

VISIBLE LIGHT PRODUCTS SPECIFICATION

HCL-1904AY-4



| Drawn by | Checked by | Approved by |
|----------|------------|-------------|
| | | |
| | | |

RoHS
Conformity

DATE:2011/12/26

REV:F



HUEY JANN ELECTRONICS INDUSTRY CO., LTD.

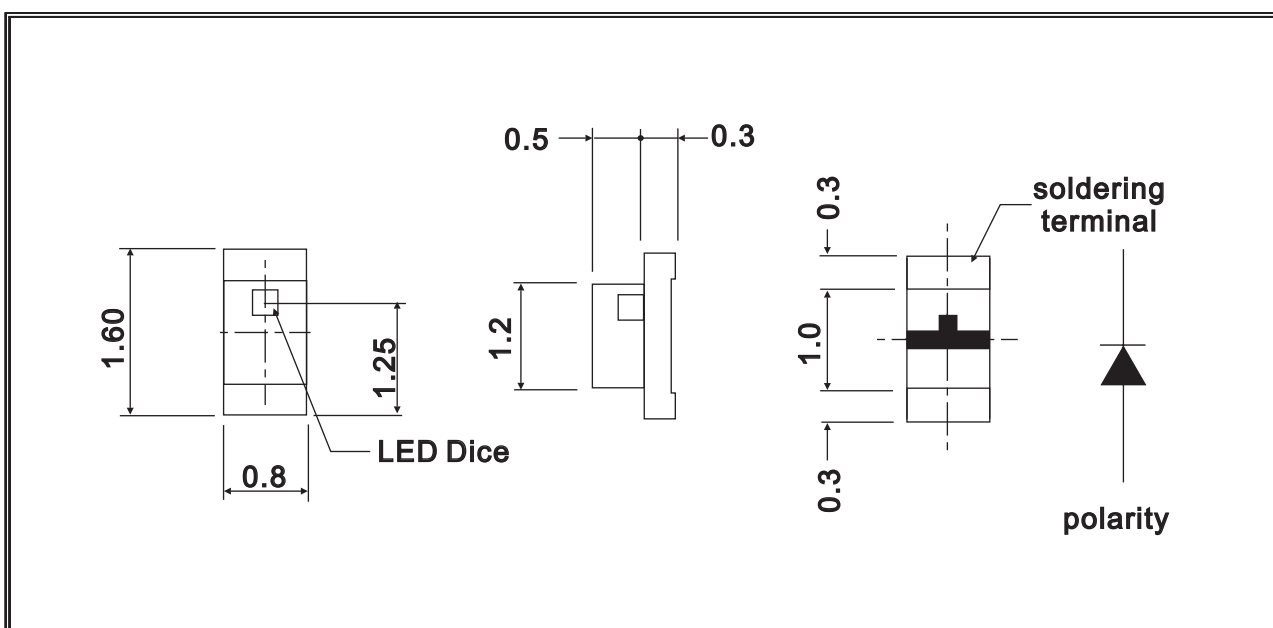
No.27 Line 466 Sec.2,Cannng-nan Rd. Wu-chi Town Taichung Shien, Taiwan, R.O.C.

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DEVICES

| Part Number | Lens | | Source | |
|--------------|-------------|--------------|--------------|--------------|
| | Color | Diffusion | Dice Source | Color |
| HCL-1904AY-4 | Water clear | Non-Diffused | AllnGaP/GaAs | Super Yellow |

PACKAGE DIMENSIONS



NOTE:

- 1.All dimensions are in millimeter.
- 2.specifications are subject to change without notice.
- 3.Tolerance is +/-0.3mm unless otherwise noted.

