4.2 Integrating Sphere Test for the higher CCT

Model No.	TRK22D2350	Sample ID.	1209806
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

1. The sample was tested according to the IES LM-79-2008 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.

2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The reference standard lamp is rated current 2.6A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.

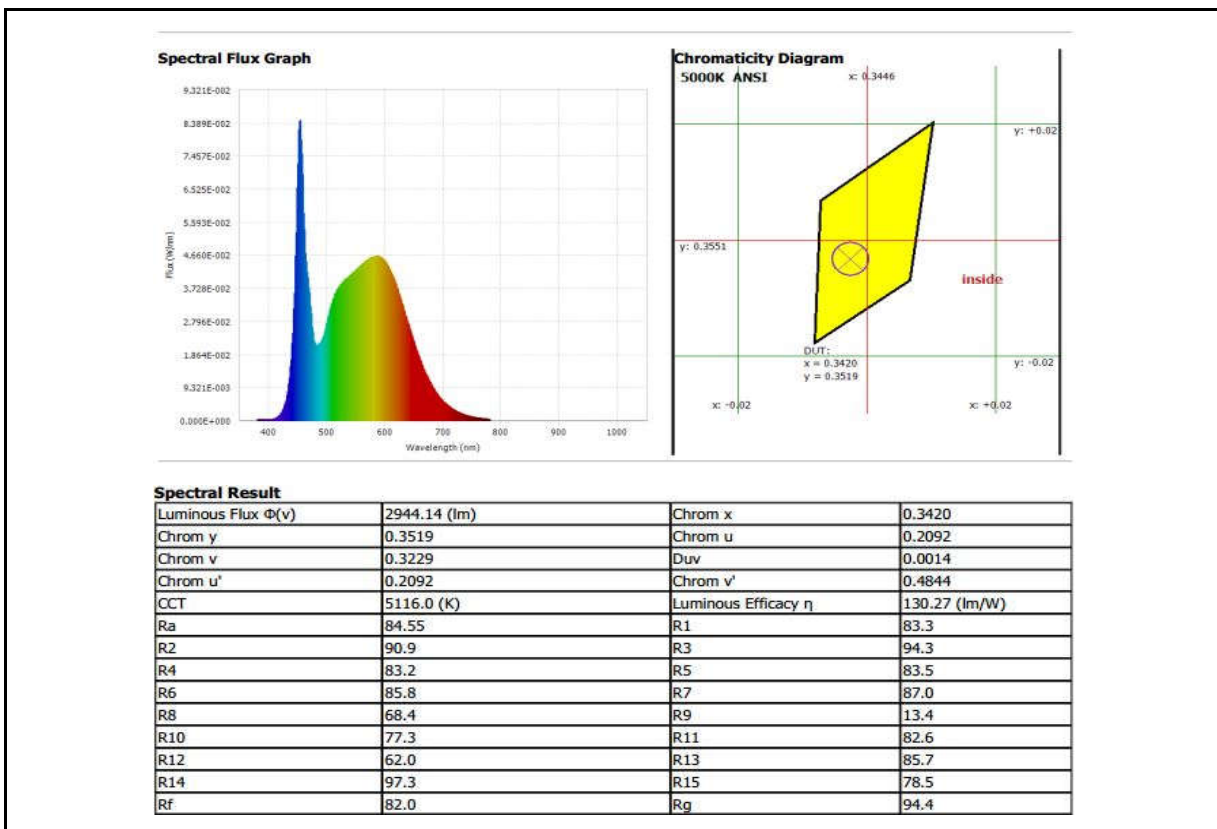
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD
25.2	120.01	60	0.1902	22.6	0.9917	10.95%

Test Results

CCT (K)	CRI (Ra)	Duv	Luminous Flux (lm)	Luminous Efficacy (lm/W)	Luminous Efficacy (lm/ft)
5116	84.55	0.0014	2944.14	130.27	N/A





5.0 LM-79 Measurement and Test Results

Model No.	TRK22D2335	Sample ID.	1209803
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

1.The sample was tested according to the IES LM-79-2008 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.
 2.Photometric paramters were measured using a type C goniophotometer and software.
 3.The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.The reference standard lamp is rated current 3.865A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.
 4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 22.5° horizontal intervals..Photometric distance was more than five times of the largest dimension of the test SSL product.

Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.01	60	0.19155	22.795	0.9917	Horizontal

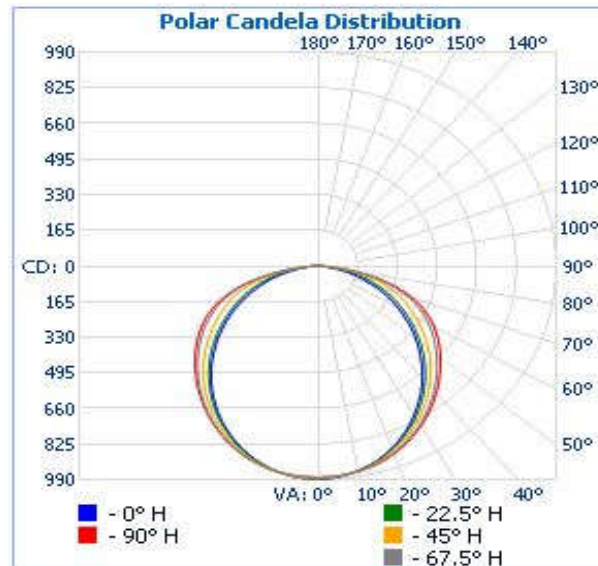
Test Result

Flux (lm)	Zonal Lumen Requirement (0°-60°)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
2965.8	75.8%	166.3	158.8	129.4	106.4	130.11
SC	SC					
0~180°	90°~270°					
1.22	1.3					

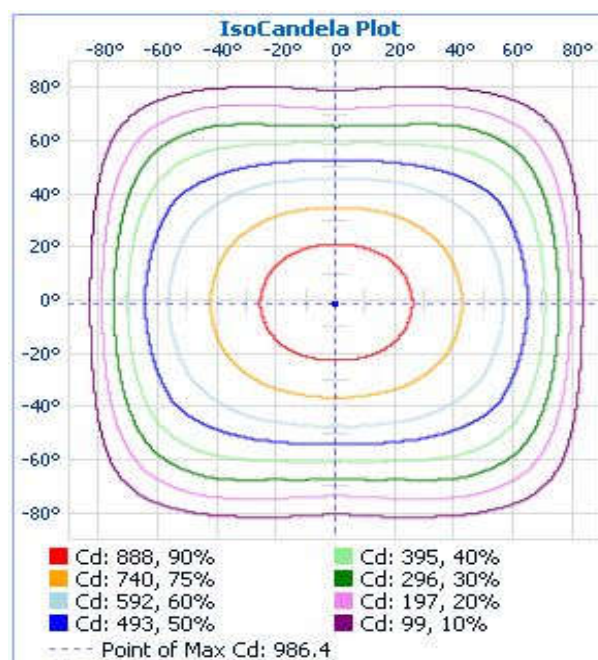


5.2 Goniophotometer Test (Cont'd)

Light Distribution Curve



IsoCandela Plot





5.2 Goniophotometer Test (Cont'd)

Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	763.4	25.7%
0-40	1,252.1	42.2%
0-60	2,248.9	75.8%
60-90	716.6	24.2%
70-100	316.8	10.7%
90-120	0	0%
0-90	2,965.5	100%
90-180	0	0%
0-180	2,965.5	100%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	23.4	0.8%	90-95	0	0%
5-10	69.5	2.3%	95-100	0	0%
10-15	113.3	3.8%	100-105	0	0%
15-20	153.2	5.2%	105-110	0	0%
20-25	187.8	6.3%	110-115	0	0%
25-30	216.1	7.3%	115-120	0	0%
30-35	237.4	8.0%	120-125	0	0%
35-40	251.2	8.5%	125-130	0	0%
40-45	257.6	8.7%	130-135	0	0%
45-50	256.5	8.7%	135-140	0	0%
50-55	248.5	8.4%	140-145	0	0%
55-60	234.1	7.9%	145-150	0	0%
60-65	213.7	7.2%	150-155	0	0%
65-70	186.2	6.3%	155-160	0	0%
70-75	149.9	5.1%	160-165	0	0%
75-80	104.2	3.5%	165-170	0	0%
80-85	53.1	1.8%	170-175	0	0%
85-90	9.5	0.3%	175-180	0	0%



