



C3535X-FNx1

High Power Infrared LED

Introduction

The C3535X-FNx1 LED from TSLC brings industry leading technology to the infrared applications market with its high reliability and performance. With a ceramic substrate and a 140/65 degree view angle primary lens, the C3535X-FNx1 LED is a perfect solution for horticulture, security cameras, surveillance systems, machine vision and general purpose IR applications.

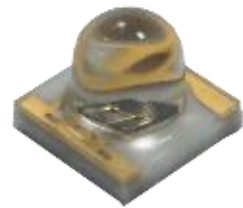
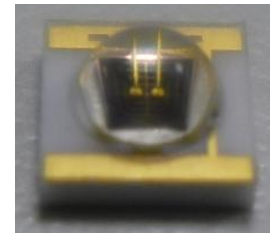


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RoHS Compliant

Characteristics

Absolute Maximum Ratings (T_j = 25°C)

Parameter	Rating
	IR Series
DC Forward Current (mA)	700 mA
LED Junction Temperature	115°C
LED Operating Temperature	-40°C ~ 85°C
Storage Temperature	-40°C ~ 115°C
Soldering Temperature	Max. 260°C / Max. 10sec. (JEDEC 020c)
ESD Sensitivity	2,000 V HBM (JESD-22A-114-B)
Reverse Voltage	Not designed to be driven in reverse bias (V _R ≤ 5V)
Preconditioning	Acc. to JEDEC Level 2

General Characteristics at 700mA

Part number	Color	Peak Wavelength λ _p		2θ _{1/2}	Temperature Coefficient of V _f (mV/°C)	Thermal Resistance Junction to Pad (°C/W)
		Min	Max		ΔV _f / ΔT _J	R _{θJ-L}
C3535X-FNL1-E1H11N	F2X	720	750	140	-2~-4	8
C3535X-FNF1-E1H11N	F2X	720	750	65	-2~-4	8

Notes: The peak/dominant wavelength is measured with an accuracy of ±1nm



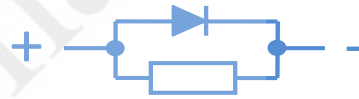
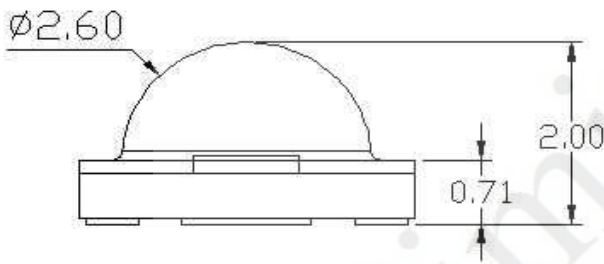
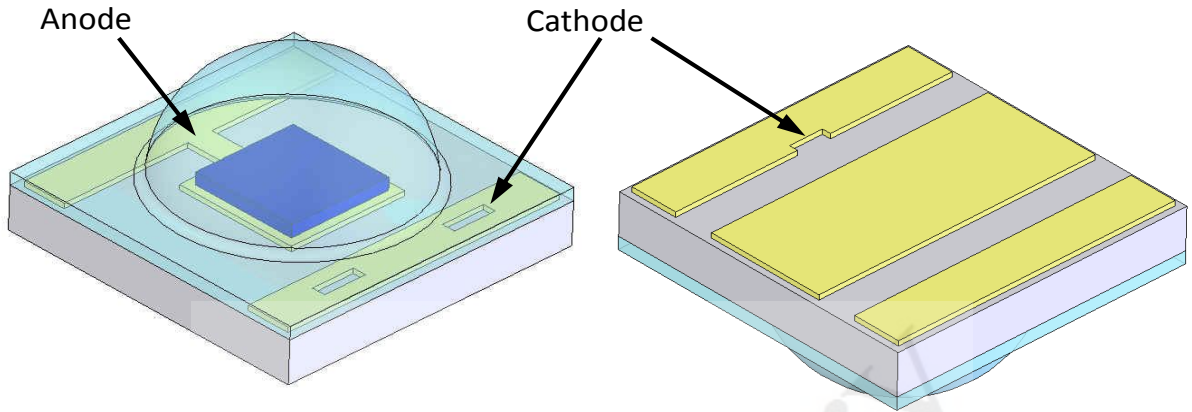
Radiometric Power and Forward Voltage (T_j = 25°C)

