

PLCC S Series

2835 0.5W Ra80 UE 2.0

Datasheet



Down Light

Commercial
LightingGeneral
Lighting

Introduction :

PLCC S Series 2835 UE 2.0 features ultra high luminous efficacy and compact package size which increase the flexibility in lamp design and expand the range of applications. With the outperforming efficiency, PLCC S Series 2835 UE2.0 is optimized to be used in high-end LED market such as boutique and luxury apparel store.

Description :

- Best luminous and color uniformity
- Enables halogen and CDM replacement
- The article itself presents the actual color

Feature and Benefits :

- Superior luminous efficiency 205lm/W @150mA,4000K
- Deliver 87.5lm @150mA, 4000K
- Pass LM-80 verification
- Suitable for all SMT assembly methods
- IR reflow process compatible
- Environmental friendly; RoHS compliance

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General Information

Ordering Code Format

2 T 03 X5 xx A 80 03 xxx
 X1 X2 X3-X4 X5-X6 X7-X8 X9 X10-X11 X12-X13 X14-X16

X1		X2		X3-X4		X5-X6		X7-X8	
Type		Component		Series		Wattage		Color/CCT	
2	Emitter	T	PLCC	03	2835	X5	0.5W	27	2700K
								30	3000K
								35	3500K
								40	4000K
								50	5000K
								57	5700K
								60	6000K
								65	6500K

X9		X10-X11		X12-X13		X14-X16	
BIN		CRI		Voltage		Serial Number	
A	Ansi	80	CRI(Ra) 80	03	3V	-	-

Absolute Maximum Ratings

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

Parameter	Symbol	Value	Units
DC Forward Current	I_F	300	mA
Pulse Forward Current ($t_p \leq 100\mu\text{s}$, Duty cycle=0.25)	I_{pulse}	350	mA
Reverse Current	I_R	10	μA
Reverse Voltage	V_R	-	V
LED Junction Temperature	T_J	125	$^{\circ}\text{C}$
Operating Temperature	-	-40 ~ +105	$^{\circ}\text{C}$
Storage Temperature	-	-40 ~ +125	$^{\circ}\text{C}$
ESD Sensitivity (HBM)	V_B	2,000	V
Soldering Temperature	T_s	Reflow Soldering : $255 \sim 260^{\circ}\text{C}/10 \sim 30\text{sec}$ Manual Soldering : $350^{\circ}\text{C}/3\text{sec}$	

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.)	$2\theta_{1/2}$	120	Degree
Thermal resistance	-	20	$^{\circ}\text{C}/\text{W}$
CRI (Ra)	-	80	-
CCT (Cool White) (Neutral White) (Warm White)	-	2,700 3,000 3,500 4,000 5,000 5,700 6,000 6,500	K
JEDEC Moisture Sensitivity	-	Level 3 Floor Life Conditions: $\leq 30^{\circ}\text{C}$ / 60% RH Soak Requirements(Standard) Time (hours): 40+1/-0 Conditions: 60°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 .
3. CIE_x/y tolerance: ± 0.005 .

Electro - Optical Characteristics (Neutral White)

$I_f=150\text{mA}$ and $T_j=25^\circ\text{C}$

If (mA)	Vf (V)	Power (W)	Im	Im/W
25	2.64	0.07	15.40	233
40	2.67	0.11	24.60	230
60	2.71	0.16	36.65	225
65	2.72	0.18	39.63	224
90	2.76	0.25	53.83	217
120	2.82	0.34	70.84	209
150 (Typ)	2.84	0.43	87.71	206
200	2.90	0.58	114.07	197
240	2.96	0.71	134.82	190
280	3.02	0.85	154.58	183
300	3.04	0.91	164.28	180.2

Note:

LM Values are for representative reference only.

Luminous Flux Characteristic

Luminous Flux Characteristics, $I_f=150\text{mA}$ and $T_j=25^\circ\text{C}$

Color	Group	Min. Luminous Flux(lm)	Max. Luminous Flux(lm)	Forward Current (mA)	Order Code
Cool White	80	80	85	150	2T03X565A8003096
	85	85	90		2T03X560A8003096
Neutral White	85	85	90		2T03X557A8003096
	75	75	80		2T03X550A8003096
Warm White	80	80	85	150	2T03X540A8003096
	85	85	90		2T03X535A8003096
Cool White	80	80	85		2T03X530A8003096
	85	85	90		2T03X527A8003096

Note:

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

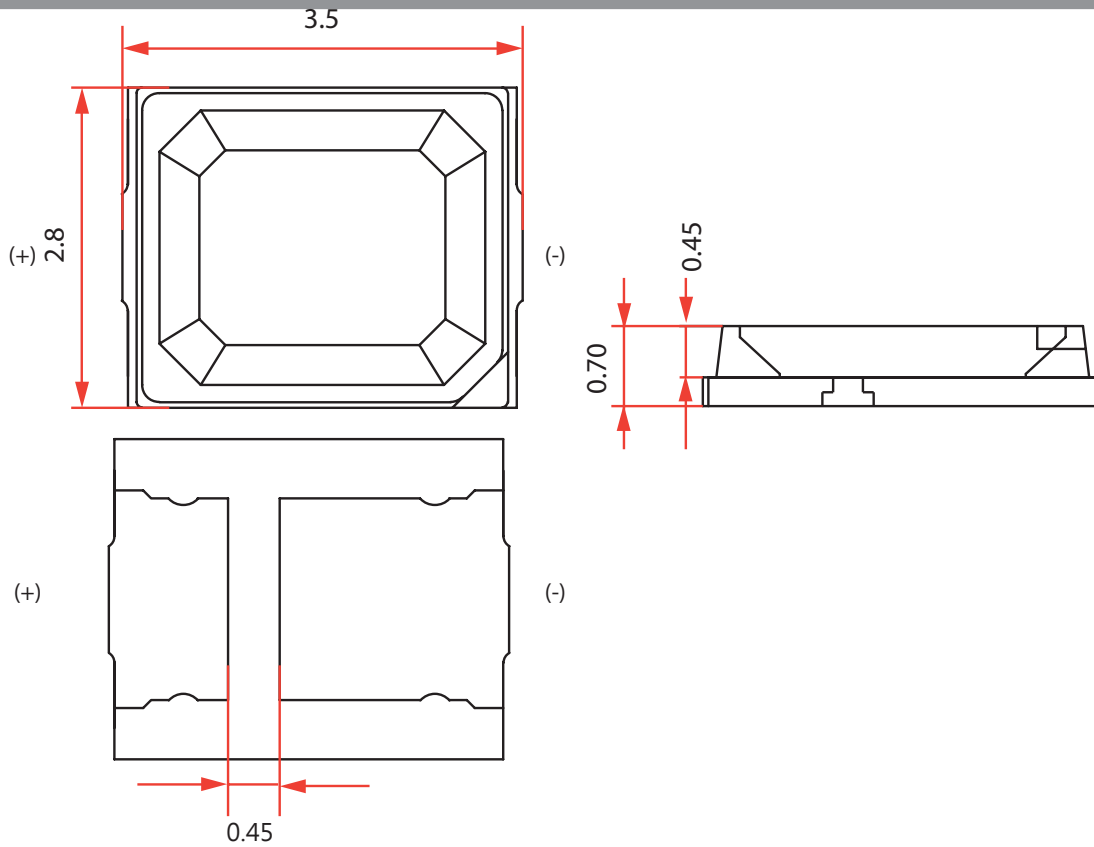
Voltage Bin Structure

Group	Min. Voltage (V)	Max. Voltage (V)
VA1	2.8	2.9
VB1	2.9	3.0
VC1	3.0	3.1

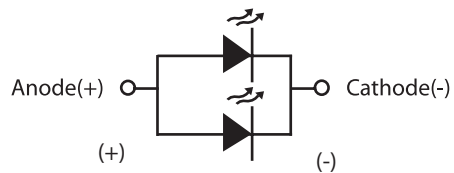
Note:

Forward voltage measurement allowance is $\pm 0.06\text{V}$.

