



DLC V4.1 TEST REPORT

Applicant's name: P.Q.L., Inc.

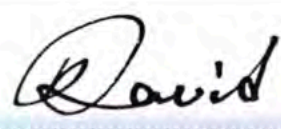
Address: 2285 Ward Avenue, Simi Valley, CA 93065

Brand Name.....: SUPERIOR LIFE®

Report No......: BTR66.181.16.0012.30

Product Name: Outdoor Wall-mounted Area Luminaires

Basic Model: 83339, 83340

Tested by
(printed name and signature): David Zhang 

Title: **Test Engineer**

Approved by
(printed name and signature): Steven Huo 

Title: **Approved Signatory**

Date of issue: Dec 30, 2016

Testing Laboratory Name: BEST Test Service Shenzhen Co., Ltd.

Address: 1st Floor, 1st Building, Weitai Industrial Park, Yingrenshi, Shiyan, Baoan, Shenzhen, China
TEL: + 86-755-28236006; FAX: + 86-755-23467087
Email: certification@bestcert.cn

Accreditation: DLC/Lighting Facts/UL/ETL/ELI/CEC/EPA/DOE
NVLAP Testing Lab Code: 200770-0

Test specification

Standard: DLC V4.1

Test procedure: DLC Test Procedure

Non-standard test method: No

Test Report Form No.: BEST_DLC-V4.1

TRF originator.....: BEST Test Service Shenzhen Co., Ltd. Mr Tseng

Master TRF: BEST_DLC V4.1.doc

Note:
This report is not valid as a BEST Test Report unless signed by an approved BEST Test Service Shenzhen Co., Ltd. This report shall not be reproduced except in full without the written approval of the testing laboratory. The test report only allows to be revised within the retention period unless further standard or the requirement was noticed. This report is for the exclusive use of BEST's Client and is provided pursuant to the agreement between BEST and its Client. BEST's responsibility and Liability are limited to the terms and conditions of the agreement. BEST assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the BEST name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by BEST. The observations and test results in this report are relevant only to the sample tested. This report by itself does not cover that the material, product, of service is or has ever been under a BEST certification program. National Voluntary Laboratory Accreditation Program (NVLAP) has accredited this laboratory under ISO17025: 2005 for specific laboratory activities as listed in the NVLAP directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation. This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

Product description:		
Sample received date	Nov 30, 2016	
Sample Quantity	1 pcs per model	
Model Number	83339; 83340	
Rating(s) (V; Hz)	120-277VAC 50/60HZ	
Nominal Power.....	120W	
Nominal Power Factor	N/A	
Nominal Lumen Output.....	13440lm; 13560lm	
Nominal CCT	4000K; 5000K	
Nominal CRI(Ra)	80	
Nominal Life	50000H	
Product Classification	<input type="checkbox"/> Premium	<input checked="" type="checkbox"/> Standard
Category	<input type="checkbox"/> Indoor	<input type="checkbox"/> Indoor Retrofit Kit
	<input checked="" type="checkbox"/> Outdoor	<input type="checkbox"/> Outdoor Retrofit Kit
	<input type="checkbox"/> Linear Replacement Lamp	<input type="checkbox"/> E39 Replacements for HID Lamps
	<input type="checkbox"/> Four Pin-Base Replacement Lamps for CFLs	
General Applicant	Outdoor –high Output	
Primary use.....	Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires	
Dimmable	<input checked="" type="checkbox"/> Yes,	<input type="checkbox"/> No
If Yes, Select Dimming Mechanism ...:	<input checked="" type="checkbox"/> Continuous dimming,	<input type="checkbox"/> Step dimming
If Yes, Mini Dimming Level	10%	
Integral Controller	<input checked="" type="checkbox"/> Yes,	<input type="checkbox"/> No
LED Lighting Source Manufacture	LUMILEDS	
LED Lighting Source Model	LUXEON 3030 2D	
LED Driver Brand.....	N/A	
LED Driver Model Number.....	N/A	
Maximum Recommended Temperature (°C) During Normal Operation	N/A	
Fixtures Band (Retrofit Kit/Lamp Only)	N/A	
Fixtures Model No. (Retrofit Kit/Lamp Only)	N/A	

