



### 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.**.....: BTR66.181.16.0027.50

**Product Name**.....: WALLPACK FIXTURE

**Basic Model** .....: 83621, 83622

**Tested by**  
(printed name and signature) .....: David Zhang  
**Title** .....: **Test Engineer** *David*

**Approved by**  
(printed name and signature) .....: Steven Huo  
**Title** .....: **Approved Signatory** *[Signature]*

**Date of issue** .....: Apr 18, 2017

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

**Address** .....: 1<sup>st</sup> Floor, 1<sup>st</sup> Building, Weitai Industrial Park, Yingrenshi, Shiyan, Baoan, Shenzhen, China  
 TEL: + 86-755-28236006; FAX: + 86-755-23467087  
 Email: [certification@bestcert.cn](mailto: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

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<b>Product description:</b>	
Sample received date .....	Apr 10, 2017
Sample Quantity .....	1 pcs per model
Model Number .....	83621, 83622
Rating(s) (V; Hz) .....	120-277VAC 50/60HZ
Nominal Power.....	30W
Nominal Power Factor .....	N/A
Nominal Lumen Output.....	3360lm; 3450lm
Nominal CCT .....	4000K; 5000K
Nominal CRI(Ra) .....	≥70
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 –Low Output
Primary use .....	Outdoor Full-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
83361	120.0	60.0	0.234	11.4%	27.75	0.990	3188.17	114.88
83361	277.0	60.0	0.113	9.5%	28.30	0.908	/	/

EUT	CCT (K)	CRI Ra	R9	x CIE1931	y CIE1931
83361	4041	73.9	-17	0.3769	0.3689
83362	5191	74.8	-15	0.3399	0.3458

EUT	u' CIE1976	v' CIE1976	Duv	Rf	Rg
83361	0.2259	0.4975	-0.0027	72	95
83362	0.2101	0.4810	-0.0008	72	95

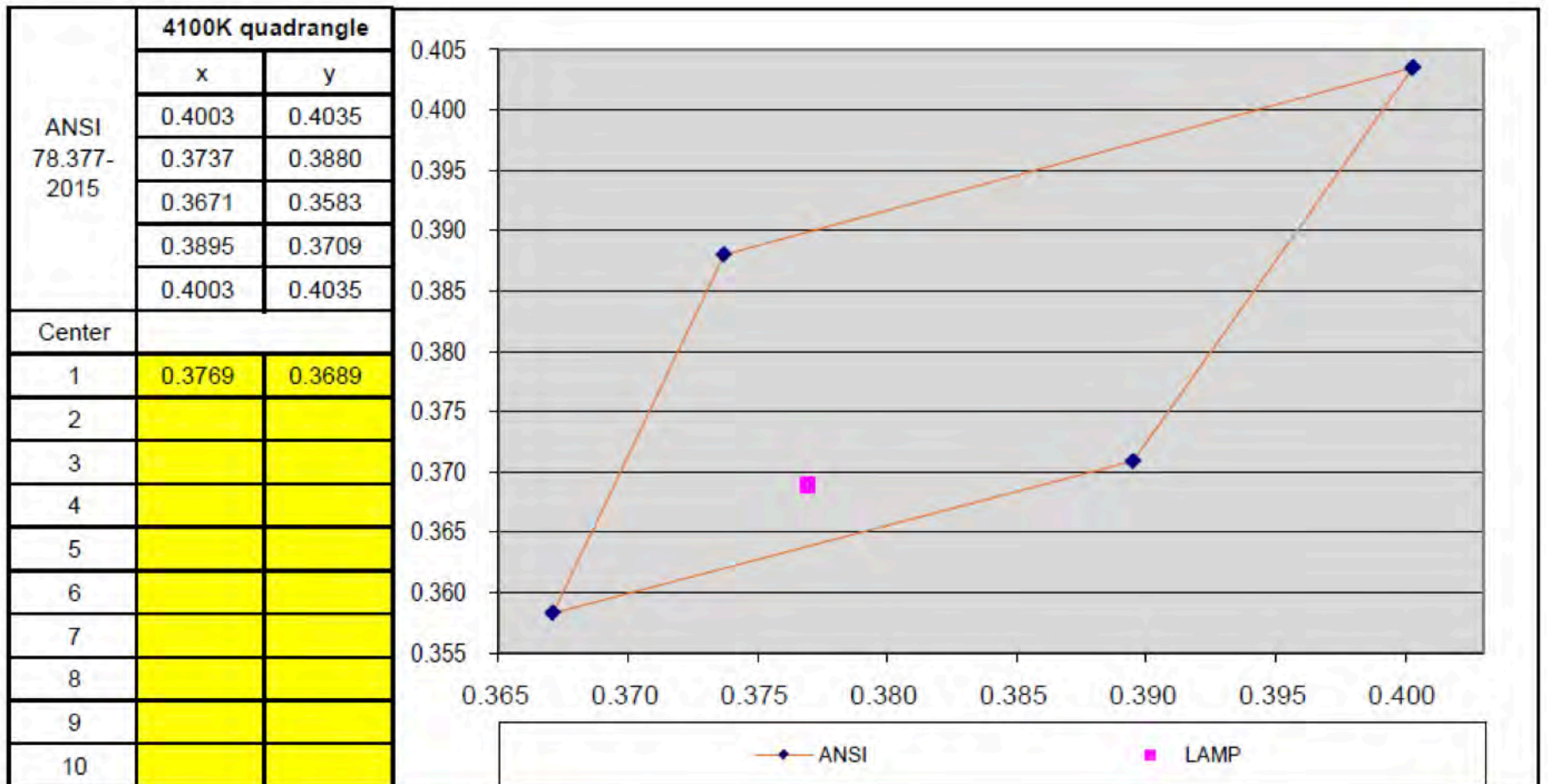
EUT	Zonal Lumen Density zone (0-90°)	Zonal Lumen Density zone (80-90°)*
83361	99.9% (3% tolerance)	0.7%

