

# SPECIFICATION FOR APPROVAL

**Customer Name :**

**Customer Item :**

**Part No. :** PG-S188HQ-NA13-HDT

**Product Description :**

**Draw Date :**

**1.Accessory:**  **Samples**  **Samples Data**

**2.Customer's Proposal :**  **Agree**  **Disagree**

**Reason :**



Rev.	Draw by :	Checked by :	Approved by :
1.2.2	Steven Chen	Gray Huang	Caren
Customer Approve			

**Features**

1.8mmx0.8mm SMD LED, 0.55mm thickness

Low power consumption

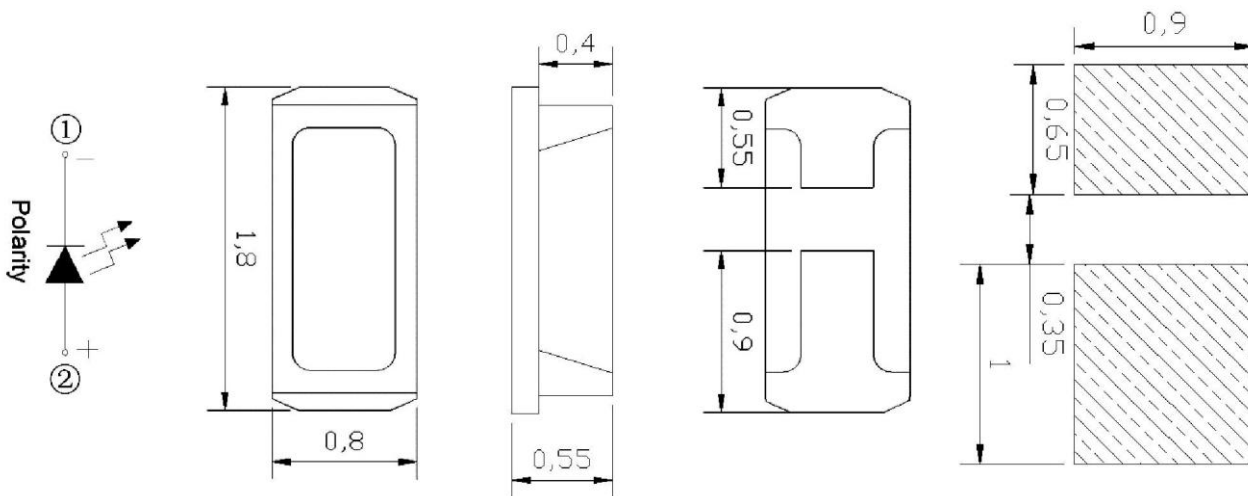
Wide view angle

Package: 4000pcs/reel

RoHS Compliant



**Package outlines/ Recommend Pad Layout**



Part No.	Emitted color	Dice	Lens color
PG-S188HQ-NA13-HDT	Green	GaN	Water transparent

Notes:

1. All dimensions are in millimeters (inches);
2. Tolerances are  $\pm 0.1\text{mm}$  (0.004inch) unless otherwise noted.

**Max Vantage****Absolute Maximum Ratings (Ta=25°C)**

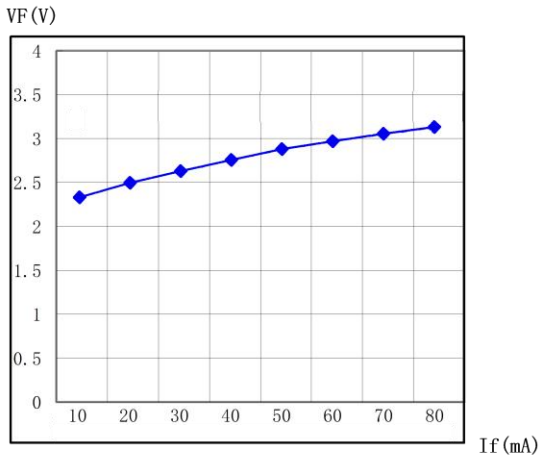
Parameter	Symbol	Value	Unit
Forward current	If	50	mA
Reverse voltage	Vr	5	V
Operating temperature	Top	-40 ~+100	°C
ESD(Human-body mode)	--	2	Kv
Storage temperature	Tstg	-40 ~+100	°C
Peak pulsing current (1/8 duty f=1kHz)	Ifp	200	mA

