

# VISIBLE LIGHT PRODUCTS SPECIFICATION

## HB5-439AWF

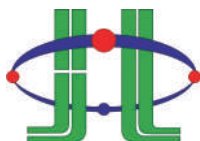


| Drawn by | Checked by | Approved by |
|----------|------------|-------------|
|          |            |             |
|          |            |             |



DATE:2010/7/9

REV:I



**HUEY JANN ELECTRONICS INDUSTRY CO., LTD.**

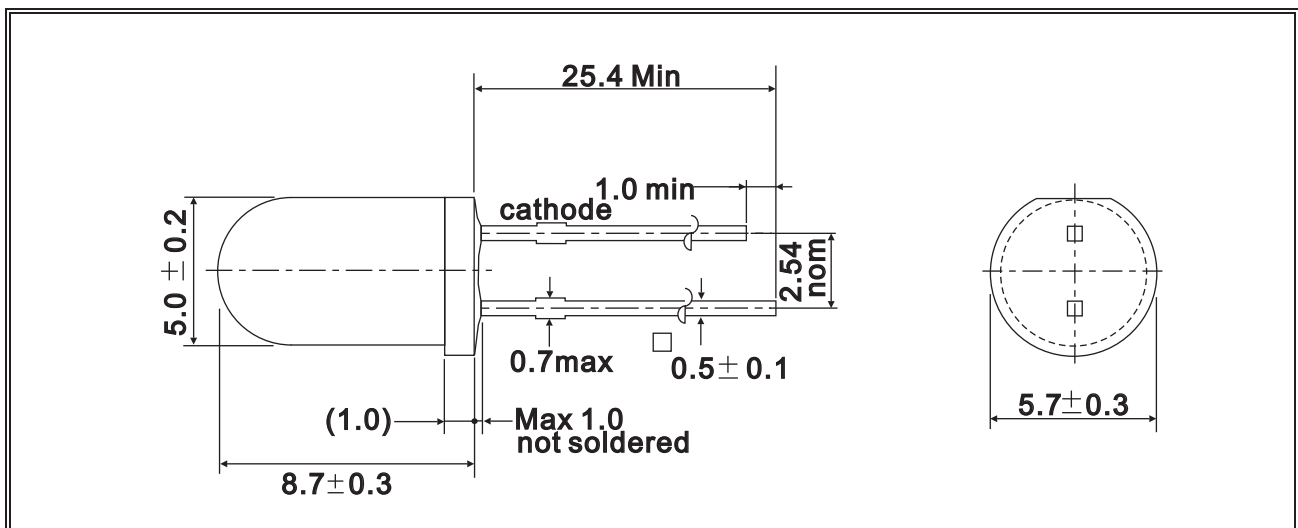
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DEVICES

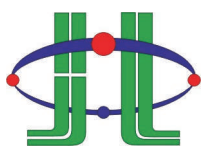
| Part Number | Lens        |               | Source      |             |
|-------------|-------------|---------------|-------------|-------------|
|             | Color       | Diffusion     | Dice Source | Color       |
| HB5-439AWF  | Water Clear | Non-Diffusion | GaN/InN     | Super White |

PACKAGE DIMENSIONS:



NOTE:

- 1.All dimensions are in millimeter.
- 2.Lead spacing is measured where the lead emerge from the package.
- 3.Protruded resin under flange is 1.5mm max.
- 4.Specifications are subject to change without notice.
- 5.Tolerance is  $0.3$ mm unless otherwise noted.



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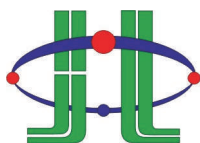
**ABSOLUTE MAXIMUM RATINGS**

TA=25°C

| PARAMETER   | SYMBOL | MAX. RATING | UNIT |
|---|--------|-------------|------|
| Continuous Forward Current  | IF     | 25          | mA   |
| Peak Forward Current *1   | IFM    | 100         | mA   |
| Reverse Voltage   | VR     | 4           | V    |
| Electrostatic Discharge (HBM)   | ESD    | 150         | V    |
| LED Junction Temperature  | Tj     | 100         | °C   |
| Operating Temperature   | Topr   | -40 ~ +85   | °C   |
| Storage Temperature   | Tstg   | -40 ~ +100  | °C   |
| Dip Soldering Temperature (3mm from case Bottom 260 °C for 5 seconds) |        |             |      |

