

Filament 0.8W Series Datasheet



Features :

- 360° (omnidirectional) light distribution
- High luminous efficiency (125lm/W @2700K) with high CRI (>80)
- Long lifespan (>25,000 hours)

Typical Applications :

- Bulb
- Candle light
- Indoor lighting

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General Information

Introduction

Filament 0.8W Series use packaging technology and serial LED chips to achieve 360° (omnidirectional) light distribution. With excellent light quality, the filament brings a whole new visual experience which is unlike traditional LED. As a result of using copper substrate as lead frame, the filament has better heat dissipation and higher reliability performance.

Furthermore, the luminous efficacy of Edison filament can reach 125lm/W (under 2700K, CRI > 80) which is well-matched with sapphire substrate. Used in 4W bulb, the LED bulb can replace 40W incandescent bulb, bringing the advantages (energy saving and high efficiency) of LED into full play.

Ordering Code Format

<u>2</u>	<u>W</u>	<u>LF</u>	<u>X 8</u>	<u>W W</u>	<u>x x</u>	<u>0 0 0</u>	<u>x x x</u>		
X1	X2	X3-X4	X5-X6	X7-X8	X9-X10	X11-X13	X14-X16		
X1	X2	X3-X4	X5-X6	X7-X8					
Type	Component		Series		Wattage		Color		
2	Emitter	W	Filament	LF	Filament	X8	0.8W	WW	Warm White
X9-X10	X11-X13	X14-X16							
Internal code	PCB Board		Serial Number						
-	-	000	-	-	-				

Absolute Maximum Ratings

Absolute maximum ratings ($T_a=25^{\circ}\text{C}$)

Parameter	Symbol	Value	Units
Forward Current	I_F	12	mA
Pulse Forward Current ($t_p \leq 100\mu\text{s}$, Duty cycle=0.25)	I_{pulse}	15	mA
Reverse Current	I_R	10	μA
Reverse Voltage	V_R	5	V
LED Junction Temperature	T_J	125	$^{\circ}\text{C}$
Operating Temperature	-	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature	-	-40 ~ +125	$^{\circ}\text{C}$
ESD Sensitivity (HBM)	V_B	2,000	V
Soldering Temperature	T_s	Reflow Soldering : 255~260 $^{\circ}\text{C}$ /10~30sec Manual Soldering : 350 $^{\circ}\text{C}$ /3sec	

Notes:

1. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
2. LEDs are not designed to be driven in reverse bias.

Characteristics

Parameter	Symbol	Value	Units
Viewing Angle (Typ.)	$2\theta_{1/2}$	360	Degree
Thermal resistance	-	15	$^{\circ}\text{C}/\text{W}$
Forward Voltage (Typ.)	V_F	80	V
CCT (Warm White)	-	2,700 3,000	K
CRI	-	>80	-
JEDEC Moisture Sensitivity	-	Level 2a Floor Life Conditions: $\leq 30^{\circ}\text{C}$ / 60% RH Soak Requirements(Standard) Time (hours): 120+1/-0 Conditions: 60 $^{\circ}\text{C}$ / 60% RH	

Notes:

1. $2\theta_{1/2}$ is the off-axis angle where the luminous intensity is half of the axial luminous intensity.
2. Color Rendering index CRI tolerance: ± 2 .

Luminous Flux Characteristic

Luminous Flux Characteristics, $I_f=10\text{mA}$ and $T_j=25^\circ\text{C}$

Color	Group	Min. Luminous Flux(lm)	Max. Luminous Flux(lm)	Forward Current (mA)	Order Code
Warm White	U2	90	100	10	2WLFX8WW11000001
	U3	100	110		

Note:

The luminous flux performance is guaranteed within published operating conditions. Edison Opto maintains a tolerance of $\pm 10\%$ on flux measurements.

