Product Datasheet

N5050U-VNH4 Series
High Power UV LED

Introduction

The N5050U-VNH4 series is LED from TSLC brings industry leading technology to the UV lighting market with its high reliability and performance. With a ceramic substrate and 80 degree viewing angle primary optic, the N5050U-VNH4 is ideal for all UV curing and general uv applications.

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N5050U-VNH4 Series
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RoHS Compliant

Characteristics

Absolute Maximum Ratings (T_j=25˚C)

Parameter	Rating
	N5050U-VNH4 Series
Max Forward Current (mA)	700 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 (VR≦5V)
Preconditioning	Acc. to JEDEC Level 1

General Characteristics at 700mA

Part number	Color	Peak Wavelength λp		$2\theta_{1/2}$	Temperature Coefficient of Vf (mV/˚C)	Thermal Resistance Junction to Pad (˚C/W)
		Min	Max		ΔVF /ΔTJ	$R\Theta_{J-L}$
N5050U-VNH4	U2B	365	370	80	-2~-4	1.5
	U3A	370	375	80	-2~-4	1.5

Notes:

1. The peak wavelength is measured with an accuracy of ±1nm
2. All values stated are subject to the limits and set up of TSLC's testers. All other measurement data are defined as long-term production mean values and are only given for reference.
3. A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system. Life support devices or systems are intended (i) to be implanted in the human body, or (ii) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered. Components used as a critical component must be approved in writing by TSLC Corporation.
4. These devices emit high intensity UV/NUV light. Necessary precautions must be taken during operation. Do not look directly into the light or look through the optical system when in operation. Protective eyewear should be worn at all times during operation.
5. Do not drive at rated current for more than 5 seconds without proper thermal management.
6. Always follow thermal design recommendations in the relevant Application Note.
7. Lens discoloration may occur with prolonged exposure to UN/NUV light. Additional lens material will need to be tested for UN/NUV light compatibility and durability.

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

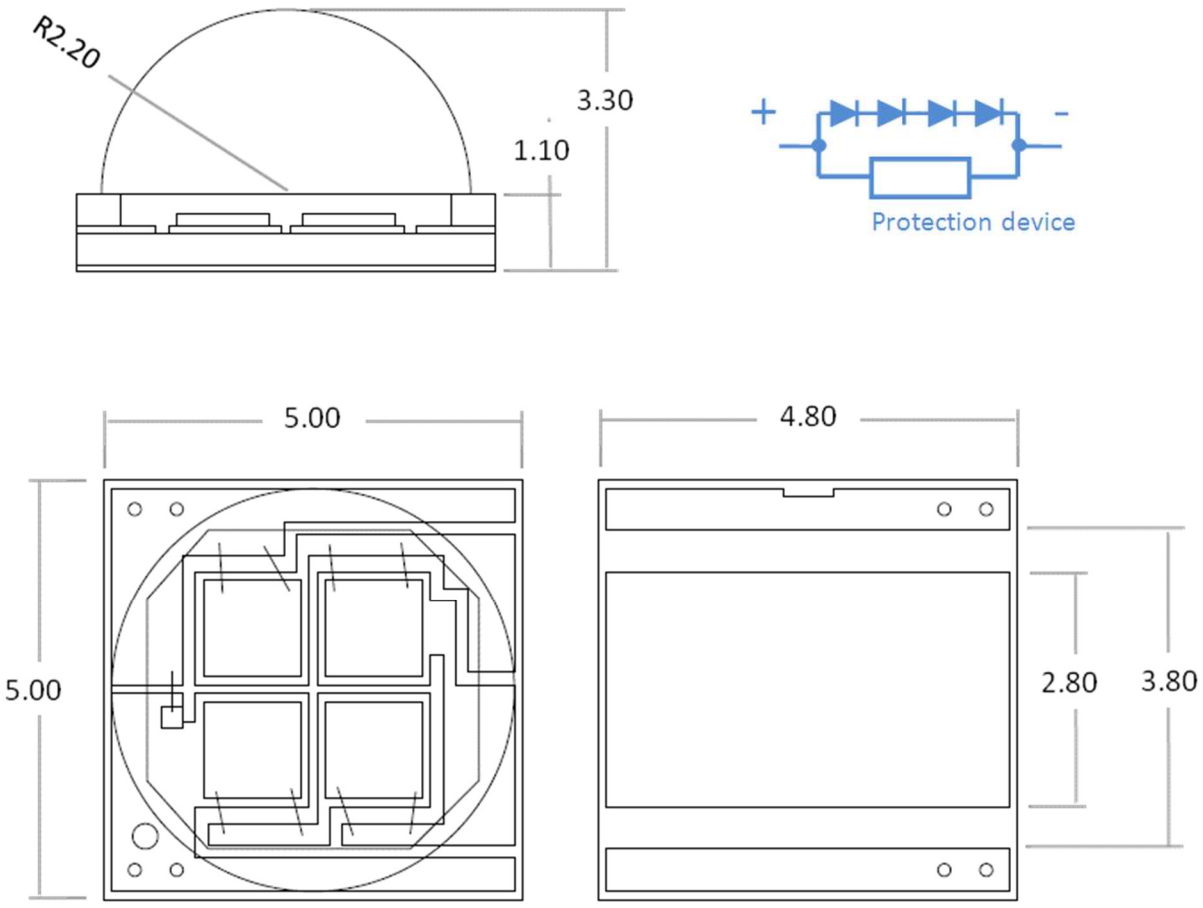
Part number	Color	Performance at Test Current (700mA)				
		Group	Radiometric Power (mW)		VF	
			Min	Max	Min	Max
N5050U-VNH4	U2B (365-370nm)	NI1	1800	2000	13	19
		NI2	2000	2200	13	19
		NI3	2200	2400	13	19
		NI4	2400	2600	13	19
	U3A (370-375nm)	NI1	1800	2000	13	19
		NI2	2000	2200	13	19
		NI3	2200	2400	13	19
		NI4	2400	2600	13	19