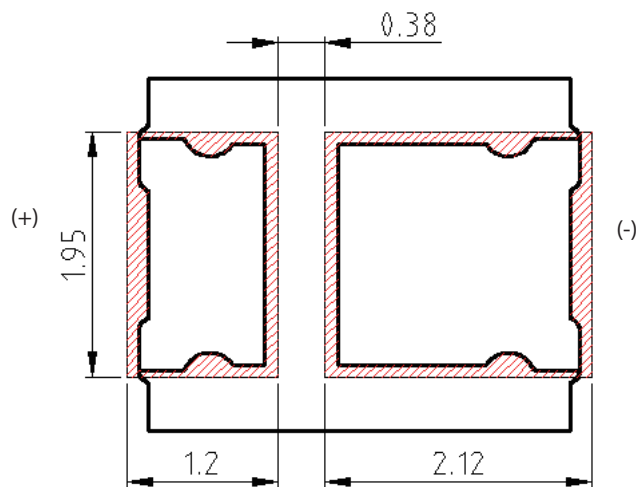
Mechanical Dimensions



Circuit



Solder Pad



Notes:
1. All dimensions are measured in mm.
2. Tolerance : ± 0.20 mm

Color BIN code

Color region stay within Macadam "3-Step/5-step" ellipse from the chromaticity center.

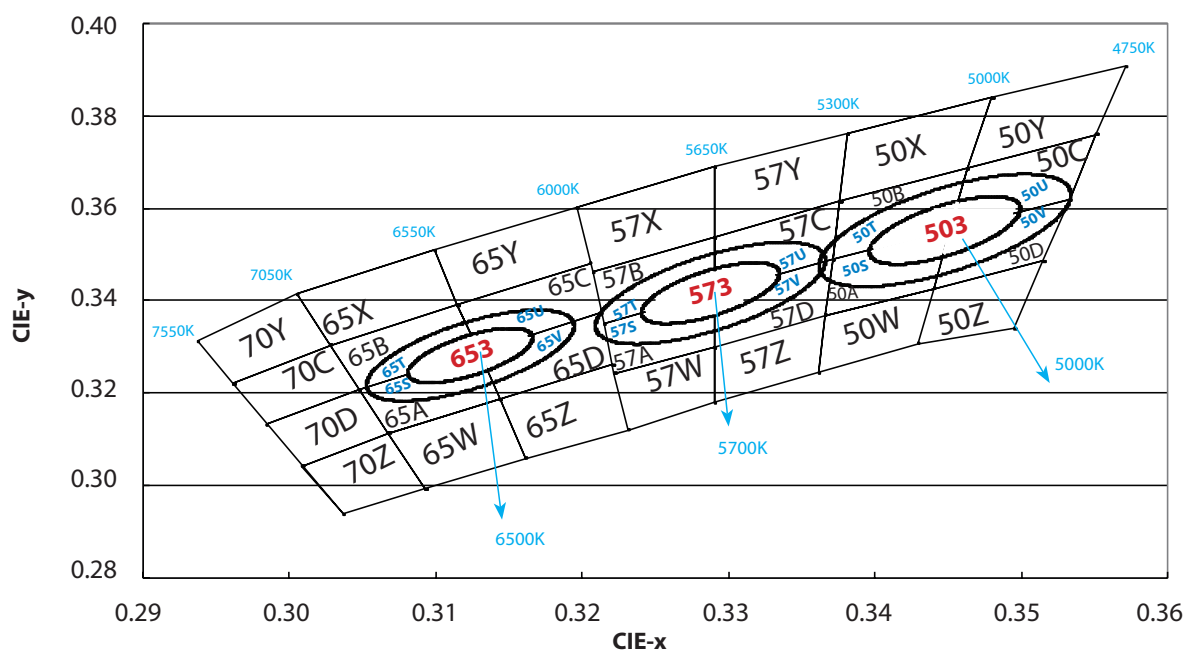
The chromaticity center refers to ANSI C78.377:2008.

Please refer to ANSI C78.377 for the chromaticity center.

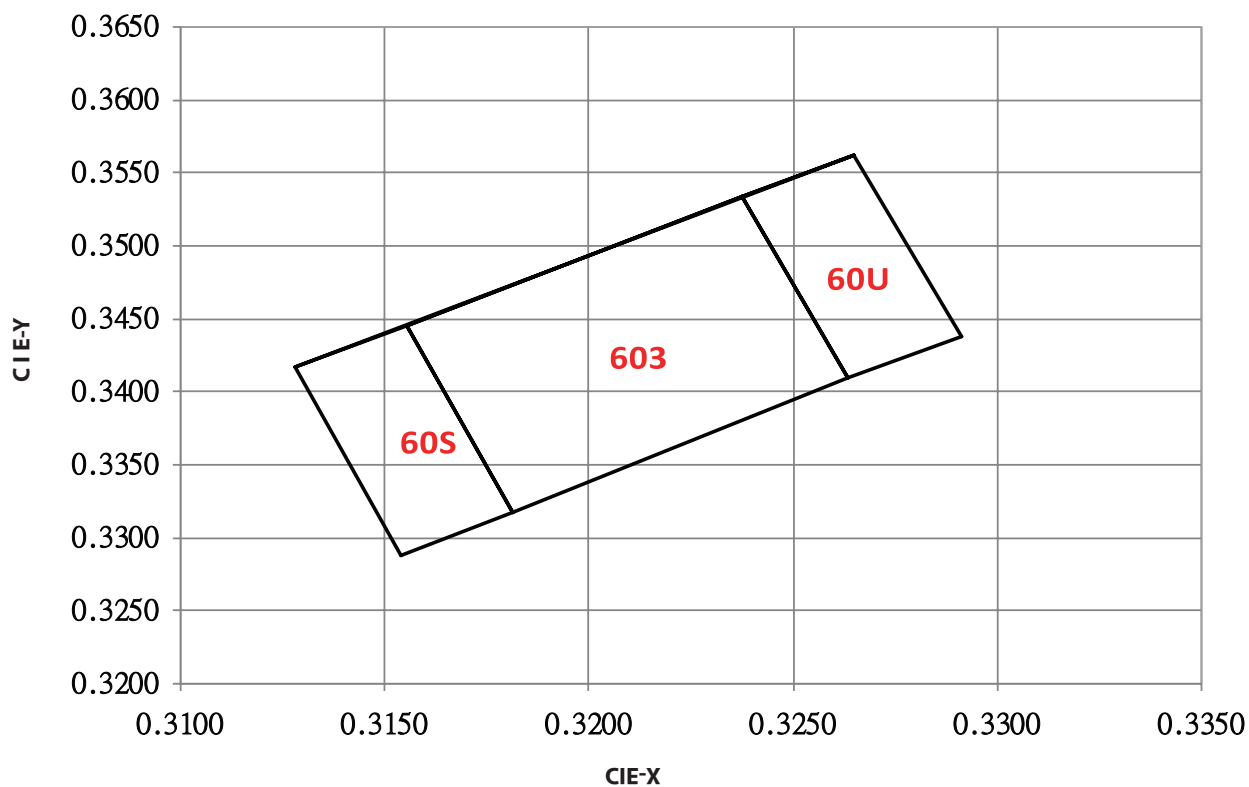
CCT	Steps	Cx	Cy	a	b	theta
2700K	5	0.4578	0.4101	0.01350	0.00700	53.70
3000K	5	0.4338	0.4030	0.01390	0.00680	53.22
3500K	5	0.4073	0.3917	0.01545	0.00690	54.00
4000K	5	0.3818	0.3797	0.01565	0.00670	53.72
5000K	5	0.3447	0.3553	0.01370	0.00590	59.62
5700K	5	0.3287	0.3417	0.01243	0.00533	59.09
6500K	5	0.3123	0.3282	0.01115	0.00475	58.57