\*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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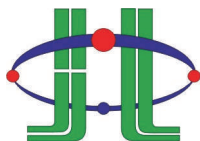
ELECTRIC-OPTICAL CHARACTERISTICS

TA=25°C

| PARAMETER                                 | SYMBOL   | TEST CONDITION | MIN   | TYP   | MAX | UNIT |
|---|----------|----------------|-------|-------|-----|------|
| View Angle of Half Power                  | 2θ1/2    | IF=20mA        |       | 22    |     | deg  |
| Forward Voltage                           | VF       |                |       | 3.3   | 3.8 | V    |
| Reverse Current                           | IR       | VR=5V          |       |       | 60  | μA   |
| Luminous Intensity *2                     | IV       | IF=20mA        | 15000 | 27000 |     | mcd  |
| Chromaticity Coordinates<br>(Bin Sorting) | x        |                |       | 0.30  |     |      |
|   | y        |                |       | 0.31  |     |      |
| Dominate Wave Length *3                   | λ d(HUE) |                |       | ---   |     | nm   |
| Spectrum Width Of Half Valve              | Δλ       |                |       |       | --- | nm   |

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

\*3.The dominate wavelength , λ d, is derived from the CIE Chromaticity Diagram and represents the color of the device.



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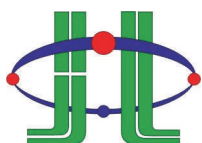
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RELIABILITY TEST

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

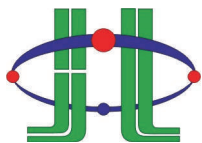
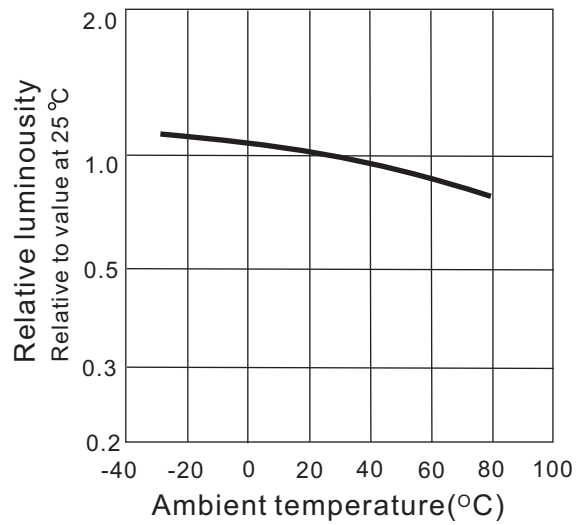
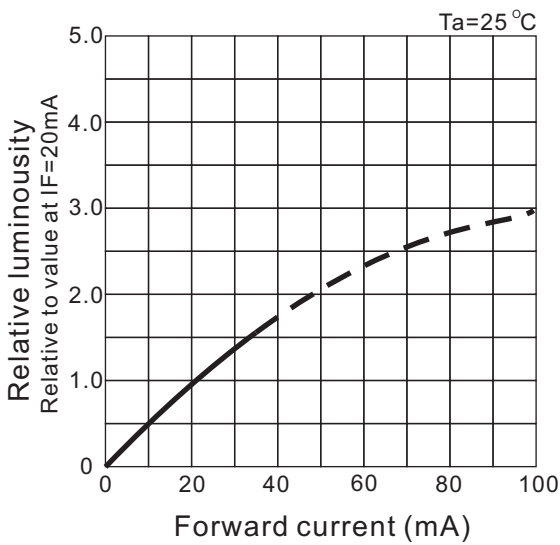
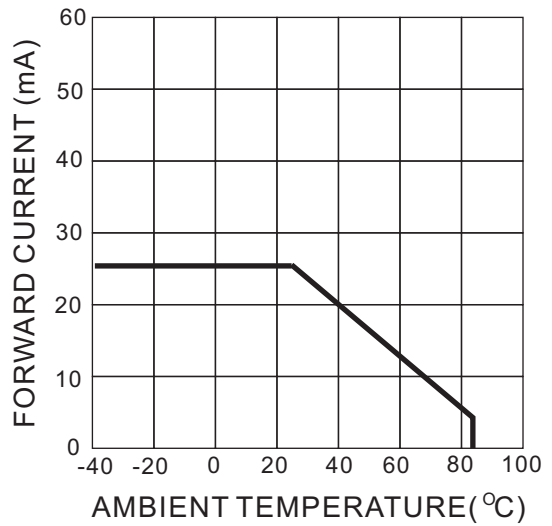
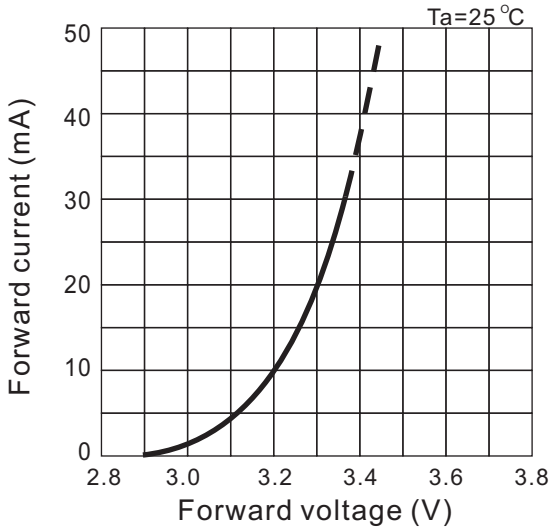