Note: 1. Radiometric power is measured with an accuracy of ±10%

2. The forward voltage is measured with an accuracy of ±0.2V

* Calculated values are for reference only.

Mechanical Dimensions

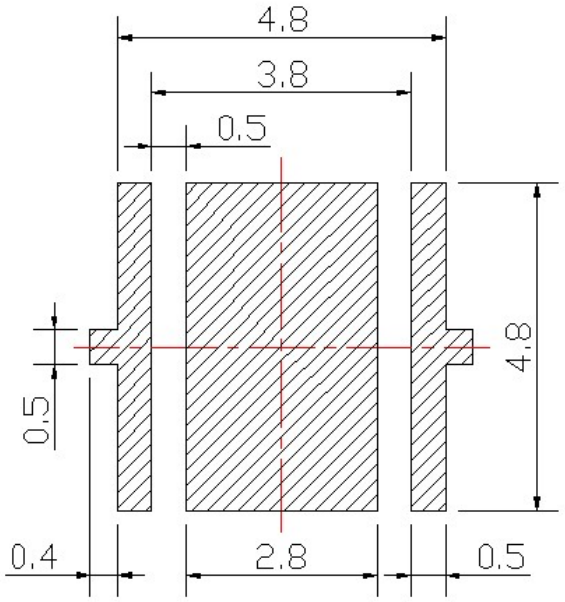


Notes :

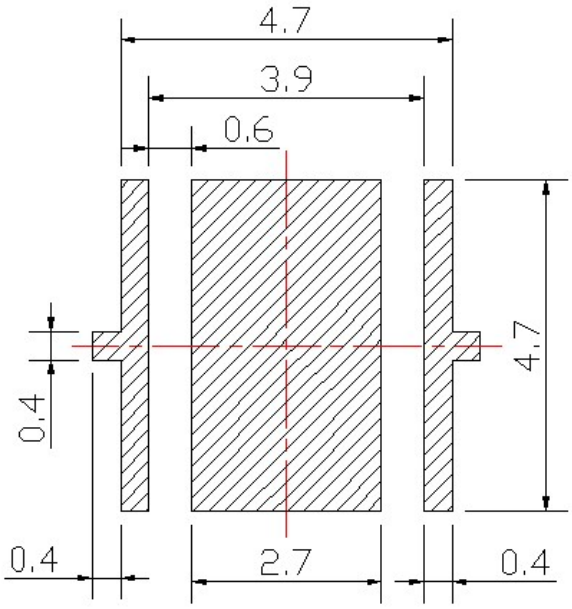
1. Drawing is not to scale
2. All dimensions are in millimeter
3. Dimensions are ±0.13mm unless otherwise indicated

