



## Characteristics

### Absolute Maximum Ratings ( $T_j=25^{\circ}\text{C}$ )

Parameter	Rating
	N3535U-UNx1 Series
DC Forward Current (mA)	1000 mA
LED Junction Temperature	150 $^{\circ}\text{C}$
LED Operating Temperature	-40 $^{\circ}\text{C}$ ~85 $^{\circ}\text{C}$
Storage Temperature	-40 $^{\circ}\text{C}$ ~125 $^{\circ}\text{C}$
Soldering Temperature	Max. 260 $^{\circ}\text{C}$ / Max. 10sec. (JEDEC 020c)
ESD Sensitivity	2,000 V HBM (JESD-22A-114-B)
Reverse Voltage	Not designed to be driven in reverse bias ( $V_R \leq 5\text{V}$ )
Preconditioning	Acc. to JEDEC Level 2

### General Characteristics at 350mA

Part number	Color	Peak Wavelength $\lambda_p$		$2\theta_{1/2}$	Temperature Coefficient of $V_f$ (mV/ $^{\circ}\text{C}$ )	Thermal Resistance Junction to Pad ( $^{\circ}\text{C}/\text{W}$ )
		Min	Max		$\Delta V_f / \Delta T_j$	$RO_{j-L}$
N3535U-UNL1-A1G11H	U40	380	390	125	-2~-4	4.4
	U50	390	400	125	-2~-4	4.4
	U60	400	410	125	-2~-4	4.4
	U70	410	420	125	-2~-4	4.4
N3535U-UNF1-A1G11H	U40	380	390	55	-2~-4	4.4
	U50	390	400	55	-2~-4	4.4
	U60	400	410	55	-2~-4	4.4
	U70	410	420	55	-2~-4	4.4

Notes:

The peak wavelength is measured with an accuracy of  $\pm 1\text{nm}$

Caution: Users are requested to comply with the laws and public regulations concerning safety.



Radiometric Power and Forward Voltage ( $T_j=25^\circ\text{C}$ )

Part number	Color	Performance at Test Current (350mA)					Performance at 700mA
		Group	Radiometric Power (mW)		VF		* Calculated Minimum Radiometric Power (mW)
			Min	Max	Min	Max	
N3535U-UNL1-A1G11H (beam angle 125°)	U40 (380-390nm)	ND4	320	360	3	4	580
		ND5	360	400	3	4	650
		NE1	400	440	3	4	720
		NE2	440	480	3	4	790
	U50 (390-400nm)	ND5	360	400	3	4	650
		NE1	400	440	3	4	720
		NE2	440	480	3	4	790
		NE3	480	520	3	4	865
	U60 (400-410nm)	NE1	400	440	3	4	720
		NE2	440	480	3	4	790
		NE3	480	520	3	4	865
		NE4	520	560	3	4	940
	U70 (410-420nm)	NE1	400	440	3	4	720
		NE2	440	480	3	4	790
		NE3	480	520	3	4	865
		NE4	520	560	3	4	940

Note: 1. Radiometric power is measured with an accuracy of  $\pm 10\%$

2. The forward voltage is measured with an accuracy of  $\pm 0.2\text{V}$

\* Calculated values are for reference only.



