SEMILEDS

PRODUCT DATASHEET

C35L-XX-A

High Power LED

Introduction

The C35L-XX-A LED from SemiLEDs brings industry leading technology to the solid state lighting market with its high quality and performance. With a silicone lens, C35L-XX-A LEDs from SemiLEDs feature very high brightness and efficacy, as well as excellent lifetime.

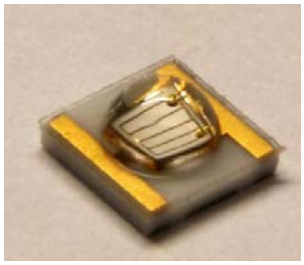


Table of Contents

RoHS Compliant

Characteristics

Absolute Maximum Ratings (Tj=25℃)

Parameter	Rating
	White / Royal Blue / Blue / Green / Cyan / Amber / Red
DC Forward Current (mA)	1000 mA (White/ Royal Blue/ Blue/ Green/ Cyan)
DC Forward Current (mA)	700 mA (Amber/ Red)
LED Junction Temperature	150℃ (White / Royal Blue / Blue /Green /Cyan)
LED Junction Temperature	125℃ (Red, Amber)
LED Operating Temperature	-40℃~125℃
Storage Temperature	-40℃~125℃
Soldering Temperature	Max. 260℃ / Max. 10sec. (JEDEC 020c)
ESD Sensitivity	2,000 V HBM (JESD-22A-114-B)
Reverse Voltage	Not designed to be driven in reverse bias (VR≦5V)
Preconditioning	Acc. to JEDEC Level 2

General Characteristics at 350mA (Tj=25℃)

Part number	Color	Dominant Wavelength λ_d Peak Wavelength λp (1) Correlated Color Temperature, CCT		$2\theta_{1/2}$	Temperature Coefficient of Vf (mV/℃)	Thermal Resistance Junction to Pad
		Min	Max		$\Delta V_F/\Delta T_J$	(℃/W) $R\Theta_{J-P}$
C35L-W0-A	Daylight	4750K	10000K	135	-3	8
C35L-W1-A	Neutral White	3700K	4750K	130	-3	8
C35L-W7-A	Warm White	2600K	3700K	130	-3	8
C35L-RN	Red	620	635	125	-	-
C35L-AN	Amber	580	600	125	-	-
C35L-GN-A	Green	520	535	125	-3	8
C35L-CN-A	Cyan	500	520	125	-3	8
C35L-BN-A	Blue	460	470	125	-3	8
C35L-DN-A	Royal Blue	440	460*	125	-3	8

Notes:

1. The peak/dominant wavelength is measured with an accuracy of ±1nm
2. SemiLEDs maintains a tolerance of ±2 on CRI measurements.
   Typical CRI for Cool White (4750 K – 10,000 K CCT) is 70.
   Typical CRI for Neutral White (3700 K – 4750 K CCT) is 75.
   Minimum CRI for Warm White (2600 K – 3700 K CCT) is 80.

Luminous Flux and Forward Voltage (Tj=25℃)

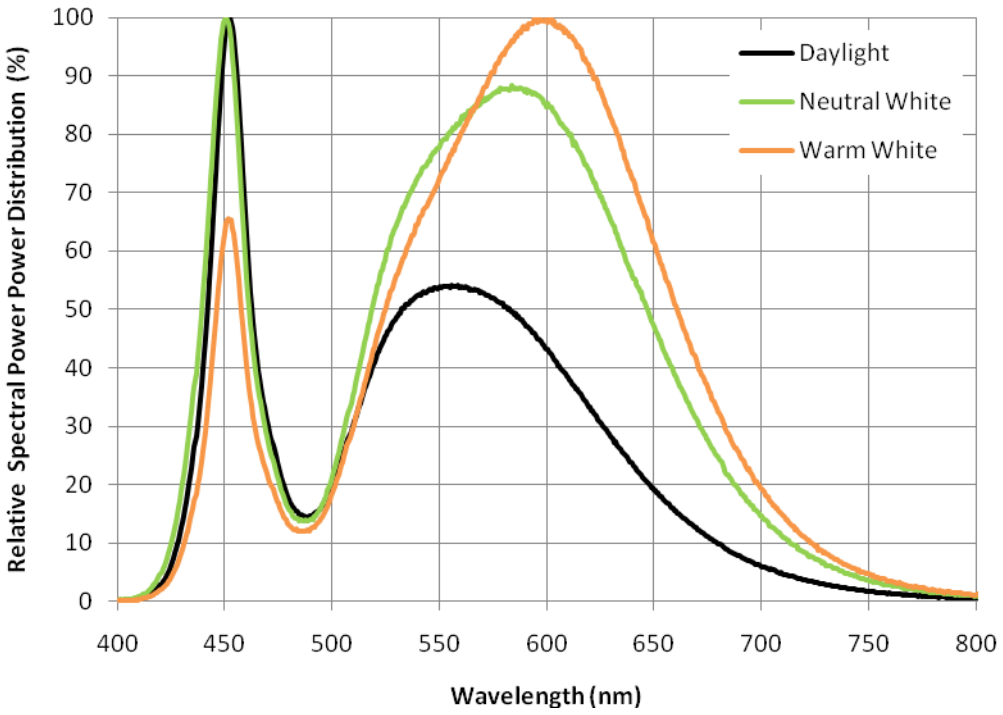
Part number	Color	Performance at Test Current (350mA)				Performance at 700mA
		Group	Minimum Luminous Flux (lm) or Radiometric Power* (mW)	VF		Typical Luminous Flux (lm) or Radiometric Power* (mW)
				Min	Max	
C35L-W0-A	Daylight	QE	107	2.8	3.6	185
		RB	114	2.8	3.6	200
		RC	122	2.8	3.6	215
		RD	130	2.8	3.6	230
		RE	139	2.8	3.6	245
C35L-W1-A	Neutral White	QD	100	2.8	3.6	168
		QE	107	2.8	3.6	180
		RB	114	2.8	3.6	200
		RC	122	2.8	3.6	210
C35L-W7-A	Warm White	PD	80.6	2.8	3.6	145
		QB	87.4	2.8	3.6	150
		QC	93.9	2.8	3.6	163
		QD	100	2.8	3.6	175
		QE	107	2.8	3.6	185
C35L-RN	Red	NB	51.7	2.0	3.0	96
		NC	56.8	2.0	3.0	105
C35L-AN	Amber	NB	51.7	2.0	3.0	96
		NC	56.8	2.0	3.0	105
C35L-GN-A	Green	PD	80.6	2.8	3.6	118
		QB	87.4	2.8	3.6	130
C35L-CN-A	Cyan	PD	80.6	2.8	3.6	118
		QB	87.4	2.8	3.6	130
C35L-BN-A	Blue	JC	23.5	2.8	3.6	33
		KB	30.6	2.8	3.6	43
C35L-DN-A	Royal Blue	E1	400*	2.8	3.6	712*
		E2	440*	2.8	3.6	783*
		E3	480*	2.8	3.6	850*

Note:

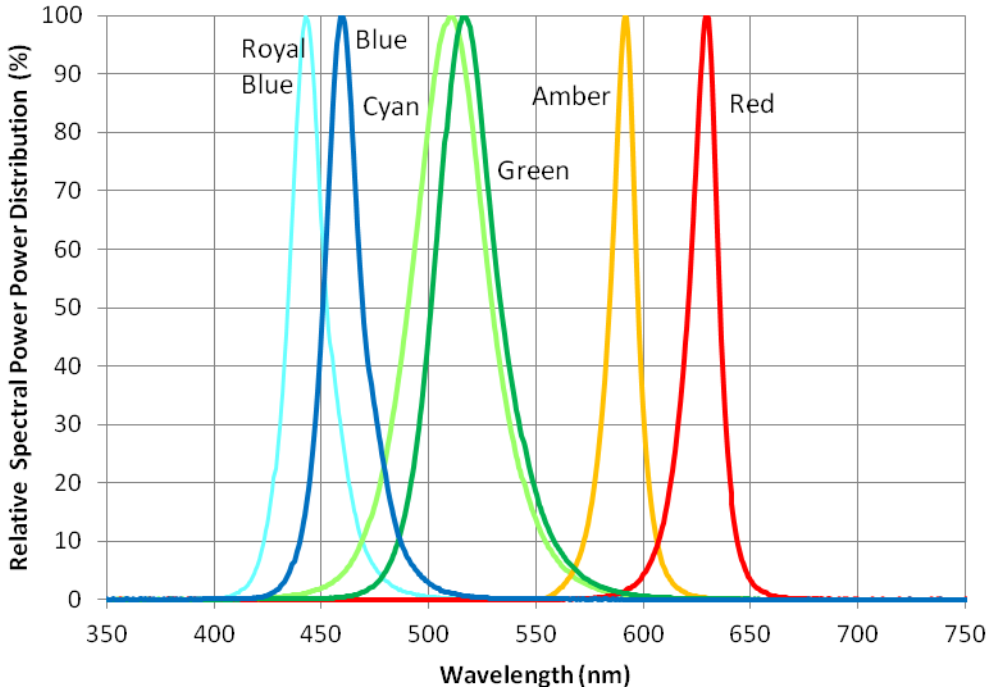
1. Luminous flux is measured with an accuracy of ±10%
2. The forward voltage is measured with an accuracy of ±0.1V

