



N3535U-UNx1 High Power UV LED

Introduction

The N3535U-UNx1 Series LED from TSLC brings industry leading technology to the UV lighting market with its high reliability and performance. With a ceramic substrate and a 125/55 degree viewing angle primary optic, the N3535U-UNx1 is ideal for all UV curing and general UV applications.

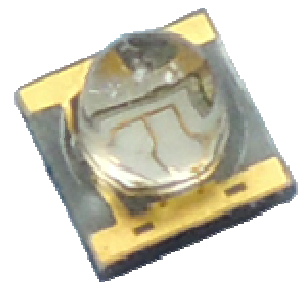


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RoHS Compliant

Characteristics

Absolute Maximum Ratings (T_j=25°C)

Parameter	Rating
	N3535U-UNx1 Series
DC Forward Current (mA)	1000 mA
LED Junction Temperature	150°C
LED Operating Temperature	-40°C~85°C
Storage Temperature	-40°C~125°C
Soldering Temperature	Max. 260°C / Max. 10sec. (JEDEC 020)
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 1

General Characteristics at 500mA

Part number	Color	Peak Wavelength λ _p		2θ _{1/2}	Temperature Coefficient of Vf (mV/°C)	Thermal Resistance Junction to Pad (°C/W)
		Min	Max		ΔV _F / ΔT _J	R _{Θ_{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 ±1nm

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 (500mA)					Performance at 1000mA
		Group	Radiometric Power (mW)		VF		Calculated Minimum Radiometric Power* (mW)
			Min	Max	Min	Max	
N3535U-UNL1-A1G11H (beam angle 125°)	U40 (380-390nm)	NE2	440	480	3.2	4.2	820
		NE3	480	520	3.2	4.2	890
		NE4	520	560	3.2	4.2	960
		NE5	560	600	3.2	4.2	1030
		NF1	600	650	3.2	4.2	1100
		NF2	650	700	3.2	4.2	1200
	U50 (390-400nm)	NF1	600	650	3.2	4.2	1100
		NF2	650	700	3.2	4.2	1200
		NF3	700	750	3.2	4.2	1300
		NF4	750	800	3.2	4.2	1400
		NF5	800	850	3.2	4.2	1500
	U60 (400-410nm)	NF1	600	650	3.2	4.2	1100
		NF2	650	700	3.2	4.2	1200
		NF3	700	750	3.2	4.2	1300
		NF4	750	800	3.2	4.2	1400
		NF5	800	850	3.2	4.2	1500
	U70 (410-420nm)	NF1	600	650	3.2	4.2	1100
		NF2	650	700	3.2	4.2	1200
		NF3	700	750	3.2	4.2	1300
		NF4	750	800	3.2	4.2	1400
		NF5	800	850	3.2	4.2	1500
NG1		850	900	3.2	4.2	1600	

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 (500mA)					Performance at 1000mA
		Group	Radiometric Power (mW)		VF		Calculated Minimum Radiometric Power* (mW)
			Min	Max	Min	Max	
N3535U-UNF1-A1G11H (beam angle 55°)	U40 (380-390nm)	NE1	400	440	3.2	4.2	750
		NE2	440	480	3.2	4.2	820
		NE3	480	520	3.2	4.2	890
		NE4	520	560	3.2	4.2	960
		NE5	560	600	3.2	4.2	1030
	U50 (390-400nm)	NE4	520	560	3.2	4.2	960
		NE5	560	600	3.2	4.2	1030
		NF1	600	650	3.2	4.2	1100
		NF2	650	700	3.2	4.2	1200
		NF3	700	750	3.2	4.2	1300
		NF4	750	800	3.2	4.2	1400
	U60 (400-410nm)	NE4	520	560	3.2	4.2	960
		NE5	560	600	3.2	4.2	1030
		NF1	600	650	3.2	4.2	1100
		NF2	650	700	3.2	4.2	1200
		NF3	700	750	3.2	4.2	1300
		NF4	750	800	3.2	4.2	1400
	U70 (410-420nm)	NE4	520	560	3.2	4.2	960
		NE5	560	600	3.2	4.2	1030
		NF1	600	650	3.2	4.2	1100
		NF2	650	700	3.2	4.2	1200
		NF3	700	750	3.2	4.2	1300
		NF4	750	800	3.2	4.2	1400

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.