Part number	Color	Performance at Test Current (700mA)				
		Group	Radiometric Power (mW)		VF	
			Min	Max	Min	Max
C3535X- FNL1-E1H11N (beam angle 140°)	F2X (720-750nm)	ND5	360	400	1.6	3.0
		NE1	400	440	1.6	3.0
		NE2	440	480	1.6	3.0
		NE3	480	520	1.6	3.0
		NE4	520	560	1.6	3.0
		NE5	560	600	1.6	3.0
		NF1	600	650	1.6	3.0
		NF2	650	700	1.6	3.0
		NF3	700	750	1.6	3.0
C3535X- FNF1-E1H11N (beam angle 65°)	F2X (720-750nm)	ND5	360	400	1.6	3.0
		NE1	400	440	1.6	3.0
		NE2	440	480	1.6	3.0
		NE3	480	520	1.6	3.0
		NE4	520	560	1.6	3.0
		NE5	560	600	1.6	3.0
		NF1	600	650	1.6	3.0
		NF2	650	700	1.6	3.0
		NF3	700	750	1.6	3.0

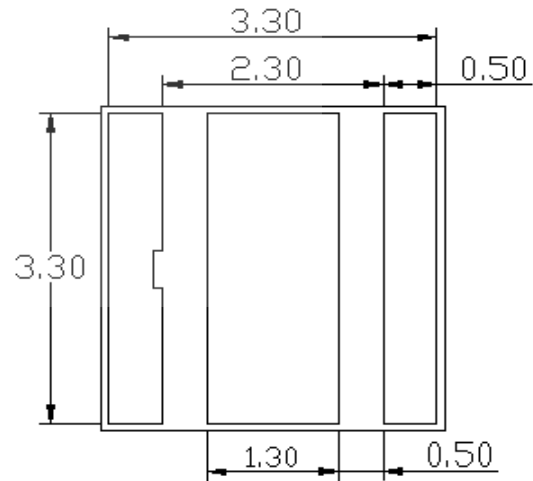
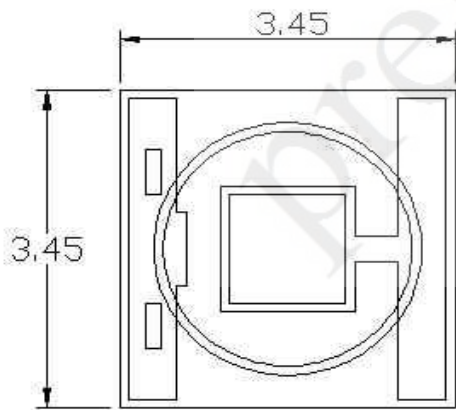
- Note: 1. Radiometric power is measured with an accuracy of $\pm 10\%$
 2. The forward voltage is measured with an accuracy of $\pm 0.2V$

Mechanical Dimensions

C3535X-FNL1-E1H11N (beam angle 140°)



