

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

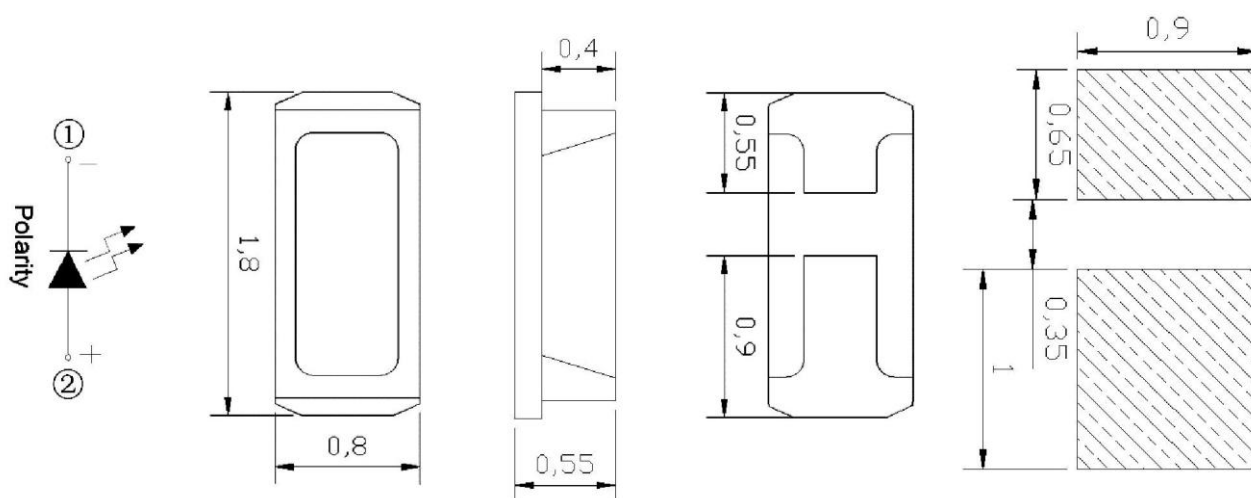
Wide view angle

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.

Absolute Maximum Ratings (Ta=25°C)

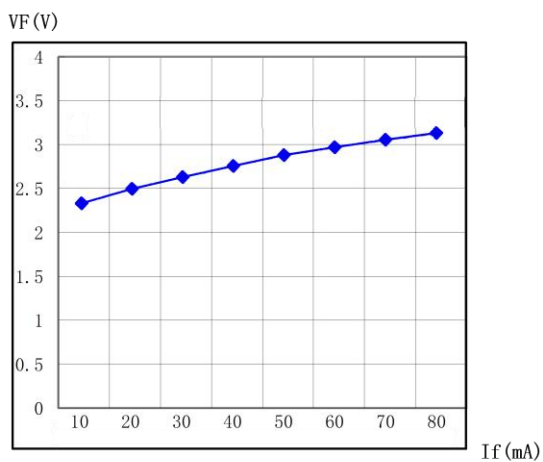
| Parameter | Symbol | Value | Unit |
|--|--------|-----------|------|
| Forward current | If | 50 | mA |
| Reverse voltage | Vr | 5 | V |
| Operating temperature | Top | -40 ~+100 | °C |
| ESD(Human-body mode) | -- | 2 | Kv |
| Storage temperature | Tstg | -40 ~+100 | °C |
| Peak pulsing current (1/8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

Electro-Optical Characteristics (Ta=25°C)

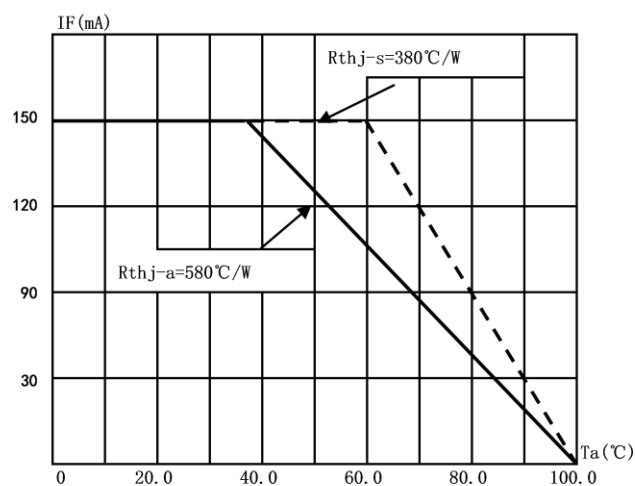
| Parameter | Test Condition | Symbol | Value | | | Unit |
|-----------------------------|----------------|-----------------|-------|------|------|---------|
| | | | Min | Typ | Max | |
| Wavelength at peak emission | If=20mA | λ_p | -- | 525 | -- | nm |
| Spectral half bandwidth | If=20mA | $\Delta\lambda$ | -- | 10 | -- | nm |
| Dominant wavelength | If=20mA | λ_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 θ 1/2 | -- | 75 | -- | Deg |
| Reverse current | Vr=5V | Ir | -- | -- | 10 | μ A |