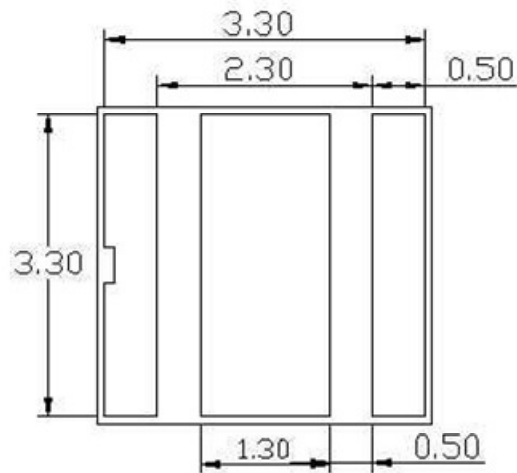
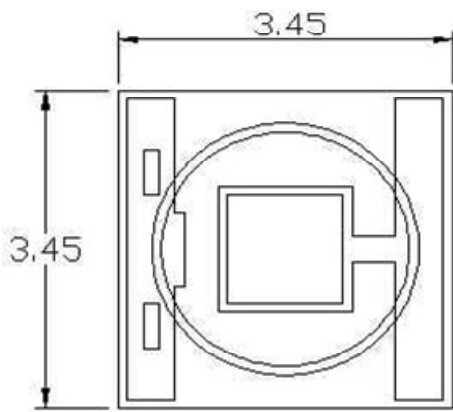
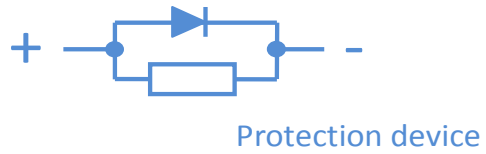
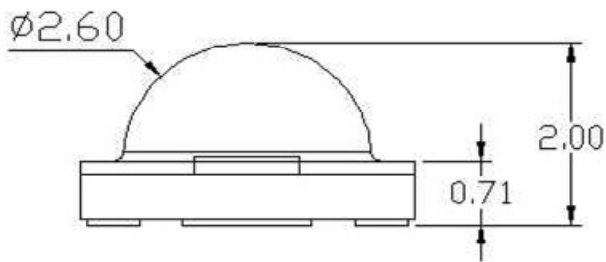
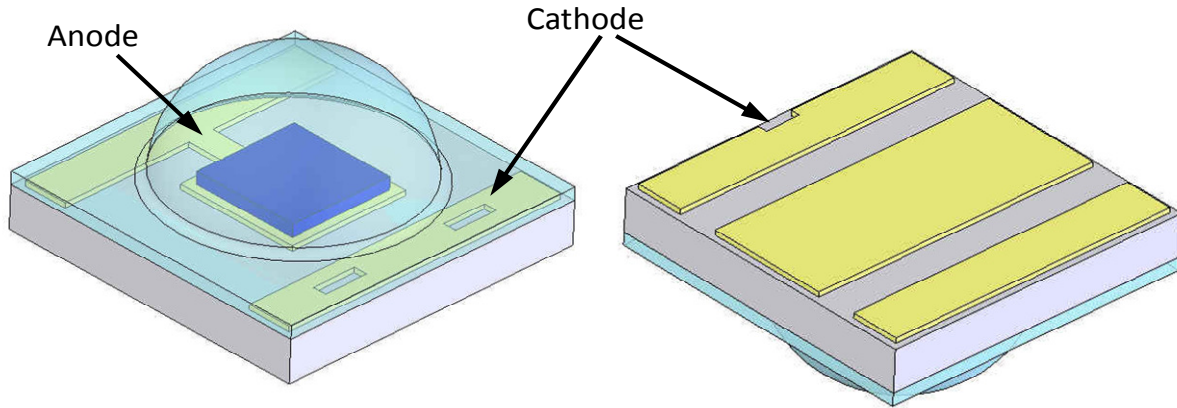
Electrical Characteristics

Part number	Performance at Test Current (500mA)		
	Vf Group	Minimum (V)	Maximum (V)
N3535U-UNL1-A1G11H (beam angle 125°) N3535U-UNF1-A1G11H (beam angle 55°)	V32	3.2	3.4
	V34	3.4	3.6
	V36	3.6	3.8
	V38	3.8	4.0
	V40	4.0	4.2



Mechanical Dimensions

N3535U-UNL1-A1G11H (beam angle 125°)