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
3500K	3	0.4073	0.3917	0.00927	0.00414	54.00
4000K	3	0.3818	0.3797	0.00939	0.00402	53.72
5000K	3	0.3447	0.3553	0.00822	0.00354	59.62
5700K	3	0.3287	0.3417	0.00746	0.00320	59.09
6500K	3	0.3123	0.3282	0.00669	0.00285	58.57

Cool White

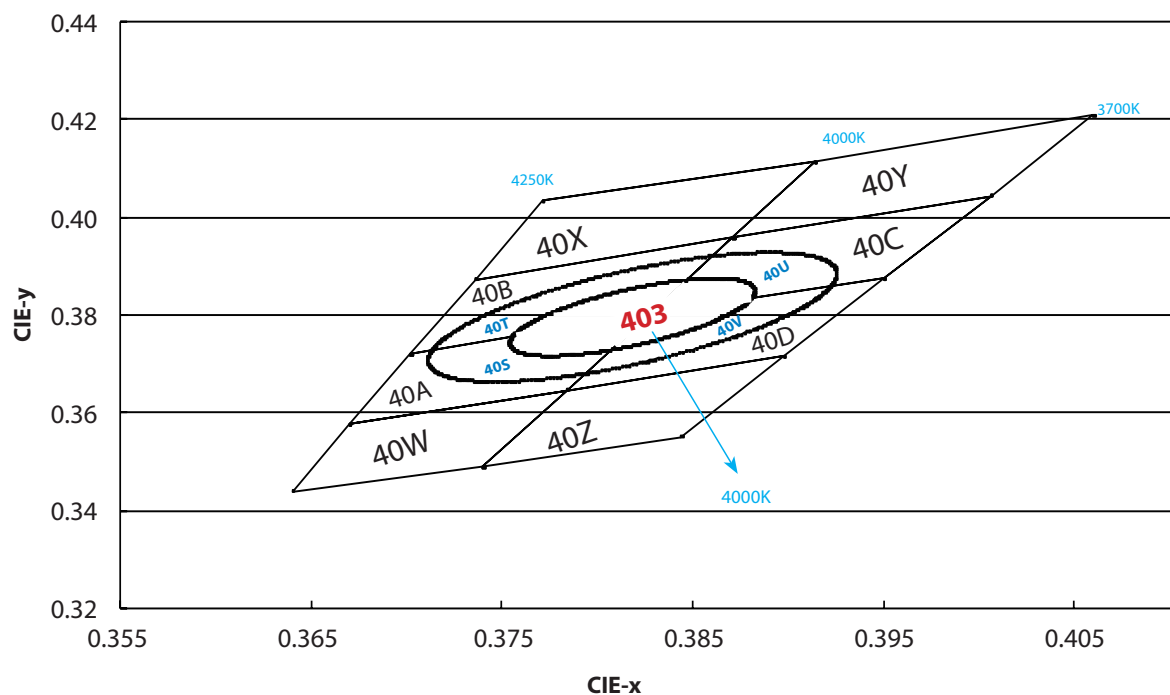


Cool White 6000K

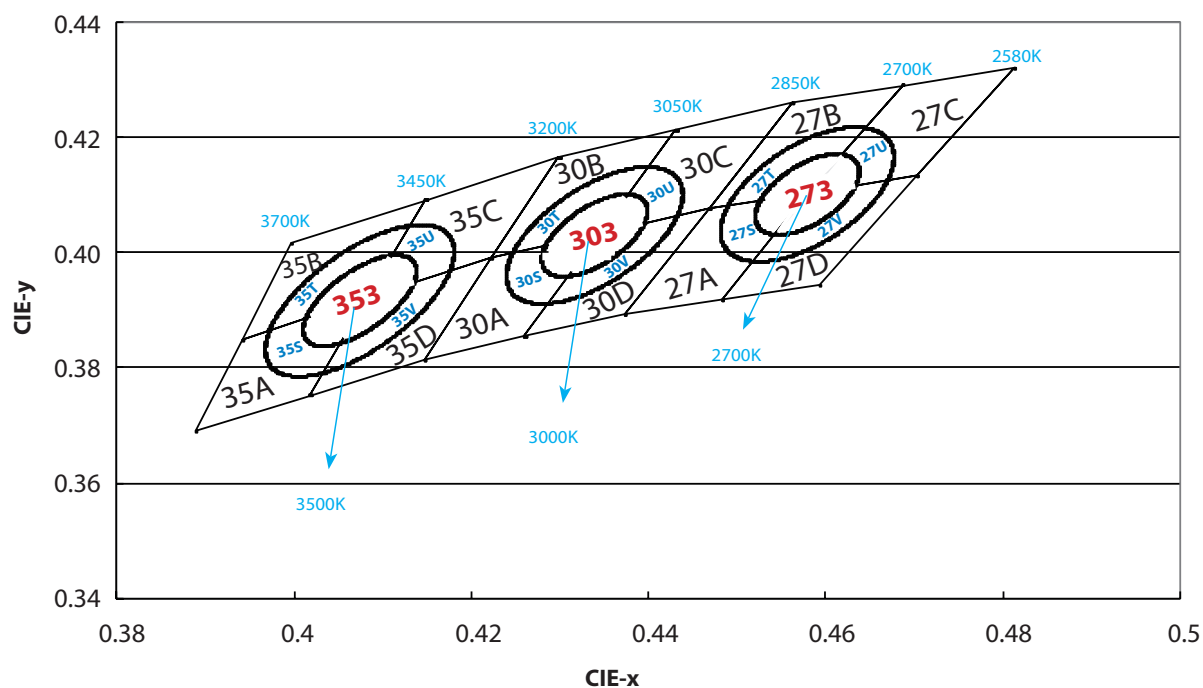


60S		603		60U		605	
X	Y	X	Y	X	Y	X	Y
0.3155	0.3445	0.3238	0.3533	0.3265	0.3562	0.3128	0.3416
0.3128	0.3416	0.3155	0.3445	0.3238	0.3533	0.3265	0.3562
0.3154	0.3288	0.3181	0.3317	0.3264	0.3409	0.3291	0.3438
0.3181	0.3317	0.3264	0.3409	0.3291	0.3438	0.3154	0.3288