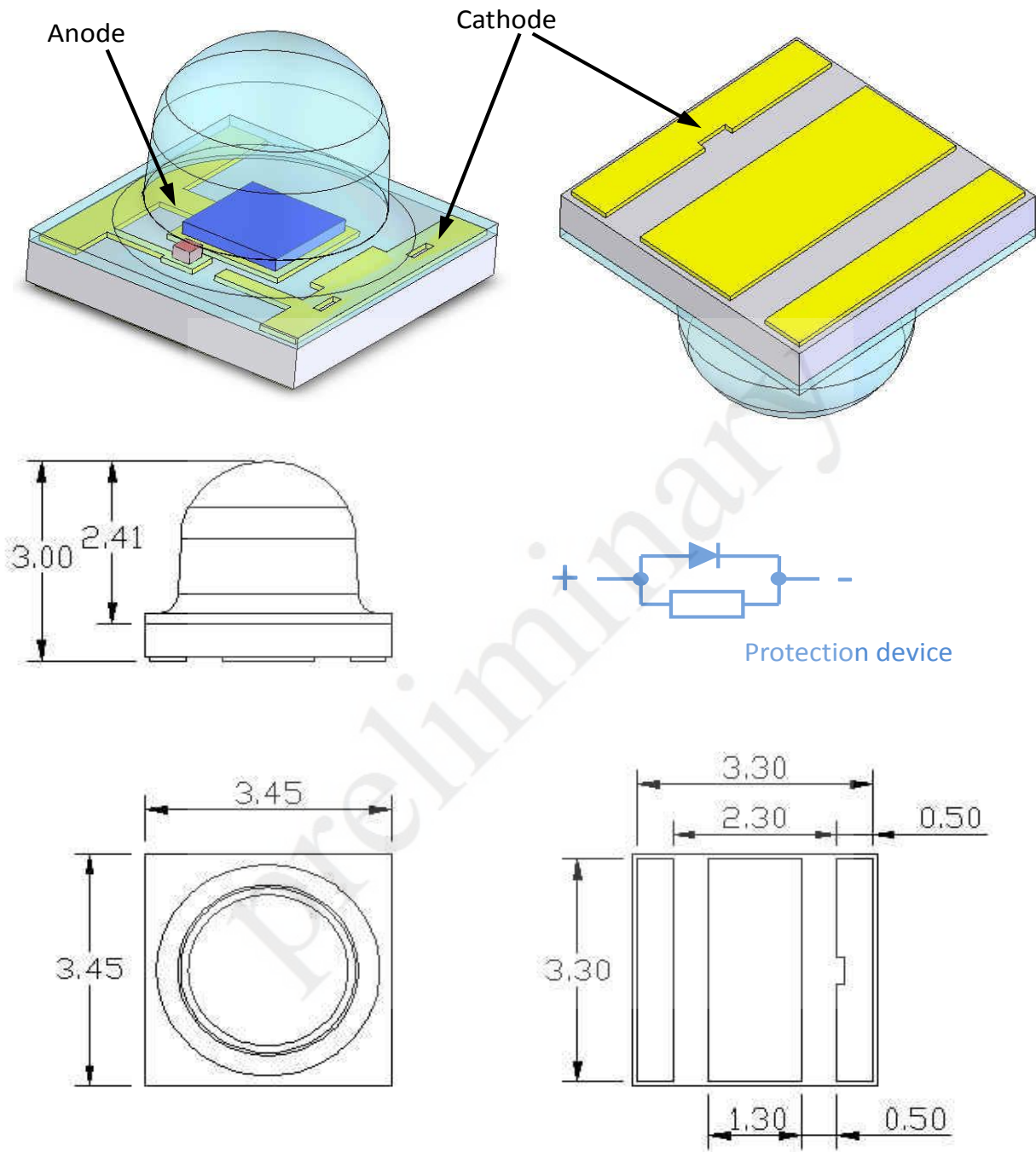
Protection device



Notes :

1. Drawing is not to scale
2. All dimensions are in millimeter
3. Dimensions are $\pm 0.13\text{mm}$ unless otherwise indicated

C3535X-FNF1-E1H11N (beam angle 65°)

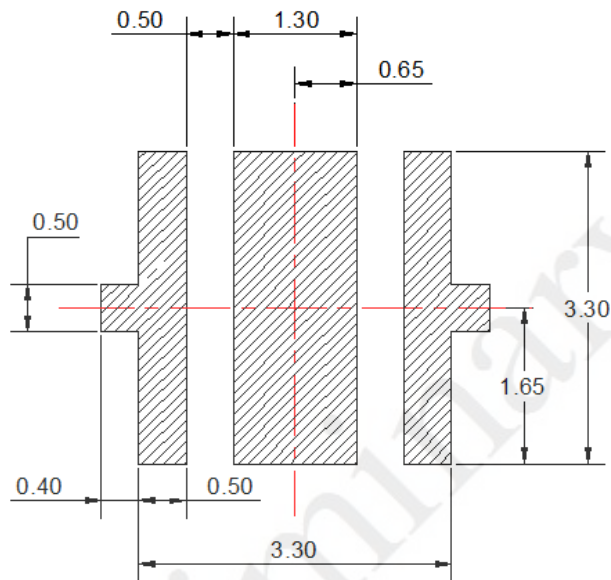


Notes :