Voltage Bin Structure

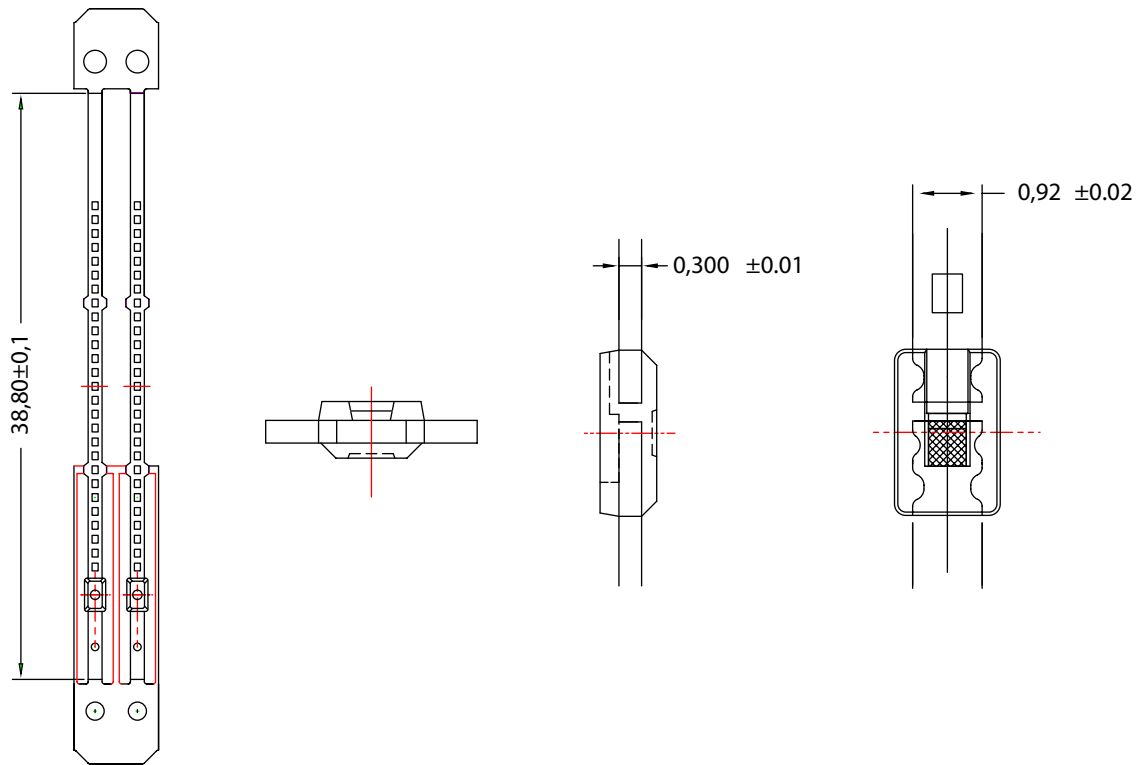
Group	Min. Voltage (V)	Max. Voltage (V)
VL1	70	75
VL2	75	80
VL3	80	85
VL4	85	90

Note:

Forward voltage measurement allowance is $\pm 1\text{V}$.