Neutral White



Warm White



6500K

65X		65B		65A		65W	
X	Y	X	Y	X	Y	X	Y
0.3005	0.3415	0.3115	0.3391	0.3130	0.3290	0.3068	0.3113
0.3099	0.3509	0.3028	0.3304	0.3048	0.3207	0.3144	0.3186
0.3115	0.3391	0.3048	0.3207	0.3068	0.3113	0.3161	0.3059
0.3028	0.3304	0.3130	0.3290	0.3144	0.3186	0.3093	0.2993

65Y		65C		65D		65Z	
X	Y	X	Y	X	Y	X	Y
0.3099	0.3509	0.3205	0.3481	0.3213	0.3373	0.3144	0.3186
0.3196	0.3602	0.3115	0.3391	0.3130	0.3290	0.3221	0.3261
0.3205	0.3481	0.3130	0.3290	0.3144	0.3186	0.3231	0.3120
0.3115	0.3391	0.3213	0.3373	0.3221	0.3261	0.3161	0.3059

5700K

57X		57B		57A		57W	
X	Y	X	Y	X	Y	X	Y
0.3196	0.3602	0.3290	0.3538	0.3290	0.3417	0.3222	0.3243
0.3290	0.3690	0.3207	0.3462	0.3215	0.3350	0.3290	0.3300
0.3290	0.3538	0.3215	0.3350	0.3222	0.3243	0.3290	0.3180
0.3207	0.3462	0.3290	0.3417	0.3290	0.3300	0.3231	0.3120

57Y		57C		57D		57Z	
X	Y	X	Y	X	Y	X	Y
0.3290	0.3690	0.3376	0.3616	0.3371	0.3490	0.3290	0.3300
0.3381	0.3762	0.3290	0.3538	0.3290	0.3417	0.3366	0.3369
0.3376	0.3616	0.3290	0.3417	0.3290	0.3300	0.3361	0.3245
0.3290	0.3538	0.3371	0.3490	0.3366	0.3369	0.3290	0.3180

5000K

50X		50B		50A		50W	
X	Y	X	Y	X	Y	X	Y
0.3381	0.3762	0.3463	0.3687	0.3451	0.3554	0.3366	0.3369
0.3480	0.3840	0.3376	0.3616	0.3371	0.3490	0.3440	0.3427
0.3463	0.3687	0.3371	0.3490	0.3366	0.3369	0.3429	0.3307
0.3376	0.3616	0.3451	0.3554	0.3440	0.3427	0.3361	0.3245

50Y		50C		50D		50Z	
X	Y	X	Y	X	Y	X	Y
0.3480	0.3840	0.3551	0.3760	0.3533	0.3620	0.3440	0.3427
0.3571	0.3907	0.3463	0.3687	0.3451	0.3554	0.3515	0.3487
0.3551	0.3760	0.3451	0.3554	0.3440	0.3427	0.3495	0.3339
0.3463	0.3687	0.3533	0.3620	0.3515	0.3487	0.3429	0.3307

4000K

40X		40B		40A		40W	
X	Y	X	Y	X	Y	X	Y
0.3771	0.4034	0.3871	0.3959	0.3828	0.3803	0.3670	0.3578
0.3736	0.3874	0.3736	0.3874	0.3702	0.3722	0.3640	0.3440
0.3871	0.3959	0.3702	0.3722	0.3670	0.3578	0.3740	0.3491
0.3914	0.4115	0.3828	0.3803	0.3784	0.3647	0.3784	0.3647

40Y		40C		40D		40Z	
X	Y	X	Y	X	Y	X	Y
0.3914	0.4115	0.4006	0.4044	0.3950	0.3875	0.3784	0.3647
0.3871	0.3959	0.3871	0.3959	0.3828	0.3803	0.3740	0.3491
0.4006	0.4044	0.3828	0.3803	0.3784	0.3647	0.3844	0.3552
0.4060	0.4208	0.3950	0.3875	0.3898	0.3716	0.3898	0.3716

3500K

35A		35B		35C		35D	
X	Y	X	Y	X	Y	X	Y
0.4083	0.3921	0.4148	0.4090	0.4299	0.4165	0.4223	0.399
0.3941	0.3848	0.3996	0.4015	0.4148	0.4090	0.4083	0.3921
0.3889	0.3690	0.3941	0.3848	0.4083	0.3921	0.4018	0.3752
0.4018	0.3752	0.4083	0.3921	0.4223	0.399	0.4147	0.3814

3000K

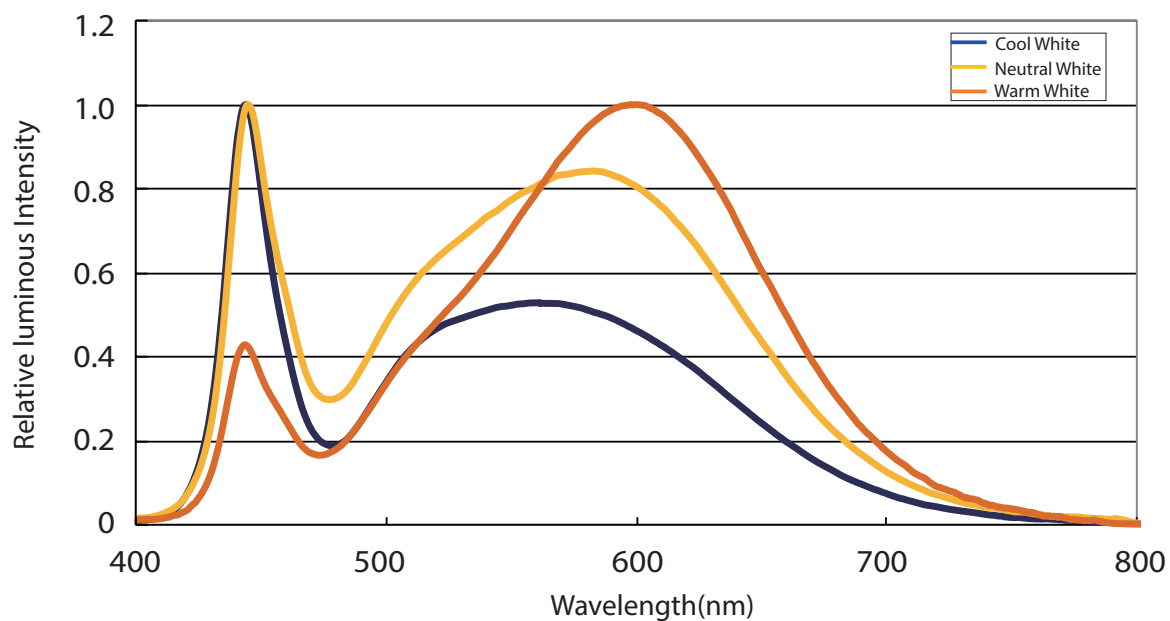
30A		30B		30C		30D	
X	Y	X	Y	X	Y	X	Y
0.4345	0.4033	0.4431	0.4213	0.4562	0.4260	0.4468	0.4077
0.4223	0.3990	0.4299	0.4165	0.4431	0.4213	0.4345	0.4033
0.4147	0.3814	0.4223	0.3990	0.4345	0.4033	0.4260	0.3854
0.4260	0.3854	0.4345	0.4033	0.4468	0.4077	0.4373	0.3893