Test Method Description

ANSI C78.376-2001 Specifications for the Chromaticity of Fluorescent Lamps
 ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products
 ANSI/NEMA/ANSLG C78.377-2011 Specifications for the Chromaticity of Solid State Lighting Products
 ANSI C78.5-2003 Specifications for Performance of Self-ballasted Compact Fluorescent Lamps
 ANSI/ANSLG C78.81-2010 Double-Capped Fluorescent Lamps—Dimensional and Electrical Characteristics
 ANSI C78.901-2014 Single-Based Fluorescent Lamps—Dimensional and Electrical Characteristics
 ANSI/ANSLG C81.61-2009 Specifications for Bases (Caps) for Electric Lamps
 ANSI/ANSLG C81.62-2009 Lamp holders for Electric Lamps
 ANSI C82.11-2011 High-Frequency Fluorescent Lamp Ballasts
 ANSI/ANSLG C82.16-2015 (anticipated) Light Emitting Diode Drivers—Methods of Measurement
 ANSI C82.2-2002 Method of Measurement of Fluorescent Lamp Ballasts
 ANSI C82.77-10:2014 Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
 ANSI/IEEE C62.41.1-2002 IEEE Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits
 ANSI/IEEE C62.41.2-2002 IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000V and Less) AC Power Circuits
 ANSI/UL 153-2002 Standard for Safety of Portable Electric Luminaires
 ANSI/UL 935-2009 Standard for Safety of Fluorescent-Lamp Ballasts
 ANSI/UL 1310-2010 Standard for Safety of Class 2 Power Units
 ANSI/UL 1574-2004 Standard for Safety of Track Lighting Systems
 ANSI/UL 1598-2008 Standard for Safety of Luminaires
 ANSI/UL 1598C Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits
 ANSI/UL 1598B-2010 Standard for Supplemental Requirements for Luminaire Reflector Kits for Installation on Previously Installed Fluorescent Luminaires
 ANSI/UL 1993-2009 Standard for Safety of Self-Ballasted Lamps and Lamp Adapters
 ANSI/UL 2108-2004 Standard for Low-Voltage Lighting Systems
 ANSI/UL 8750-2009 Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products
 ASTM E283-04 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
 CIE Pub. No. 13.3-1995 Method of Measuring and Specifying Color Rendering of Light Sources
 CIE Pub. No. 15:2004 Colorimetry
 EU Directive 2002/95/EC Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the Restriction of the Use of Certain Hazardous Substances In Electrical and Electronic Equipment
 FCC CFR Title 47 Part 15 Radio Frequency Devices
 FCC CFR Title 47 Part 18 Industrial, Scientific, and Medical Equipment
 IEC 60061-1 (2012) Lamp Caps and Holders Together with Gauges for the Control of Interchangeability and Safety – Part 1: Lamp Caps
 IEC 60081 Amend 4 Ed 5.0 (2010) Double-capped Fluorescent Lamps - Performance Specifications
 IEC 60901 (2011) Single-capped Fluorescent Lamps - Performance Specifications
 IEC 62301 ED.2.0 B:2011 Household electrical appliances - Measurement of standby power
 IEC 61347-2-3-am2 ed1.0 b.2011 Amendment 2 - Lamp Control Gear - Part 2-3: Particular Requirements for A.C. Supplied Electronic Ballasts for Fluorescent Lamps
 IEC 62321 Ed. 1.0 Electrotechnical Products - Determination Of Levels Of Six Regulated Substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)
 IEEE PAR1789 IEEE Recommending Practices for Modulating Current in High Brightness LEDs for Mitigating Health Risks to Viewers
 IES LM-9-09 Electric and Photometric Measurements of Fluorescent Lamps
 IES LM-10-96 or LM-10-XX Photometric Testing of Outdoor Fluorescent Luminaires (2015 update anticipated)
 IES LM-31-95 Photometric Testing of Roadway Luminaires Using Incandescent Filament and High Intensity Discharge (HID) Lamps
 IES LM-40-10 Life Testing of Fluorescent Lamps
 IES LM-41-14 Approved Method for Photometric Testing of Indoor Fluorescent Luminaires
 IES LM-46-04 Photometric Testing of Indoor Luminaires Using High Intensity Discharge or Incandescent Filament Lamps
 IES LM-49-12 Life Testing of Incandescent Filament Lamps
 IES LM-58-13 Method for Spectroradiometric Measurement Methods for Light Sources
 IES LM-65-14 Life Testing of Compact Fluorescent Lamps
 IES LM-66-14 Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps
 IES LM-79-08 Electrical and Photometric Measurements of Solid-State Lighting Products
 IES LM-80-08 Measuring Lumen Maintenance of LED Light Sources
 IES LM-82-12 Method for the Characterization of LED Light Engines and Integrated LED Lamps for Electrical and Photometric Properties as a Function of Temperature
 IES LM-84-14 Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires
 IES RP-16-10 Nomenclature and Definitions for Illuminating Engineering
 IES TM-21-11 Projecting Long Term Lumen Maintenance of LED Sources
 IES TM-28-14 Projecting Long-Term Luminous Flux Maintenance of LED Lamps and Luminaires
 NEMA LL 9-2009 Dimming of T8 Fluorescent Lighting Systems
 NEMA LSD 45-2009 Recommendations for Solid State Lighting Sub-Assembly Interfaces for Luminaires
 NEMA SSL 7A-2013 Phase Cut Dimming for Solid State Lighting: Basic Compatibility