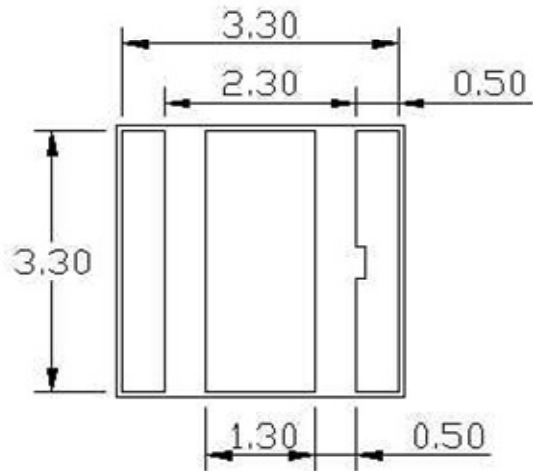
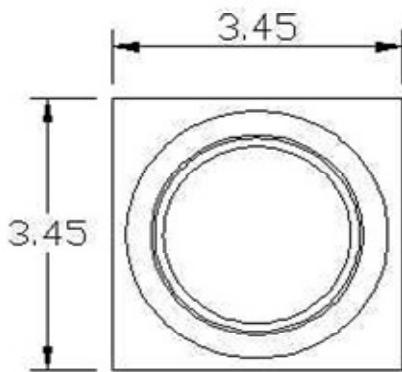
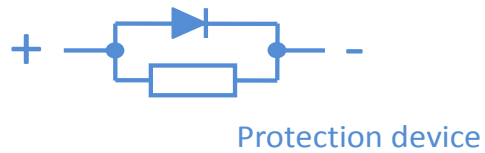
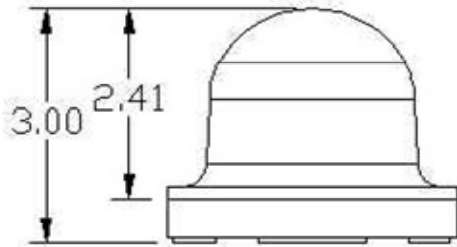
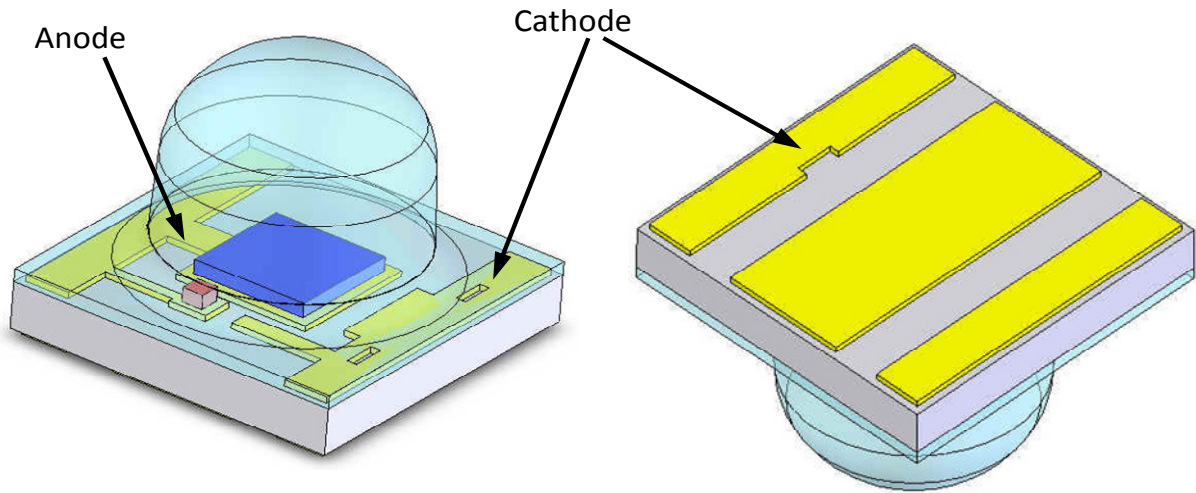


Notes :

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°)



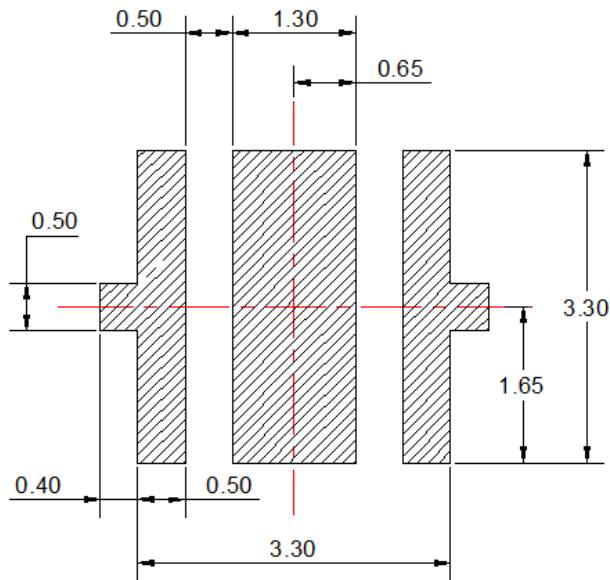
Notes :