2700K

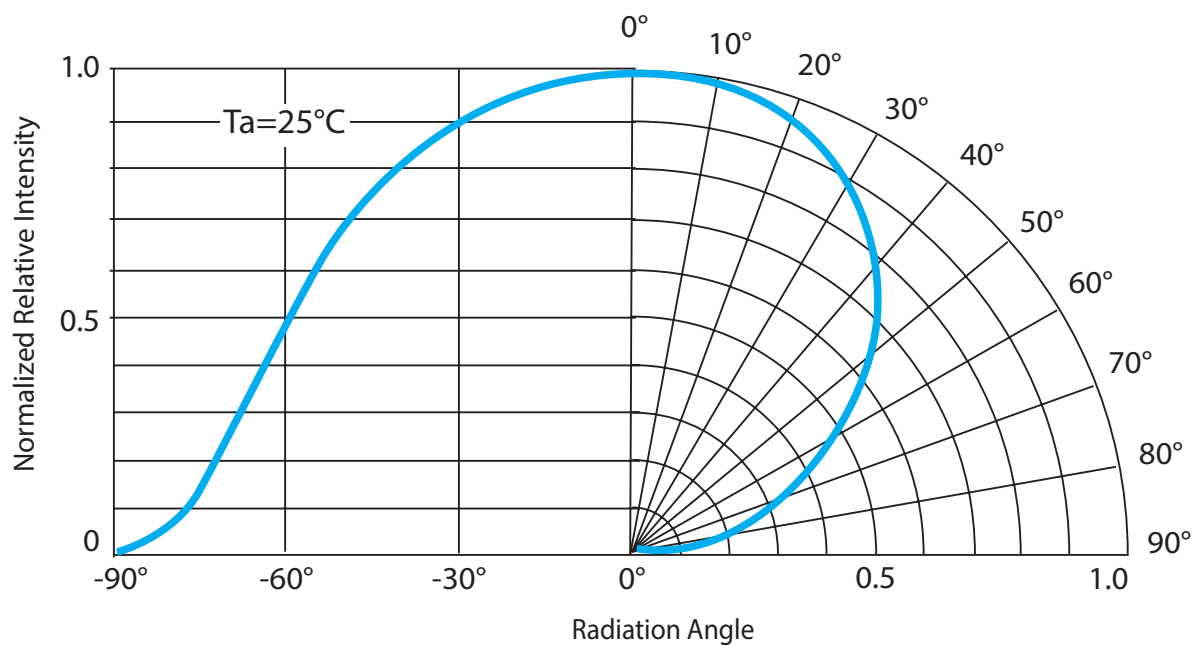
27A		27B		27C		27D	
X	Y	X	Y	X	Y	X	Y
0.4578	0.4101	0.4687	0.4289	0.4813	0.4319	0.4703	0.4132
0.4468	0.4077	0.4562	0.4260	0.4687	0.4289	0.4578	0.4101
0.4373	0.3893	0.4468	0.4077	0.4578	0.4101	0.4483	0.3919
0.4483	0.3919	0.4578	0.4101	0.4703	0.4132	0.4593	0.3944