Initial Photometric and Electrical Test Data

EUT	Input Voltage (V)	Frequency (Hz)	Input Current (A)	ITHD	Input Power (W)	Power Factor	Lumen Output (Lumens)	Efficiency Lumen/w
83339	120.0	60.0	0.997	8.6%	118.70	0.992	13616.40	114.71
83339	277.0	60.0	0.468	16.5%	118.50	0.914	/	/

EUT	CCT (K)	CRI Ra	R9	x CIE1931	y CIE1931
83339	4119	75.9	-15	0.3752	0.3731
83340	5203	78.7	-5	0.3397	0.3486

EUT	u' CIE1976	v' CIE1976	Duv	Rf	Rg
83339	0.2231	0.4992	-0.0002	74	91
83340	0.2090	0.4824	0.0007	76	93

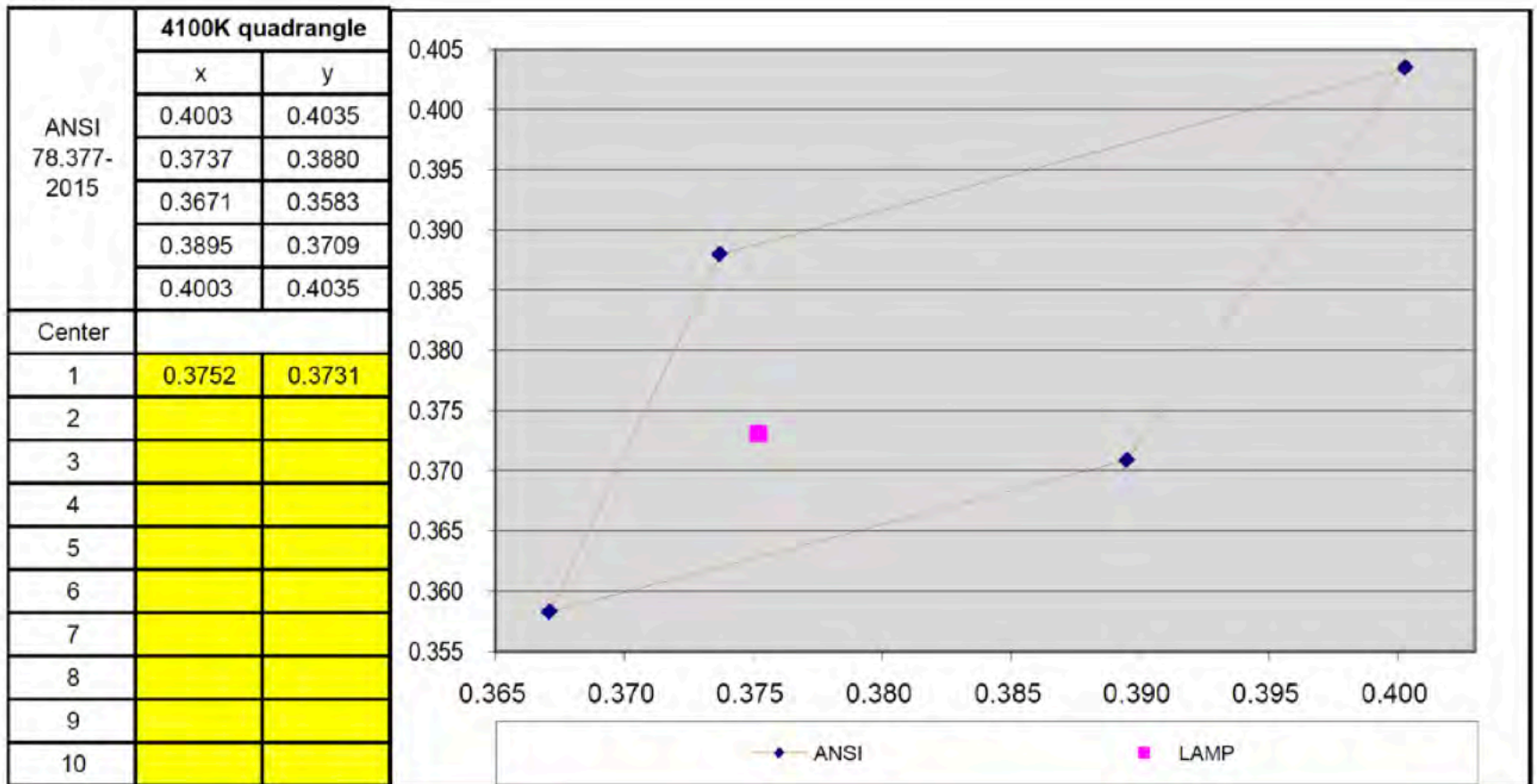
EUT	Lumen Output (Lumens)*	Efficiency (Lumen/w)*	Zonal Lumen Density zone (80-90°)*
83339	11900	100.25	10.8% (3% tolerance)

Note:

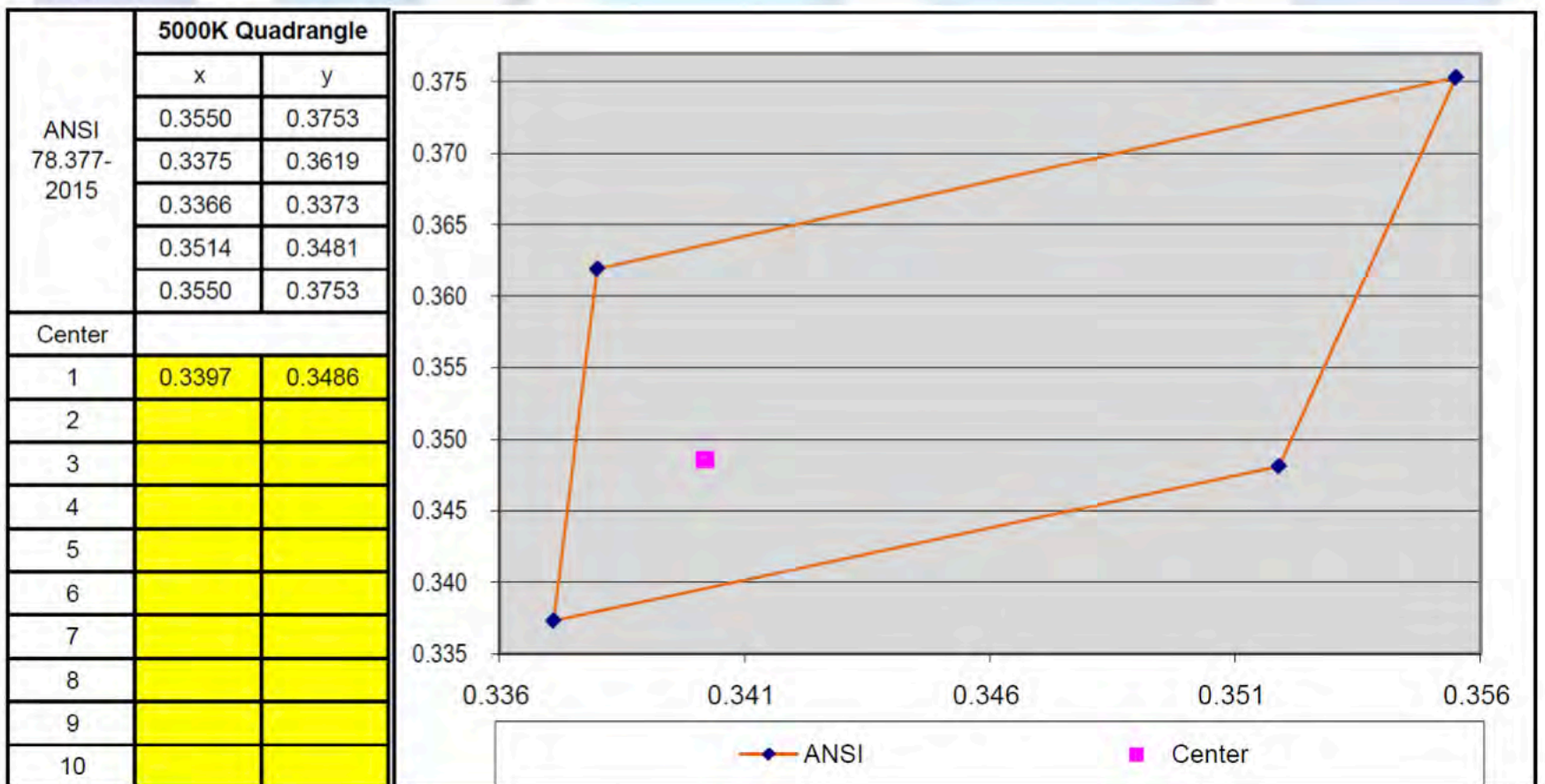
- * evaluated based on the lumens in the 0-90° zone
- See the annex of Luminous Intensity Distribution Test Plots