Recommended Solder Pad Design

Recommended Soldering Pad Design



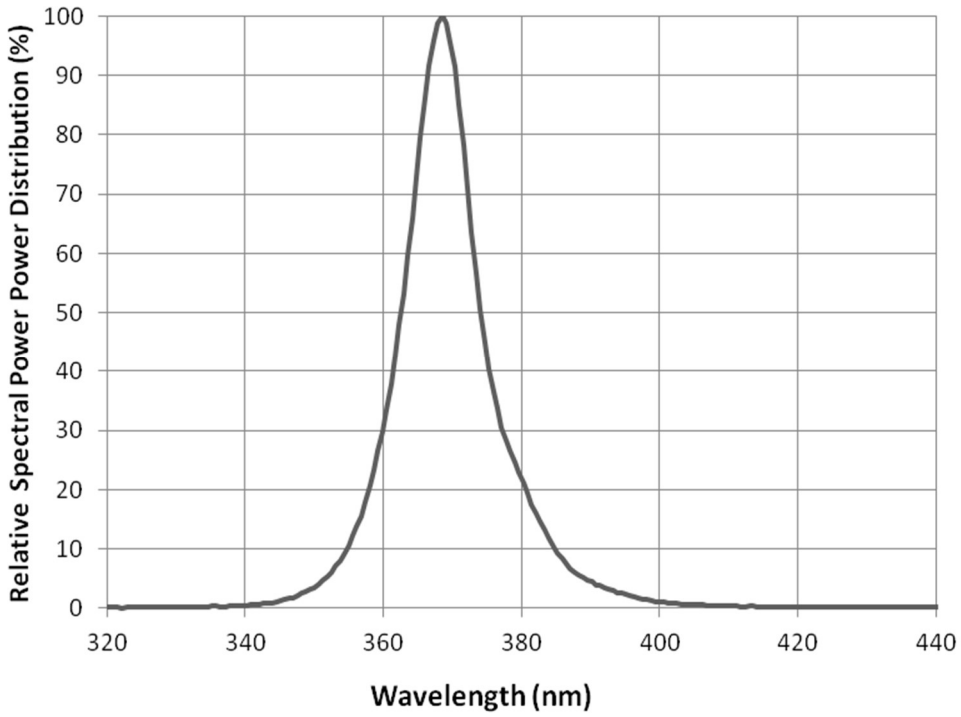
Recommended Stencil Pattern Design (Marked Area is Opening)



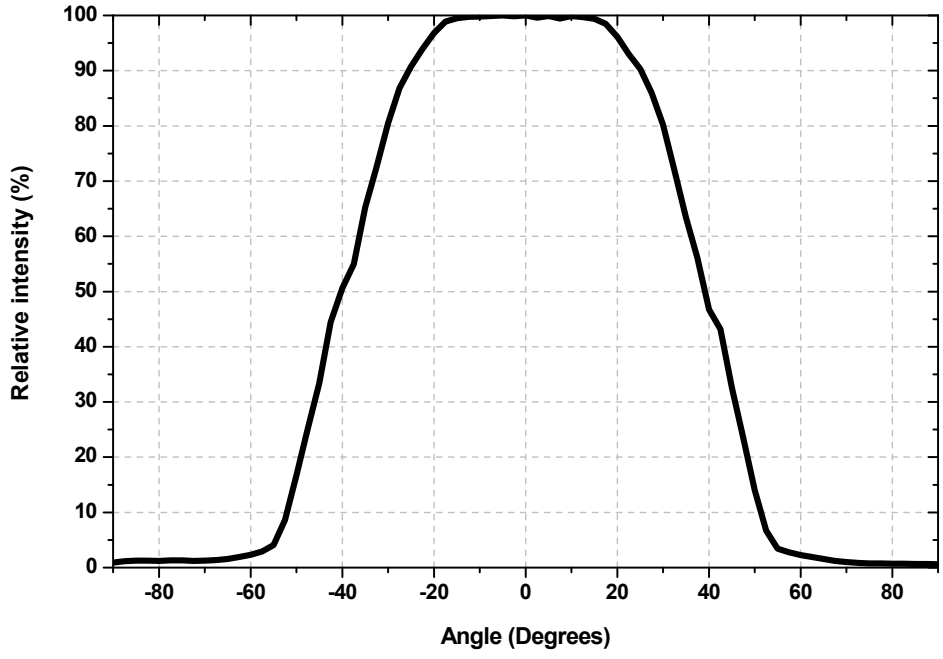
Notes :