Relative Spectral Power Distribution, Tj=25 ℃

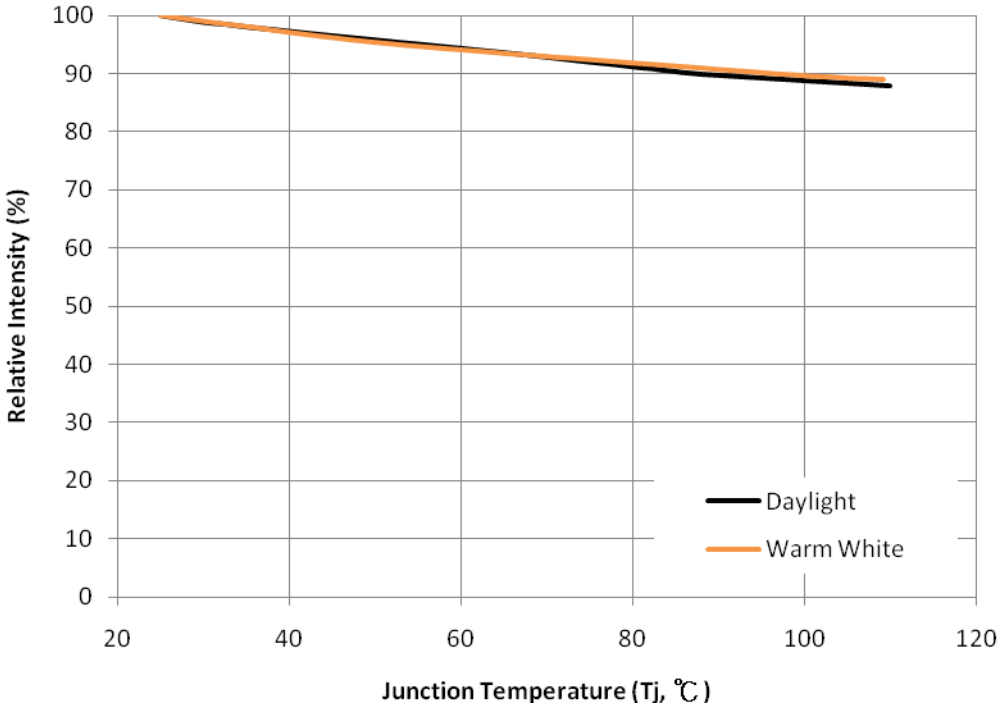
White

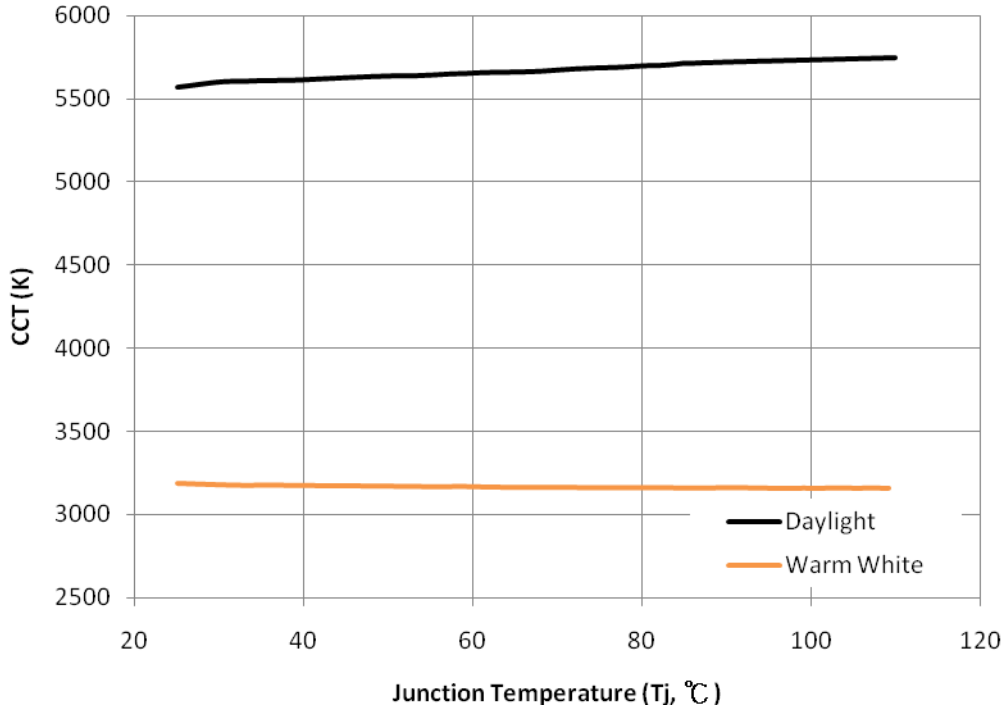


Royal Blue / Blue / Cyan / Green / Amber / Red



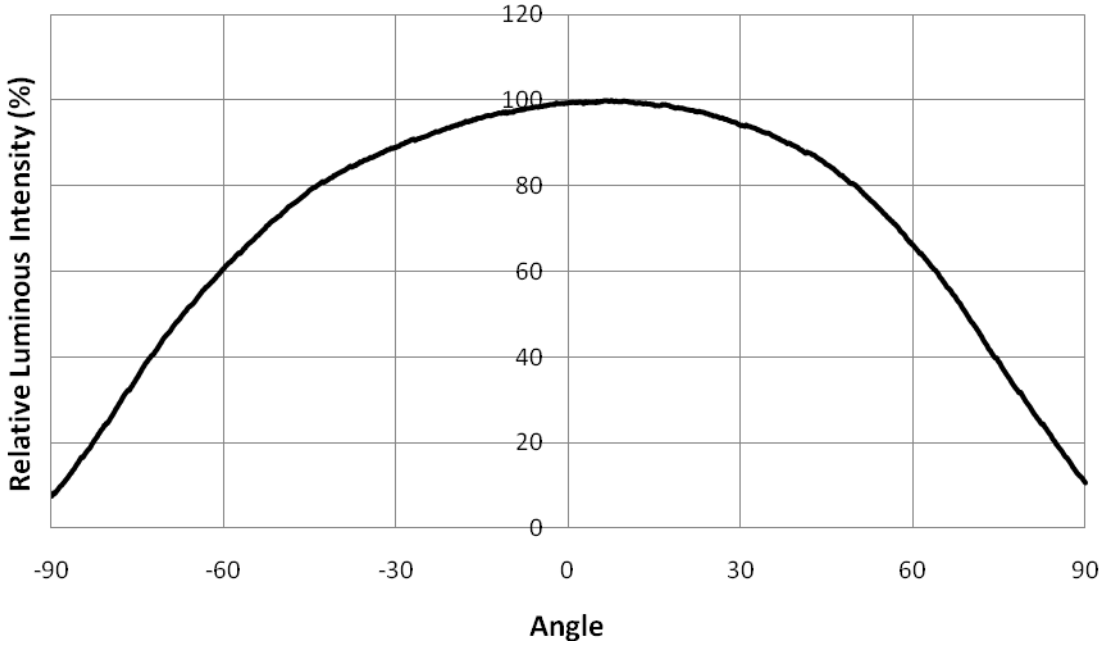
Typical Light Output Characteristics Vs. Temperature