7 Step Quadrangle

83339



83340



Spectral Energy Distribution

83339

WL(nm)	Spectrum	Spectrum	WL(nm)	Spectrum	Spectrum
380	0.0155	3.5350	585	0.8853	201.4000
385	0.0110	2.4990	590	0.8768	199.5000
390	0.0086	1.9470	595	0.8602	195.7000
395	0.0071	1.6180	600	0.8376	190.6000
400	0.0071	1.6080	605	0.8072	183.6000
405	0.0085	1.9390	610	0.7706	175.3000
410	0.0128	2.9170	615	0.7280	165.6000
415	0.0239	5.4380	620	0.6823	155.3000
420	0.0467	10.6300	625	0.6330	144.0000
425	0.0839	19.0900	630	0.5826	132.6000
430	0.1409	32.0700	635	0.5320	121.1000
435	0.2260	51.4300	640	0.4830	109.9000
440	0.3410	77.5800	645	0.4348	98.9300
445	0.5044	114.8000	650	0.3898	88.6800
450	0.7304	166.2000	655	0.3490	79.4000
455	0.9591	218.2000	660	0.3121	71.0100
460	0.9609	218.6000	665	0.2778	63.2000
465	0.7195	163.7000	670	0.2464	56.0600
470	0.5230	119.0000	675	0.2186	49.7400
475	0.4005	91.1300	680	0.1931	43.9400
480	0.3007	68.4200	685	0.1695	38.5600
485	0.2360	53.6900	690	0.1492	33.9500
490	0.2182	49.6400	695	0.1303	29.6400
495	0.2261	51.4400	700	0.1133	25.7900
500	0.2576	58.6100	705	0.0994	22.6300
505	0.3094	70.4000	710	0.0865	19.6900
510	0.3745	85.2100	715	0.0754	17.1600
515	0.4395	100.0000	720	0.0655	14.9100
520	0.4785	108.9000	725	0.0570	12.9700
525	0.5514	125.4000	730	0.0498	11.3200
530	0.6062	137.9000	735	0.0427	9.7160
535	0.6477	147.4000	740	0.0377	8.5670
540	0.6881	156.6000	745	0.0326	7.4070
545	0.7219	164.3000	750	0.0283	6.4310
550	0.7579	172.4000	755	0.0249	5.6670
555	0.7920	180.2000	760	0.0217	4.9480
560	0.8200	186.6000	765	0.0191	4.3560
565	0.8452	192.3000	770	0.0166	3.7820
570	0.8678	197.5000	775	0.0147	3.3450
575	0.8794	200.1000	780	0.0137	3.1120
580	0.8868	201.8000			

