

SiBDI S35L-U LED

PRODUCT DATASHEET



The S35L-U LED from SiBDI brings industry leading technology to the UV applications market with its high quality and performance. With a silicone lens, S35L-U LEDs from SiBDI feature very high efficacy, as well as excellent lifetime. S35L-U LEDs are reflow solderable at 245°C.

S35L-U LEDs also feature a special design to fit secondary optics for various curing applications. The user can easily get uniform light with small size optics.

With excellent package control, S35L-U LEDs have very narrow wavelength (10nm) distribution for each bin and can help our customers to easy control their process during the applications.



Feature :

- Excellent Operating Life
- High Efficacy
- Low Thermal Resistance
- SMD Device
- Instant Light
- Fully Dimmable
- Small footprint
- Superior ESD Protection
- RoHS Compatibility

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Characteristics

Absolute Ratings

Parameter	Rating
	U50(390-400nm); U60(400-410nm); U70(410-420nm)
DC Forward Current (mA)	350 mA
LED Junction Temperature	125°C
LED Operating Temperature	-40°C ~110°C
Storage Temperature	-40°C ~110°C
Soldering Temperature	Max. 260°C / Max. 10sec. (JEDEC 020c)
ESD Sensitivity	2,000 V HBM (JESD-22A-114-B)
Reverse Voltage	Not design to be driven in reverse bias (VR ≤ 5V)
Preconditioning	Acc. to JEDEC Level 2

General Characteristics at 350mA

Part number	Wavelength(nm)	Peak Wavelength λp		2θ _{1/2} degree	Temperature Coefficient of Vf (mV/°C)	Thermal Resistance Junction to Pad
		Min	Max		ΔV _F /ΔT _J	(°C/W) Rθ _{J-L}
S35L-U	U50(390-400nm)	390	400	120	-4	6
S35L-U	U60(400-410nm)	400	410	120	-4	6
S35L-U	U70(410-420nm)	410	420	120	-4	6

Notes:

1. The peak wavelength is measured with an accuracy of ±1nm

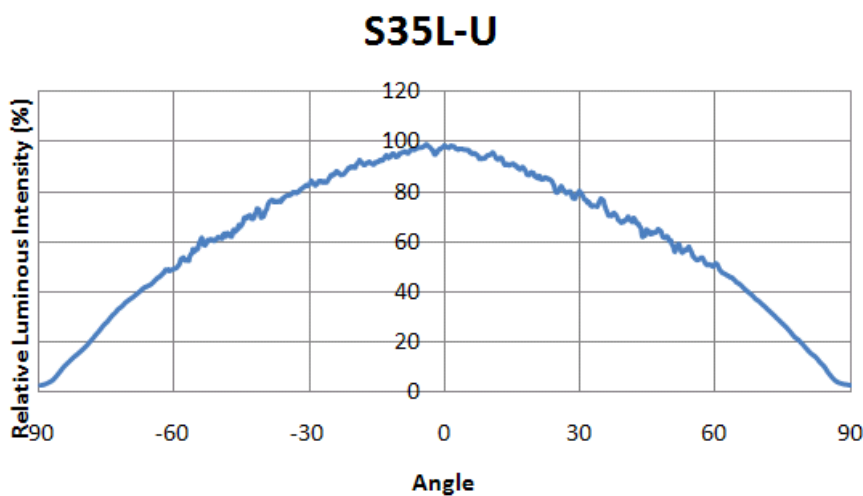
Radiometric Power v.s Different Wavelength

Part number	Wavelength	Performance at Test Current (350mA)				
		Group	Minimum Radiometric Power* (mW)	VF		Max. Radiometric Power* (mW)
				Min	Max	
S35L-U	U50(390-400nm)	D1	200*	3.0	4.0	240*
		D2	240*	3.0	4.0	280*
		D3	280*	3.0	4.0	320*
S35L-U	U60(400-410nm)	D1	200*	3.0	4.0	240*
		D2	240*	3.0	4.0	280*
		D3	280*	3.0	4.0	320*
		D4	320*	3.0	4.0	360*
S35L-U	U70(410-420nm)	D2	240*	3.0	4.0	280*
		D3	280*	3.0	4.0	320*
		D4	320*	3.0	4.0	360*
		D5	360*	3.0	4.0	400*

Note:

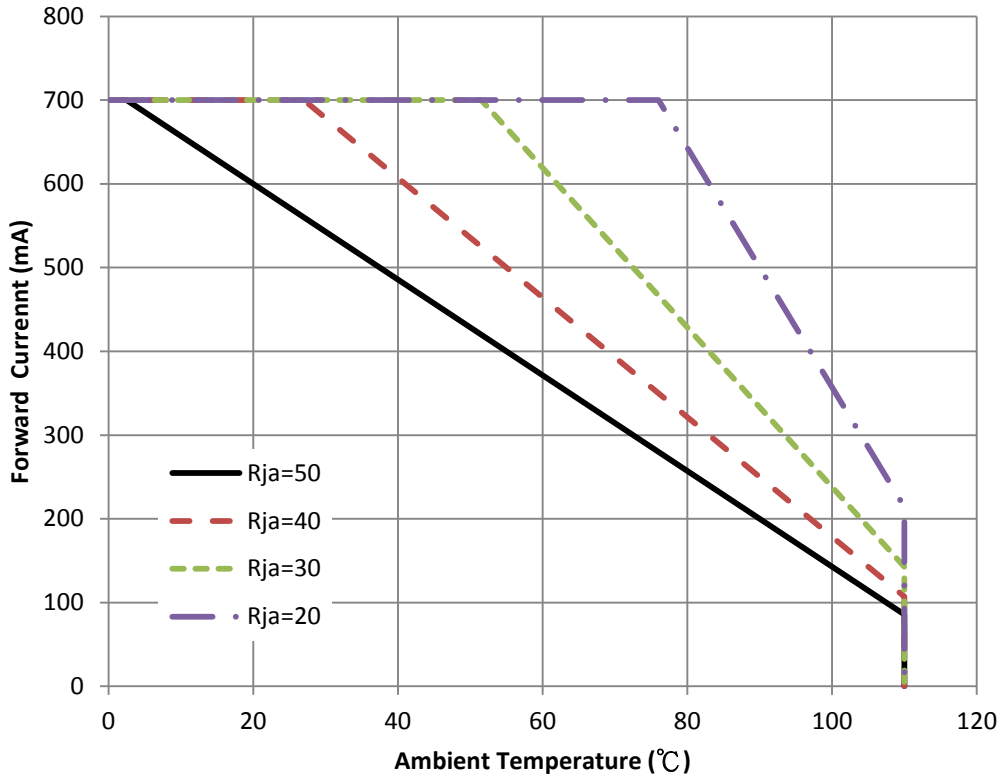
1. Radiometric power is measured with an accuracy of $\pm 10\%$
2. The forward voltage is measured with an accuracy of $\pm 0.1V$

Typical Spatial Radiation Pattern



Thermal Design

Thermal design of the end product is important. Considering the thermal resistance between the junction and the solder point ($R_{\theta_{j-p}}$) is $6^{\circ}\text{C}/\text{W}$, 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 Ambient Temperature vs. Allowable Forward Current.



The junction temperature can be correlated to the thermal resistance between the junction and ambient (R_{ja}) by the following equation.