Mechanical Dimensions

Emitter Type Dimension



Circuit



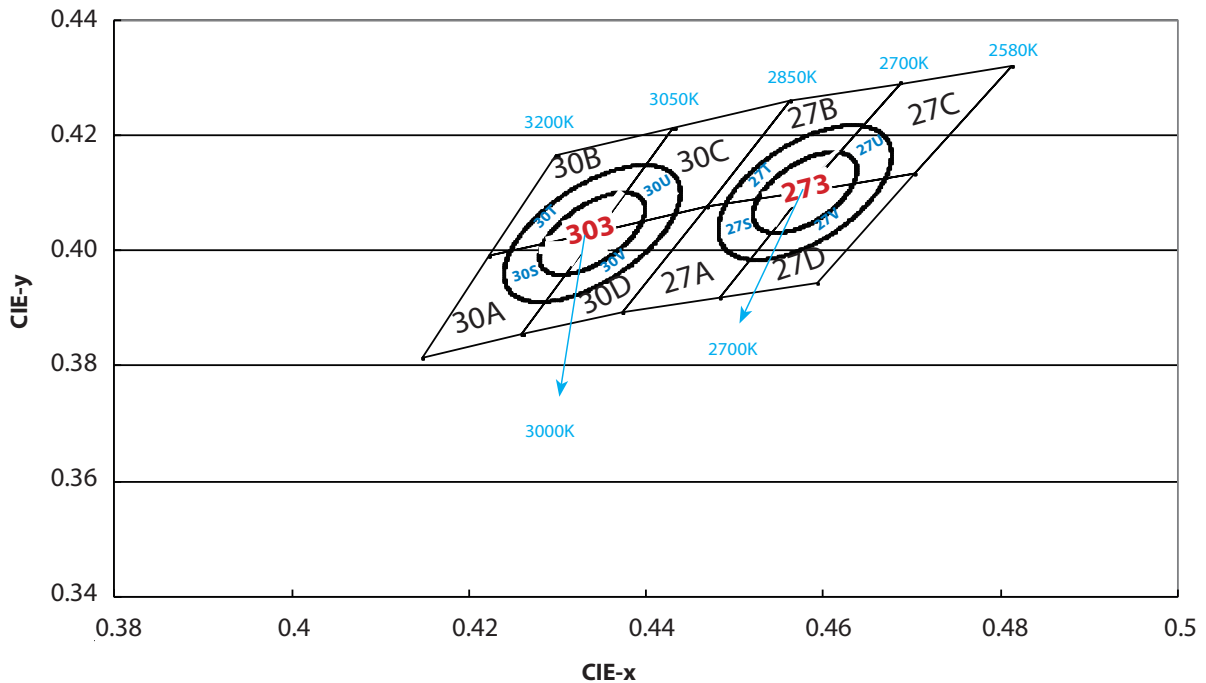
Color BIN code

Color region stay within Macadam "3-Step/5-step" ellipse from the chromaticity center.
The chromaticity center refers to ANSI C78.377:2008.
Please refer to ANSI C78.377 for the chromaticity center.

CCT	Steps	Cx	Cy	a	b	theta
2700K	5	0.4578	0.4101	0.01350	0.00700	53.70
3000K	5	0.4338	0.4030	0.01390	0.00680	53.22