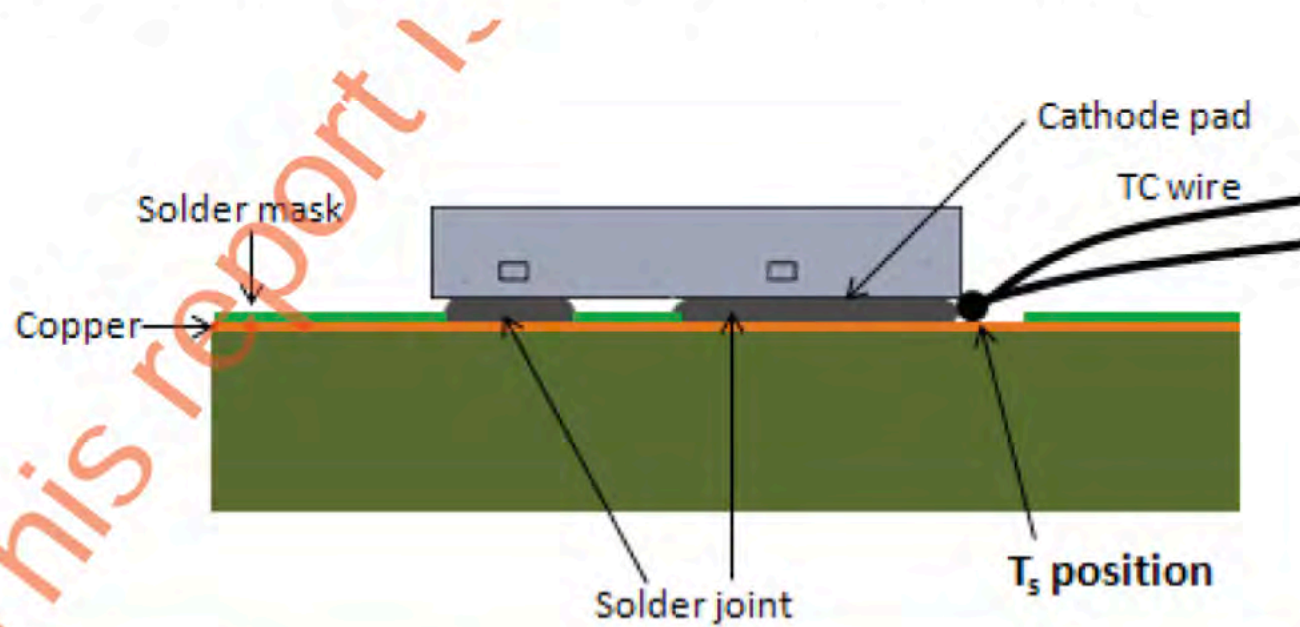
83340

WL(nm)	Spectrum	Spectrum	WL(nm)	Spectrum	Spectrum
380	0.0156	3.4670	585	0.6011	133.7000
385	0.0112	2.4810	590	0.5898	131.2000
390	0.0082	1.8160	595	0.5742	127.7000
395	0.0069	1.5240	600	0.5553	123.5000
400	0.0062	1.3750	605	0.5314	118.2000
405	0.0077	1.7110	610	0.5046	112.2000
410	0.0130	2.8810	615	0.4749	105.6000
415	0.0247	5.4900	620	0.4449	98.9400
420	0.0460	10.2200	625	0.4134	91.9300
425	0.0859	19.1000	630	0.3795	84.4000
430	0.1542	34.3000	635	0.3480	77.3800
435	0.2580	57.3600	640	0.3165	70.3700
440	0.4004	89.0300	645	0.2858	63.5400
445	0.6022	133.9000	650	0.2564	57.0100
450	0.8665	192.7000	655	0.2309	51.3500
455	0.9978	221.9000	660	0.2068	45.9800
460	0.8269	183.9000	665	0.1839	40.9000
465	0.5849	130.1000	670	0.1648	36.6400
470	0.4323	96.1300	675	0.1460	32.4600
475	0.3211	71.4100	680	0.1293	28.7600