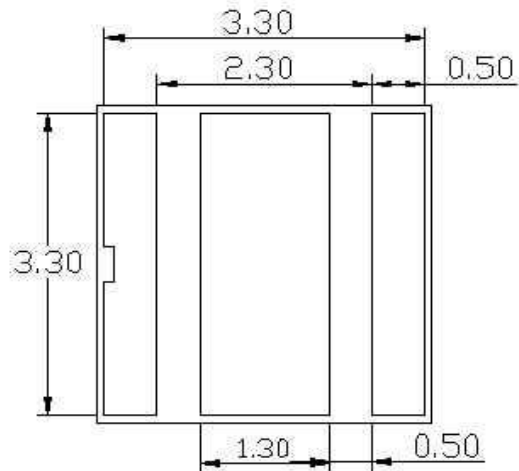
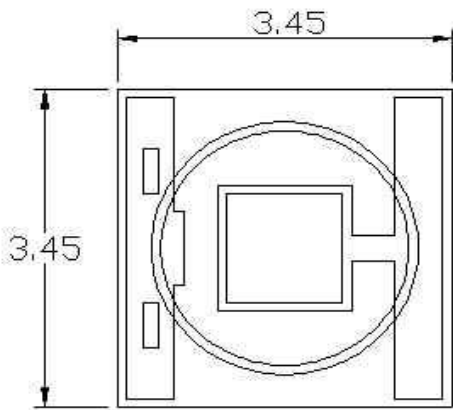
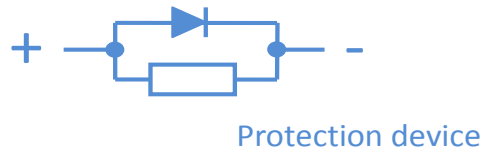
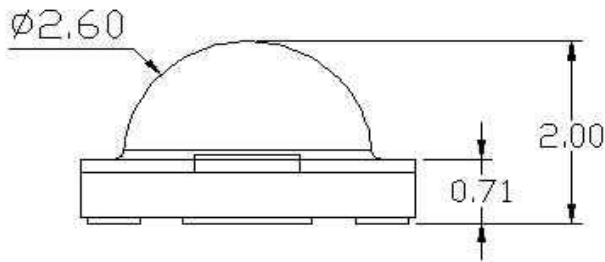
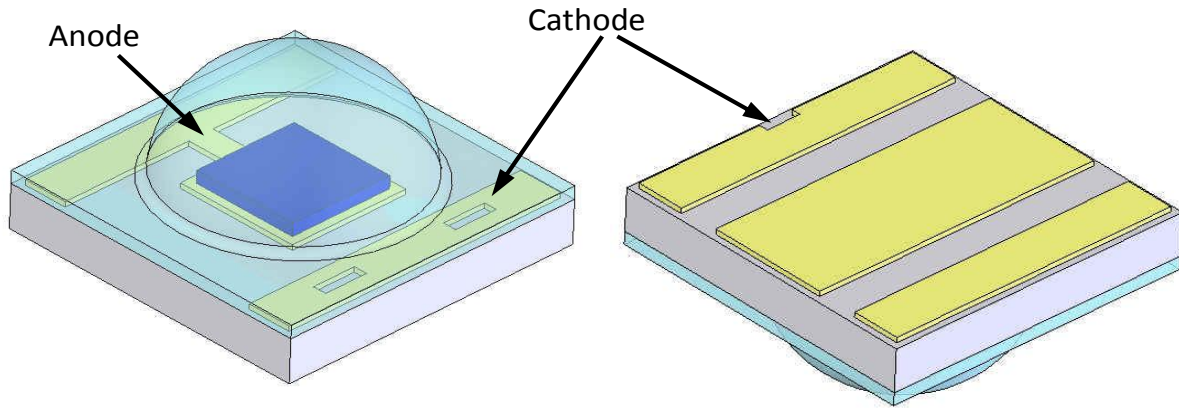
Part number	Color	Performance at Test Current (350mA)					Performance at 700mA
		Group	Radiometric Power (mW)		VF		* Calculated Minimum Radiometric Power (mW)
			Min	Max	Min	Max	
N3535U-UNF1-A1G11H (beam angle 55°)	U40 (380-390nm)	ND4	320	360	3	4	580
		ND5	360	400	3	4	650
		NE1	400	440	3	4	720
		NE2	440	480	3	4	790
	U50 (390-400nm)	ND5	360	400	3	4	650
		NE1	400	440	3	4	720
		NE2	440	480	3	4	790
		NE3	480	520	3	4	865
	U60 (400-410nm)	NE1	400	440	3	4	720
		NE2	440	480	3	4	790
		NE3	480	520	3	4	865
		NE4	520	560	3	4	940
	U70 (410-420nm)	NE1	400	440	3	4	720
		NE2	440	480	3	4	790
		NE3	480	520	3	4	865
		NE4	520	560	3	4	940

- Note: 1. Radiometric power is measured with an accuracy of  $\pm 10\%$   
 2. The forward voltage is measured with an accuracy of  $\pm 0.2V$   
 \* Calculated values are for reference only.