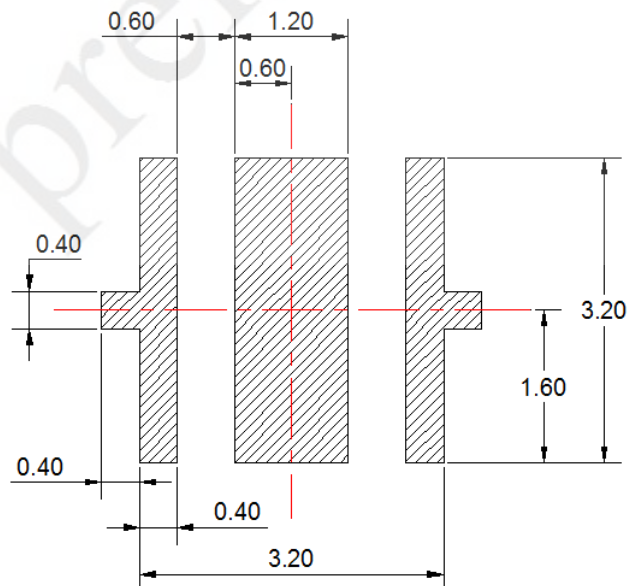
1. Drawing is not to scale
2. All dimensions are in millimeter
3. Dimensions are $\pm 0.13\text{mm}$ unless otherwise indicated

Recommended Solder Pad Design

Recommended Soldering Pad Design



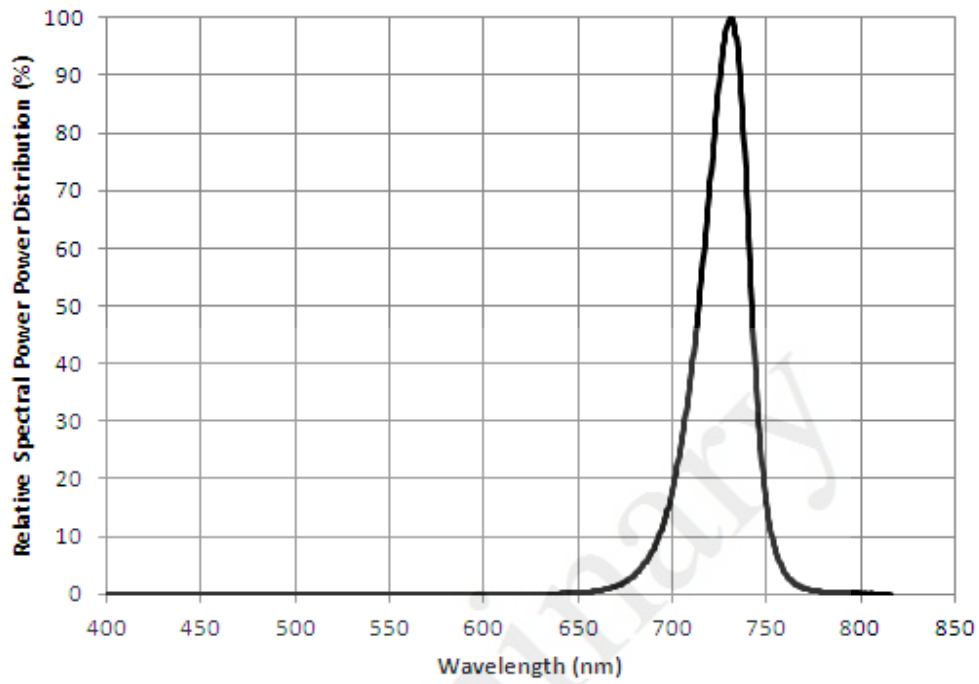
Recommended Stencil Pattern Design (Marked Area is Opening)



Notes :