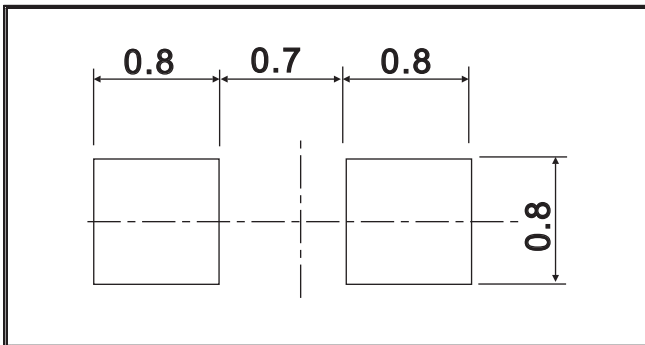


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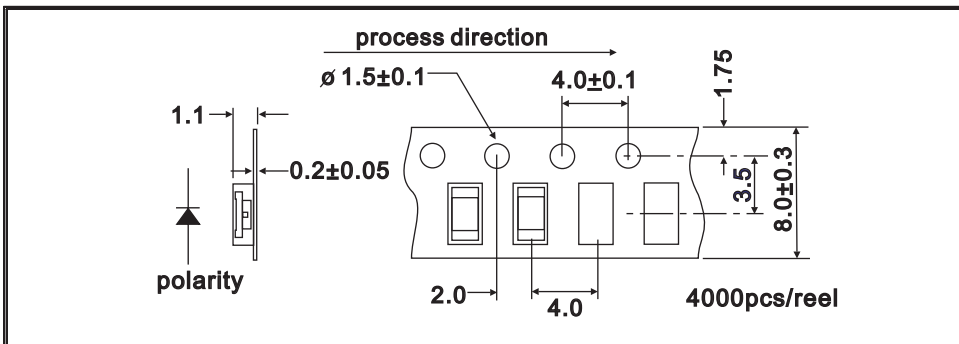
RECOMMENDED SOLDERING PATTERN



NOTE:

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TAPE SPECIFICATIONS



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ABSOLUTE MAXIMUM RATINGS

TA=25°C

| PARAMETER | SYMBOL | MAX. RATING | UNIT |
|----------------------------------------------------------------------------|--------|-------------|------|
| Power Dissipation | Pd | 100 | mW |
| Continuous Forward Current | IF | 25 | mA |
| Peak Forward Current *1 | IFM | 50 | mA |
| Reverse Voltage | VR | 5 | V |
| Operating Temperature | Topr | -40 ~ +85 | °C |
| Storage Temperature | Tstg | -40 ~ +85 | °C |
| Reflow Soldering (preheat 150-180°C 60-120sec, soldering temp 260°C 10sec) | | | |

*1.Duty Ratio=0.1%,Pulse Width=10us.

*2.Iron soldering in 350°C within 5 seconds will not cause damage to the dice. But be aware of the high temperature will not only make the epoxy soften but also cause the lead moving and the gold wire broken and even open. So before returning to the normal temperature PLEASE AVOID any serious pressure on the top of epoxy and lead.



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ELECTRIC-OPTICAL CHARACTERISTICS

TA=25°C

| PARAMETER | SYMBOL | TEST CONDITION | MIN | TYP | MAX | UNIT |
|------------------------------|----------------------|----------------|-----|-----|-----|------|
| View Angle of Half Power | 2θ _{1/2} | IF=20mA | | 140 | | deg |
| Forward Voltage | V _F | | | 2.0 | 2.4 | V |
| Reverse Current | I _R | VR=5V | | | 10 | μA |
| Luminous Intensity *2 | I _V | IF=20mA | 40 | 80 | | mcd |
| Peak Emission Wavelength | λ _p | | | 589 | | nm |
| Dominant Wave Length *3 | λ _d (HUE) | | | | 588 | nm |
| Spectrum Width Of Half Valve | Δλ | | | | 20 | nm |

*2.Tolerance: 15% HUEY-JANN measuring equipment : EXELTRON 2001. 2.S370 made by U.D.T.

*3.The dominant wavelength , λ_d, is derived from the CIE Chromaticity Diagram and represents the color of the device.



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RELIABILITY TEST

| Classification | Test Item | Reference Standard | Test Conditions | Result |
|------------------|----------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Endurance Test | Operation Life | MIL-STD-750:1026 MIL-STD-883:1005 JIS-C-7021 :B-1 | Connect with a power if=20mA Ta=Under room temperature Test Time=1,000hrs | 0/22 |
| | High Temperature High Humidity Storage | MIL-STD-202:103B JIS-C-7021 :B-11 | Ta=+85°C 5°C RH=90% ~ 95% Test Time=1000hrs | 0/22 |
| | High Temperature Storage | MIL-STD-883:1008 JIS-C-7021 :B-10 | High Ta=+100°C 5°C Test Time=1,000hrs | 0/22 |
| | Low Temperature Storage | JIS-C-7021 :B-12 | Low Ta=-40°C 5°C Test Time=1,000hrs | 0/22 |
| | Environmental Test | Temperature Cycling | MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS-C-7021 :A-4 | -40°C ~ +25°C ~ +85°C ~ +25°C 60min 20min 60min 20min Test Time=200cycle |
| Thermal Shock | | MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 | -40°C 5°C ~ +85°C 5°C 20min 20min Test Time=200cycle | 0/22 |

*Failure Criteria:

1. VF arise \geq 10%
2. IV decline \geq 30%
3. A failure is an LED that is open or shorted

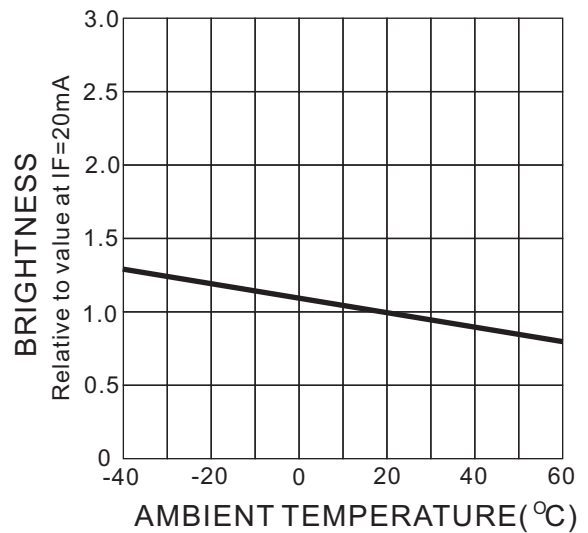
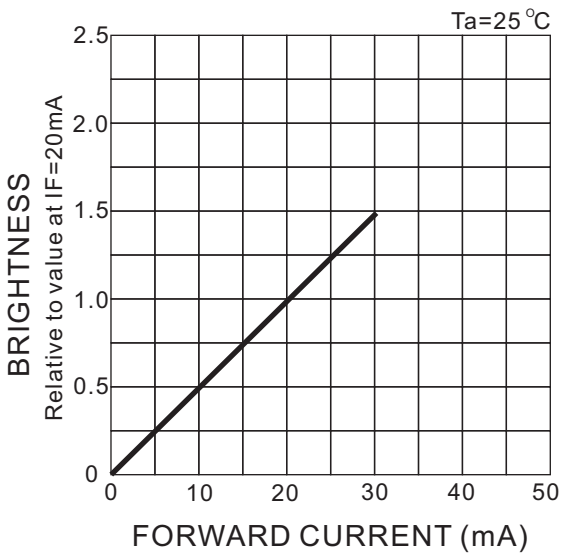
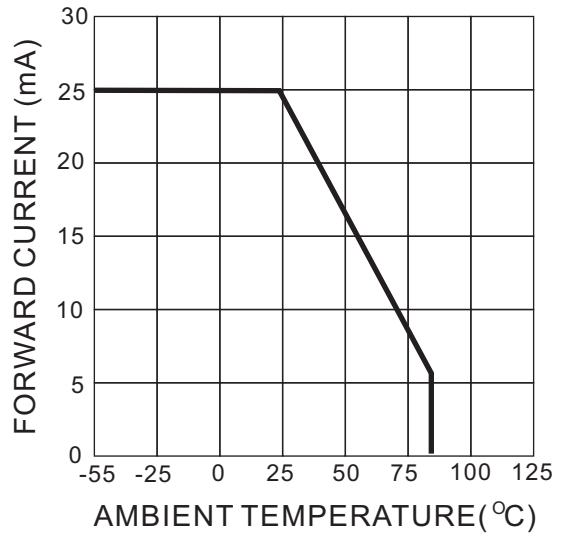
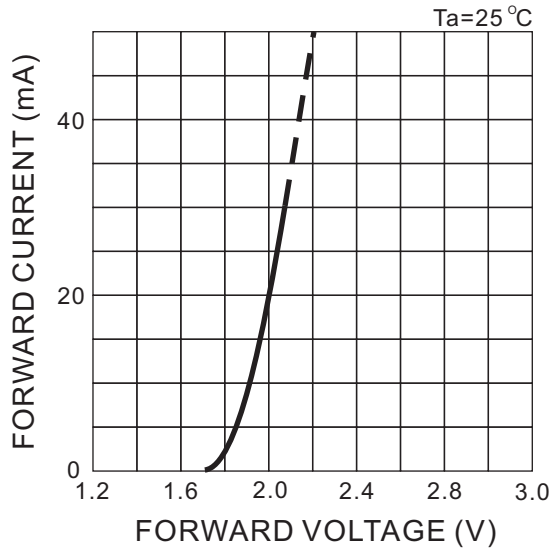