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

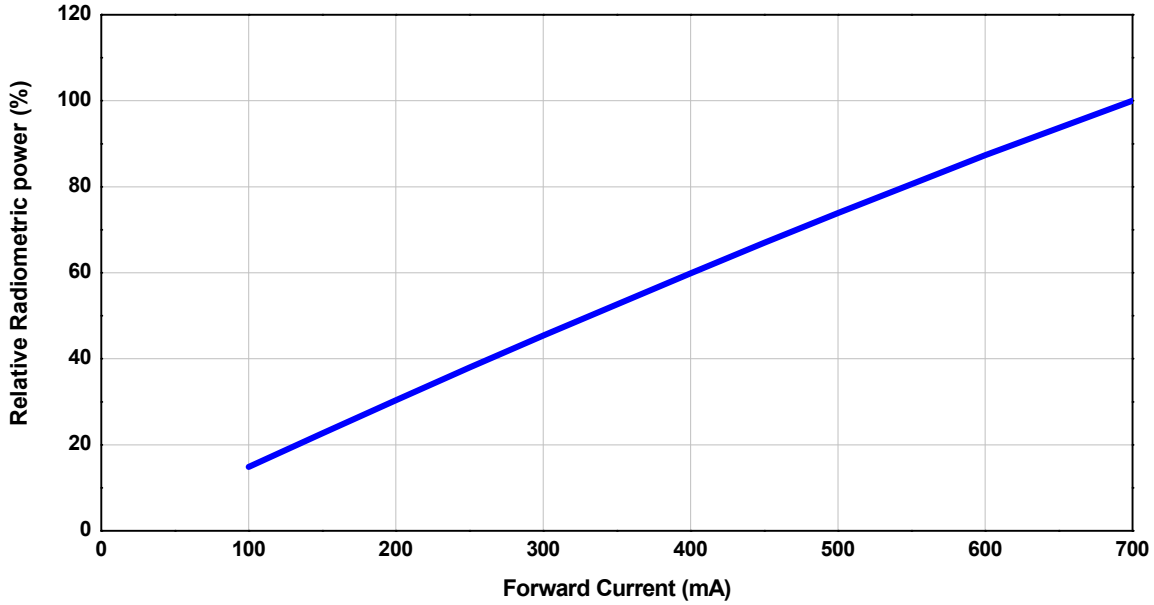
Relative Spectral Power Distribution, T_j=25°C