5.2 Goniophotometer Test (Cont'd)

Intensity Data(cd)

	0	22.5	45	67.5	90	113	135	158	180	203	225	247.5	270	293	315	338	360
0	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982
1	986	984	983	978	978	979	983	984	986	984	983	979	978	978	983	984	986
2	985	984	982	978	979	984	984	985	984	984	984	979	979	978	982	984	985
3	985	982	982	978	978	978	981	984	984	984	981	978	978	978	982	982	985
4	982	981	980	978	977	978	981	982	984	982	981	978	977	978	980	981	982
5	980	979	978	976	976	977	980	981	981	981	980	977	976	976	978	979	980
6	978	977	976	974	975	977	978	979	980	979	978	977	975	974	976	977	978
7	974	974	974	973	972	975	977	977	978	977	977	975	972	973	974	974	974
8	971	971	971	970	971	973	973	973	973	973	973	973	971	970	971	971	971
9	965	967	968	968	968	969	971	970	971	970	971	969	968	968	968	967	965
10	962	964	965	965	966	967	968	966	967	966	968	967	966	965	965	964	962
11	957	959	961	962	964	964	964	963	962	963	964	964	964	962	961	959	957
12	952	955	957	959	960	961	961	958	958	958	961	961	960	959	957	955	952
13	948	951	952	954	957	958	957	953	952	953	957	958	957	954	952	951	948
14	942	944	948	951	954	954	952	947	947	947	952	954	954	951	948	944	942
15	936	938	943	947	950	950	947	942	940	942	947	950	950	947	943	938	936
16	928	931	937	942	945	945	942	937	935	937	942	945	945	942	937	931	928
17	923	925	932	937	940	939	937	930	927	930	937	939	940	937	932	925	923
18	914	919	926	932	937	934	931	924	920	924	931	934	937	932	926	919	914
19	906	912	920	927	930	931	925	916	912	916	925	931	930	927	920	912	906
20	899	904	911	920	926	924	918	909	905	909	918	924	926	920	911	904	899
25	852	860	874	887	893	892	881	868	861	868	881	892	893	887	874	860	852
30	799	811	828	847	856	852	837	819	810	819	837	852	856	847	828	811	799
35	738	755	777	800	813	807	787	763	752	763	787	807	813	800	777	755	738
40	674	692	721	752	766	758	732	702	689	702	732	758	766	752	721	692	674
45	605	627	662	699	715	704	672	638	620	638	672	704	715	699	662	627	605
50	534	556	598	644	666	650	609	567	548	567	609	650	666	644	598	556	534
55	460	484	534	588	612	593	544	495	473	495	544	593	612	588	534	484	460
60	382	411	469	531	556	535	478	422	397	422	478	535	556	531	469	411	382
65	306	338	404	464	490	470	412	349	320	349	412	470	490	464	404	338	306
70	228	265	332	386	408	390	340	275	243	275	340	390	408	386	332	265	228
75	153	192	249	288	302	292	257	202	167	202	257	292	302	288	249	192	153
80	85	119	152	170	177	174	160	127	97	127	160	174	177	170	152	119	85
85	29	44	52	52	54	57	59	50	38	50	59	57	54	52	52	44	29
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



6.0 THD and PF Test

Model No.	TRK22D2335	Sample ID.	1209803
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Test Method

1. The samples were tested according to the ANSI C82.77-2002 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.
2. The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD
25.2	276.99	60	0.0855	22.401	0.9459	11.16%



7.0 In-Situ Temperature Measurement Test

Model No.	TRK22D2335	Sample ID.	1209803
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Test Method

1. In-Situ Temperature Measurement Test is conducted according to the UL1598-2008, Section 14 or UL1993-2012, Section 8.5 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.