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TYPICAL ELECTRICAL OPTICAL CHARACTERISTICS CURVES

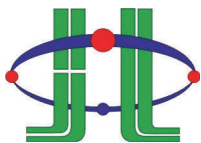
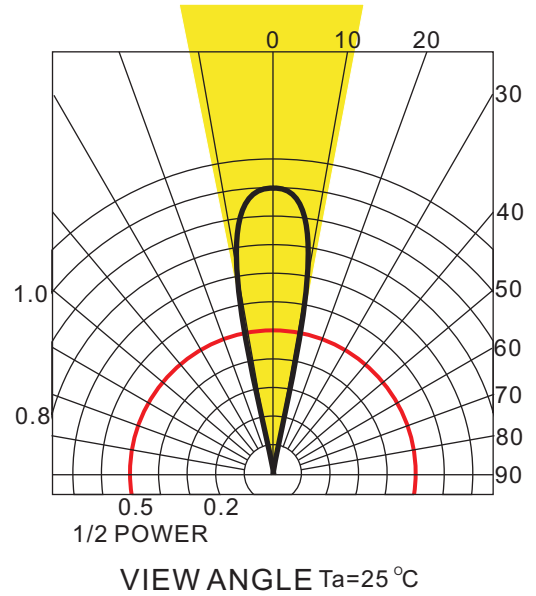
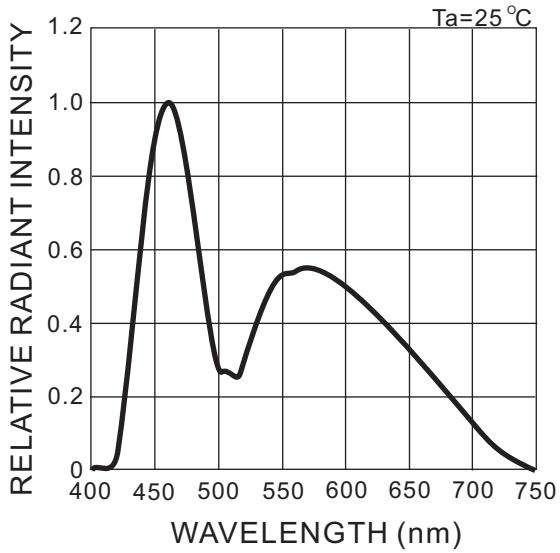