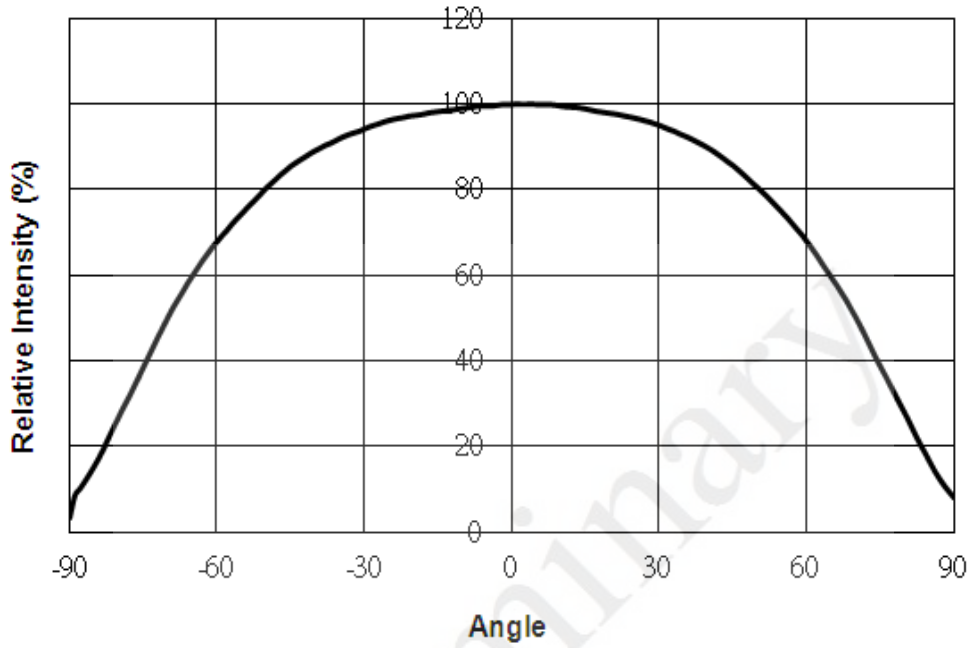
1. Drawing is not to scale
2. All dimensions are in millimeter