480	0.2427	53.9600	685	0.1143	25.4100
485	0.2067	45.9700	690	0.1009	22.4500
490	0.2030	45.1300	695	0.0891	19.8100
495	0.2212	49.2000	700	0.0781	17.3600
500	0.2582	57.4200	705	0.0684	15.2200
505	0.3075	68.3900	710	0.0597	13.2800
510	0.3611	80.3000	715	0.0523	11.6200
515	0.4095	91.0700	720	0.0458	10.1900
520	0.4318	96.0200	725	0.0399	8.8770
525	0.4836	107.5000	730	0.0349	7.7610
530	0.5172	115.0000	735	0.0308	6.8410
535	0.5393	119.9000	740	0.0266	5.9060
540	0.5599	124.5000	745	0.0234	5.2000
545	0.5743	127.7000	750	0.0207	4.5920
550	0.5894	131.1000	755	0.0179	3.9850
555	0.6008	133.6000	760	0.0162	3.6090
560	0.6086	135.3000	765	0.0139	3.0970
565	0.6151	136.8000	770	0.0123	2.7290
570	0.6175	137.3000	775	0.0109	2.4330
575	0.6161	137.0000	780	0.0102	2.2650
580	0.6100	135.6000			

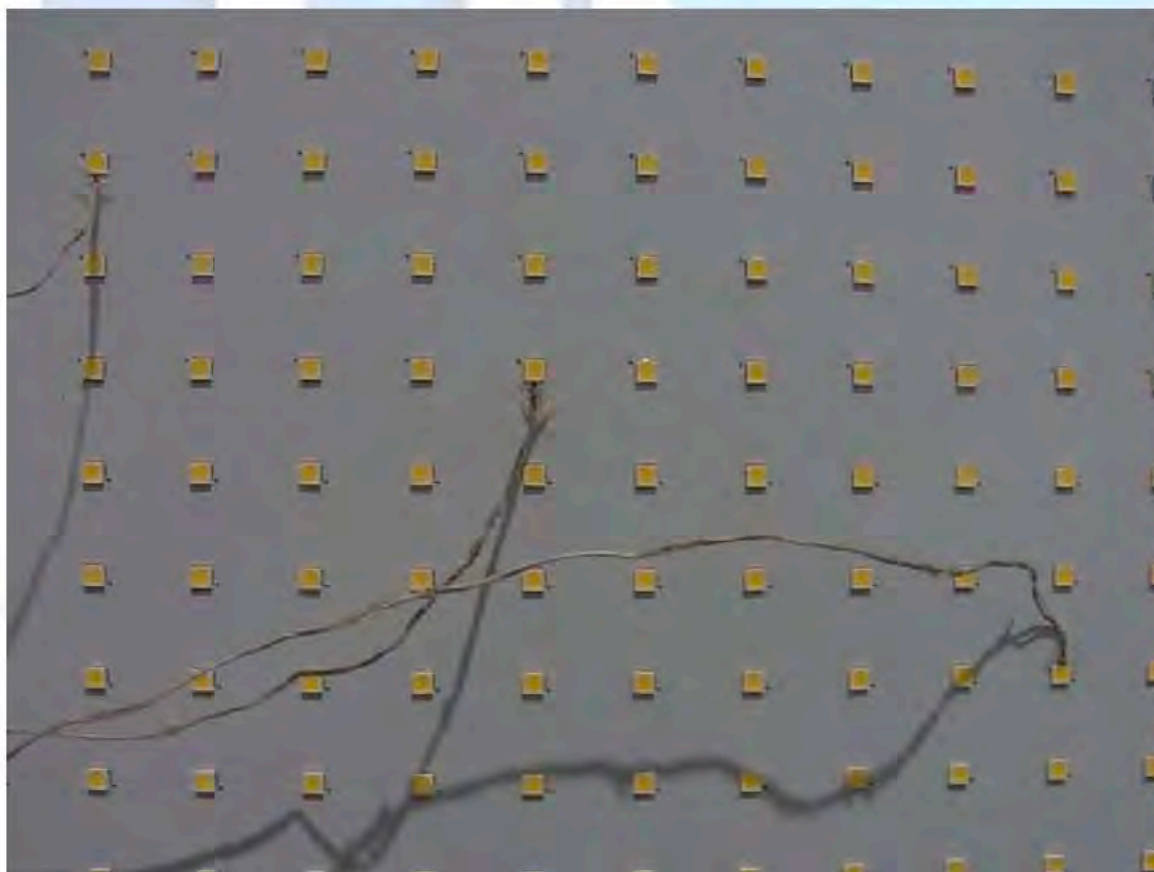
Driver Case Temperature/ LED Drive Current/TMP_{LED} Test Data