CCT	Steps	Cx	Cy	a	b	theta
2700K	3	0.4578	0.4101	0.00810	0.00420	53.70
3000K	3	0.4338	0.4030	0.00834	0.00408	53.22

Warm White



3000K

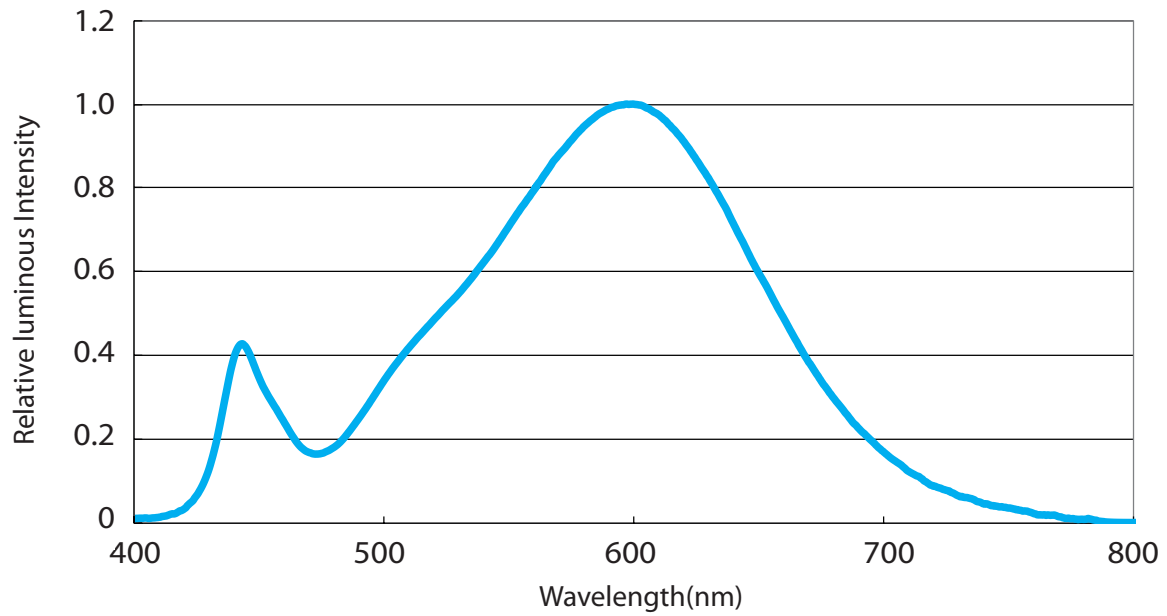
30A		30B		30C		30D	
X	Y	X	Y	X	Y	X	Y
0.4345	0.4033	0.4431	0.4213	0.4562	0.4260	0.4468	0.4077
0.4223	0.3990	0.4299	0.4165	0.4431	0.4213	0.4345	0.4033
0.4147	0.3814	0.4223	0.3990	0.4345	0.4033	0.4260	0.3854
0.4260	0.3854	0.4345	0.4033	0.4468	0.4077	0.4373	0.3893