Characteristic curve

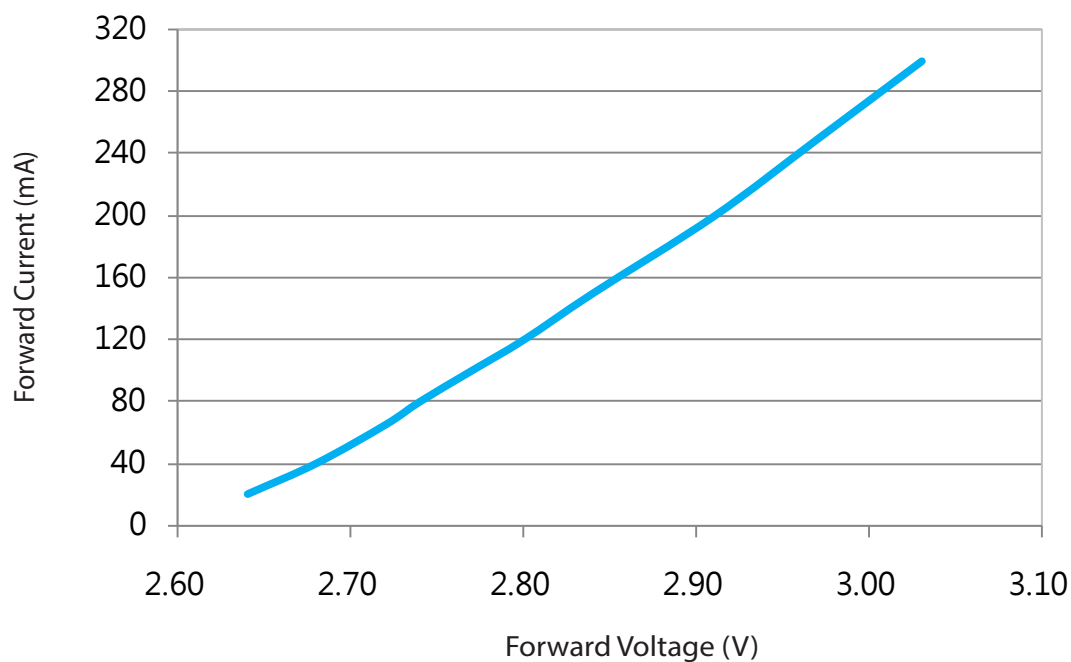
Color Spectrum



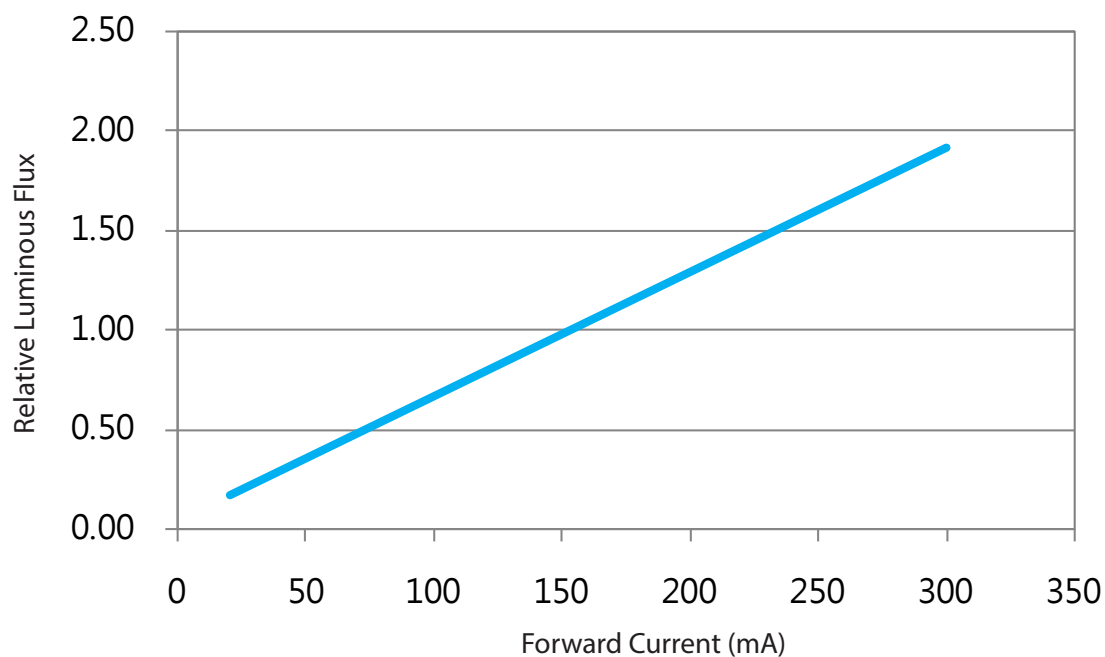
Beam Pattern



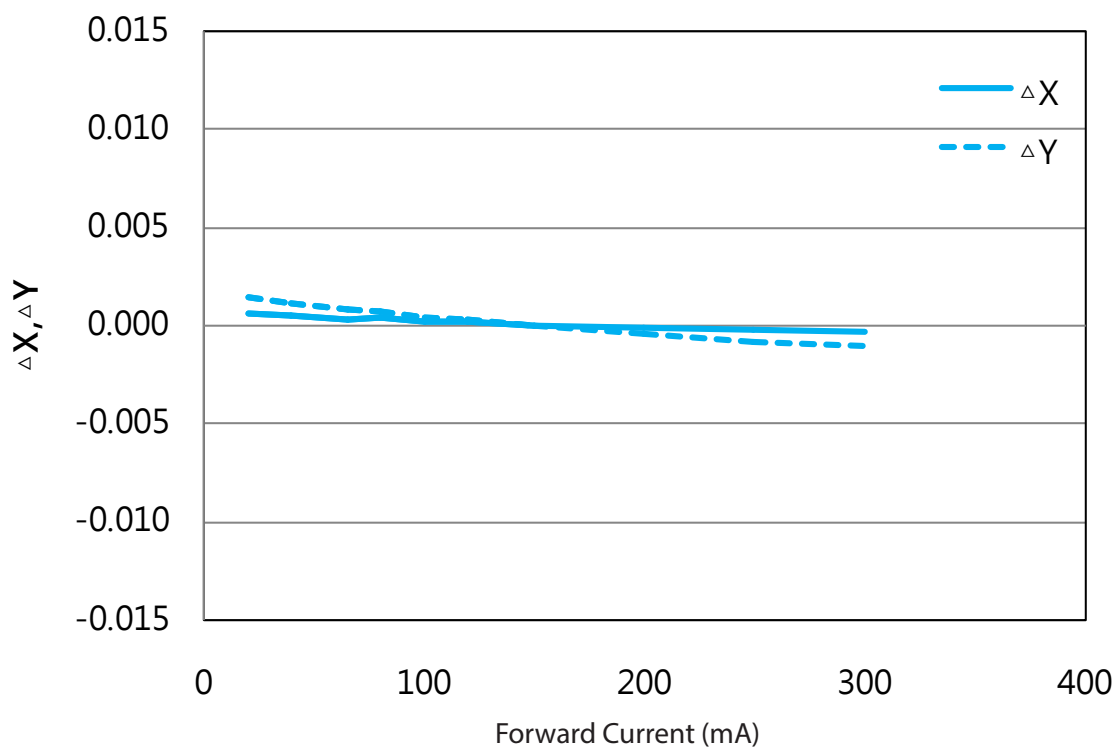
Forward Current vs. Forward Voltage



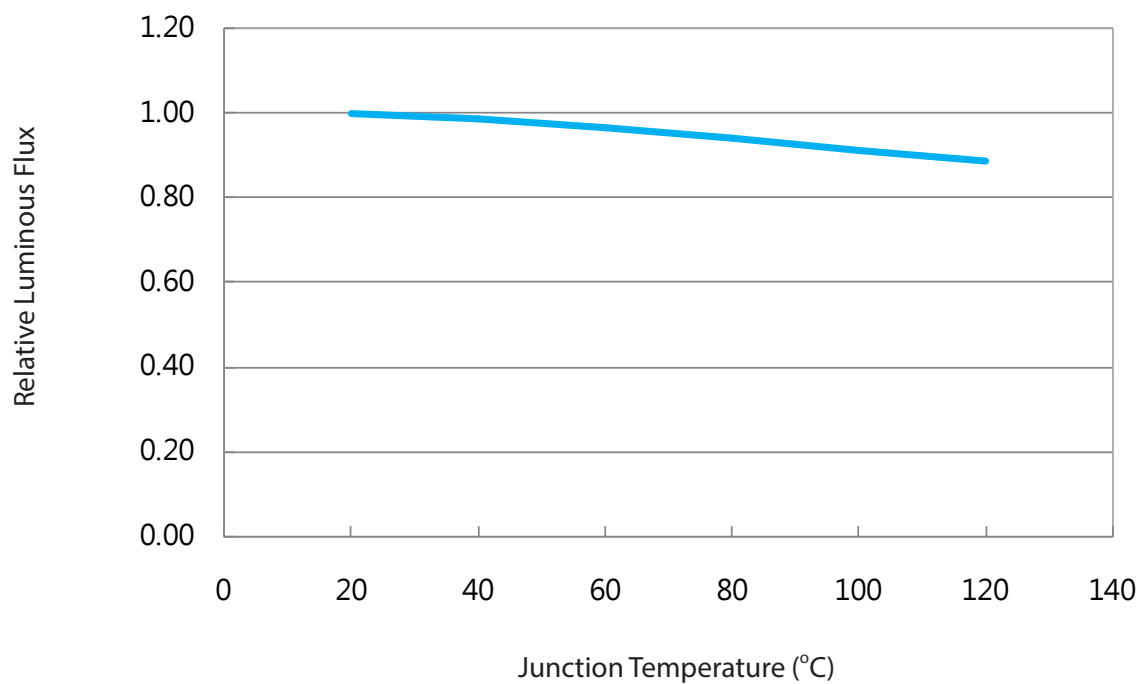
Relative Luminous Flux vs. Forward Current