## Mechanical Dimensions

### N3535U-UNL1-A1G11H (beam angle 125°)

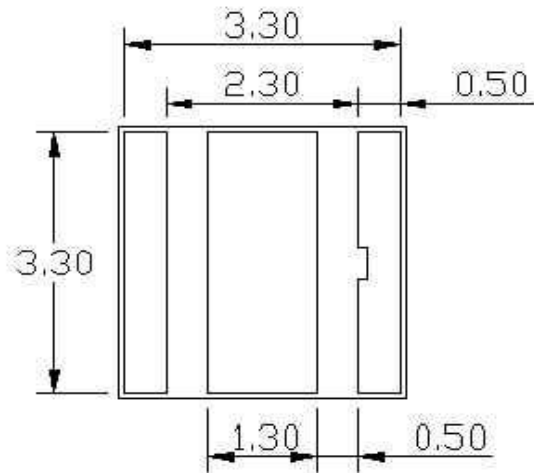
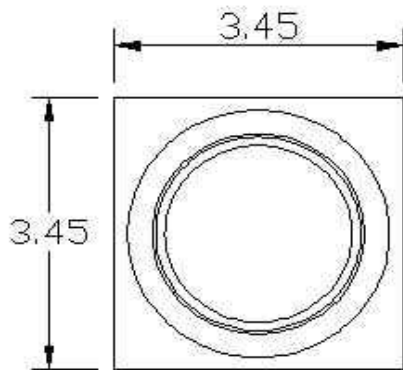
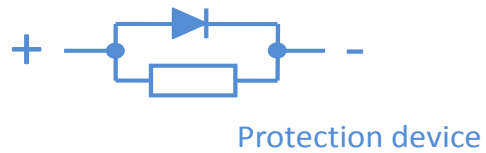
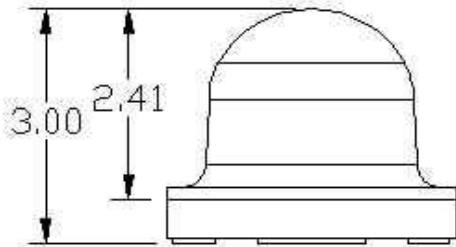
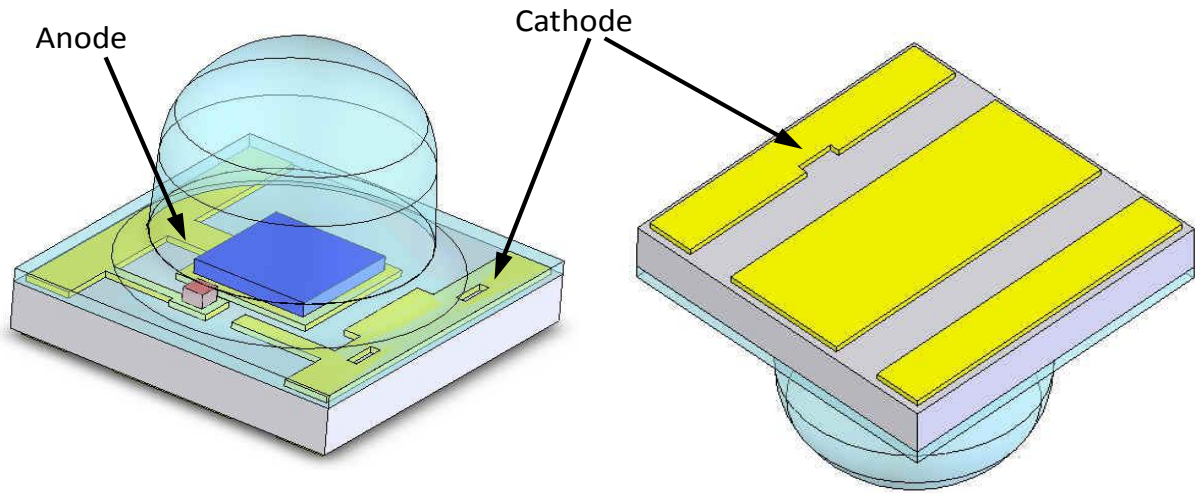


Notes :

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



**N3535U-UNF1-A1G11H (beam angle 55°)**



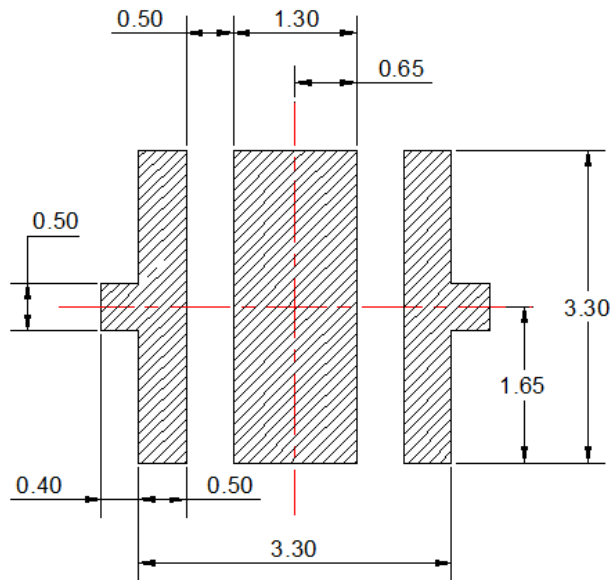
Notes :

4. Drawing is not to scale
5. All dimensions are in millimeter
6. Dimensions are  $\pm 0.13\text{mm}$  unless otherwise indicated