Relative Spectral Power Distribution, T_j=25°C

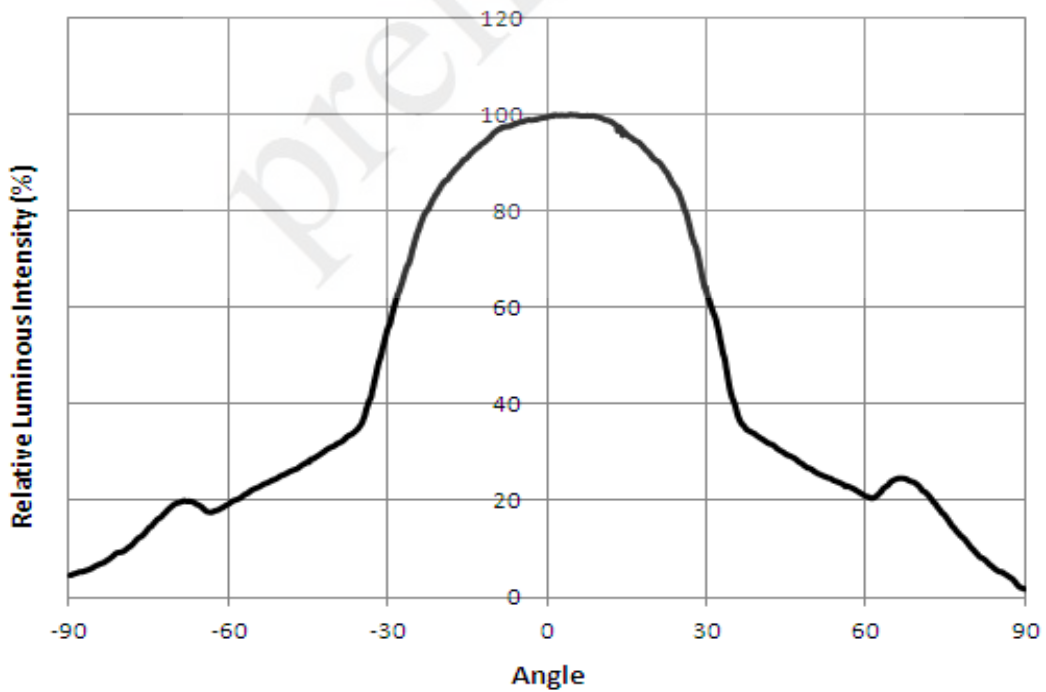


Typical Spatial Radiation Pattern

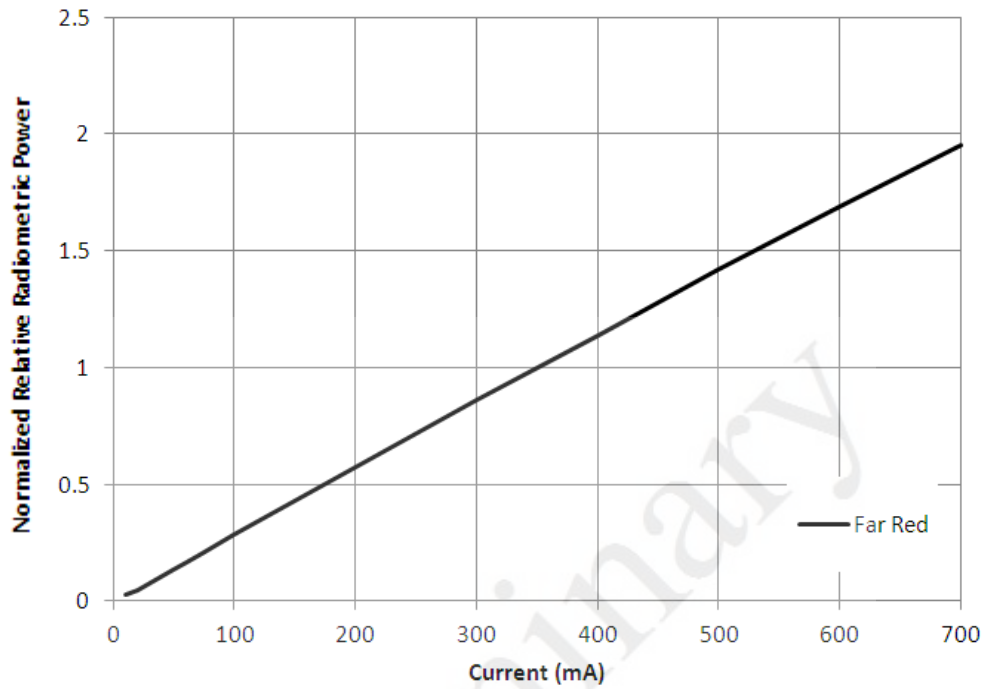
C3535X-FNL1-E1H11N (beam angle 140°)



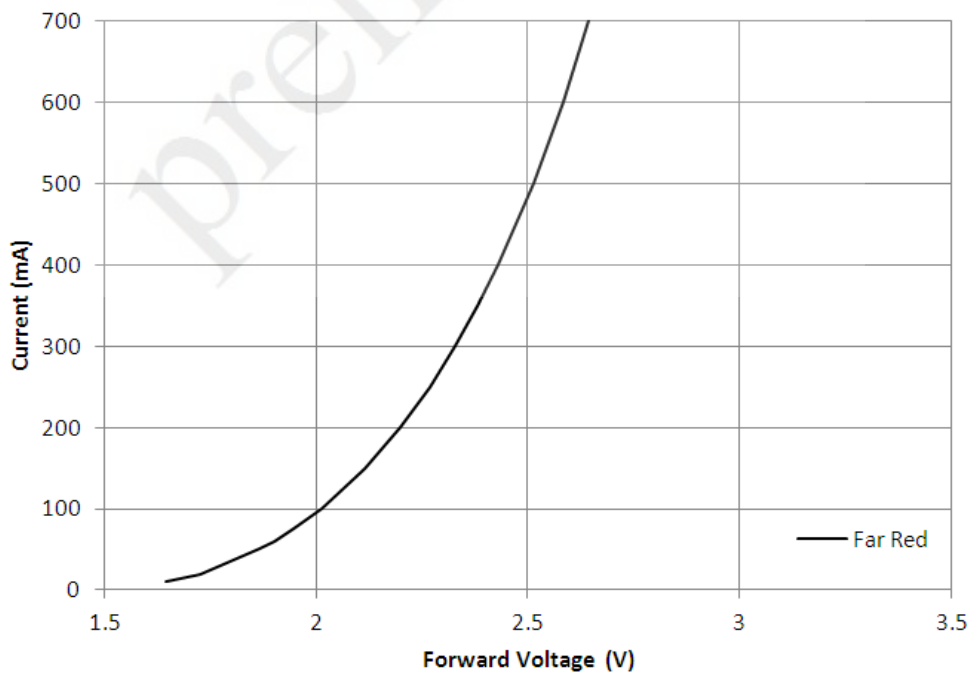
C3535X-FNF1-E1H11N (beam angle 65°)



