5334S Series
Single Color φ5 Round Shape Type

Features

| Package | φ5 Round shape type,  
EBG/BG, EPG/PG : Green Diffused epoxy  
EPY/Py, EAY/AY : Yellow Diffused epoxy  
EAA/AA : Orange Diffused epoxy  
EVR/VR, EBR/BR, PR : Red Diffused epoxy |
|------------------|------------------------------------------------------|
| Product features | • Outer Dimension φ5 Round shape type  
• Operation temperature range.  
  Storage Temperature : -30 °C ~ 100 °C  
  Operating Temperature : -30 °C ~ 85 °C  
• Lead-free soldering compatible  
• RoHS compliant |
| Dominant wavelength | Green : 558nm (EBG/BG), 567nm (EPG/PG)  
Yellow Green : 572nm (EPY/Py)  
Yellow : 590nm (EAY/AY)  
Orange : 606nm (EAA/AA)  
Red : 624nm (EVR/VR)  
647nm (EBR/BR)  
630nm (PR) |
EBR/BR : 30 deg. |
| Die materials | EBG/BG, EPG/PG, EPY/Py, PR : GaP  
EAY/AAY, EAA/AA, EVR/VR : GaAsP  
EBR/BR : GaAlAs |
| Rank grouping parameter | Sorted by luminous intensity per rank taping |
| Soldering methods | TTW (Through The Wave) soldering and manual soldering |
| ESD | More than 2kV (HBM) |
| Packing | Bulk : 200pcs (MIN.) |

Recommended Applications

Amusement Equipment, Electric Household Appliances, OA/FA, Other General Applications
## Color and Luminous Intensity

(Ta=25°C)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Material</th>
<th>Emitted Color</th>
<th>Lens Color</th>
<th>Dominant Wavelength λd (nm)</th>
<th>Luminous Intensity Iy (mcd)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TYP.</td>
<td>MIN.</td>
</tr>
<tr>
<td>EBG/BG5334S</td>
<td>GaP</td>
<td>Green</td>
<td>Green</td>
<td>558</td>
<td>20</td>
</tr>
<tr>
<td>EPG/PG5334S</td>
<td>GaP</td>
<td>Yellow Green</td>
<td>Green</td>
<td>567</td>
<td>20</td>
</tr>
<tr>
<td>EPY/PY5334S</td>
<td>GaP</td>
<td>Yellow Green</td>
<td>Yellow</td>
<td>572</td>
<td>20</td>
</tr>
<tr>
<td>EAY/AY5334S</td>
<td>GaAsP</td>
<td>Yellow</td>
<td>Diffused</td>
<td>590</td>
<td>20</td>
</tr>
<tr>
<td>EAA/AA5334S</td>
<td>GaAsP</td>
<td>Orange</td>
<td>Orange</td>
<td>606</td>
<td>20</td>
</tr>
<tr>
<td>EVR/VR5334S</td>
<td>GaAsP</td>
<td>Red</td>
<td>Red</td>
<td>624</td>
<td>20</td>
</tr>
<tr>
<td>EBR/BR5334S</td>
<td>GaAlAs</td>
<td>Red</td>
<td>Red</td>
<td>647</td>
<td>20</td>
</tr>
<tr>
<td>PR5334S</td>
<td>GaP</td>
<td></td>
<td></td>
<td>630</td>
<td>10</td>
</tr>
</tbody>
</table>
## Absolute Maximum Ratings

(Ta=25°C)

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Absolute Maximum Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EBG/BG</td>
<td>EPG/PG</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>$P_d$</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>Continuous Forward Current</td>
<td>$I_F$</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Repetitive Peak Forward Current ※1</td>
<td>$I_{BRM}$</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Derating (Ta=25°C or higher)</td>
<td>$\Delta I_F$</td>
<td>0.67</td>
<td>0.67</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_R$</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>$T_{opr}$</td>
<td>-30〜+85</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{stg}$</td>
<td>-30〜+100</td>
<td></td>
</tr>
</tbody>
</table>