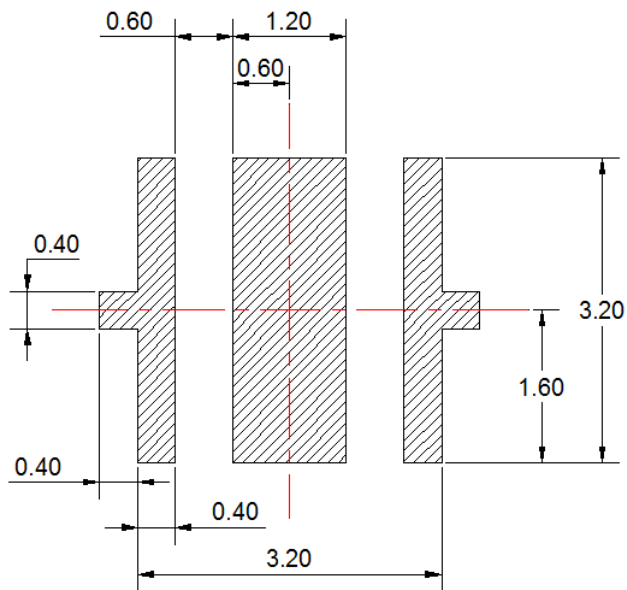


## Recommended Solder Pad Design

### Recommended Soldering Pad Design



### Recommended Stencil Pattern Design (Marked Area is Opening)

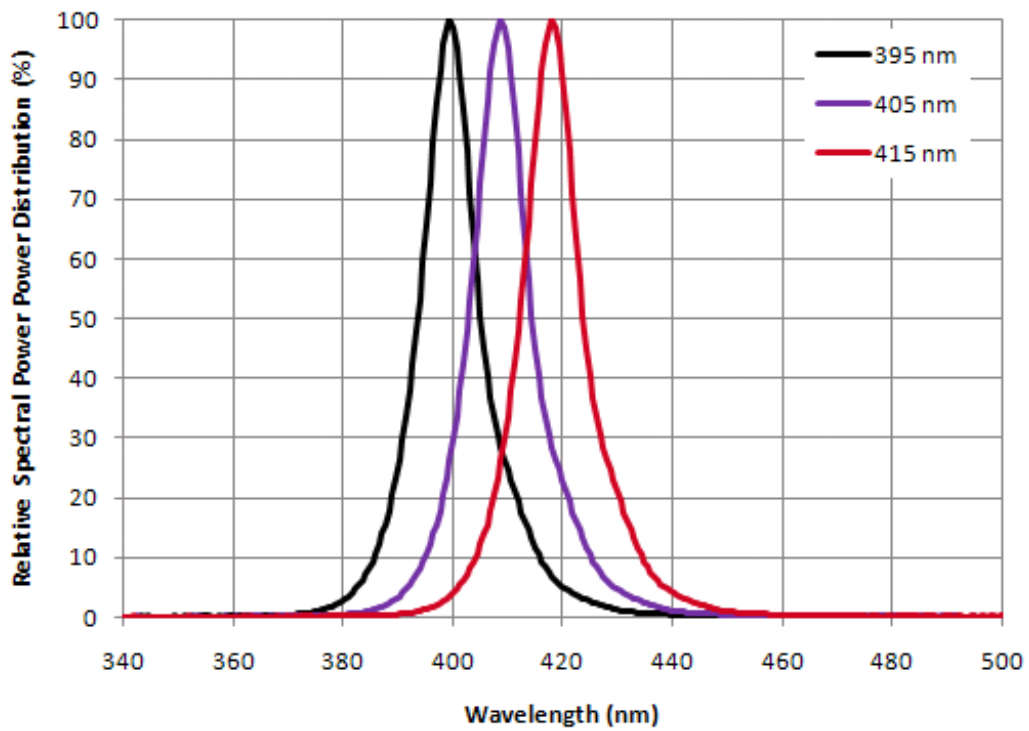


Notes :

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



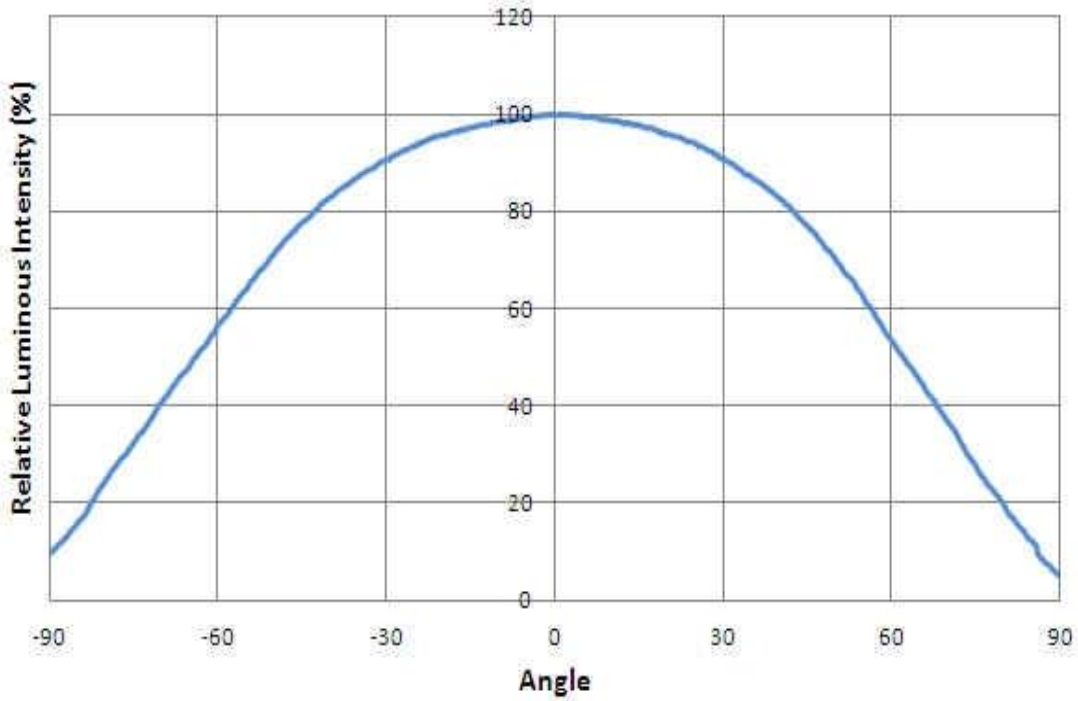
Relative Spectral Power Distribution,  $T_j=25^{\circ}\text{C}$