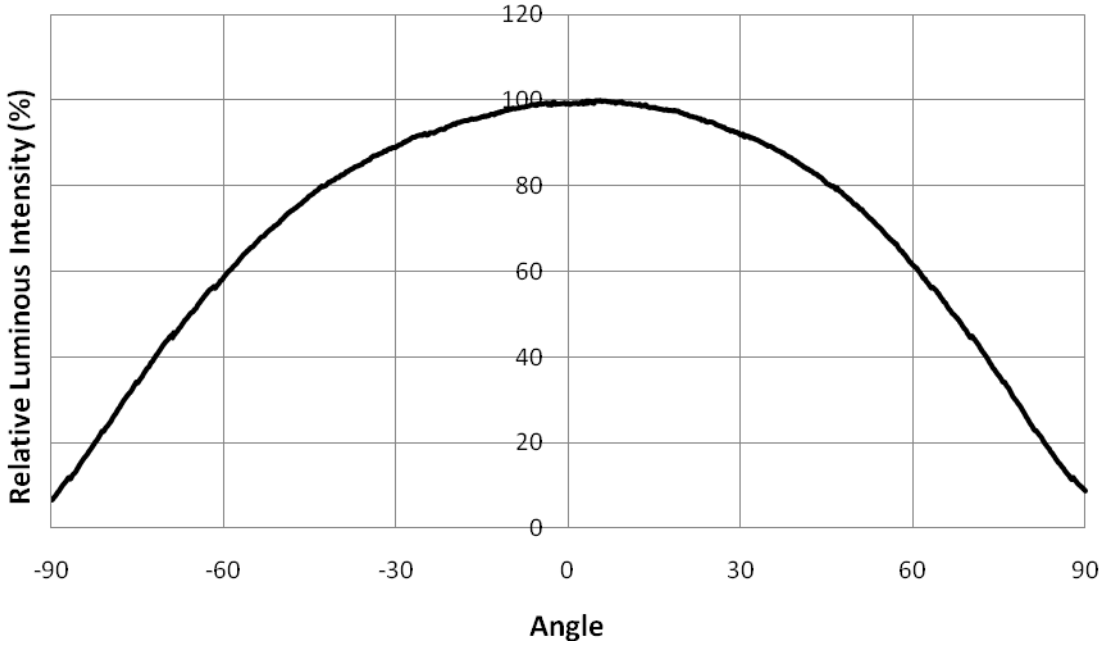


Typical Spatial Radiation Pattern

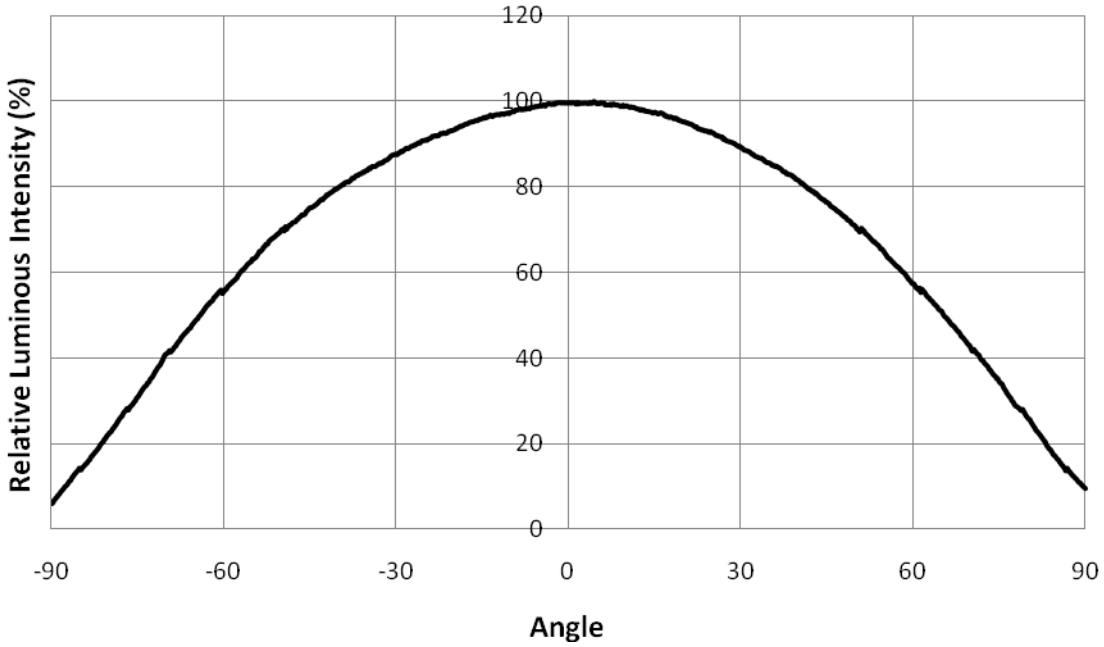
C35L-W0-A Daylight



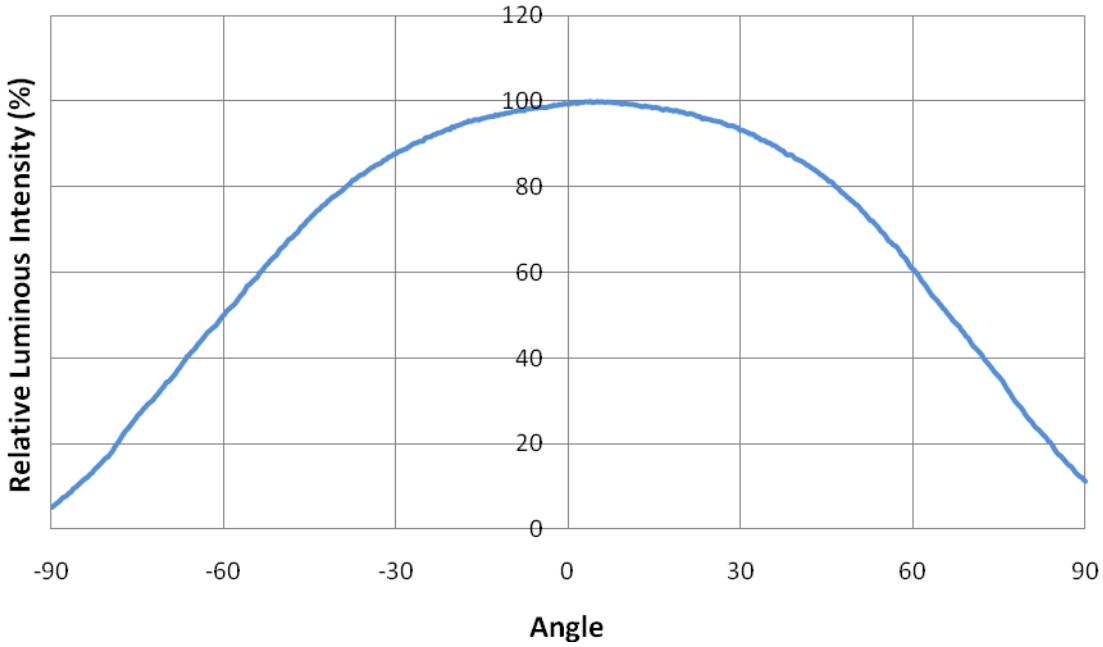
C35L-W1-A Neutral White



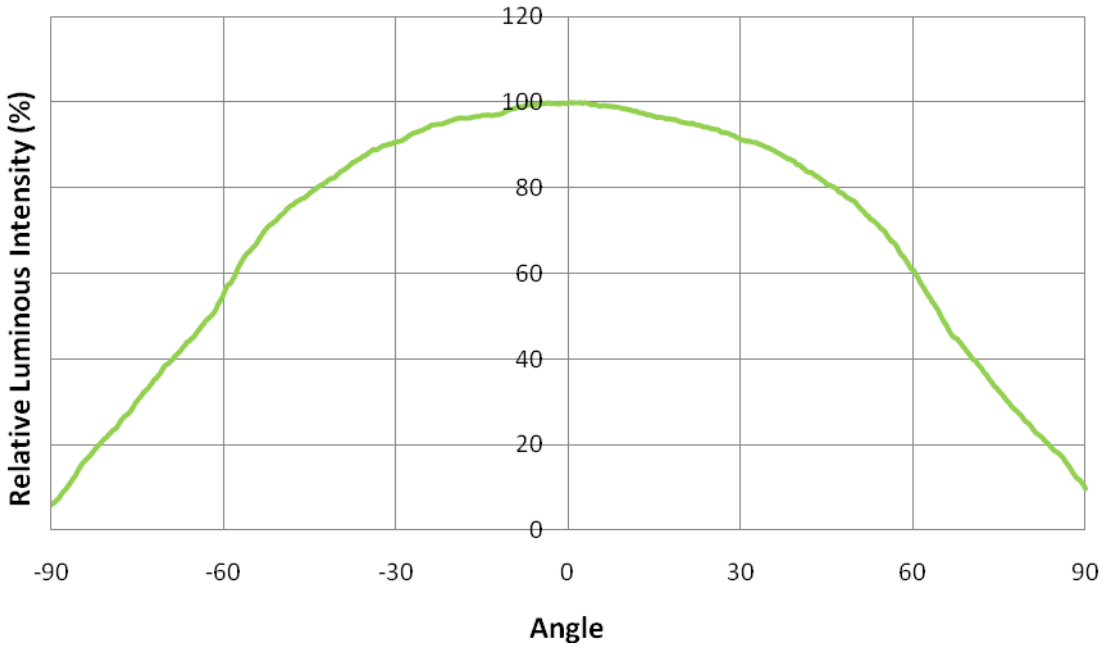
C35L-W7-A Warm White



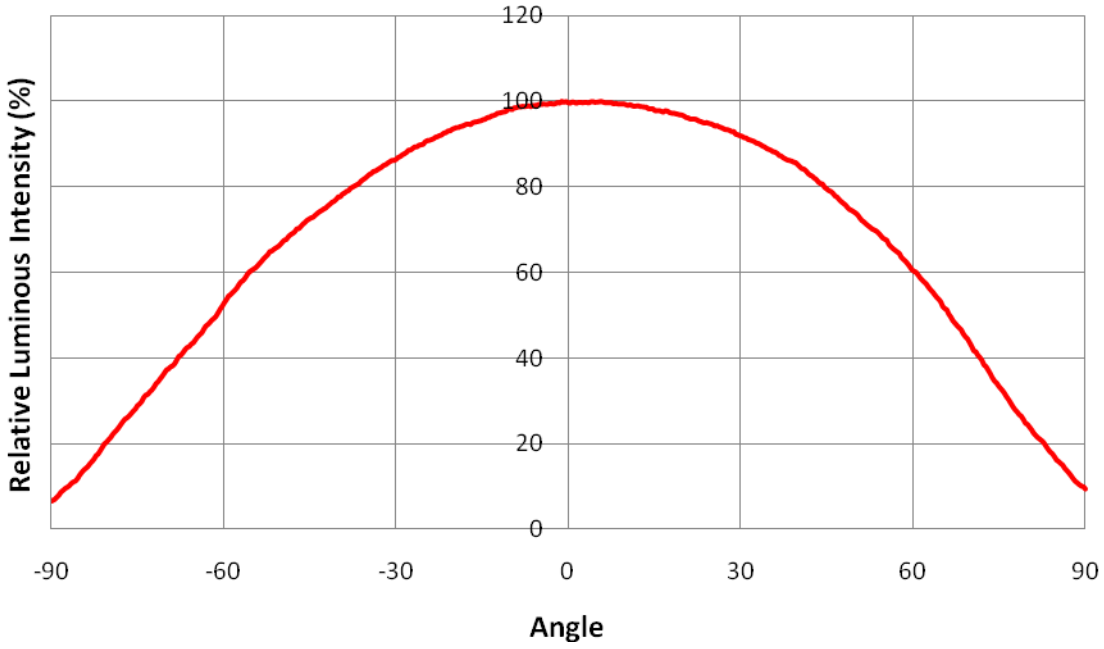
C35L-DN-A, C35L-BN-A



C35L-GN-A, C35L-CN-A

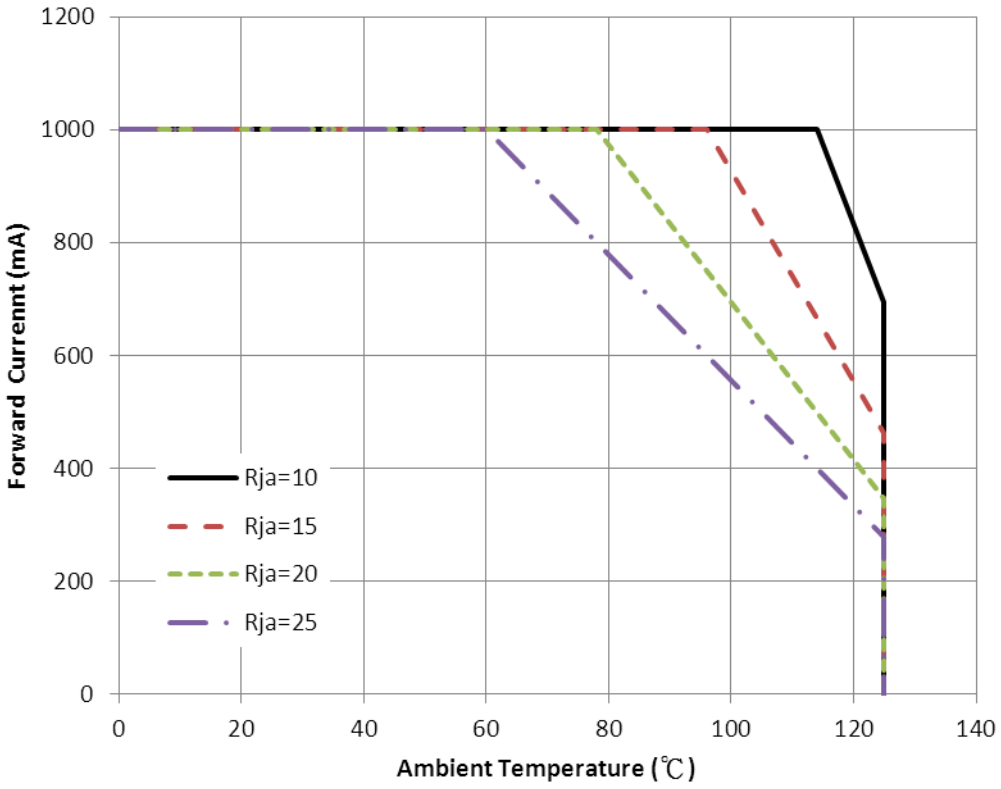


C35L-AN, C35L-RN



Thermal Design

Thermal design of the end product is important. The thermal resistance between the junction and the solder point ($R\Theta_{J-P}$) is 8℃/W, and the end product should be designed