**Note:**

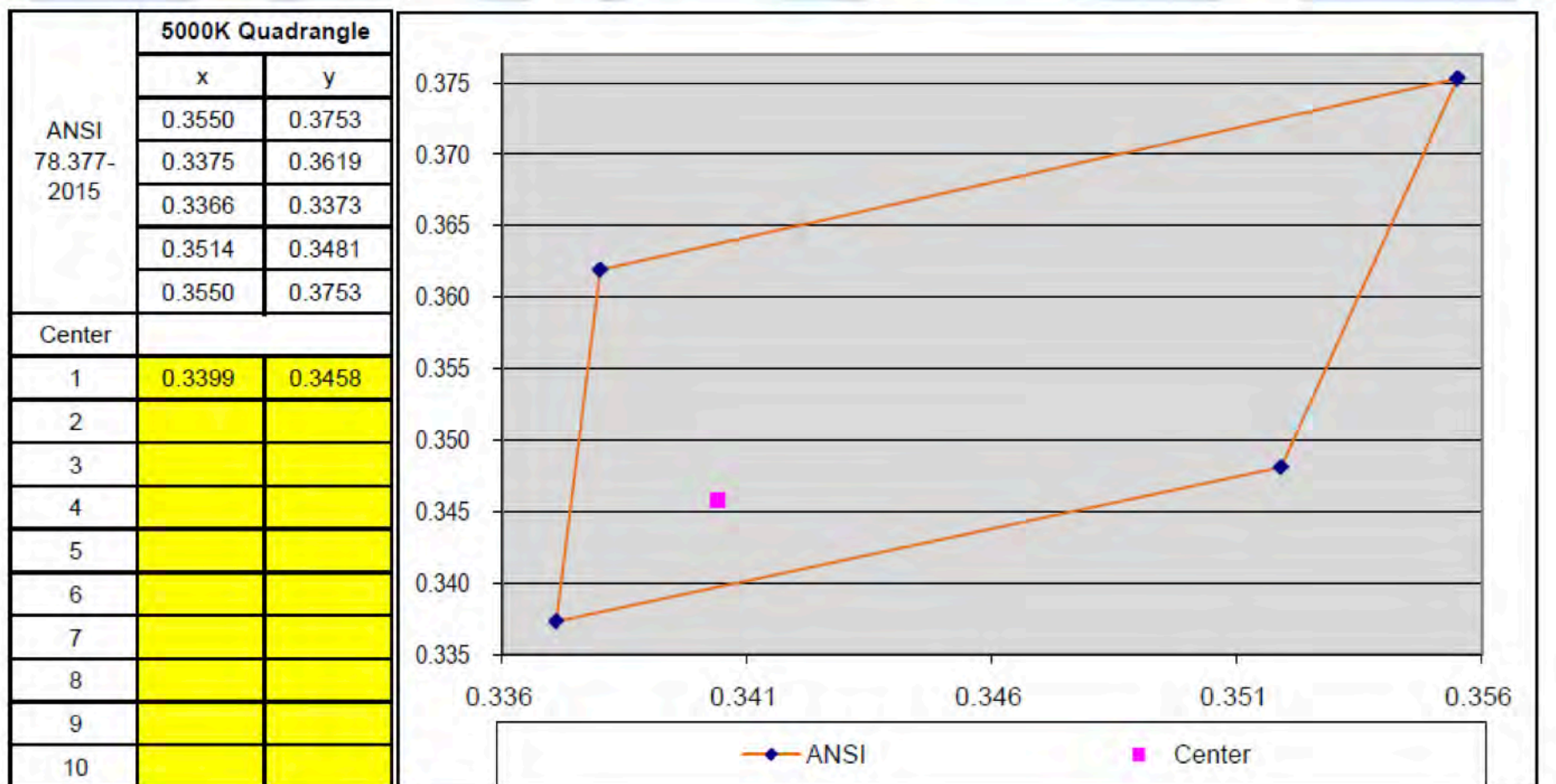
1. See the annex of Luminous Intensity Distribution Test Plots