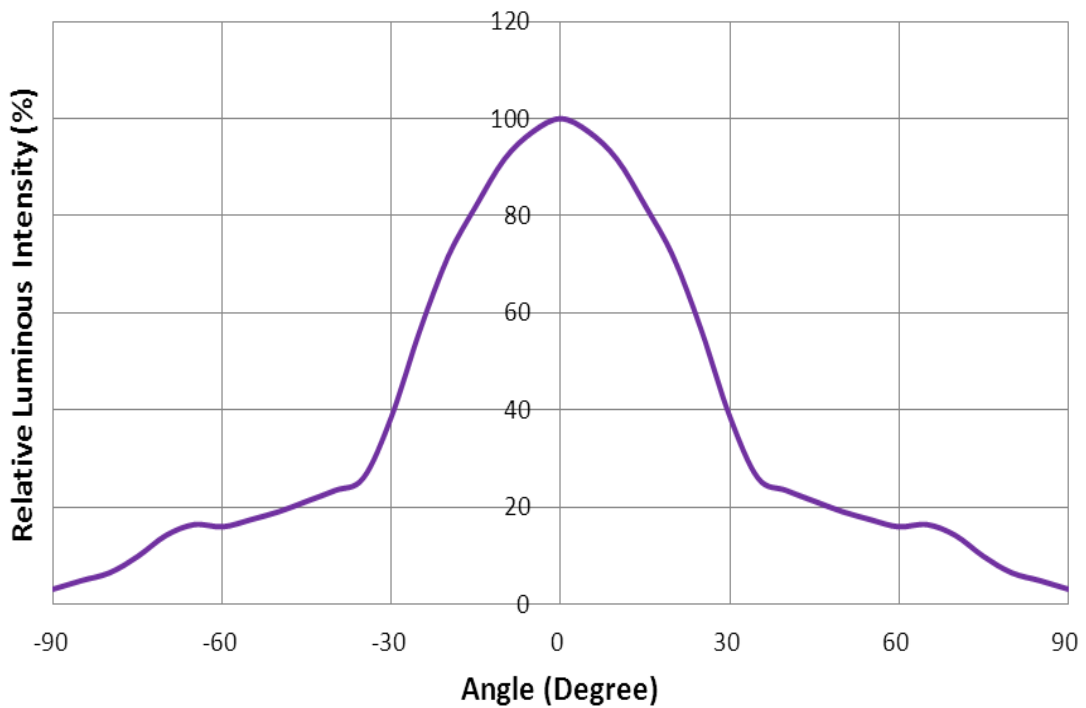


## Typical Spatial Radiation Pattern

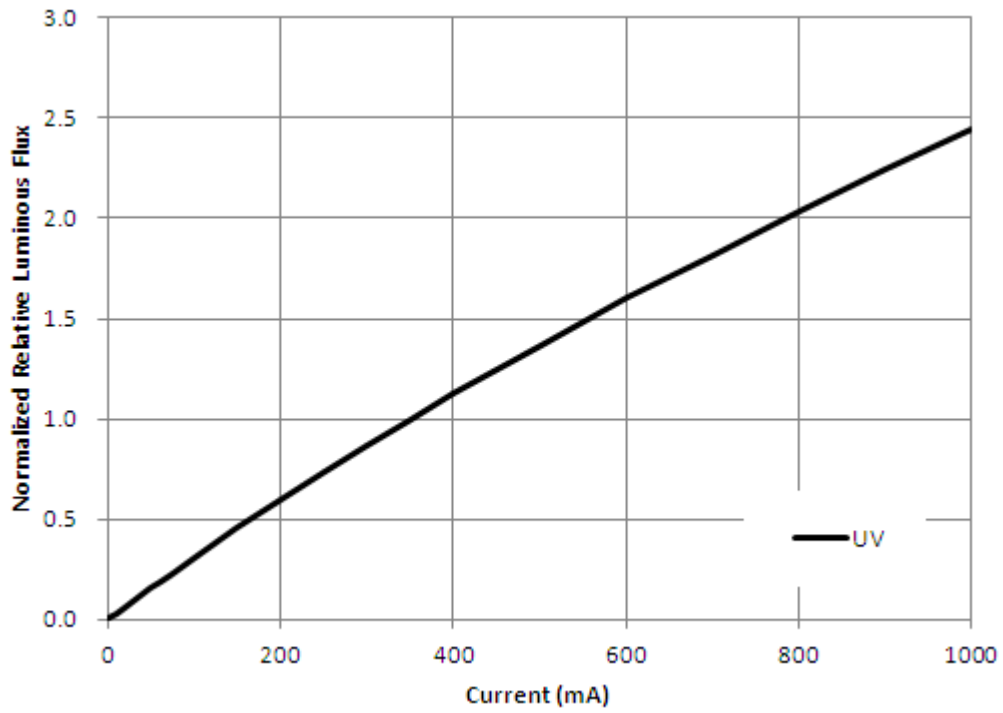
**N3535U-UNL1-A1G11H (beam angle 125°)**