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LED VF Bin Selection

$I_F=20\text{mA}$

| BIN CODE | Forward Voltage |         |
|----------|-----------------|---------|
|          | Minimum         | Maximum |
| <b>k</b> | 3.2             | 3.4     |
| <b>m</b> | 3.4             | 3.6     |
| <b>n</b> | 3.6             | 3.8     |
|          |                 |         |
|          |                 |         |

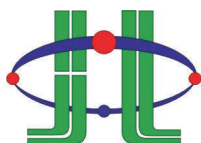
Voltage tolerance for each bin limit is  $\pm 0.03\text{V}$

Brightness Code

$I_F=20\text{mA}$

| BIN CODE  | Brightness in mcd |         |
|-----------|-------------------|---------|
|           | Minimum           | Maximum |
| <b>Z2</b> | 21000             | 27000   |
| <b>Z3</b> | 27000             | 35000   |
| <b>Z4</b> | 35000             | 45000   |
| <b>Z5</b> | 45000             | 59000   |
|           |                   |         |

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



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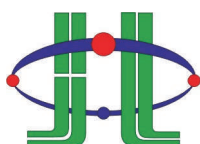
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Color Bin Selection

If=20mA

| Bin              |     | Chromaticity Coordinates |       |              |       | Bin              |    | Chromaticity Coordinates |   |              |       |       |       |
|------------------|-----|--------------------------|-------|--------------|-------|------------------|----|--------------------------|---|--------------|-------|-------|-------|
| 3                | 3-1 | x                        | 0.260 | 0.270        | 0.270 | 0.260            | 8  | 8-1                      | x | 0.310        | 0.320 | 0.320 | 0.310 |
|                  |     | y                        | 0.280 | 0.290        | 0.270 | 0.260            |    |                          | y | 0.330        | 0.340 | 0.320 | 0.310 |
|                  | 3-2 | x                        | 0.260 | 0.270        | 0.270 | 0.260            |    | 8-2                      | x | 0.310        | 0.320 | 0.320 | 0.310 |
|                  |     | y                        | 0.260 | 0.270        | 0.240 | 0.230            |    |                          | y | 0.310        | 0.320 | 0.290 | 0.280 |
| 4                | 4-1 | x                        | 0.270 | 0.280        | 0.280 | 0.270            | 9  | 9-1                      | x | 0.320        | 0.330 | 0.330 | 0.320 |
|                  |     | y                        | 0.290 | 0.300        | 0.280 | 0.270            |    |                          | y | 0.360        | 0.370 | 0.350 | 0.340 |
|                  | 4-2 | x                        | 0.270 | 0.280        | 0.280 | 0.270            |    | 9-2                      | x | 0.320        | 0.330 | 0.330 | 0.320 |
|                  |     | y                        | 0.270 | 0.280        | 0.250 | 0.240            |    |                          | y | 0.340        | 0.350 | 0.315 | 0.305 |
| 5                | 5-1 | x                        | 0.280 | 0.290        | 0.290 | 0.280            | 10 | 10-1                     | x | 0.330        | 0.340 | 0.340 | 0.330 |
|                  |     | y                        | 0.300 | 0.310        | 0.290 | 0.280            |    |                          | y | 0.370        | 0.380 | 0.360 | 0.350 |
|                  | 5-2 | x                        | 0.280 | 0.290        | 0.290 | 0.280            |    | 10-2                     | x | 0.330        | 0.340 | 0.340 | 0.330 |
|                  |     | y                        | 0.280 | 0.290        | 0.260 | 0.250            |    |                          | y | 0.350        | 0.360 | 0.325 | 0.315 |
| 6                | 6-1 | x                        | 0.290 | 0.300        | 0.300 | 0.250            | 11 | 11-1                     | x | 0.340        | 0.350 | 0.350 | 0.340 |
|                  |     | y                        | 0.310 | 0.320        | 0.300 | 0.290            |    |                          | y | 0.380        | 0.390 | 0.370 | 0.360 |
|                  | 6-2 | x                        | 0.250 | 0.300        | 0.300 | 0.290            |    | 11-2                     | x | 0.340        | 0.350 | 0.350 | 0.340 |
|                  |     | y                        | 0.290 | 0.300        | 0.270 | 0.260            |    |                          | y | 0.360        | 0.370 | 0.335 | 0.325 |
| 7                | 7-1 | x                        | 0.300 | 0.310        | 0.310 | 0.300            | 12 | 12-1                     | x | 0.350        | 0.360 | 0.360 | 0.350 |
|                  |     | y                        | 0.320 | 0.330        | 0.310 | 0.300            |    |                          | y | 0.390        | 0.400 | 0.380 | 0.370 |
|                  | 7-2 | x                        | 0.300 | 0.310        | 0.310 | 0.300            |    | 12-2                     | x | 0.350        | 0.360 | 0.360 | 0.350 |
|                  |     | y                        | 0.300 | 0.310        | 0.280 | 0.270            |    |                          | y | 0.370        | 0.380 | 0.345 | 0.335 |
| <b>Tolerance</b> |     | $x \pm 0.02$             |       | $y \pm 0.02$ |       | <b>Tolerance</b> |    | $x \pm 0.02$             |   | $y \pm 0.02$ |       |       |       |