**Electro-Optical Characteristics (Ta=25°C)**

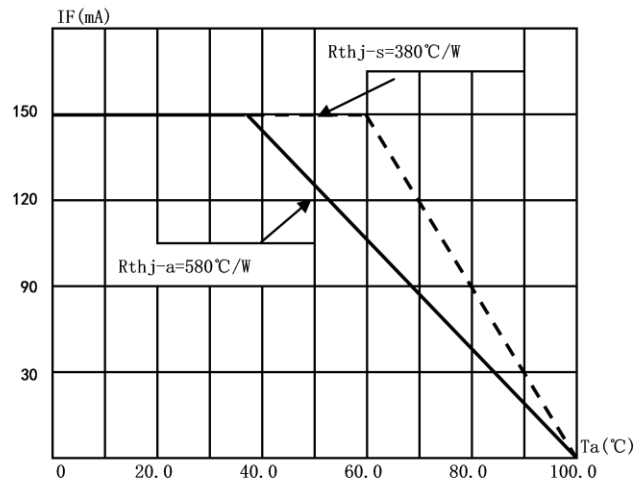
Parameter	Test Condition	Symbol	Value			Unit
			Min	Typ	Max	
Wavelength at peak emission	If=20mA	$\lambda_p$	--	525	--	nm
Spectral half bandwidth	If=20mA	$\Delta\lambda$	--	10	--	nm
Dominant wavelength	If=20mA	$\lambda_d$	--	--	--	nm
Forward voltage	If=50mA	Vf	1.8	--	2.8	V
	If=100mA	Vf	--	--	3.2	V
Luminous intensity	If=20mA	Iv	1800	2400	3400	mcd
	If=50mA	Iv	4500	6100	8200	mcd
Viewing angle at 50% Iv	If=50mA	2 $\theta$ 1/2	--	75	--	Deg
Reverse current	Vr=5V	Ir	--	--	10	$\mu$ A