Radiation Characteristics

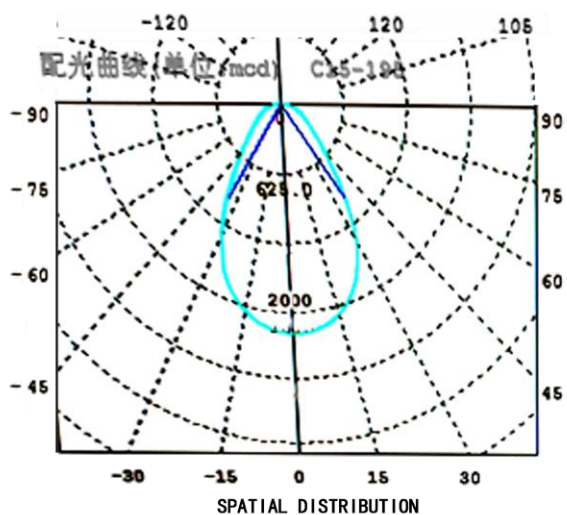
IF=50mA, Ta=25°C



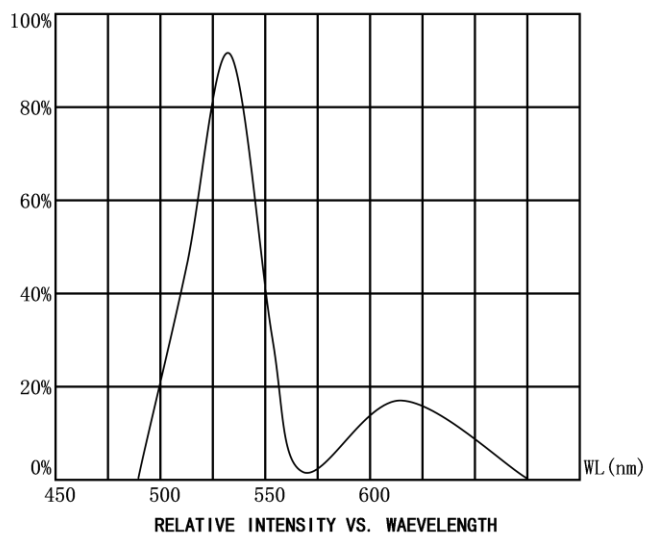
FORWARD CURRENT VS. FORWARD VOLTAGE



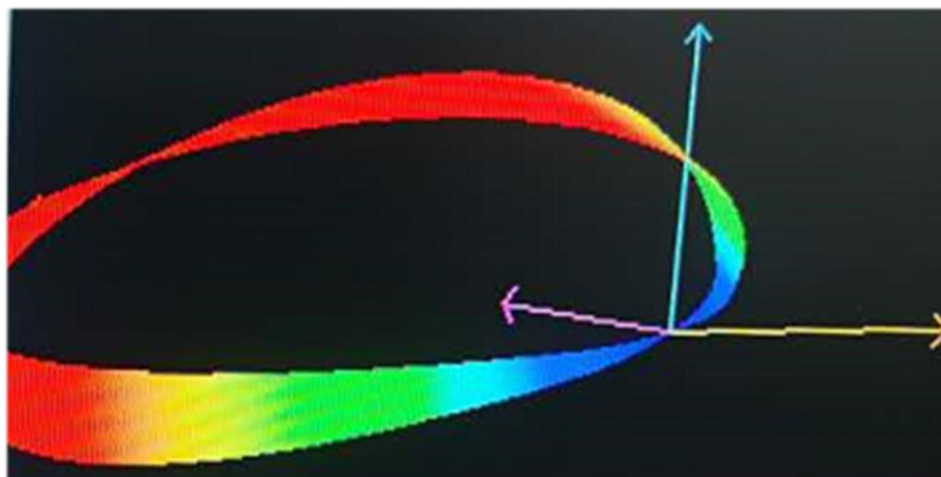
FORWARD CURRENT VS. DERATING CURVE



SPATIAL DISTRIBUTION

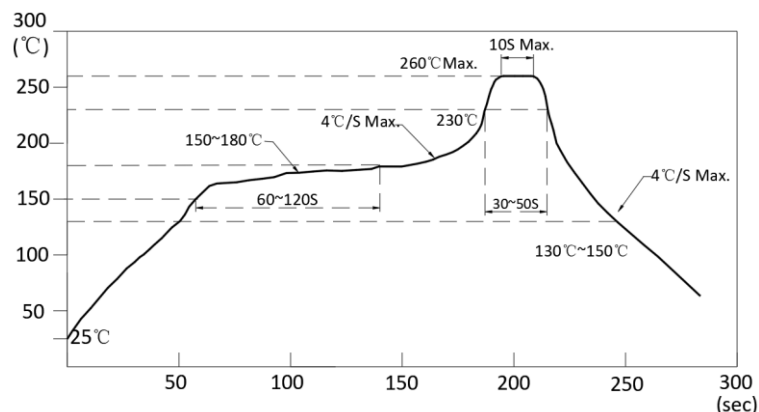


RELATIVE INTENSITY VS. WAVELENGTH



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.

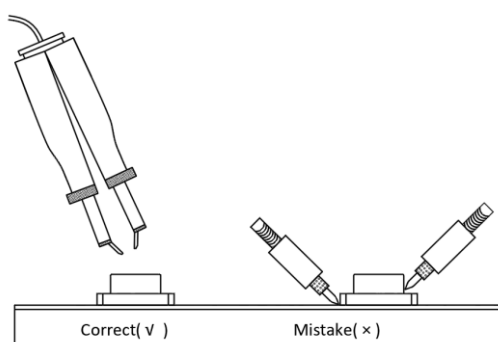
■ Soldering iron

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.

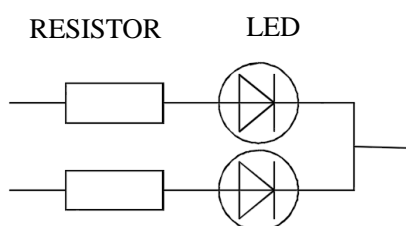


- Avoid rubbing or scraping the resin by any object, during high temperature, for example reflow solder etc.

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 keeping to store at ≤ 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 |