2700K

27A		27B		27C		27D	
X	Y	X	Y	X	Y	X	Y
0.4578	0.4101	0.4687	0.4289	0.4813	0.4319	0.4703	0.4132
0.4468	0.4077	0.4562	0.4260	0.4687	0.4289	0.4578	0.4101
0.4373	0.3893	0.4468	0.4077	0.4578	0.4101	0.4483	0.3919
0.4483	0.3919	0.4578	0.4101	0.4703	0.4132	0.4593	0.3944

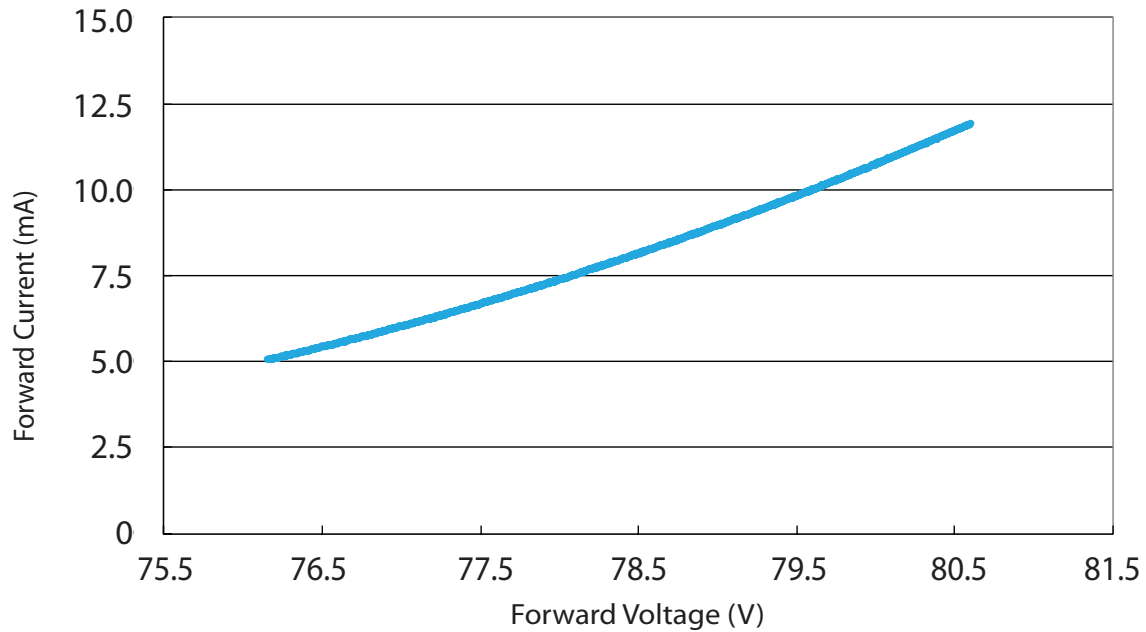