to minimize the thermal resistance from the solder point to ambient in order to optimize the emitter life and optical characteristics. The maximum operation current is determined by the plot of Allowable Forward Current vs. Ambient Temperature.



The junction temperature can be correlated to the thermal resistance between the junction and ambient (Rja) by the following equation.

$Tj=Ta + Rja*W$

Tj: LED junction temperature

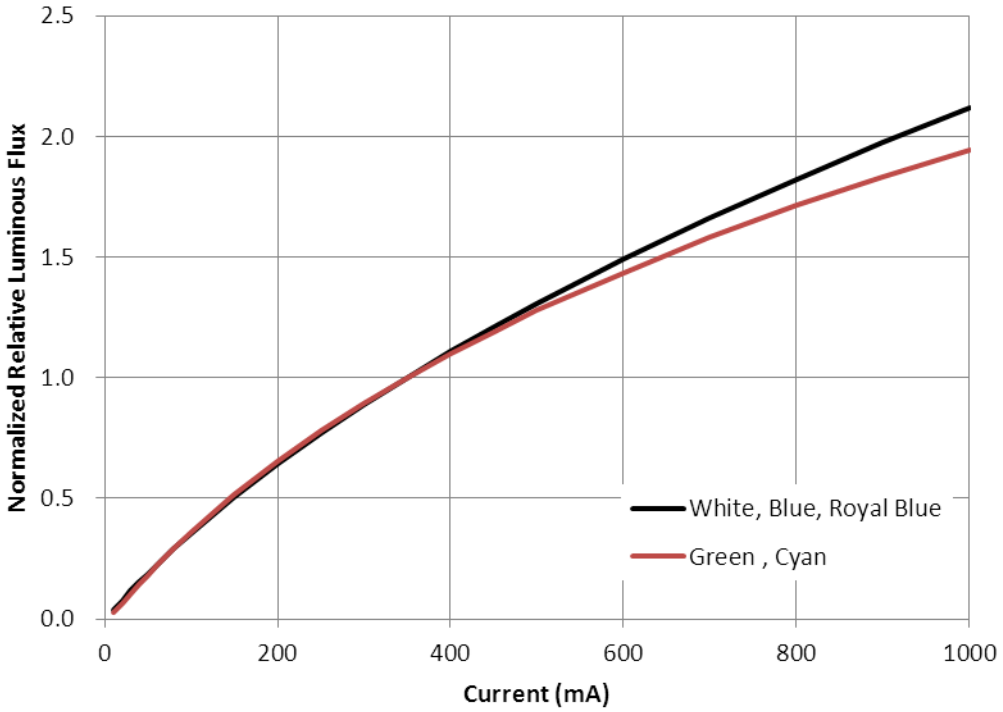
Ta: Ambient temperature

Rja: Thermal resistance between the junction and ambient

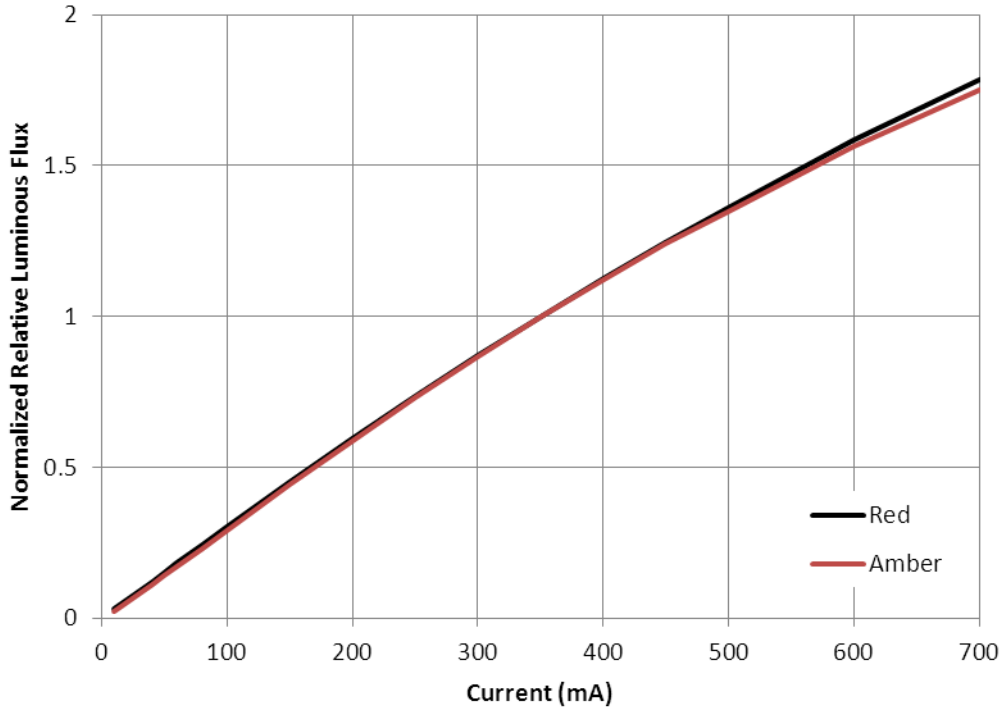
W: Input power (I_F*V_F)