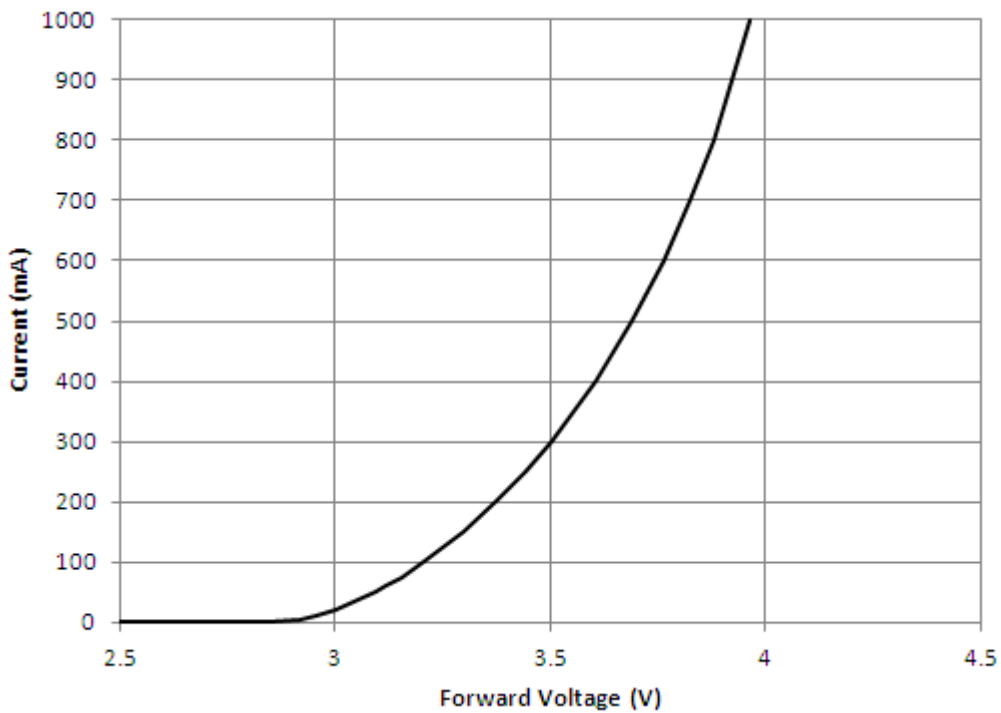
**N3535U-UNF1-A1G11H (beam angle 55°)**



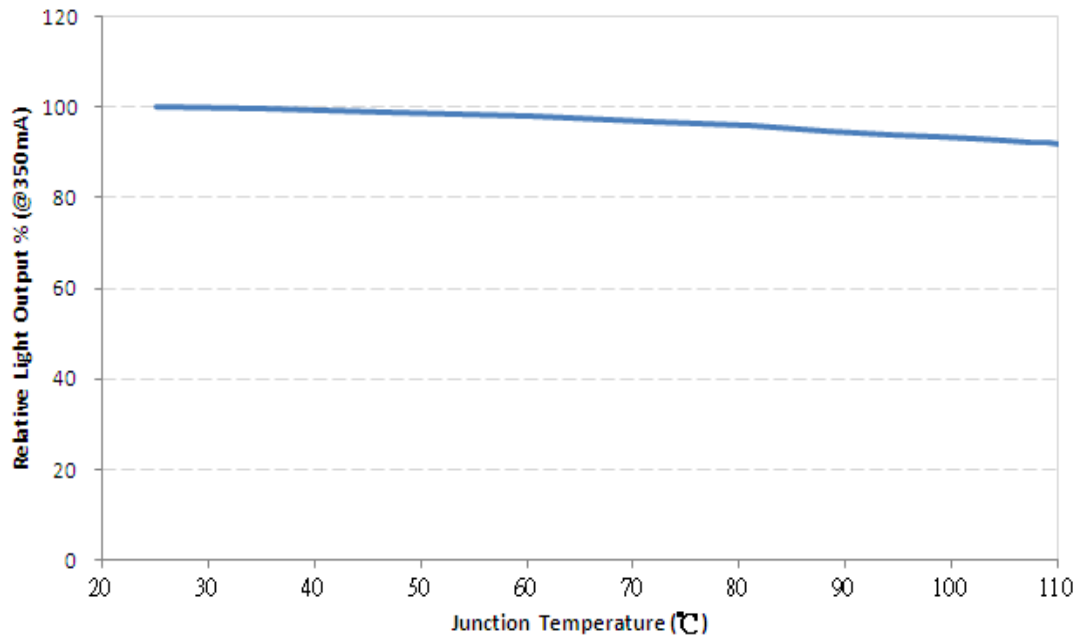
### Typical Forward L-I Characteristics, $T_j=25^\circ\text{C}$