Typical Forward L-I Characteristics, $T_j=25^\circ\text{C}$

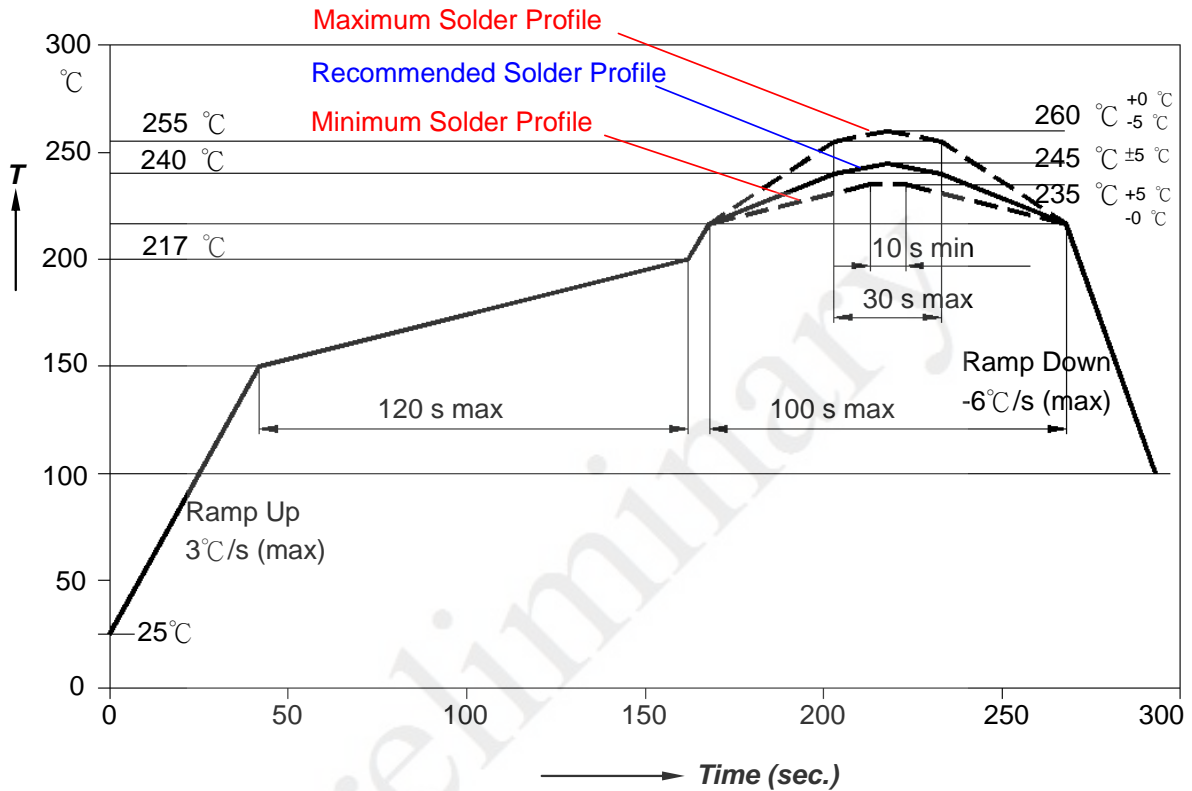


Typical Forward I-V Characteristics, $T_j=25^\circ\text{C}$



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.