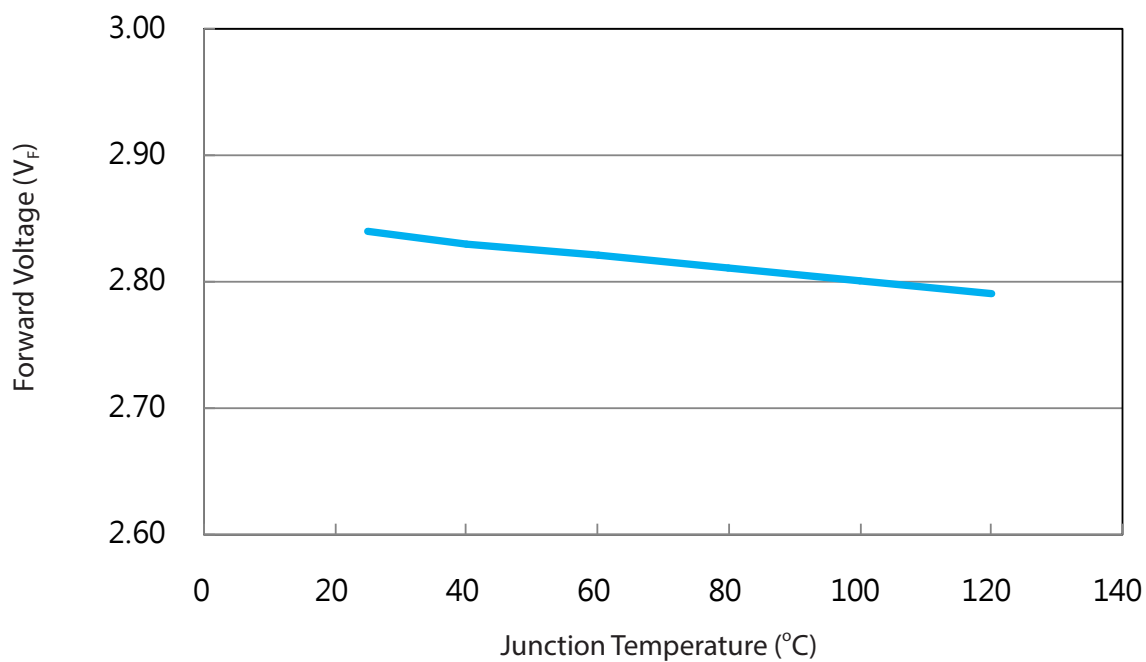
$\Delta x, \Delta y$ vs. Forward Current



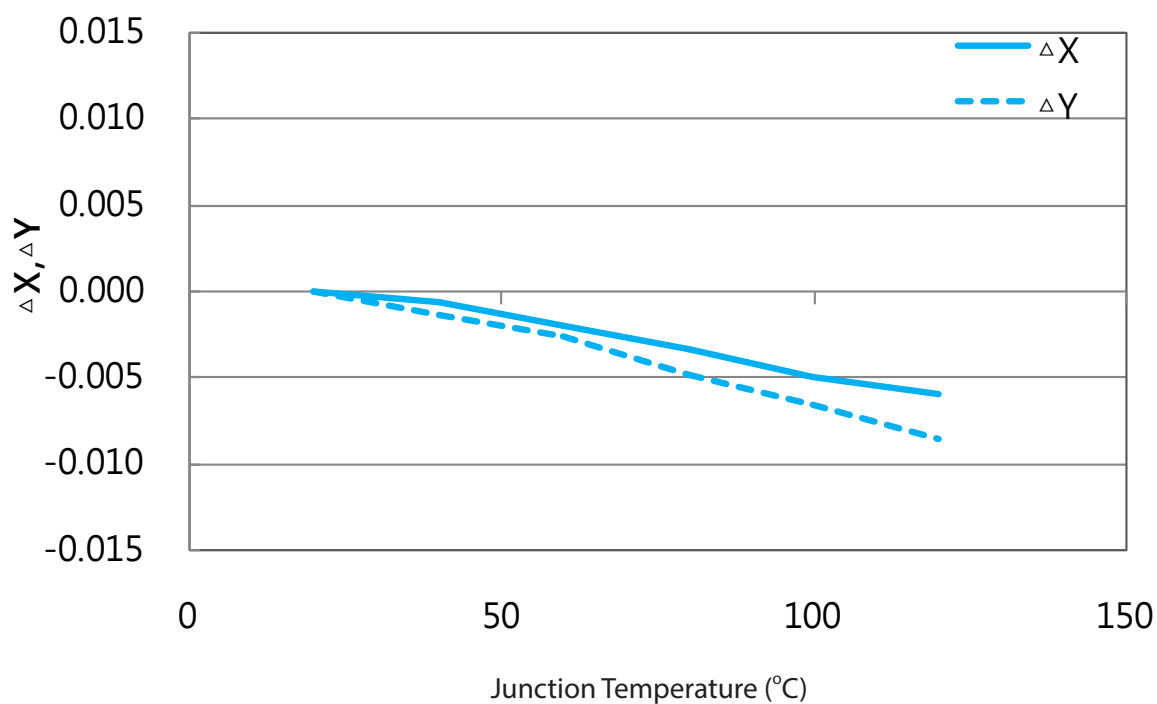
Relative Luminous Flux vs. Junction Temperature



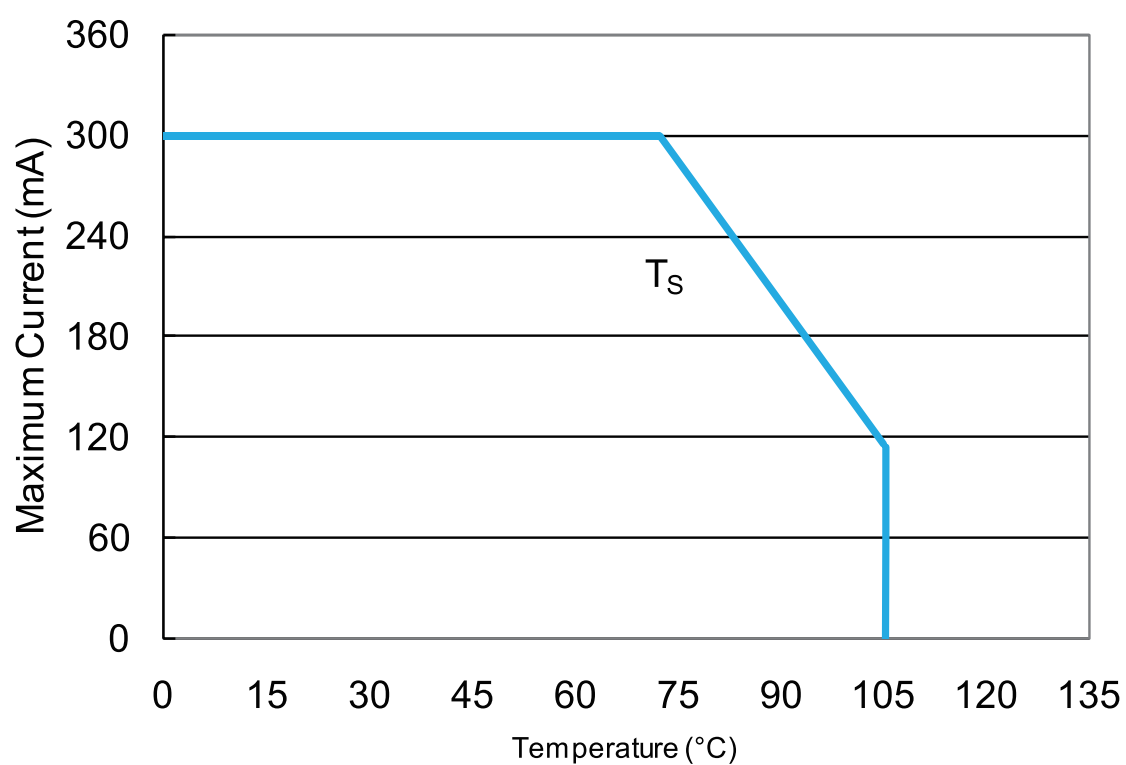
Forward Voltage vs. Junction Temperature