## 7 Step Quadrangle

83361



83362





## Spectral Energy Distribution

83361

WL(nm)	Spectrum	Spectrum	WL(nm)	Spectrum	Spectrum
380	0.0214	2.2730	585	0.8380	89.0300
385	0.0150	1.5900	590	0.8320	88.3900
390	0.0103	1.0910	595	0.8177	86.8700
395	0.0078	0.8312	600	0.7956	84.5200
400	0.0078	0.8298	605	0.7658	81.3600
405	0.0115	1.2260	610	0.7314	77.7000
410	0.0232	2.4650	615	0.6919	73.5000
415	0.0486	5.1590	620	0.6485	68.9000
420	0.0941	10.0000	625	0.6031	64.0700
425	0.1636	17.3800	630	0.5574	59.2200
430	0.2693	28.6100	635	0.5096	54.1400
435	0.4148	44.0700	640	0.4639	49.2900
440	0.6097	64.7700	645	0.4204	44.6600
445	0.8598	91.3400	650	0.3784	40.2000
450	0.9967	105.9000	655	0.3377	35.8700
455	0.7658	81.3600	660	0.3009	31.9700
460	0.4859	51.6200	665	0.2673	28.4000
465	0.3446	36.6100	670	0.2354	25.0100
470	0.2412	25.6200	675	0.2078	22.0800
475	0.1668	17.7200	680	0.1823	19.3700
480	0.1379	14.6500	685	0.1595	16.9400
485	0.1335	14.1800	690	0.1392	14.7900
490	0.1459	15.5100	695	0.1217	12.9300
495	0.1813	19.2600	700	0.1059	11.2500
500	0.2356	25.0300	705	0.0922	9.7980
505	0.2977	31.6300	710	0.0799	8.4860
510	0.3650	38.7800	715	0.0692	7.3470
515	0.4293	45.6100	720	0.0605	6.4290
520	0.4872	51.7600	725	0.0522	5.5470
525	0.5357	56.9100	730	0.0459	4.8760
530	0.5780	61.4100	735	0.0397	4.2130
535	0.6168	65.5300	740	0.0345	3.6680
540	0.6501	69.0700	745	0.0299	3.1780
545	0.6810	72.3500	750	0.0261	2.7760
550	0.7117	75.6100	755	0.0229	2.4320
555	0.7416	78.7900	760	0.0199	2.1170
560	0.7696	81.7600	765	0.0176	1.8740
565	0.7955	84.5100	770	0.0153	1.6290
570	0.8160	86.6900	775	0.0135	1.4390
575	0.8289	88.0600	780	0.0125	1.3320
580	0.8376	88.9800			