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

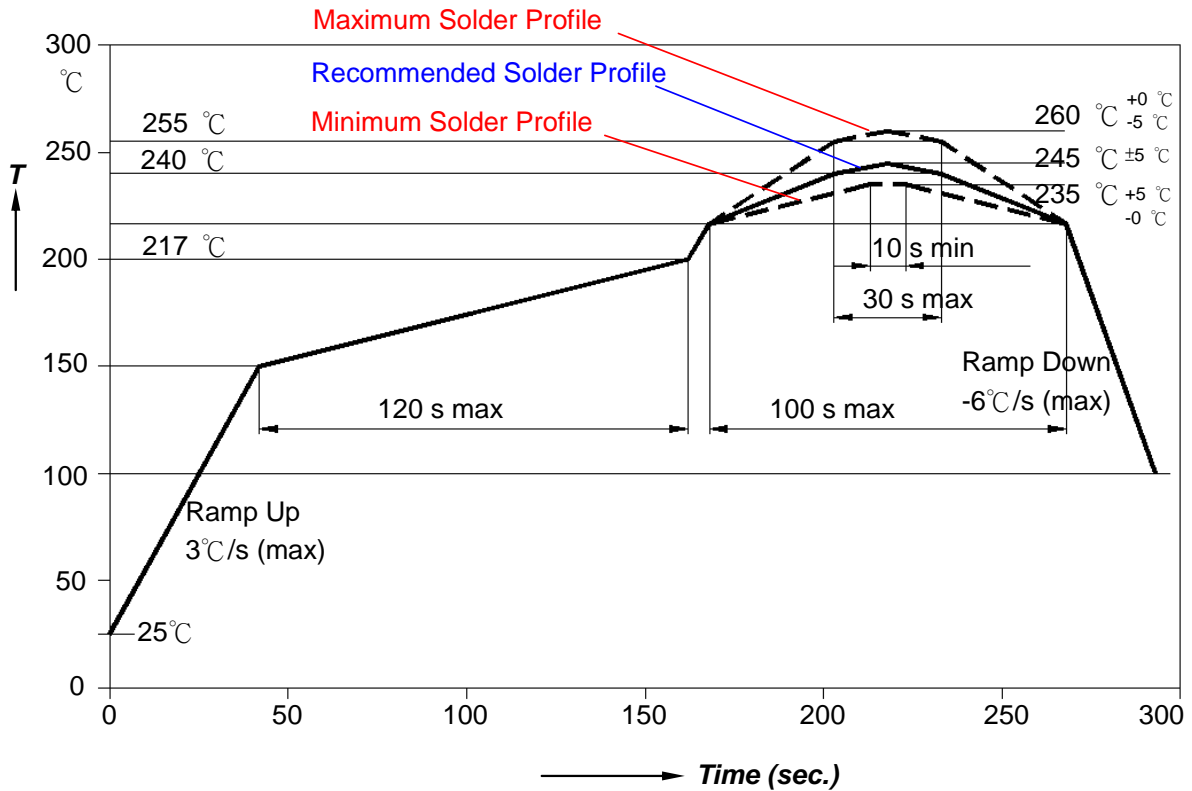


## Typical Light Output vs. T<sub>j</sub> Characteristics



## 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.

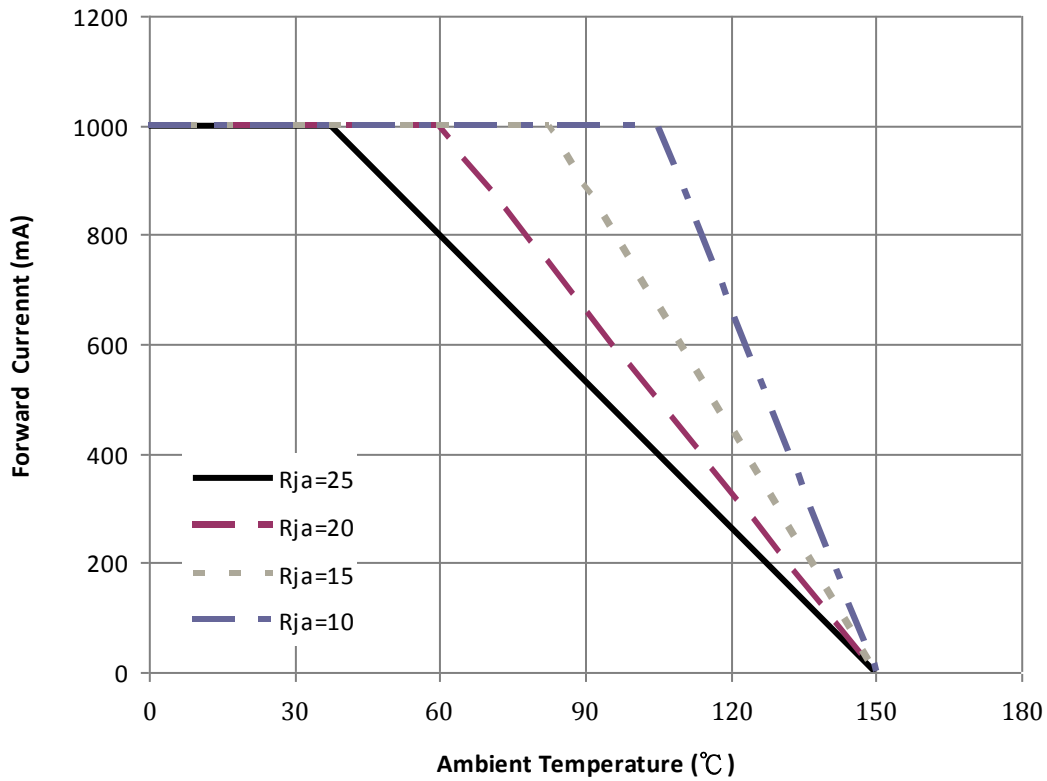


Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-up Rate (T <sub>Smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
- Temperature Min(T <sub>Smin</sub> )	100°C	150°C
- Temperature Max(T <sub>Smax</sub> )	150°C	200°C
- Time(t <sub>Smin</sub> to t <sub>Smax</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
- Temperature(T <sub>L</sub> )	183°C	217°C
- Time(t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak/classification Temperature(T <sub>p</sub> )	215°C	260°C
Time within 5°C of actual Peak Temperature(t <sub>p</sub> )	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