$\Delta X, \Delta Y$ vs. Junction Temperature

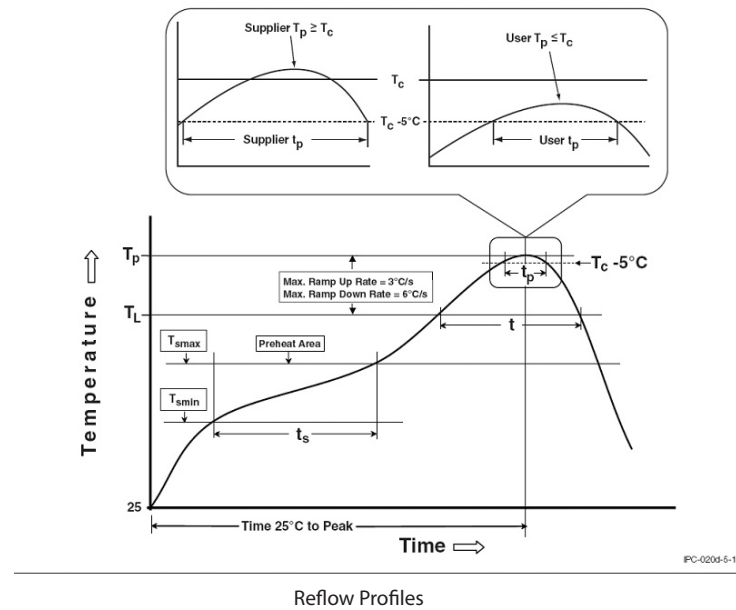


Maximum Current vs. Temperature



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_{sm})	150 °C
Temperature max (T_{sm})	200 °C
Time (T_{sm} 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 ≤ 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	

Cautions

LEDs should be stored or lighted in the environment of no sulfur.

Some materials, such as plastic seals, printing ink, enclosures and adhesives, may contain sulfur.

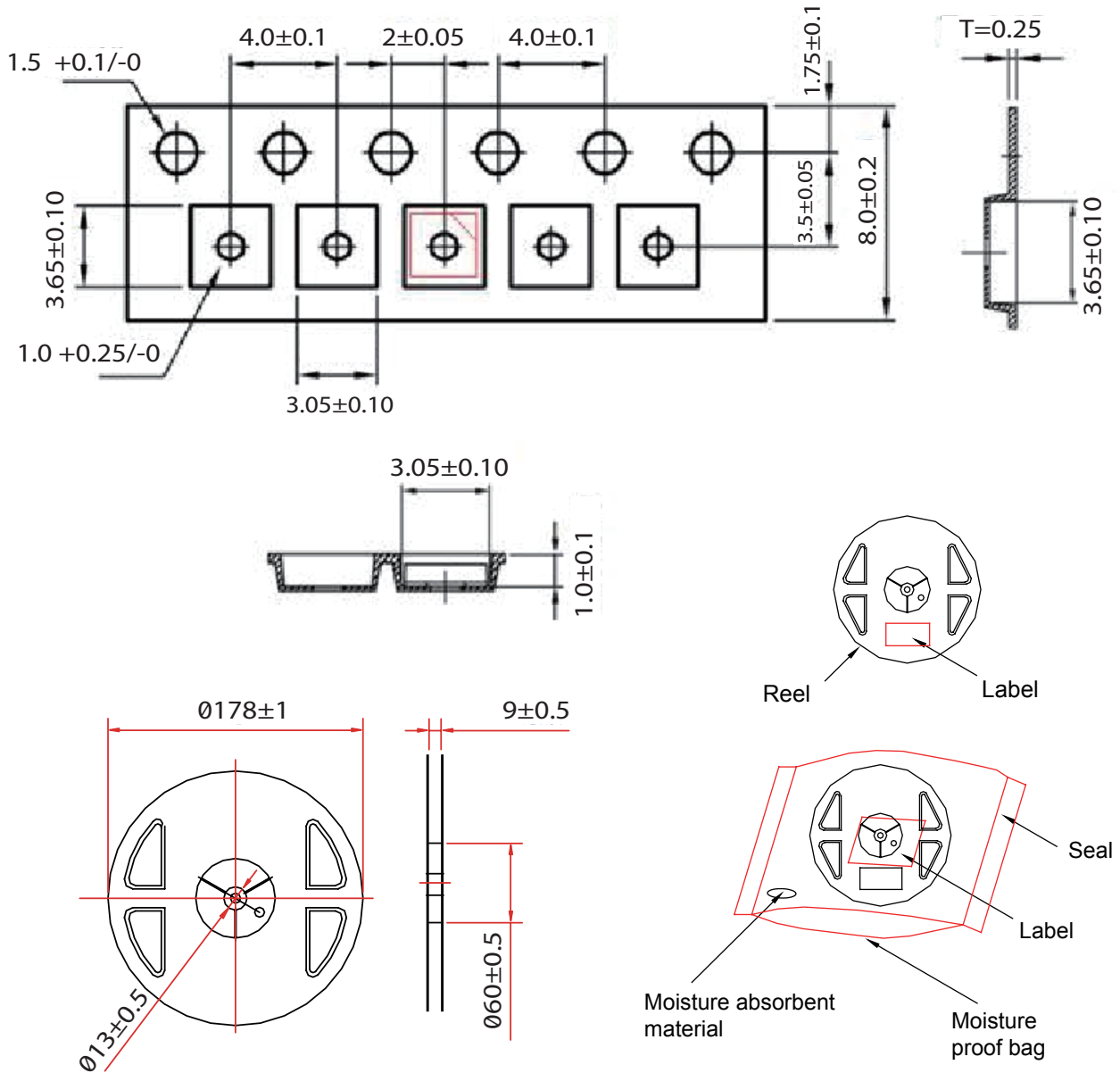
LEDs also should not be exposed in the acid or halogen environment.

**LM
80**

Lumen Maintenance

Edison Opto's LM-80 verification is conducted according to standardized IES LM-80-08 and TM-21-11 methods. Based on the different testing intervals data, Edison Opto can speculate LED lumen maintenance. For more details on lumen maintenance testing, chromaticity and LED case temperatures please refer to Edison Opto's LM-80 reports.

Product Packaging Information



Item	Quantity	Total	Dimensions(mm)
Reel	4,000pcs	4,000pcs	R=178
Starting with 150pcs empty, and 150pcs empty at the last			

Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2022/06/15
2	Update Series code Update the Electro-Optical Characteristics	2022/09/23

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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