83362

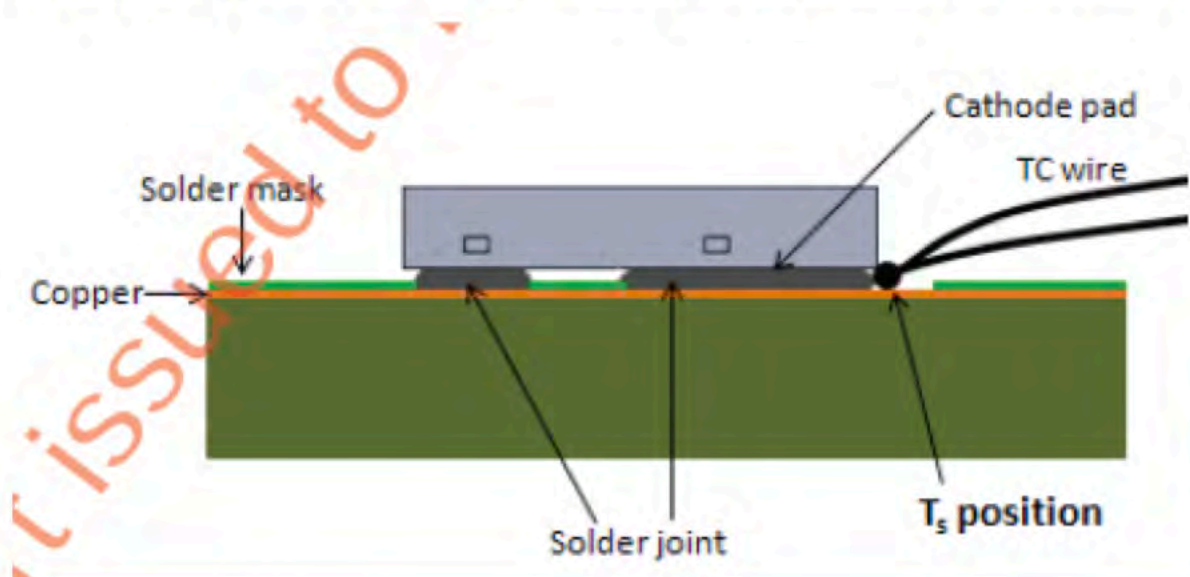
WL(nm)	Spectrum	Spectrum	WL(nm)	Spectrum	Spectrum
380	0.0218	3.0540	585	0.5789	81.0900
385	0.0132	1.8420	590	0.5646	79.0900
390	0.0097	1.3620	595	0.5472	76.6400
395	0.0078	1.0940	600	0.5255	73.6100
400	0.0078	1.0870	605	0.5008	70.1500
405	0.0107	1.4970	610	0.4741	66.4100
410	0.0227	3.1830	615	0.4443	62.2300
415	0.0485	6.7980	620	0.4127	57.8100
420	0.0943	13.2100	625	0.3804	53.2800
425	0.1663	23.2900	630	0.3496	48.9700
430	0.2676	37.4900	635	0.3188	44.6600
435	0.4059	56.8600	640	0.2884	40.3900
440	0.5997	83.9900	645	0.2599	36.4100
445	0.8594	120.4000	650	0.2330	32.6400
450	0.9972	139.7000	655	0.2082	29.1600
455	0.7724	108.2000	660	0.1848	25.8900
460	0.4931	69.0600	665	0.1635	22.9000
465	0.3524	49.3700	670	0.1446	20.2500
470	0.2450	34.3200	675	0.1266	17.7300
475	0.1697	23.7700	680	0.1114	15.6000
480	0.1384	19.3800	685	0.0977	13.6800
485	0.1316	18.4300	690	0.0852	11.9300
490	0.1422	19.9100	695	0.0741	10.3800
495	0.1748	24.4800	700	0.0650	9.1050
500	0.2239	31.3600	705	0.0562	7.8770
505	0.2811	39.3700	710	0.0491	6.8800
510	0.3397	47.5800	715	0.0426	5.9670
515	0.3925	54.9800	720	0.0370	5.1760
520	0.4375	61.2800	725	0.0324	4.5430
525	0.4744	66.4600	730	0.0279	3.9130
530	0.5013	70.2200	735	0.0244	3.4210
535	0.5242	73.4200	740	0.0212	2.9720
540	0.5417	75.8800	745	0.0187	2.6170
545	0.5557	77.8300	750	0.0164	2.2970
550	0.5666	79.3700	755	0.0143	2.0040
555	0.5781	80.9700	760	0.0124	1.7300
560	0.5858	82.0600	765	0.0109	1.5260
565	0.5902	82.6600	770	0.0096	1.3480
570	0.5939	83.1900	775	0.0085	1.1940
575	0.5928	83.0300	780	0.0079	1.1100
580	0.5878	82.3300			