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

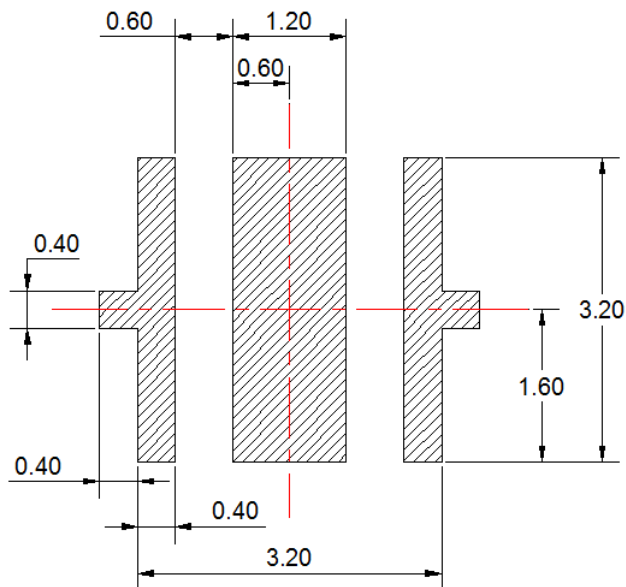


Recommended Solder Pad Design

Recommended Soldering Pad Design



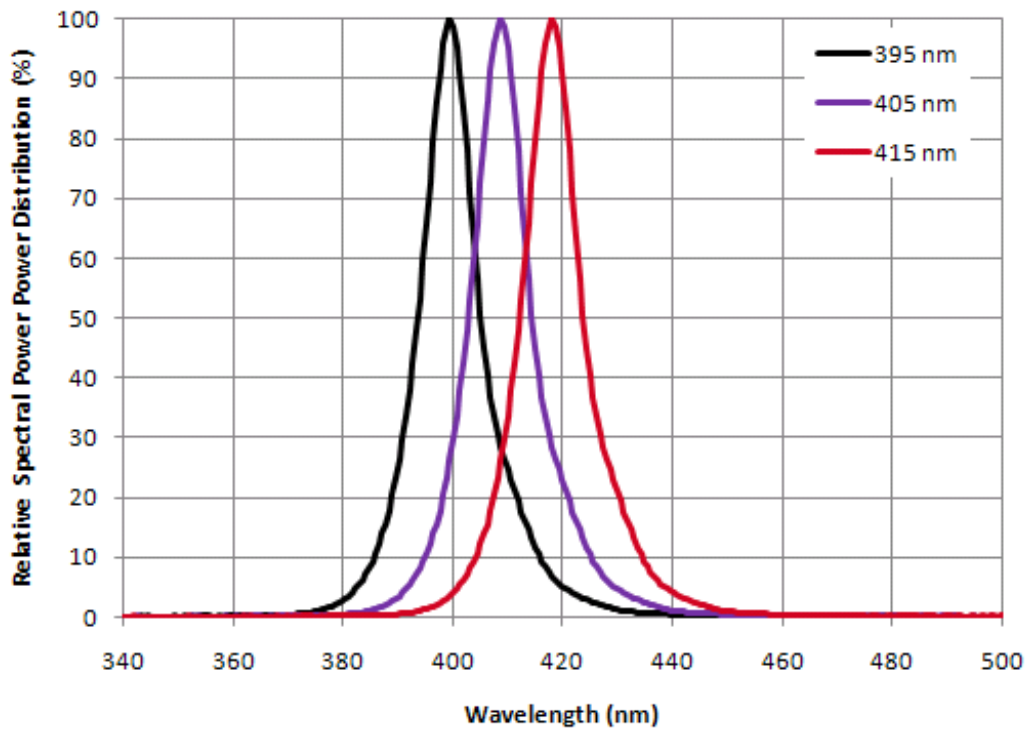
Recommended Stencil Pattern Design (Marked Area is Opening)



Notes :

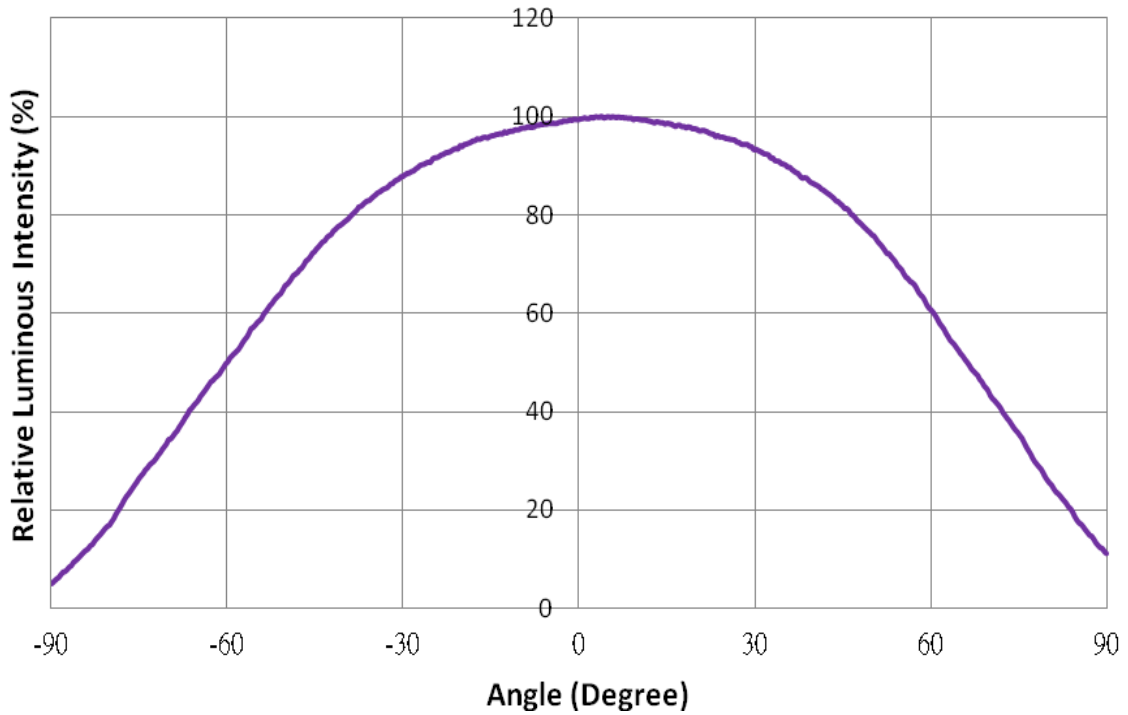
1. Drawing is not to scale
2. All dimensions are in millimeter