※1 $I_{BRM}$ Measurement condition: Pulse Width □ 1ms., Duty □ 1/20.
**Electro-Optical Characteristics**

**Single Color φ5 Round Shape Type**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Characteristics</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forward Voltage</strong></td>
<td>V_f</td>
<td>I_f=20mA</td>
<td>EBG/BG EPG/PG EPY/PY EAY/AY EAA/AA EVR/VR EBR/BR</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 2.1 2.1 2.1 2.2 2.2 2.0 1.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MAX. 2.5 2.5 2.5 2.5 2.5 2.5 2.0</td>
<td></td>
</tr>
<tr>
<td><strong>Reverse Current</strong></td>
<td>I_r</td>
<td>V_r=4V</td>
<td></td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MAX. 100 100 100 100 100 100 100</td>
<td></td>
</tr>
<tr>
<td><strong>Peak Wavelength</strong></td>
<td>( \lambda_p )</td>
<td>I_f=20mA</td>
<td>EBG/BG EPG/PG EPY/PY EAY/AY EAA/AA EVR/VR EBR/BR</td>
<td>nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 555 560 570 580 605 630 660</td>
<td></td>
</tr>
<tr>
<td><strong>Dominant Wavelength</strong></td>
<td>( \lambda_d )</td>
<td>I_f=20mA</td>
<td>EBG/BG EPG/PG EPY/PY EAY/AY EAA/AA EVR/VR EBR/BR</td>
<td>nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 558 567 572 590 606 624 647</td>
<td></td>
</tr>
<tr>
<td><strong>Spectral Line Half Width</strong></td>
<td>( \Delta \lambda )</td>
<td>I_f=20mA</td>
<td>EBG/BG EPG/PG EPY/PY EAY/AY EAA/AA EVR/VR EBR/BR</td>
<td>nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 30 30 30 30 30 30 30</td>
<td></td>
</tr>
<tr>
<td><strong>Half Intensity Angle</strong></td>
<td>2 θ 1/2</td>
<td>I_f=20mA</td>
<td>EBG/BG EPG/PG EPY/PY EAY/AY EAA/AA EVR/VR EBR/BR</td>
<td>deg.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 29 29 29 29 29 29 30</td>
<td></td>
</tr>
</tbody>
</table>

**Electro-Optical Characteristics**

**Single Color φ5 Round Shape Type**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Characteristics</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forward Voltage</strong></td>
<td>V_f</td>
<td>I_f=10mA</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 2.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MAX. 2.5</td>
<td></td>
</tr>
<tr>
<td><strong>Reverse Current</strong></td>
<td>I_r</td>
<td>V_r=4V</td>
<td></td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MAX. 100</td>
<td></td>
</tr>
<tr>
<td><strong>Peak Wavelength</strong></td>
<td>( \lambda_p )</td>
<td>I_f=10mA</td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 700</td>
<td></td>
</tr>
<tr>
<td><strong>Dominant Wavelength</strong></td>
<td>( \lambda_d )</td>
<td>I_f=10mA</td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 630</td>
<td></td>
</tr>
<tr>
<td><strong>Spectral Line Half Width</strong></td>
<td>( \Delta \lambda )</td>
<td>I_f=10mA</td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 100</td>
<td></td>
</tr>
<tr>
<td><strong>Half Intensity Angle</strong></td>
<td>2 θ 1/2</td>
<td>I_f=10mA</td>
<td></td>
<td>deg.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TYP. 30</td>
<td></td>
</tr>
</tbody>
</table>
### 5334S Series

**Single Color φ5 Round Shape Type**

**Luminous Intensity Rank**

*(Ta=25°C)*

<table>
<thead>
<tr>
<th>Rank</th>
<th>( I_V ) (mcd)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BG</td>
</tr>
<tr>
<td>A</td>
<td>5.0</td>
</tr>
<tr>
<td>B</td>
<td>7.0</td>
</tr>
<tr>
<td>C</td>
<td>10.0</td>
</tr>
<tr>
<td>D</td>
<td>14.0</td>
</tr>
<tr>
<td>E</td>
<td>20.0</td>
</tr>
</tbody>
</table>

Please contact our sales staff concerning rank designation.