2. The testing was conducted in a room with ambient temperature of 25°C ± 5°C. The apparatus construction followed those described in UL1598-2008 for normal temperature testing. Thermocouples were placed on the LED package in the locations indicated by LM-80 report. The temperature was recorded after the lamp was operated by 3.5 hours in stability or by 7.5 hours.

In-Situ Temperature Measurement Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.8	119.98	60	0.192	22.80	0.9917	Horizontal

Test Results(LED)

Thermocouple Location	Manufacturer Declared Current (mA)	Temperature for Lighting source (°C)		LED Model Number	LM-80 Limit Current (mA)	LM-80 Limit Temp. (°C)
		Test result column 1	Test result (Correct to 25 °C)			
TMP of LEDs	65	36.6	36.8	SPMWH1228xxx	120	85
Ambient temperature	N/A	24.8	25.0	xxxxxx		

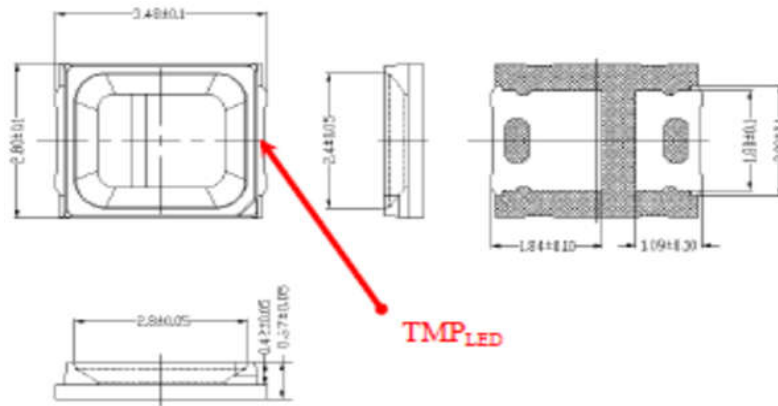
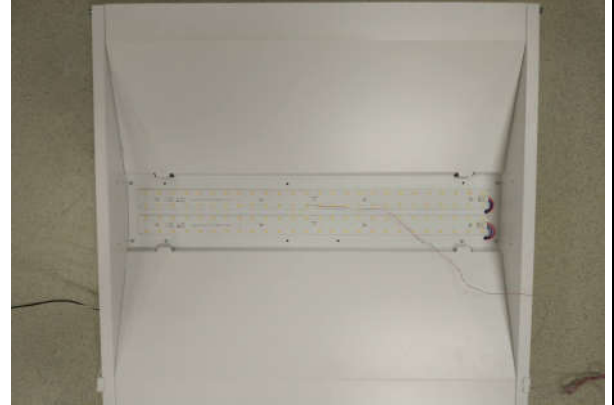
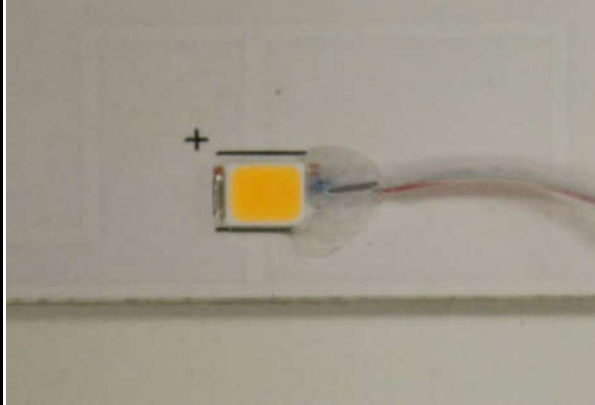
Test Results(Driver)

Thermocouple Location	Temperature for Driver (°C)		Driver Model Number	Driver Limit Temp. (°C)
	Test result column 1	Test result (Correct to 25 °C)		
TMP of Driver	37.0	37.2	SI50-I540 120-277 W D1 P	85
Ambient temperature	24.8	25.0		



7.0 In-Situ Temperature Measurement Test (Cont'd)

Test Photos for Tc Point of LED Packages





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