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TYPICAL ELECTRICAL OPTICAL CHARACTERISTICS CURVES

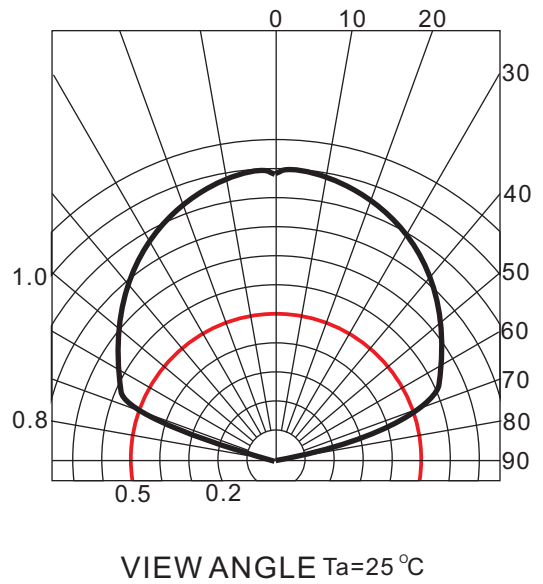
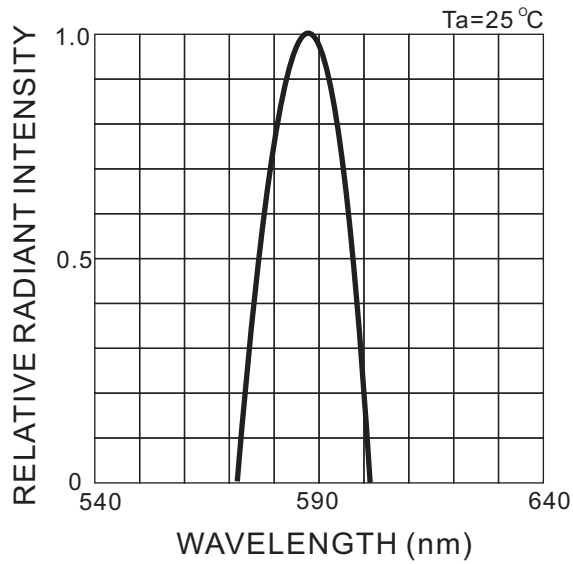


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LED VF Bin Selection

$I_F=20\text{mA}$

| BIN CODE | Forward Voltage | |
|----------|-----------------|---------|
| | Minimum | Maximum |
| d | 1.8 | 2.0 |
| e | 2.0 | 2.2 |
| f | 2.2 | 2.4 |
| | | |
| | | |

Voltage tolerance for each bin limit is $\pm 0.03\text{V}$

Brightness Bin Selection

$I_F=20\text{mA}$

| BIN CODE | Brightness in mcd | |
|----------|-------------------|---------|
| | Minimum | Maximum |
| C | 49.0 | 64.0 |
| D | 64.0 | 80.0 |
| E | 80.0 | 108 |
| F | 108 | 140 |
| | | |

Brightness tolerance for each bin limit is $\pm 15\%$



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Precautions For Use

1. Over-current-proof

Customer must apply resistors for protection , otherwise slight voltage shift will cause big current change (Burn out will happen).

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 90%RH or less.

2.3 The LEDs should be used within a year.

2.4 After opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.

2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

2.6 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment : 60 5°C for 24 hours.

3. Soldering Condition

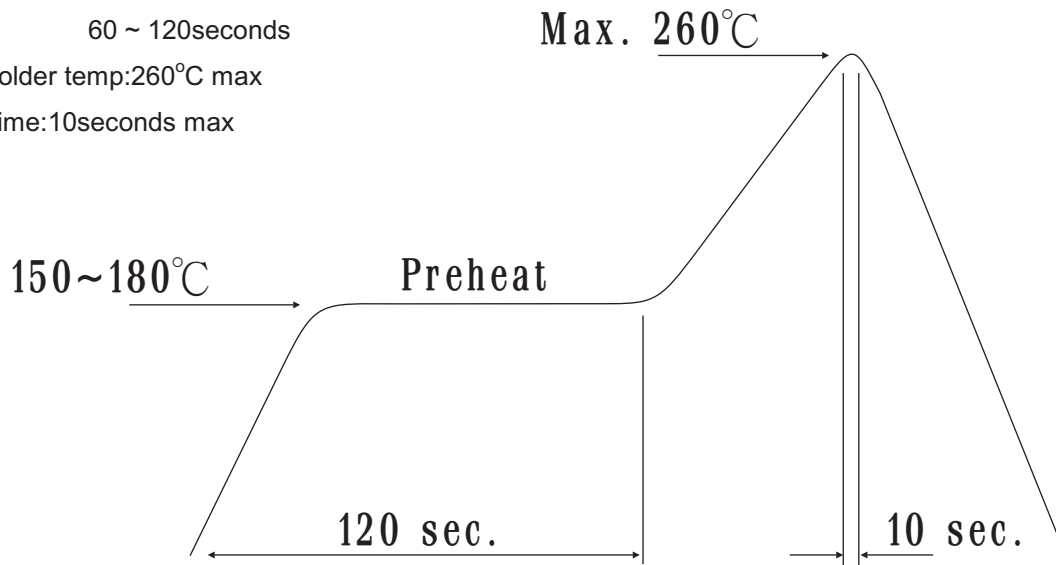
3.1 Pb-free solder temperature profile

Preheat:150 ~ 180°C

60 ~ 120seconds

Solder temp:260°C max

Time:10seconds max



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

3.4 After soldering, do not warp the circuit board.



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