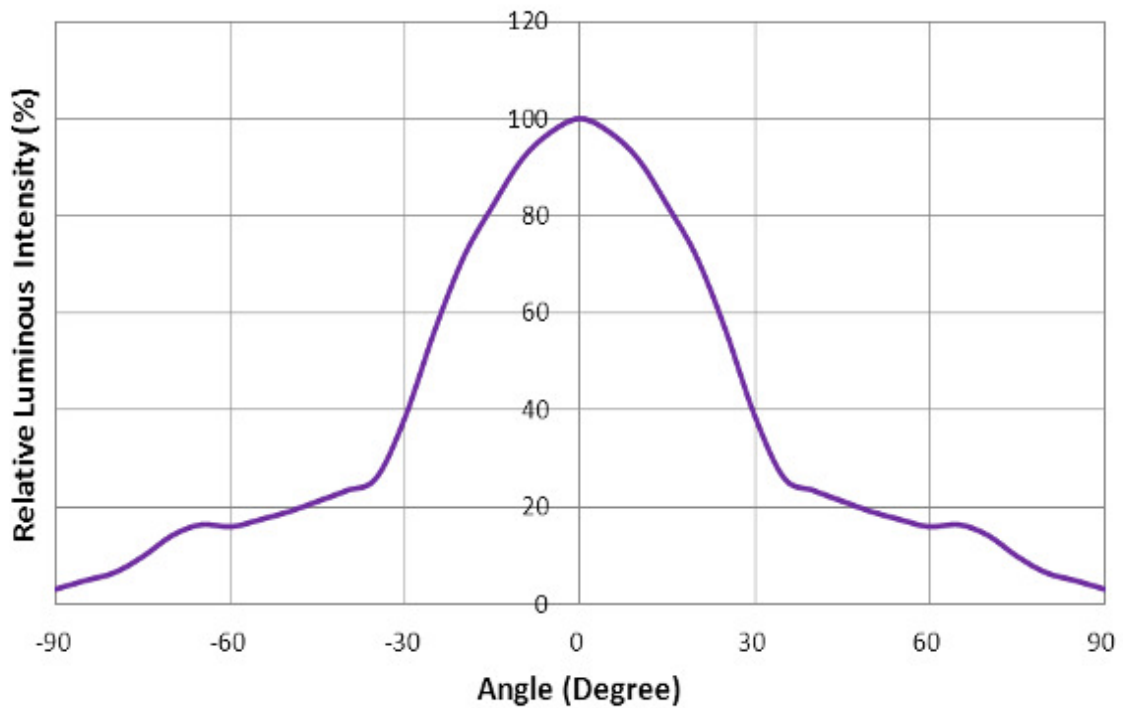
Relative Spectral Power Distribution, $T_j=25^\circ\text{C}$ 

Typical Spatial Radiation Pattern

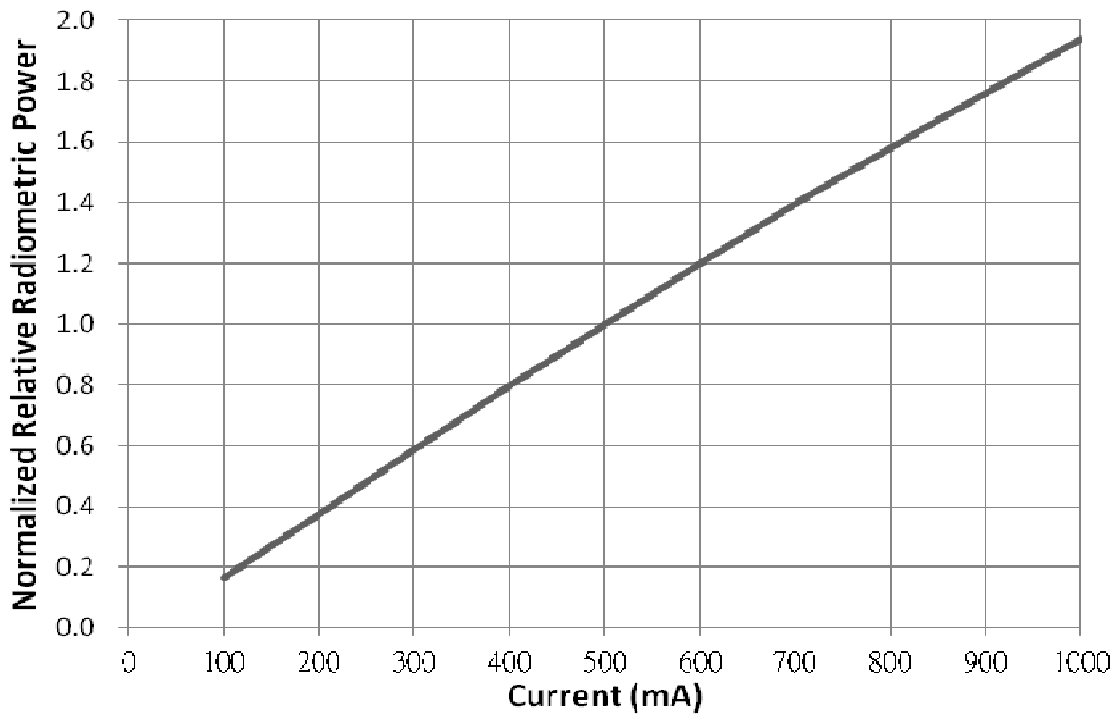
N3535U-UNL1-A1G11H (beam angle 125°)