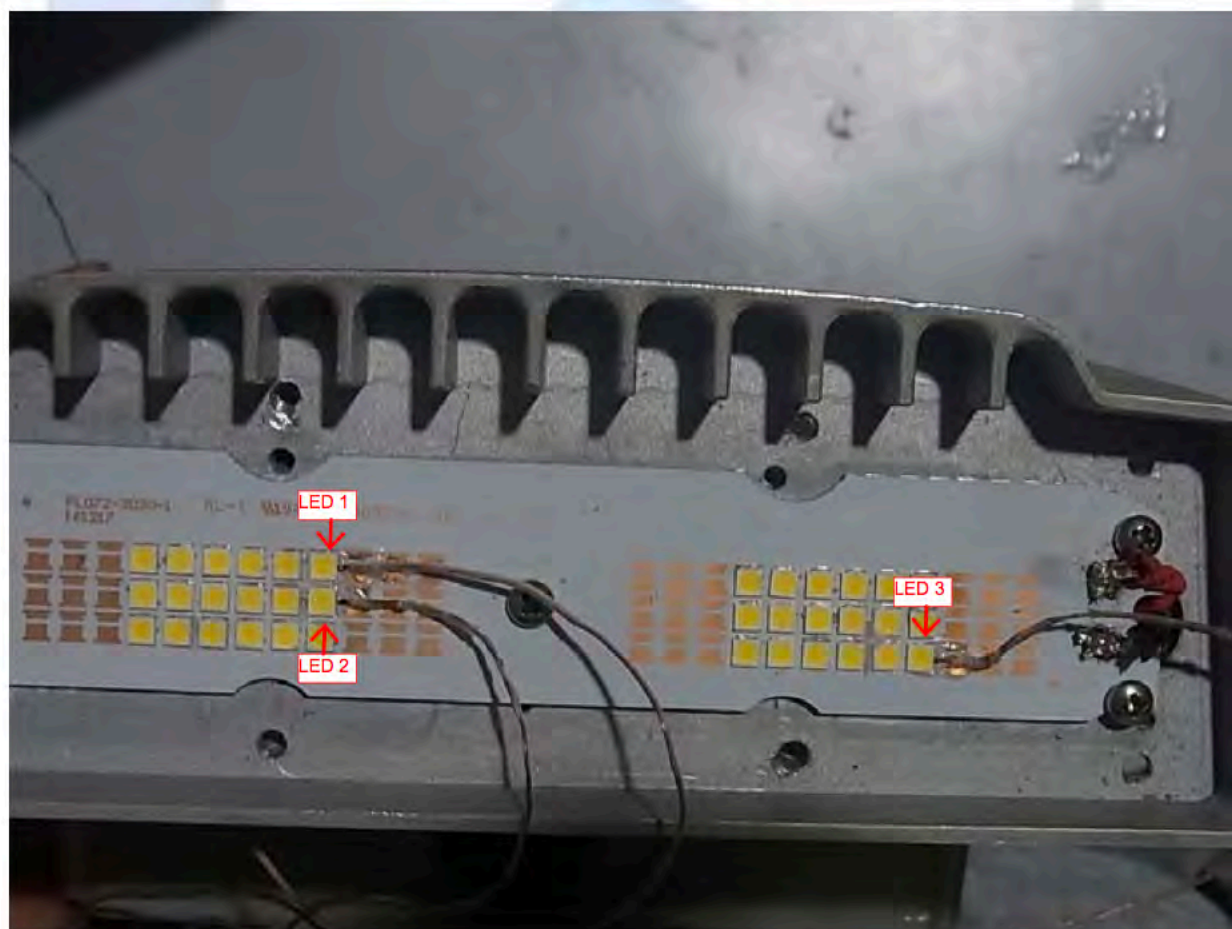
**Driver Case Temperature/ LED Drive Current/TMP<sub>LED</sub> Test Data**

EUT	Driver Max Tc (°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#)
83361	N/A	N/A	123.0	82.1	82.2	81.9