Typical Forward L-I Characteristics

White Series / Blue / Royal Blue / Green / Cyan

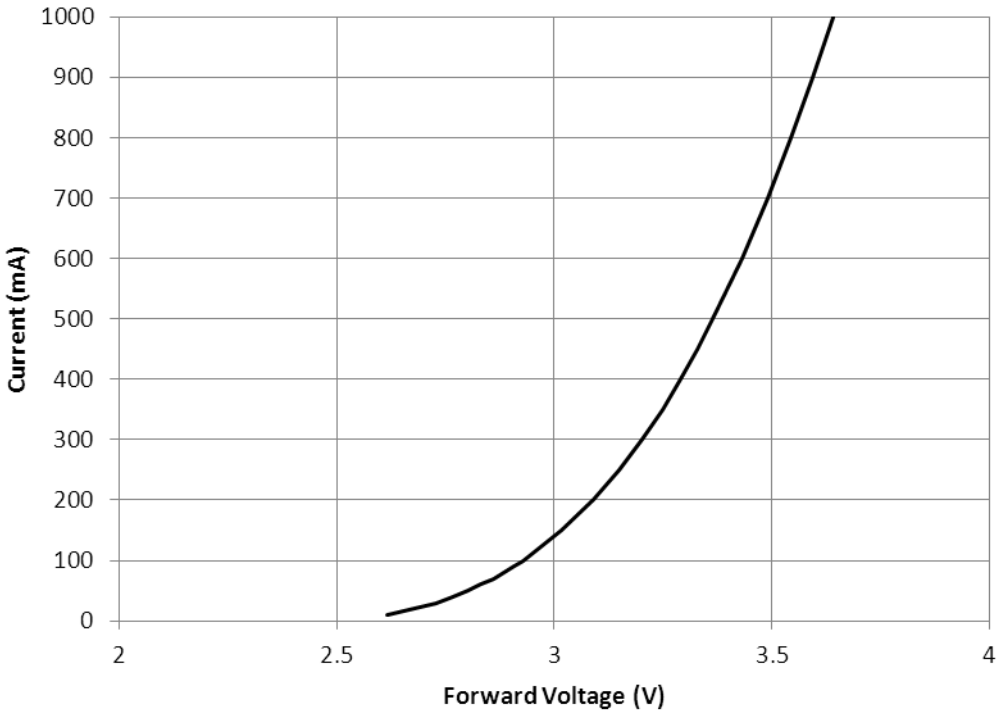


Amber / Red

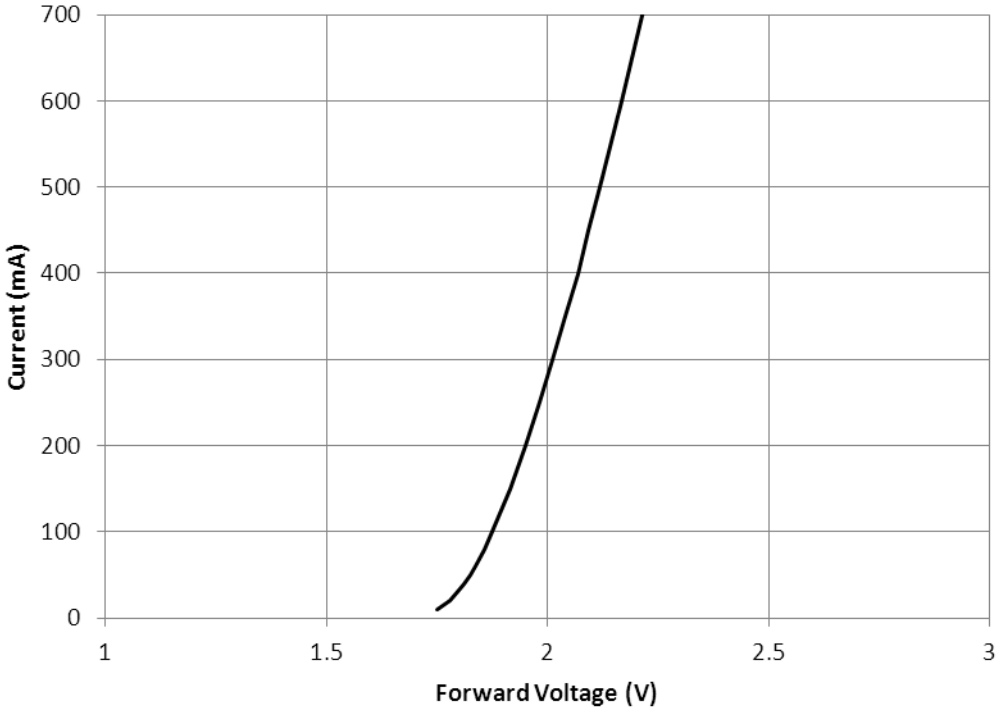


Typical Forward I-V Characteristics

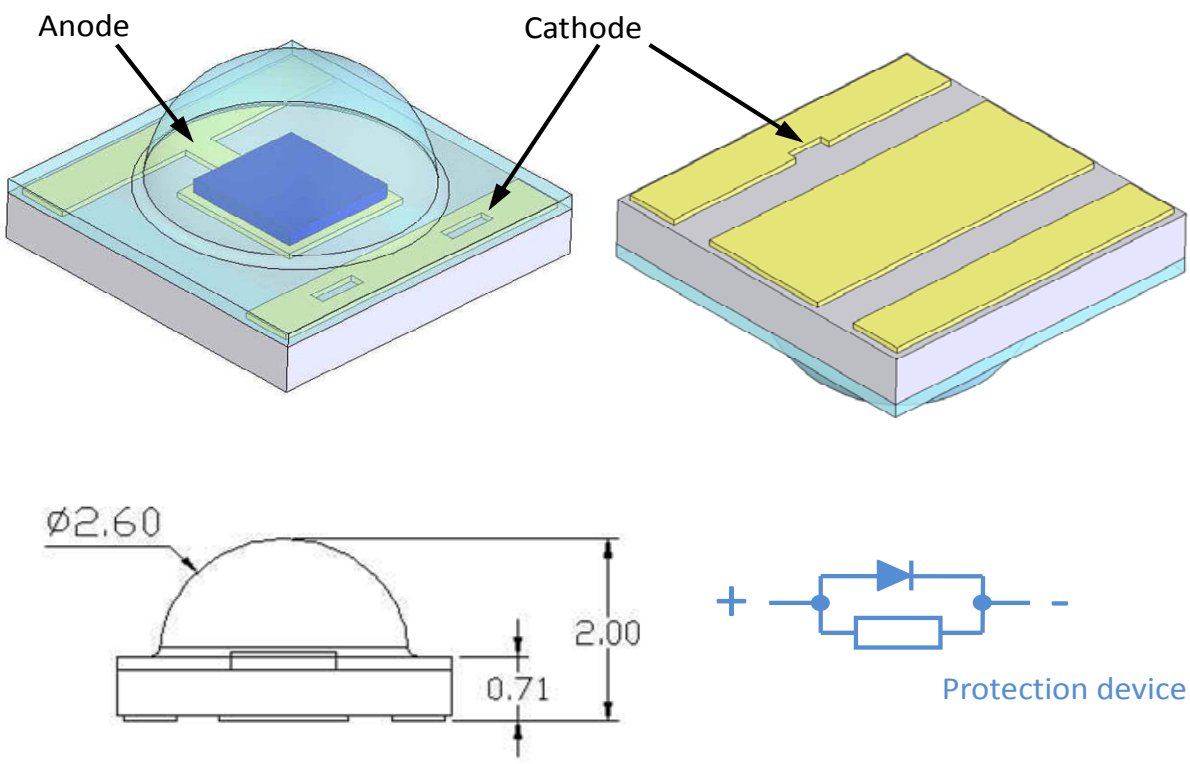
White Series / Blue / Royal Blue / Green / Cyan