Characteristic curve

Color Spectrum



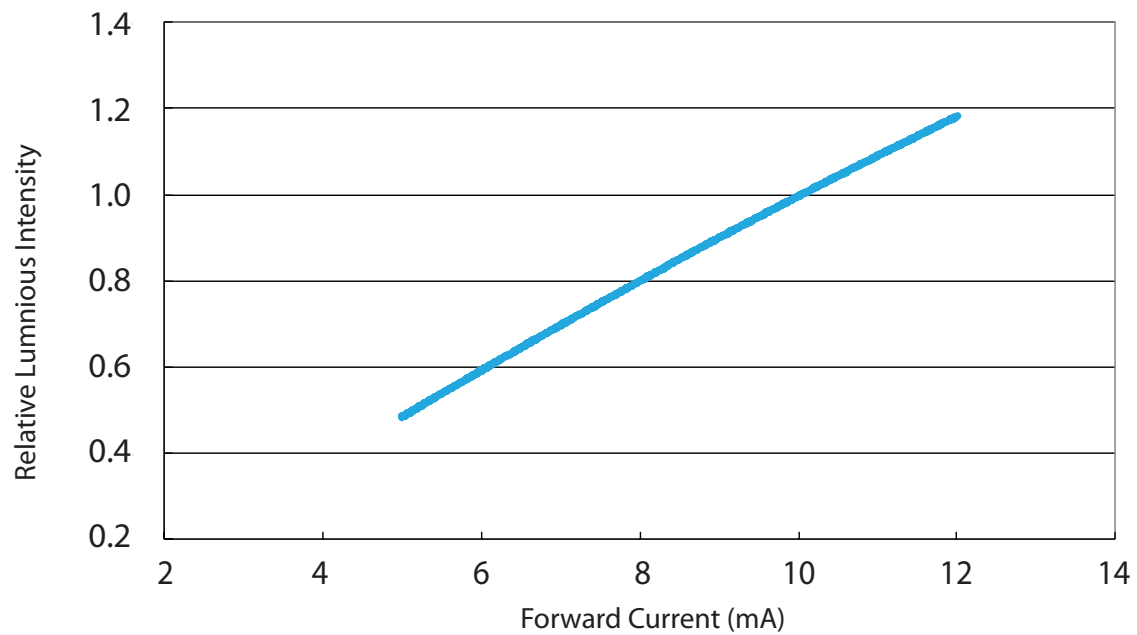
Color Spectrum at a typical CCT for Filament 0.8W Series

Forward Current vs. Forward Voltage



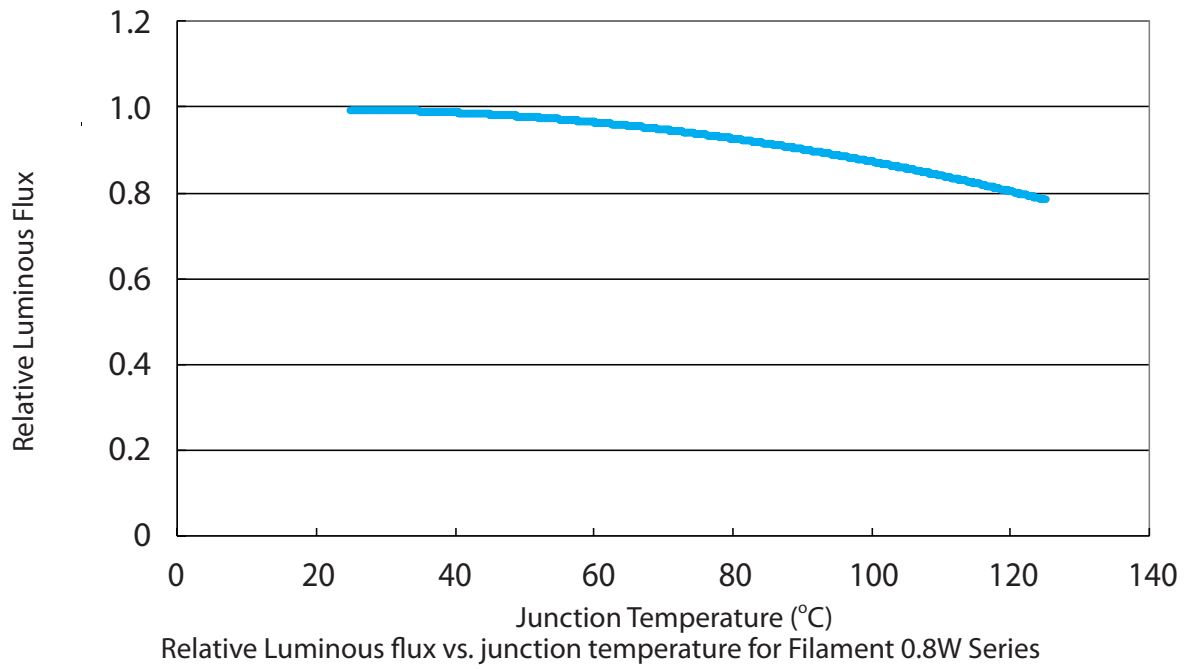
Forward Current vs. Forward Voltage for Filament 0.8W Series