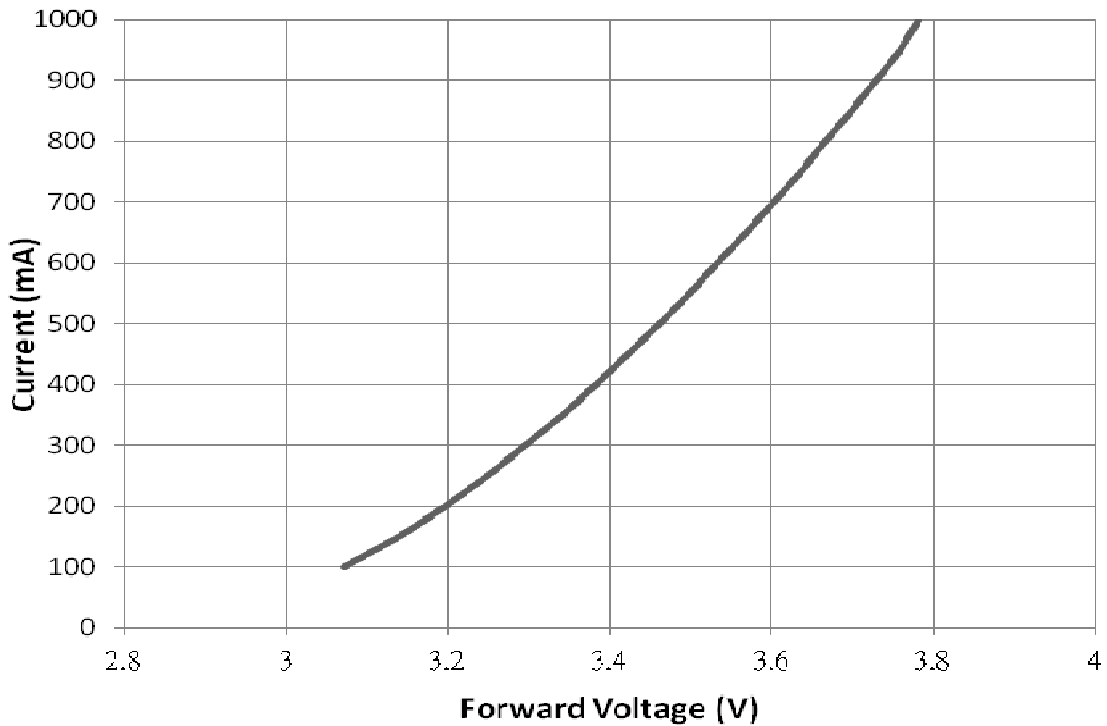
N3535U-UNF1-A1G11H (beam angle 55°)



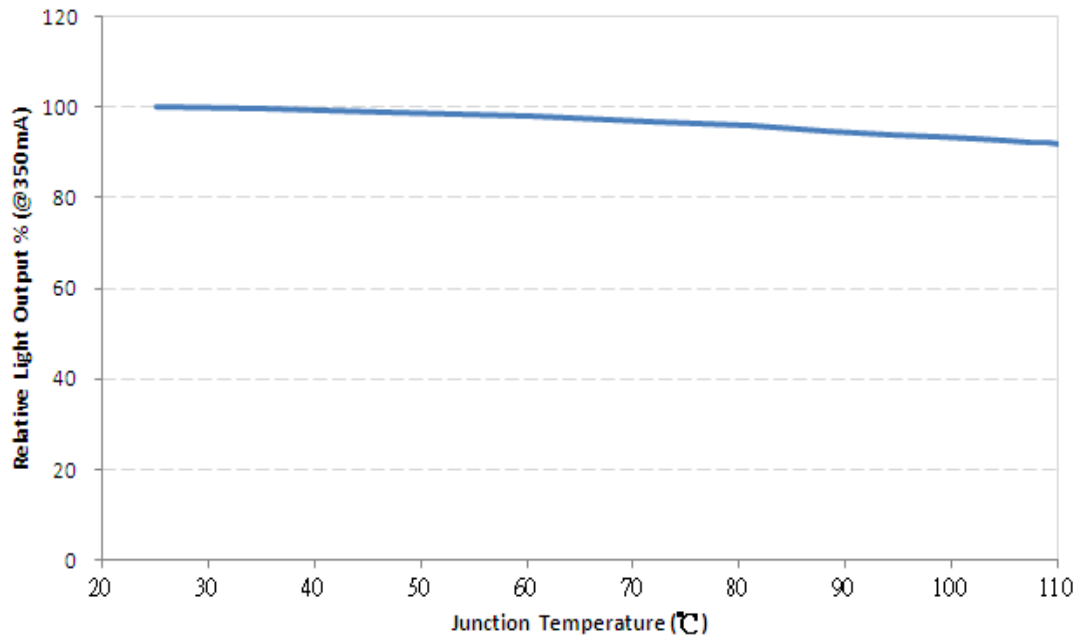
Typical Forward L-I Characteristics, $T_j=25^\circ\text{C}$