Amber / Red



Mechanical Dimensions

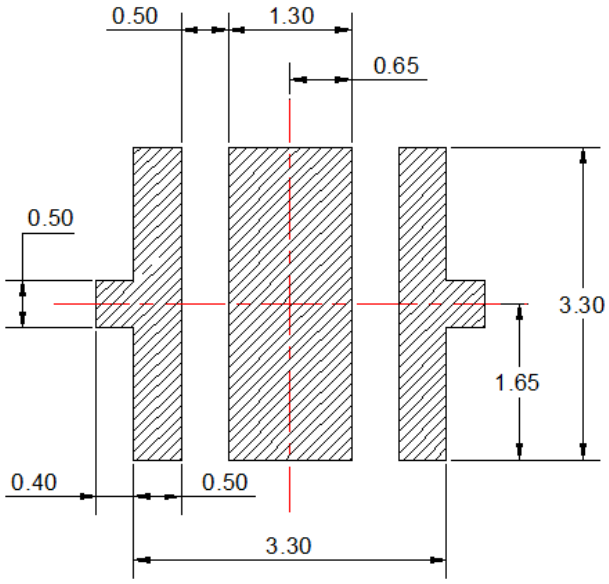


Notes :

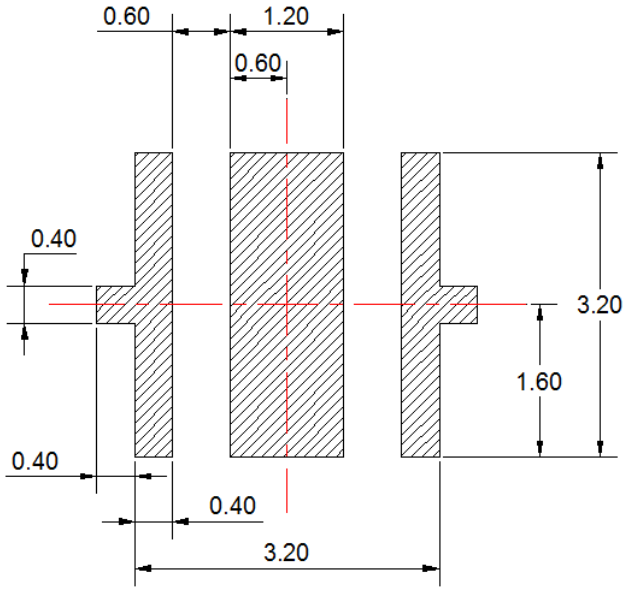
1. Drawing is not to scale
2. All dimensions are in millimeter
3. Dimensions are ±0.13mm unless otherwise indicated

Recommended Solder Pad Design

Recommended Soldering Pad Design



Recommended Stencil Pattern Design (Marked Area is Opening)

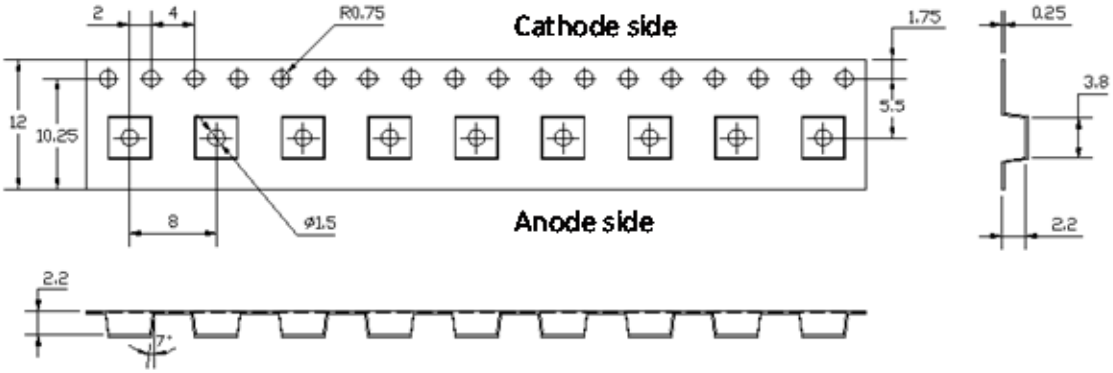


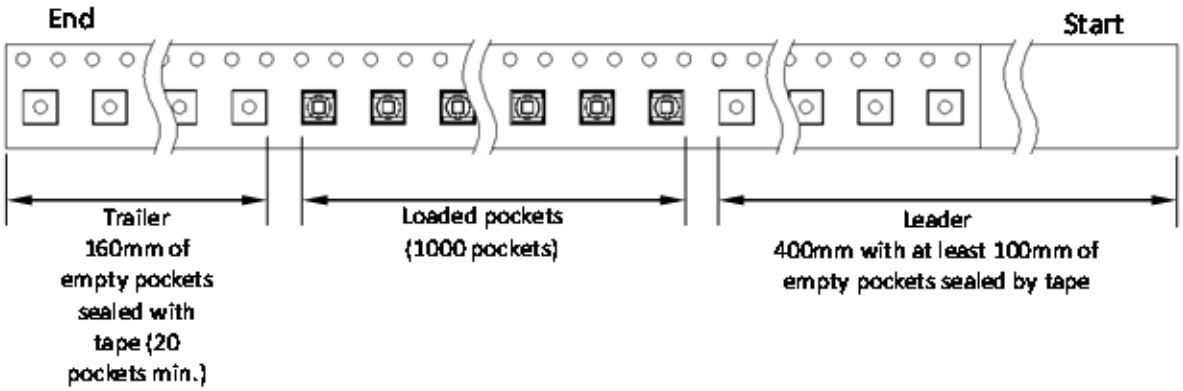
Notes :