Radiation Characteristics

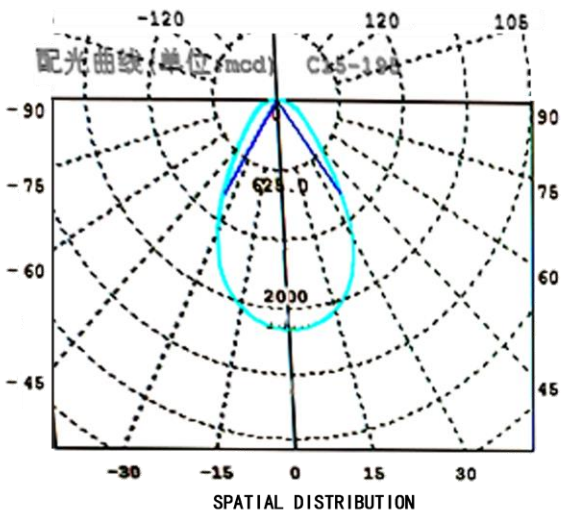
$I_F=50\text{mA}, T_a=25^\circ\text{C}$



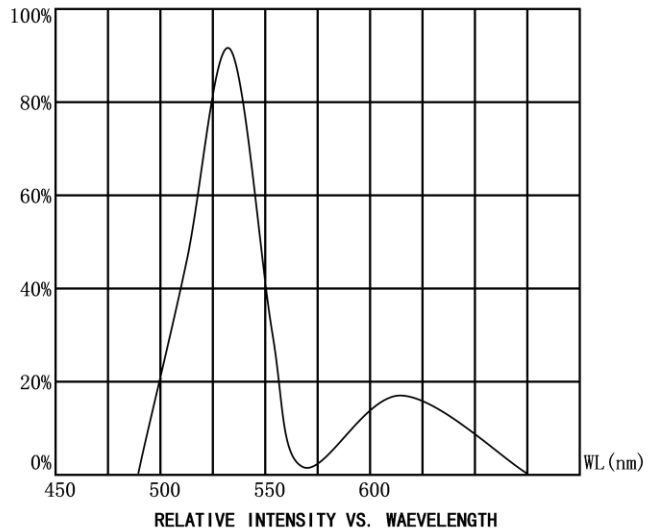
FORWARD CURRENT VS. FORWARD VOLTAGE



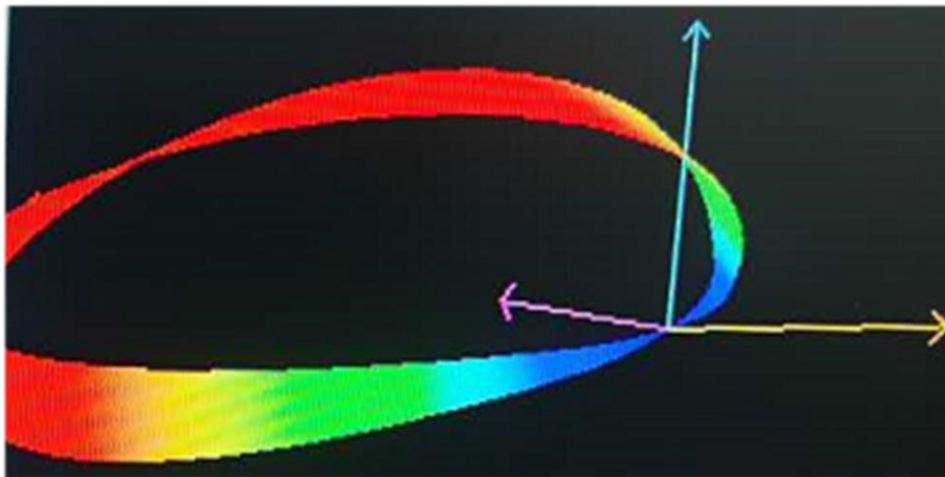
FORWARD CURRENT VS. DERATING CURVE



SPATIAL DISTRIBUTION

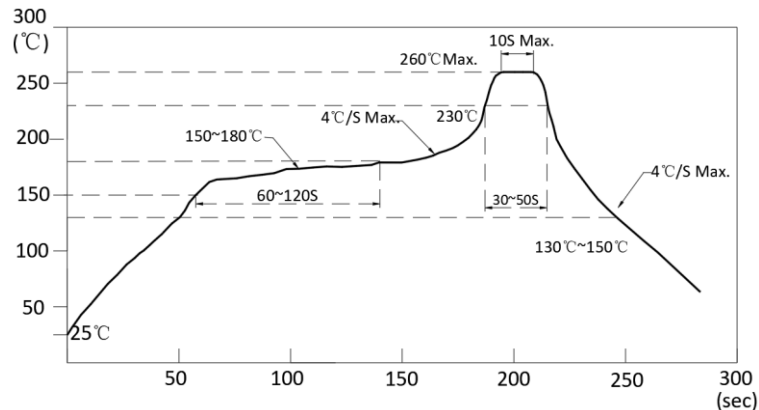


RELATIVE INTENSITY VS. WAVELENGTH



## Reflow Profile

### ■ Reflow Temp/Time



### Notes:

1. We recommend the reflow temperature 245°C ( $\pm 5^\circ\text{C}$ ).
2. The maximum soldering temperature should be limited to 260°C.
3. Don't cause stress to the epoxy resin while it is exposed to high temperature.
4. Number of reflow process shall be 2 times or less.