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

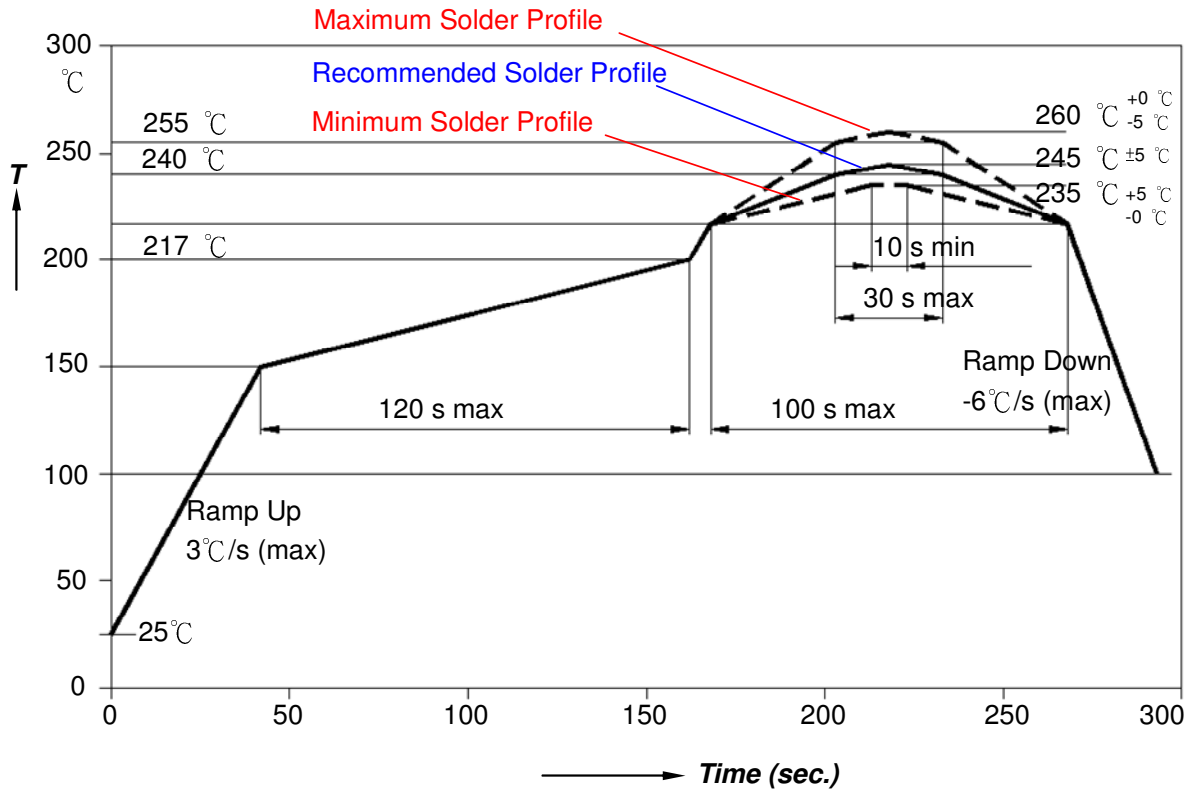


Typical Light Output vs. T_j Characteristics



Recommended Soldering Profile

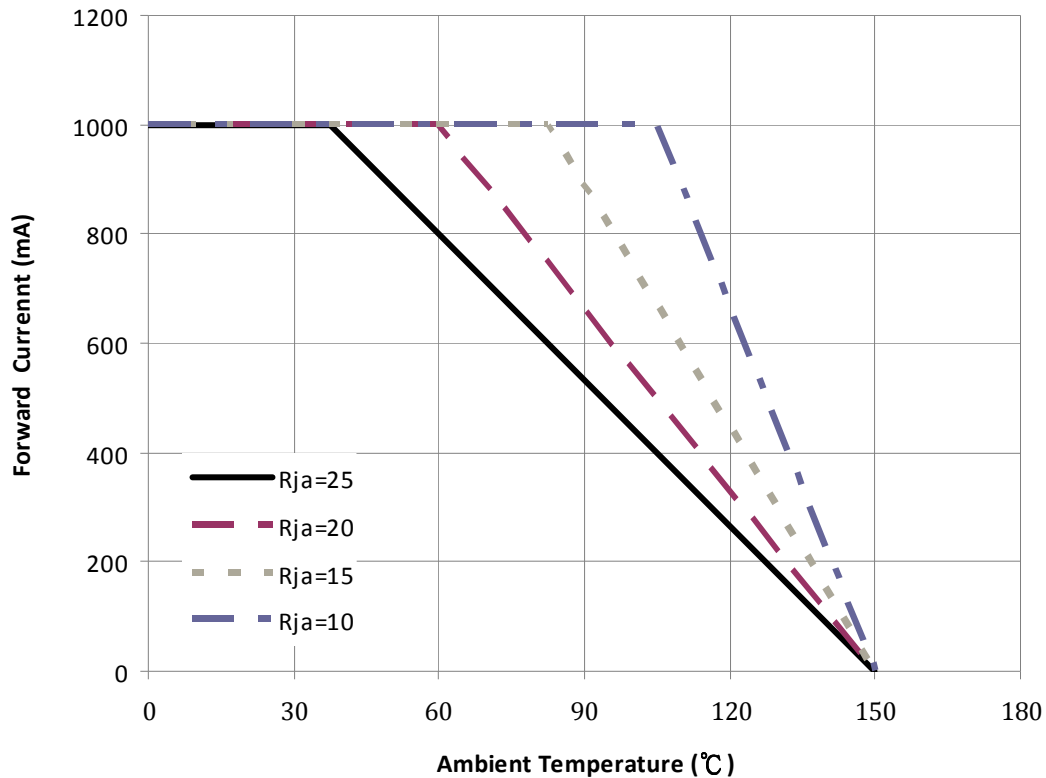
The LEDs can be soldered using the parameters listed below. As a general guideline, the users are suggested to follow the recommended soldering profile provided by the manufacturer of the solder paste. Although the recommended soldering conditions are specified in the list, reflow soldering at the lowest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