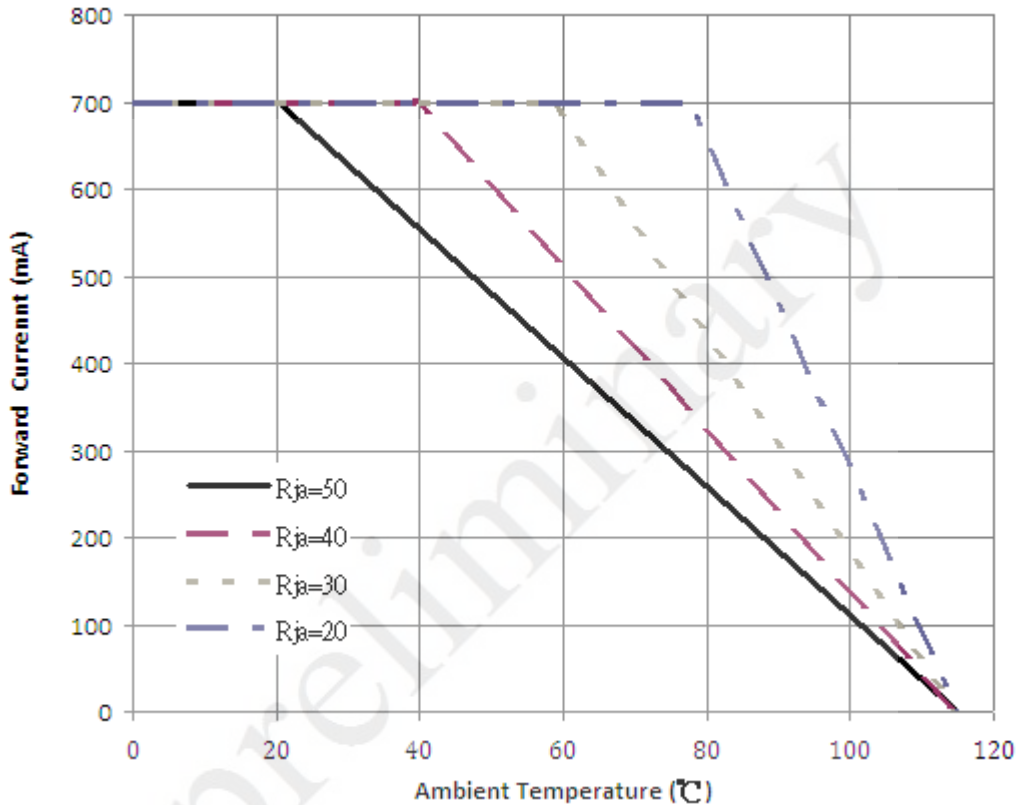


Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-up Rate (Ts _{max} to Tp)	3°C/second max.	3°C/second max.
Preheat		
- Temperature Min(Ts _{min})	100°C	150°C
- Temperature Max(Ts _{max})	150°C	200°C
- Time(ts _{min} to ts _{max})	60-120 seconds	60-180 seconds
Time maintained above: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



Thermal Design

Thermal design of the end product is important. The thermal resistance between the junction and the solder point ($R_{\theta_{j-p}}$) 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 (R_{ja}) by the following equation.

$$T_j = T_a + R_{ja} * W$$

T_j : LED junction temperature

T_a : Ambient temperature

R_{ja} : Thermal resistance between the junction and ambient

W : Input power ($I_f * V_f$)

About Us

Taiwan Semiconductor Lighting Co, Ltd (TSLC) is devoted to developing high-density, and multi-size emitters with powerful output to satisfy the needs of every customer.

Taiwan Semiconductor Lighting Co, Ltd (TSLC) is the leader in LED solutions. Unlimited design flexibility for interior and exterior spaces with high-end lighting effect; energy-efficient for UV curing to improve the quality of medical care; horticulture solutions create a better environment for everyone; high-intensity rotatable lightings for the entertainment industry, TSLC is always there for your lighting needs.

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



www.tslc.com.tw

ASIA PACIFIC

3F, No. 8, Xin An Road,
Hsinchu Science Park
Hsinchu City
Taiwan, ROC

Tel: +886-3-5789555

Fax: +886-3-5781555

sales@tslc.com.tw