**LED Lighting Source Temperature Measurement Point in LM-80 Report**

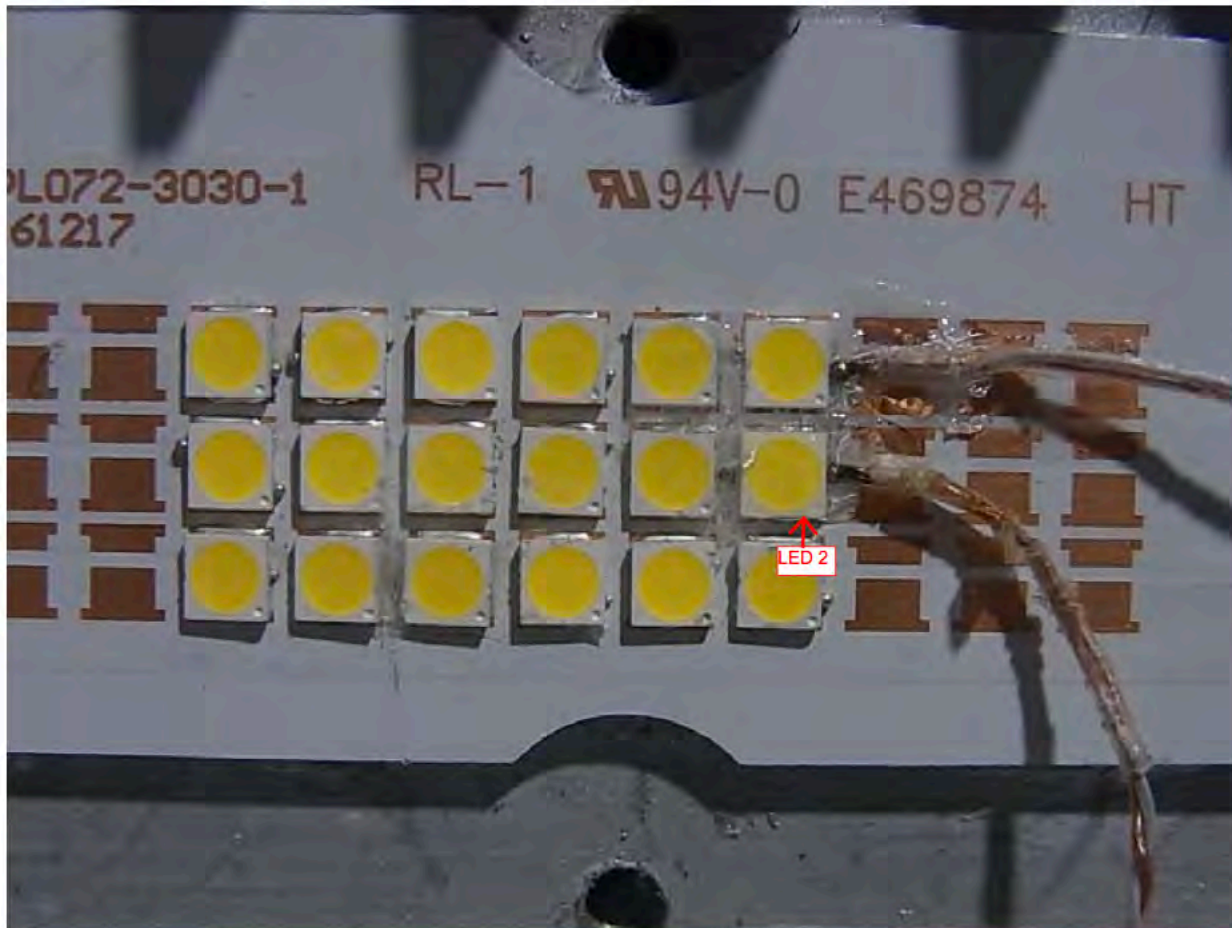


**LED Lighting Source In Situ Temperature Measurement**





TOP: LED 2



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".

Description of LED Light Source Tested  
(manufacturer, model, catalog number)

Lumileds	LUXEON 3030 2D
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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):	9000
Tested drive current (mA):	165
Tested case temperature 1 (T <sub>c</sub> , °C):	55
Tested case temperature 2 (T <sub>c</sub> , °C):	85
Tested case temperature 3 (T <sub>c</sub> , °C):	105

Test Data for 55°C Case Temperature

Time (hours)	Lumen Maintenance (%)
1000	99.18%
2000	98.66%
3000	98.49%
4000	97.91%
5000	97.58%
6000	97.18%
7000	96.66%
8000	96.56%
9000	96.30%

Test Data for 85°C Case Temperature

Time (hours)	Lumen Maintenance (%)
1000	98.98%
2000	98.21%
3000	97.84%
4000	97.15%
5000	96.76%
6000	96.36%
7000	95.94%
8000	95.99%
9000	95.53%

Test Data for 105°C Case Temperature

Time (hours)	Lumen Maintenance (%)
1000	98.84%
2000	98.00%
3000	97.50%
4000	96.62%
5000	96.24%
6000	95.70%
7000	95.33%
8000	95.45%
9000	94.81%

In-Situ Inputs

Drive current for each LED package/array/module (mA):	123
<i>In-situ</i> case temperature (T <sub>c</sub> , °C):	82.2
Percentage of initial lumens to project to (e.g. for L <sub>70</sub> , enter 70):	70

Results

Time (t) at which to estimate lumen maintenance (hours):	50,000
Lumen maintenance at time (t) (%):	84.04%
Reported L70 (hours):	>54000



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**EUT Photos**