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-up Rate (T _{Smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
- Temperature Min(T _{Smin})	100°C	150°C
- Temperature Max(T _{Smax})	150°C	200°C
- Time(t _{Smin} to t _{Smax})	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(t _p)	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

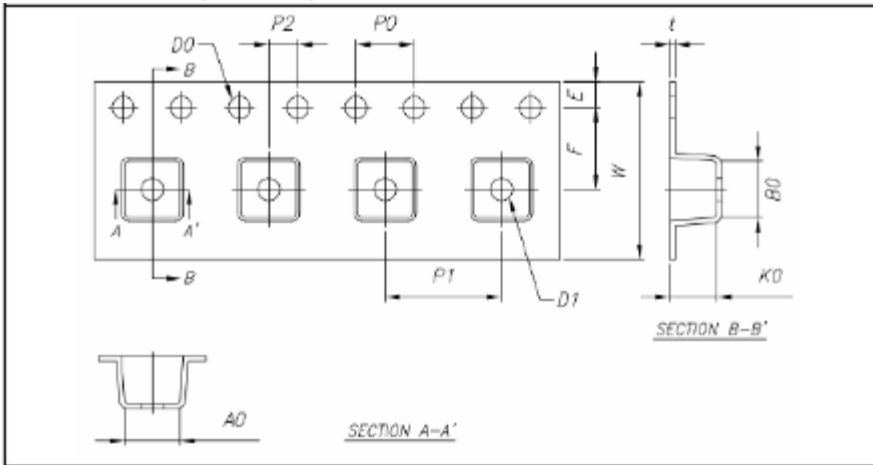
T_a : Ambient temperature

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

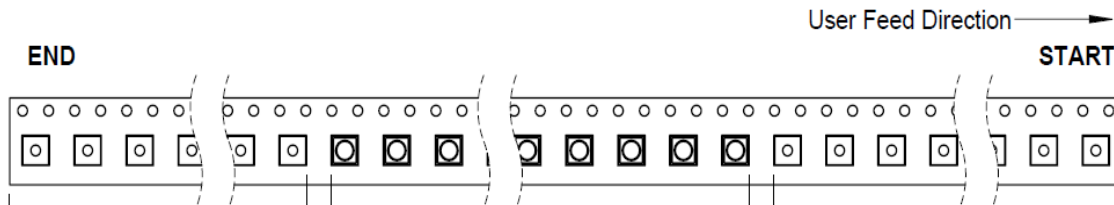
Pocket & other dimensions

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

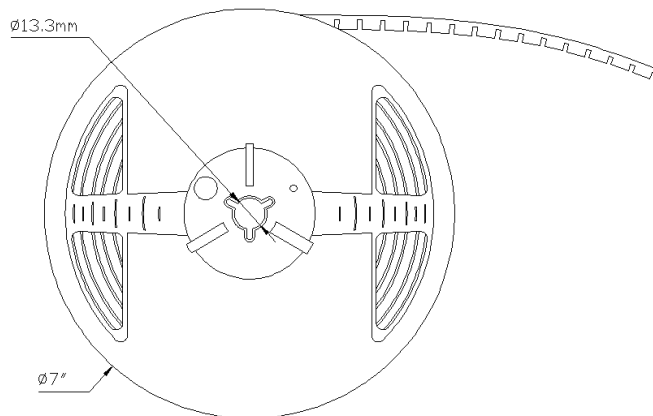
Item	Specification	Tol. (+/-)
t	0.35	±0.05
A0	3.80	±0.10
B0	3.80	±0.10
K0	3.20	±0.10



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

Loaded Pockets

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



About Us

TSLC corporation is devoted to developing high-density, and multi-size emitters with powerful output to satisfy the needs of every customer.

TSLC corporation 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.



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