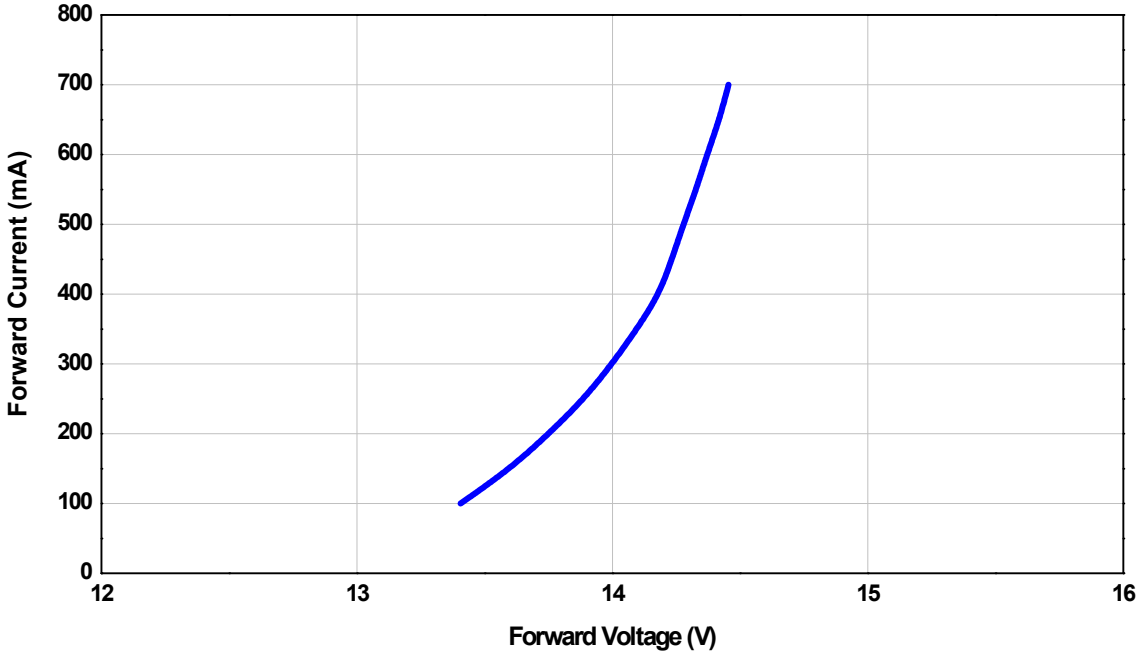
Typical Spatial Radiation Pattern



Typical Forward L-I Characteristics, T_j=25°C



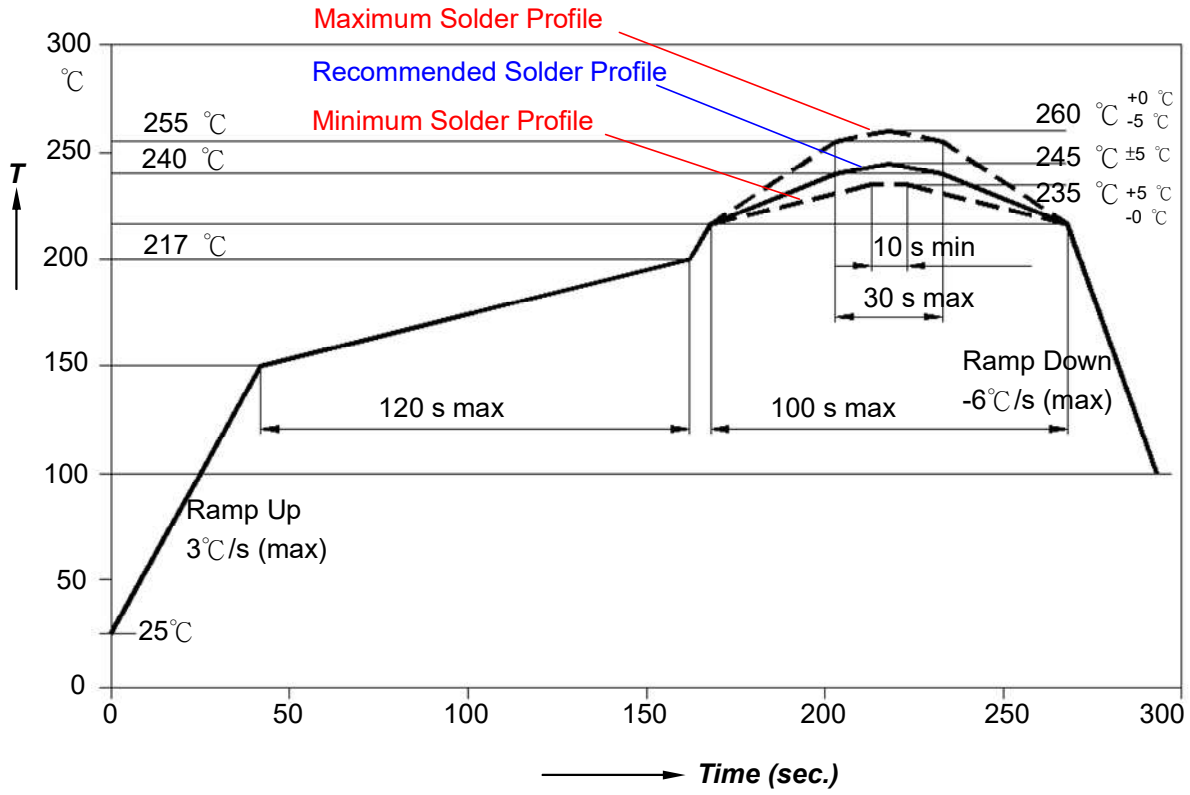
Typical Forward I-V Characteristics, T_j=25°C