EUT	Driver Max T _c (°C)	Driver In-Situ Temperature (°C)	LED In-Situ Current (mA)	LED In-Situ Temperature (°C)(1#)	LED In-Situ Temperature (°C)(2#)	LED In-Situ Temperature (°C)(3#)
83339	N/A	N/A	105.4	91.4	96.7	93.1

LED Lighting Source Temperature Measurement Point in LM-80 Report



LED Lighting Source In Situ Temperature Measurement



TOP: LED 02



Lumen Maintenance and Lighting Source Life Test Data

L70

TM-21 Inputs

Instructions

Yellow fields are completed by the user. Fields not used should be left blank. Cyan fields are calculated based on user entries.

First, enter a description of the LED light source tested. Then complete the fields labeled "LM-80 Testing Details". Test duration must be at least 6,000 hours. If only one case temperature data set is to be used (no interpolation), complete only "Tested case temperature 1". For only two case temperature data sets, complete 1 and 2.

Next, further to the right, in the corresponding box(es) for each tested case temperature, enter the test data along with the time (in hours) at which each measurement was taken. Data entered must be normalized then averaged measured data (per TM-21 sections 5.2.1 and 5.2.2). If case temperatures have different test durations, enter data up to the lowest of the test durations for all of the case temperatures.

Enter drive current, *in-situ* temperature data and the percentage of initial lumens to project to in the fields labeled "In-Situ Inputs".

Results can be tailored to estimate lumen maintenance at a specific time by entering a value (t) in the yellow field. A complete TM-21 report will appear on the next tab labeled "Report".

LM-80 Test Inputs

Description of LED Light Source Tested (manufacturer, model, catalog number)	Test Data for 55°C Case Temperature		Test Data for 85°C Case Temperature		Test Data for 105°C Case Temperature	
Philips Lumileds, LUXEON 3030 2D	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)
	0	100.00%	0	100.00%	0	100.00%
	1000	99.26%	1000	98.97%	1000	98.91%
	2000	98.64%	2000	98.43%	2000	98.15%
	3000	98.36%	3000	98.01%	3000	97.68%
	4000	97.69%	4000	97.28%	4000	96.74%
	5000	97.25%	5000	96.71%	5000	96.27%
	6000	96.81%	6000	96.24%	6000	95.73%
	7000	96.34%	7000	95.77%	7000	95.36%
	8000	95.84%	8000	95.66%	8000	95.25%
	9000	95.49%	9000	95.19%	9000	94.56%

LM-80 Testing Details

Total number of units tested per case temperature:	20
Number of failures:	0
Number of units measured:	20
Test duration (hours):	6000
Tested drive current (mA):	165
Tested case temperature 1 (T _c , °C):	55
Tested case temperature 2 (T _c , °C):	85
Tested case temperature 3 (T _c , °C):	105

In-Situ Inputs

Drive current for each LED package/array/module (mA):	105.4
In-situ case temperature (T _c , °C):	96.7
Percentage of initial lumens to project to (e.g. for L ₇₀ , enter 70):	70

Results

Time (t) at which to estimate lumen maintenance (hours):	50,000
Lumen maintenance at time (t) (%):	76.28%
Reported L70 (hours):	>36000

EUT Photo