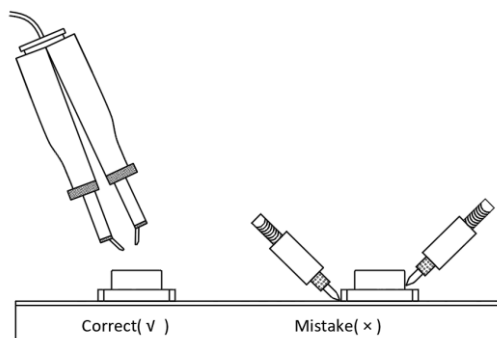
### ■ Soldering iron

Basic spec is  $\frac{6}{\lambda}$  5sec when 320°C ( $\pm 20^\circ\text{C}$ ). If temperature is higher, time should be shorter (+10°C  $\rightarrow$  -1sec).

Power dissipation of iron should be smaller than 20W, and temperatures should be controllable. Surface temperature of the device should be under 350°C.

### ■ Rework

1. Customer must finish rework within 5 sec under 340°C.
2. The head of iron cannot touch copper foil
3. Twin-head type is preferred.

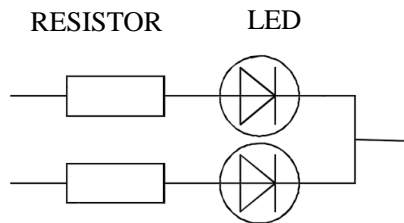


- Avoid rubbing or scraping the resin by any object, during high temperature, for example reflow solder etc.

## Handling precautions

### 1. Drive Method

A LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit below.



### 2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 60% RH or less.

2.3 After the package is opened, the products should be used within a week or they should be kept to store at  $\leq 20$  R.H. with zip-lock sealed.

### 3. Baking

It is recommended to baking before soldering when the pack is unsealed after 72hrs. The Conditions are as followings:

3.1  $60 \pm 3^\circ\text{C}$  x (12~24hrs) and  $< 5\%$  RH, taped reel type

3.2  $100 \pm 3^\circ\text{C}$  x (45min~1hr), bulk type

3.3  $130 \pm 3^\circ\text{C}$  x (15~30min), bulk type

### Test Items and Results of Reliability

Test Item	Test Conditions	Standard Test Method	Note	Number of Test
Reflow Soldering	Ta=260±5°C, Time=10±2S	JB/T 10845-2008	3times	0/22
Salt Atmosphere	Ta=35±3°C, PH=6.5 ~ 7.2	GB/T 2423.17-2008	24hrs	0/22
Temperature Cycling	-40±5°C      30±1min ↑→(25°C/5±1min)↓ 100±5°C      30±1min	GB/T 2423.22-2012	100cycles	0/22
Thermal Shock	Ta=-40±5°C ~ 100±5°C, 15±1min dwell	GB/T 2423.22-2012	100cycles	0/22
High Humidity High Temp. Cycling	Ta=30±5°C ~ 65±5°C, 90±5%RH, 24hrs/1cycle	GB/T 2423.4-2008	10cycles	0/22
High Humidity High Temp. Storage Life	Ta=85±5°C, ψ(%)=85±5%RH	GB/T 2423.3-2006	1000hrs	0/22
High Temperature Storage Life	Ta=100±5°C, non-operating	GB/T 2423.2-2008	1000hrs	0/22
Low Temperature Storage Life	Ta=-40±5°C, non-operating	GB/T 2423.1-2008	1000hrs	0/22
Life Test	Ta=26±5°C, @20mA, ψ(%)=25%RH ~ 55%RH	--	1000hrs	0/22
High Humidity High Temp. Operating Life	Ta=85±5°C, @20mA, ψ(%)=85%RH	GB/T 2423.3-2006	500hrs	0/22
Low Temperature Operating Life	Ta=-20±5°C, @20mA	GB/T 2423.1-2008	1000hrs	0/22