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.

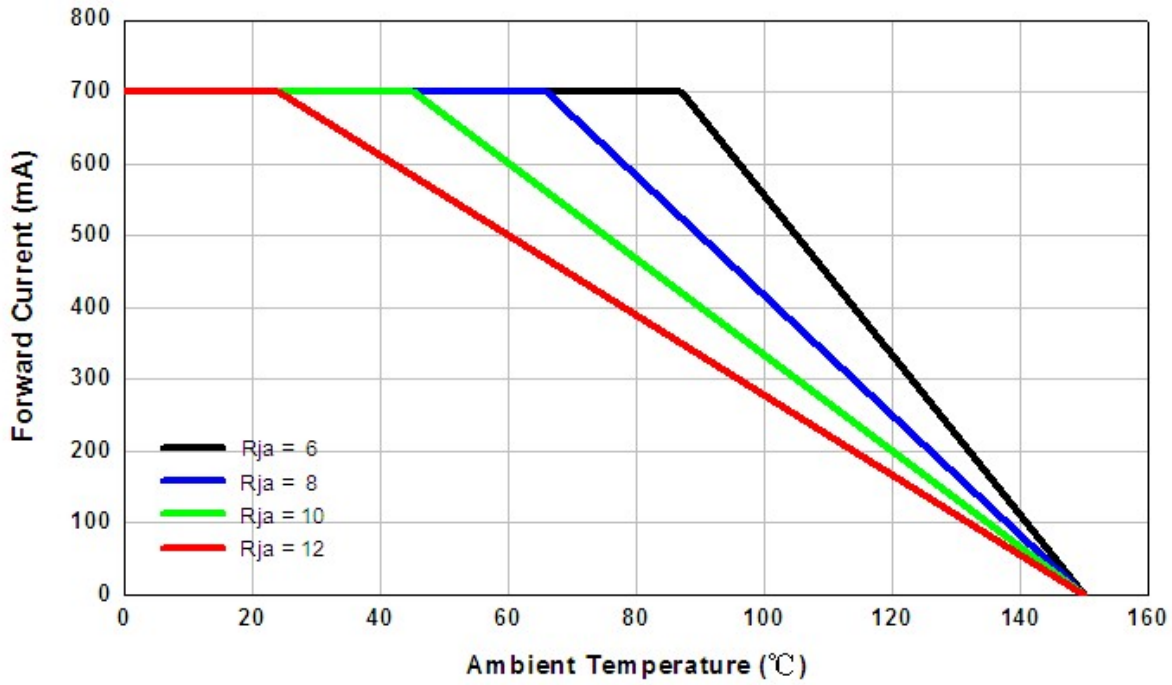


Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-up Rate (Ts_{max} to Tp)	3˚C/second max.	3˚C/second max.
Preheat - Temperature Min(Ts_{min}) - Temperature Max(Ts_{max}) - Time(ts_{min} to ts_{max})	 100˚C 150˚C 60-120 seconds	 150˚C 200˚C 60-180 seconds
Time maintained above: -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

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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