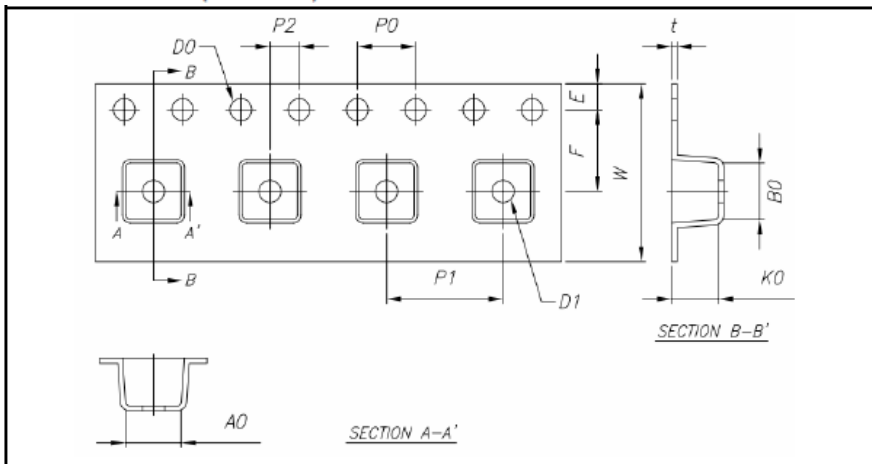
$R_{ja}$ : Thermal resistance between the junction and ambient

$W$ : Input power ( $I_F * V_F$ )



## Packing Information

Dimensions. (Unit: mm)



### Common dimensions

Item	Specification	Tol. (+/-)
W	12.00	± 0.30
E	1.75	± 0.10
F	5.50	± 0.10
D0	1.50	+0.10,-0
D1	1.50	+0.10,-0
P0	4.00	± 0.10
P1	8.00	± 0.10
P2	2.00	± 0.10
P0 x10	40.00	± 0.20

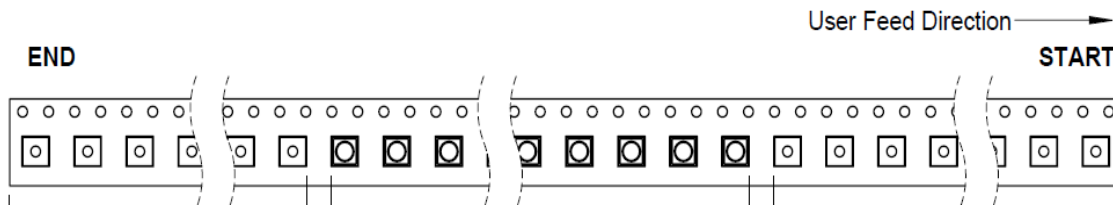
### Pocket & other dimensions

#### N3535U-UNL1 series

Item	Specification	Tol. (+/-)
t	0.25	±0.05
A0	3.80	±0.10
B0	3.80	±0.10
K0	2.20	±0.10

#### N3535U-UNF1 series

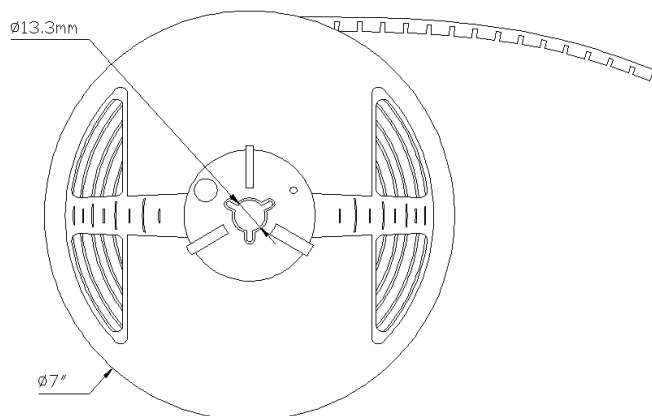
Item	Specification	Tol. (+/-)
t	0.35	±0.05
A0	3.80	±0.10
B0	3.80	±0.10
K0	3.20	±0.10



Trailer 160mm (min) of empty pockets sealed with tape

Loaded Pockets

Leader 400mm (min) of empty pockets sealed with tape



## 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](http://www.tslc.com.tw) or please contact [sales@tslc.com.tw](mailto:sales@tslc.com.tw).



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### 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](mailto:sales@tslc.com.tw)