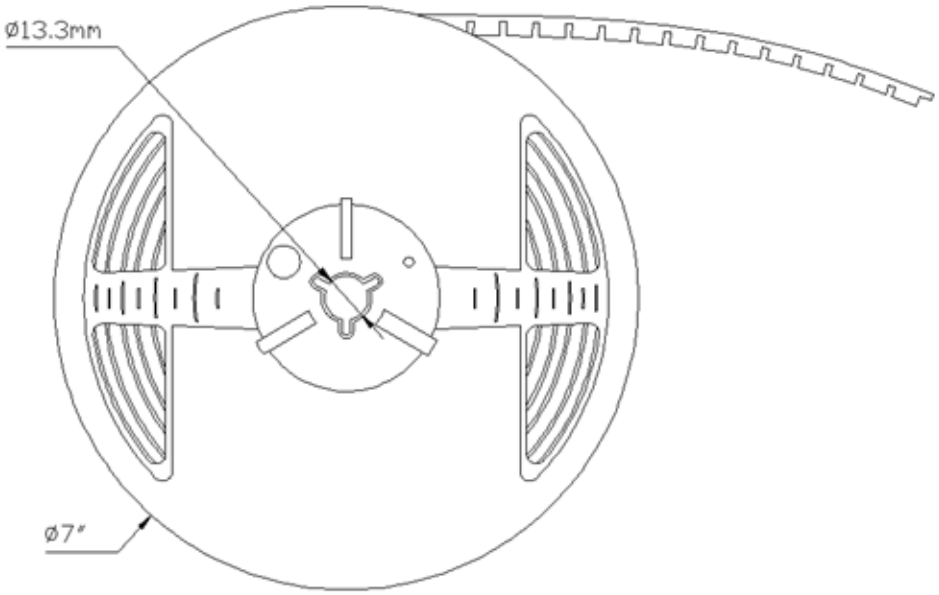
1. Drawing is not to scale
2. All dimensions are in millimeter

Packing Information

The carrier tape conform to EIA-481D.





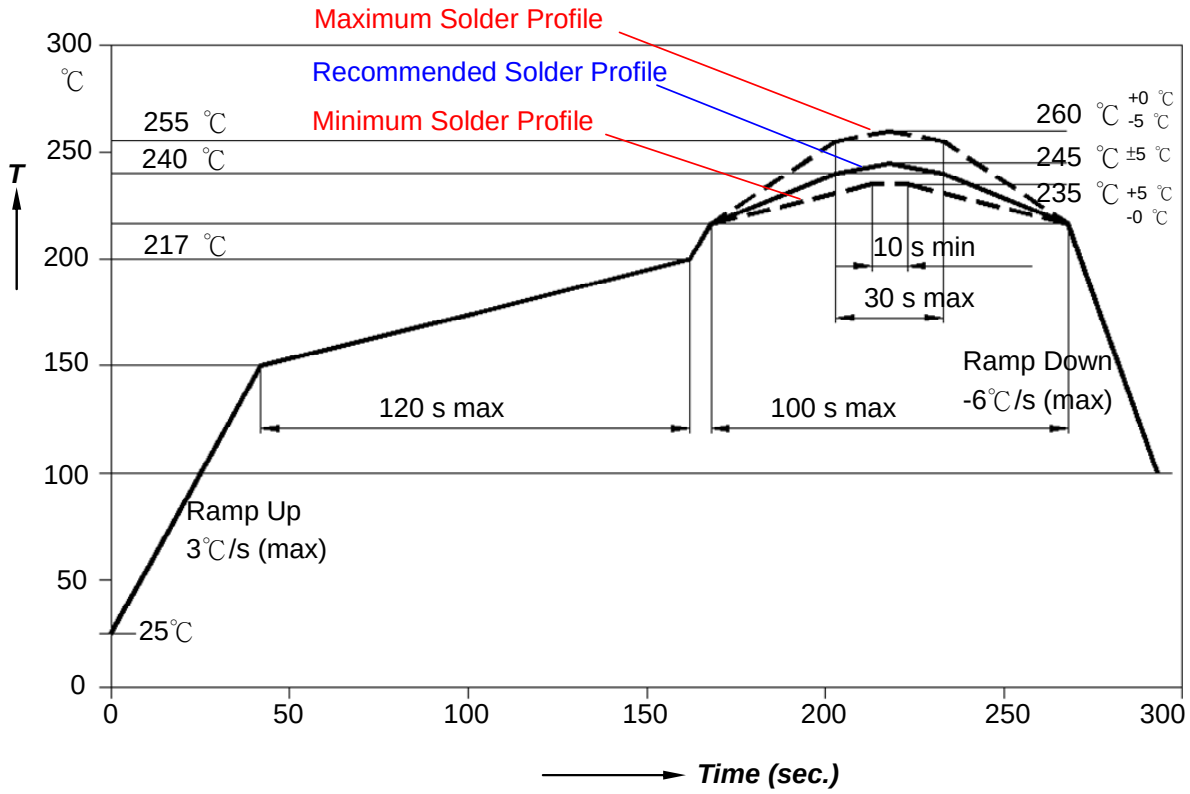


Note:

All dimensions are in millimeter.

Recommended Soldering Profile

The LEDs can be soldered using the parameters listed below. As a general guideline, the users are suggested to follow the recommended soldering profile provided by the manufacturer of the solder paste. Although the recommended soldering conditions are specified in the list, reflow soldering at the lowest possible temperature is advised for the LEDs.



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-up Rate (Ts_{max} to Tp)	3℃/second max.	3℃/second max.
Preheat - Temperature Min(Ts_{min}) - Temperature Max(Ts_{max}) - Time(ts_{min} to ts_{max})	 100℃ 150℃ 60-120 seconds	 150℃ 200℃ 60-180 seconds
Time maintained above: - Temperature(T_L) - Time(t_L)	 183℃ 60-150 seconds	 217℃ 60-150 seconds
Peak/classification Temperature(Tp)	215℃	260℃
Time within 5℃ of actual Peak Temperature(tp)	10-30 seconds	20-40 seconds
Ramp-Down Rate	6℃/second max.	6℃/second max.
Time 25℃ to Peak Temperature	6 minutes max.	8 minutes max.

About Us

SemiLEDs Corporation is a US based manufacturer of ultra-high brightness LED chips with state of the art fabrication facilities in Hsinchu Science Park, Taiwan. SemiLEDs specializes in the development and manufacturing of vertical LED chips in blue (white), green, and UV using a patented copper alloy base. This unique design allows for higher performance and longer lumen maintenance. In December 2008, The World Economic Forum recognized SemiLEDs innovations with the 2009 Technology Pioneer Award. SemiLEDs is fully ISO 9001:2008 and ISO 14001:2004 Certified.

SemiLEDs is a publicly traded company on NASDAQ Global Select Market (stock symbol "LEDS"). For investor information, please contact us at **investors@semileds.com.**

For further company or product information, please visit us at **www.semileds.com** or please contact **sales@ semileds.com.**

www.semileds.com

ASIA PACIFIC
3F, No. 11, KeJung Rd.
Chu-Nan Site
Hsinchu Science Park
Chu-Nan 350, Miao-Li County
Taiwan, ROC

Tel: +886-37-586788
Fax: +886-37-582688
sales@semileds.com