Relative Luminous Intensity vs. Forward Current

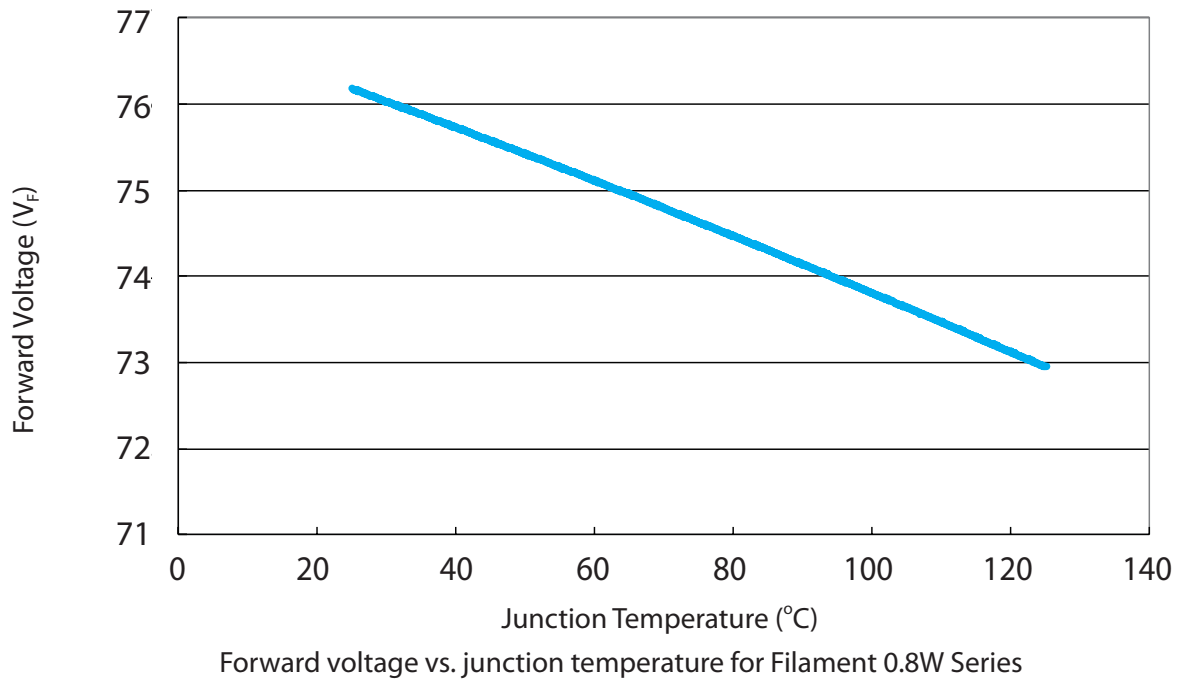


Relative Luminous Intensity vs. Forward Current for Filament 0.8W Series

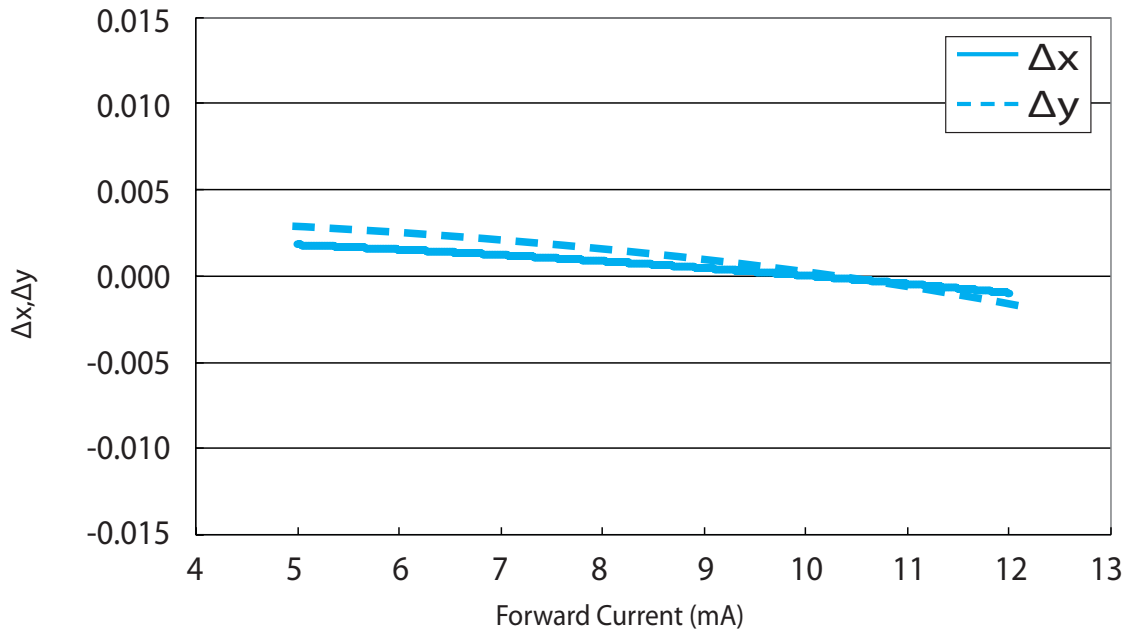
Relative Luminous Flux vs. Junction Temperature