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

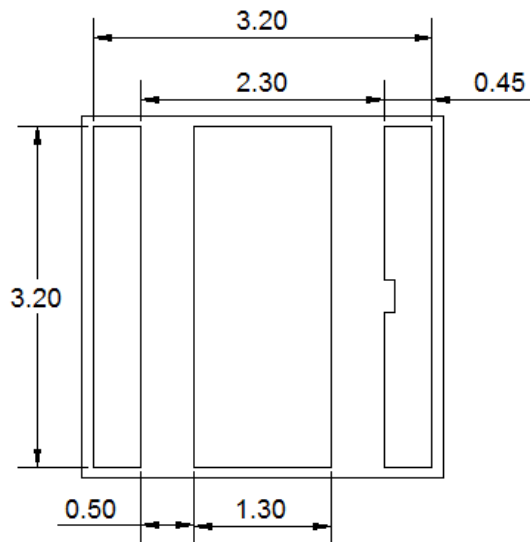
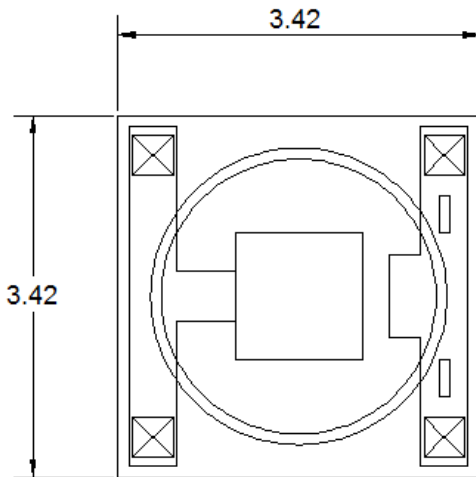
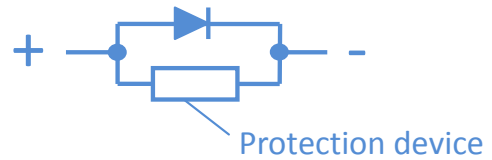
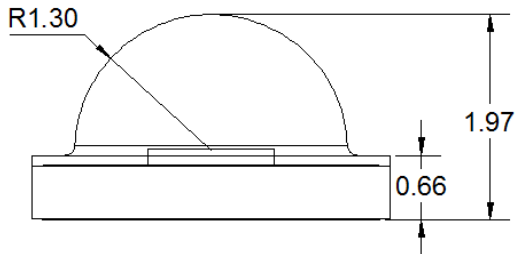
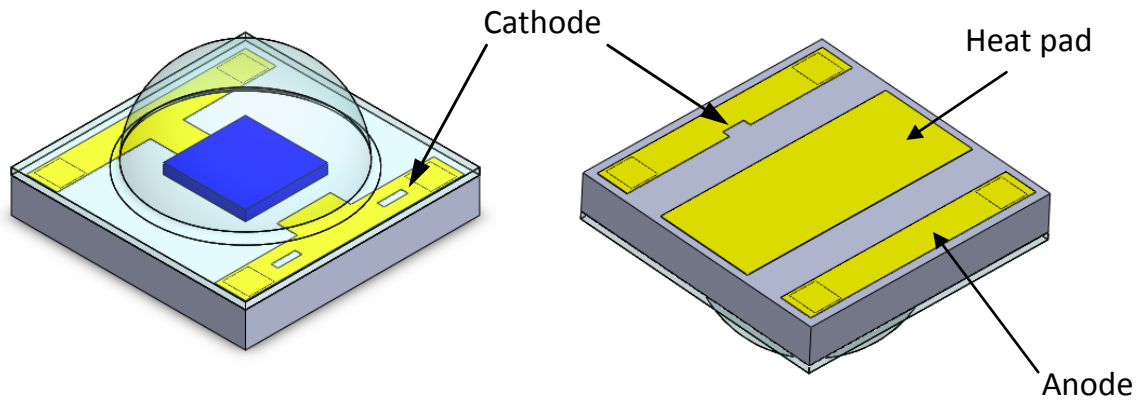
T_j : LED junction temperature

T_a : Ambient temperature

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

W : Inputting power ($I_F * V_F$)

Mechanical Dimensions



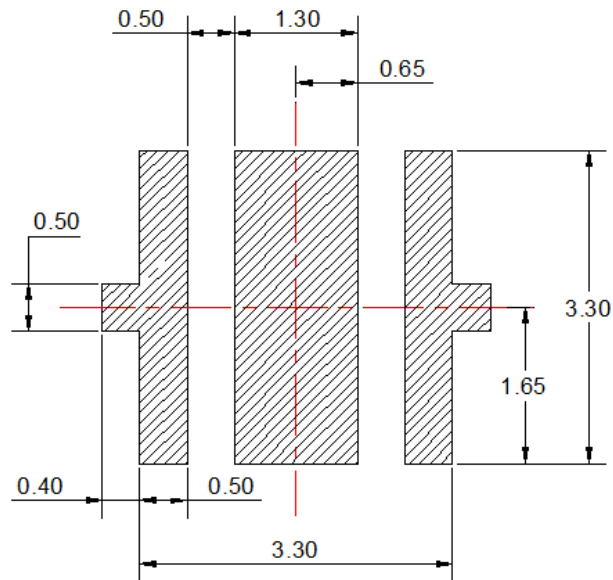
Unit : mm

Notes:

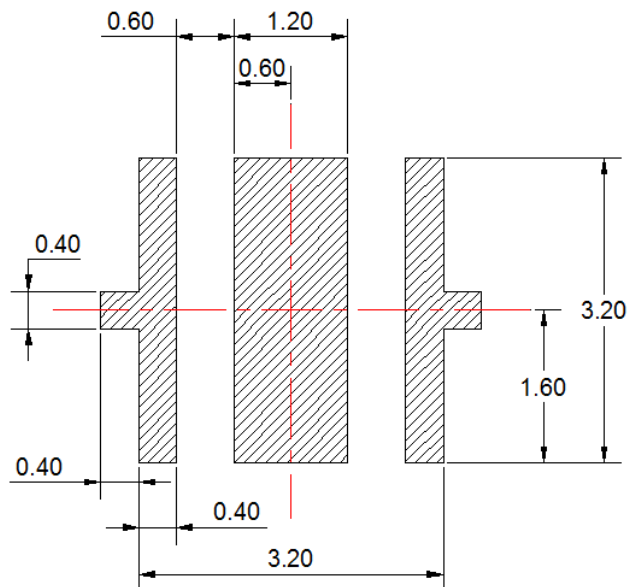
1. Drawing is not to scale
2. All dimensions are in millimeter