The chromaticity coordinates reading at center of light.

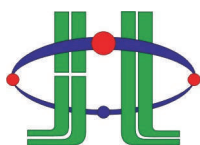
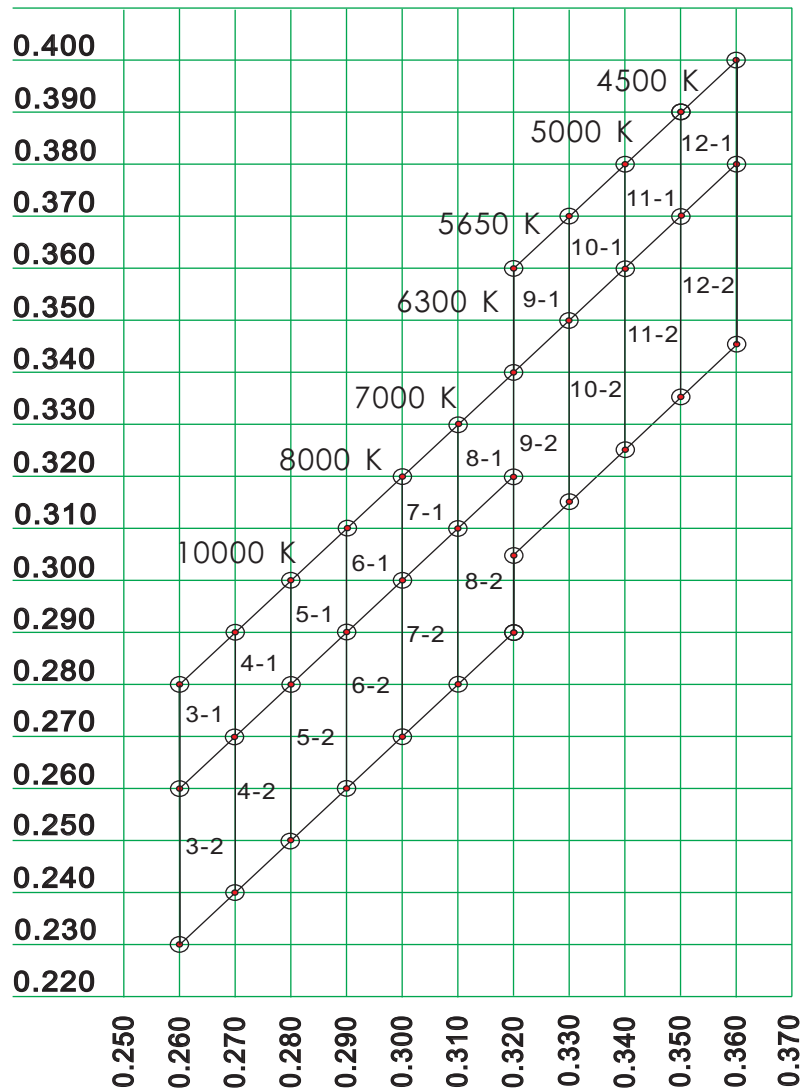


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CIE Light Color Chart



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