Forward Voltage vs. Junction Temperature

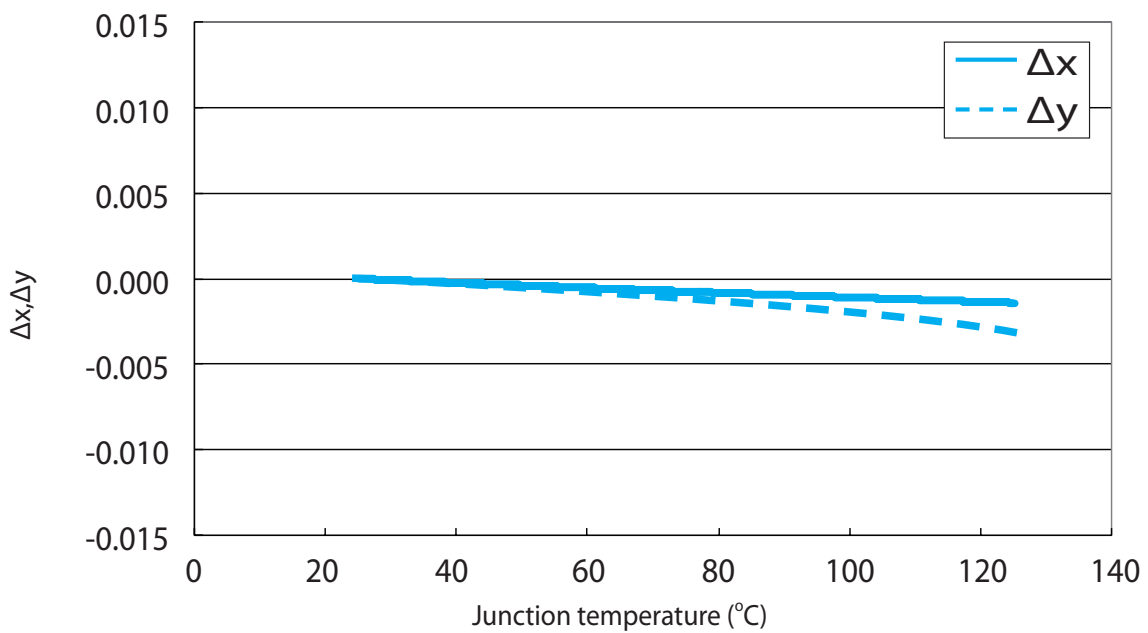


$\Delta x, \Delta y$ vs. Forward Current



$\Delta x, \Delta y$ vs. Forward Current for Filament 0.8W Series

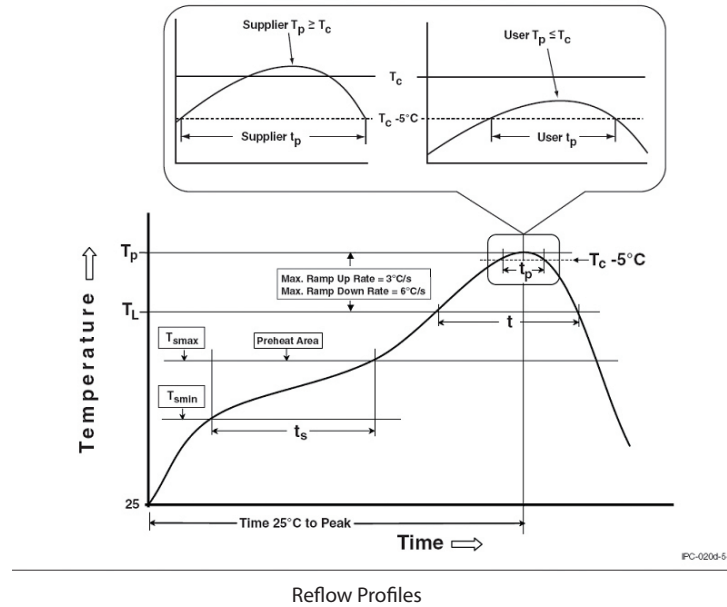
$\Delta x, \Delta y$ vs. Junction Temperature



$\Delta x, \Delta y$ vs. Junction temperature for Filament 0.8W Series

Reflow Profile

The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



Classification Reflow Profiles

Profile Feature	Pb-Free Assembly
Preheat & Soak	
Temperature min (T_{smin})	150 °C
Temperature max (T_{sm})	200 °C
Time (T_{smin} to T_{sm}) (t_s)	60-120 seconds
Average ramp-up rate (T_{sm} to T_p)	3 °C/second max.
Liquidous temperature (T_L)	217 °C
Time at liquidous (t_L)	60-150 seconds
Peak package body temperature (T_p)*	255 °C ~260 °C *
Classification temperature (T_c)	260 °C
Time (t_p)** within 5 °C of the specified classification temperature (T_c)	30** seconds
Average ramp-down rate (T_p to T_{sm})	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

Notes:

- * Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.
- ** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

Reliability

NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C 30, 30, mins	100 Cycle
2	Thermal Shock	-40°C~100°C 15, 15 mins \leq 10 sec	100 Cycle
3	Resistance to Soldering Heat	T _{SOL} =260°C, 30 sec	3 times
4	Moisture Resistance	25°C~65°C 90% RH 24 hrs / 1 cycle	10 Cycle
5	High-Temperature Storage	T _A =100°C	1,000 hrs
6	Humidity Heat Storage	T _A =85°C RH=85%	1,000 hrs
7	Low-Temperature Storage	T _A =-40°C	1,000 hrs
8	Operation Life test	25°C	1,000 hrs
9	High Temperature Operation Life test	85°C	1,000 hrs
10	High Humidity Heat Life Test	85°C, 85%RH	1,000 hrs
11	ON/OFF Test	30 sec ON, 30 sec OFF	1.5W times

Failure Criteria

Item	Criteria for Judgment	
	Min.	Max.
Lumen Maintenance	85%	-
$\Delta u'v'$	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 μ A
Resistance to Soldering Heat	No dead lamps or visual damage	

Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2014/10/17

About Edison Opto

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at www.edison-opto.com

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