Recommended Solder Pad Design

Recommended Soldering Pad Design



Recommended Stencil Pattern Design (Mark Area is Opening)

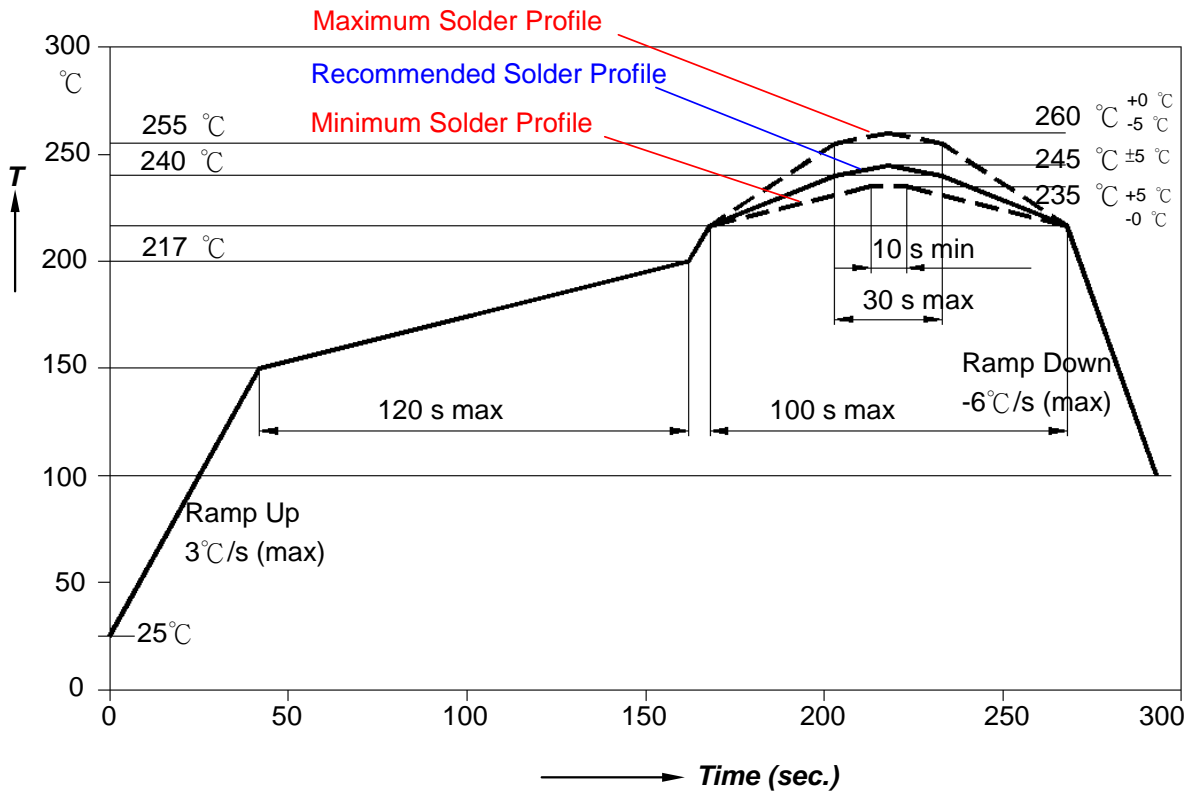


Notes:

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

Recommended Soldering Profile

The LEDs can be soldered using the parameter 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 preferred 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(Tp)	215°C	245°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.

Reliability Information

Stress Test	Stress Condition	Stress Duration
Room Temperature Operating Life (RTOL)	Tb=25°C, If=700mA	1000 hours
High Temperature Operating Life (HTOL)	Tb=85°C, If=700mA	1000 hours
Wet High Temperature Operating Life (WHTOL)	Ta=85°C, RH=85%, If=700mA	1000 hours
Temperature Cycles (TMCL)	-40°C/125, 15min dwell, 5min transfer	200 cycles
High Temperature Storage Life (HTSL)	Ta=110°C, non-operating	1000 hours
Low Temperature Storage Life (LTOL)	Ta=-40°C non-operating	1000 hours
Solder Heat Resistance (SHR)	240°C, 10 sec	

Failure Criteria:

1. Brightness attenuate difference <10%
2. Forward voltage difference: ±20%

Note:

1. Tb: board temperature
2. Ta: ambient temperature

Cautions

The devices are UV light LEDs. The LED during operation radiates intense UV light, which precautions must be taken to prevent looking directly at the UV light with unaided eyes. Do not look directly into the UV light or look through an optical system.

When there is a possibility to see the reflection of the light, protect eyes by using the UV light protective glasses.