<table>
<thead>
<tr>
<th>Rank</th>
<th>( I_V ) (mcd)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EBG</td>
</tr>
<tr>
<td>C</td>
<td>10.0</td>
</tr>
<tr>
<td>D</td>
<td>14.0</td>
</tr>
<tr>
<td>E</td>
<td>20.0</td>
</tr>
</tbody>
</table>

2012.11.09
Technical Data (EBG/BG)

**Spectral Distribution**
Relative Intensity vs. Wavelength
Condition: \( T_a = 25^\circ \), \( I_F = 20 \text{mA} \)

**Spatial Distribution Example**
Condition: \( T_a = 25^\circ \)

**Forward Voltage vs. Forward Current**
Condition: \( T_a = 25^\circ \)

**Forward Current vs. Relative Intensity**
Condition: \( T_a = 25^\circ \)
Technical Data (EBG/BG)

Derating
Ambient Temperature vs. Maximum Forward Current
Repetition Frequency: f = 50Hz

Ambient Temperature vs. Relative Intensity
Condition: IF = 20mA

Ambient Temperature vs. Forward Voltage

Power Dissipation vs. Ambient Temperature
Technical Data (EBG/BG)

Dynamic Drive Rating
Duty cycle vs. Maximum Forward Current
Condition: $T_a = 25^\circ C$

Pulse Width vs. Maximum Tolerable Peak Current
Condition: $T_a = 25^\circ C$

Downloaded from Arrow.com.
Technical Data (EPG/PG)

Spectral Distribution
Relative Intensity vs. Wavelength
Condition: Ta = 25 °C, I_f = 20mA

Spatial Distribution Example
Condition: Ta = 25 °C

Forward Voltage vs. Forward Current
Condition: Ta = 25 °C

Forward Current vs. Relative Intensity
Condition: Ta = 25 °C

Downloaded from Arrow.com.
Technical Data (EPG/PG)

Dynamic Drive Rating
Duty cycle vs. Maximum Forward Current
Condition : Ta = 25 °C

Pulse Width vs. Maximum Tolerable Peak Current
Condition : Ta = 25 °C

Downloaded from Arrow.com.
Technical Data (EPY/PY)

Spectral Distribution
Relative Intensity vs. Wavelength
Condition: $T_a = 25^\circ C$, $I_f = 20mA$

Spatial Distribution Example
Condition: $T_a = 25^\circ C$

Forward Voltage vs. Forward Current
Condition: $T_a = 25^\circ C$

Forward Current vs. Relative Intensity
Condition: $T_a = 25^\circ C$
Technical Data (EPY/PY)

Derating
Ambient Temperature vs. Maximum Forward Current
Repetition Frequency: f 50Hz

Ambient Temperature vs. Relative Intensity
Condition: I F=20mA

Ambient Temperature vs. Forward Voltage

Power Dissipation vs. Ambient Temperature
Dynamic Drive Rating
Duty cycle vs. Maximum Forward Current
Condition : Ta = 25 °C

Pulse Width vs. Maximum Tolerable Peak Current
Condition : Ta = 25 °C

Pulse Width : tw (μs)
Technical Data (EAY/AY)

Spectral Distribution
Relative Intensity vs. Wavelength
Condition : \(T_a = 25\degree\), \(I_f = 20\text{mA}\)

Spatial Distribution Example
Condition : \(T_a = 25\degree\)

Forward Voltage vs. Forward Current
Condition : \(T_a = 25\degree\)

Forward Current vs. Relative Intensity
Condition : \(T_a = 25\degree\)
Technical Data (EAY/AY)

Derating
Ambient Temperature vs. Maximum Forward Current
Repetition Frequency: f 50Hz

Ambient Temperature vs. Relative Intensity
Condition: I=20mA

Ambient Temperature vs. Forward Voltage

Power Dissipation vs. Ambient Temperature

Downloaded from Arrow.com.
Dynamic Drive Rating
Duty cycle vs. Maximum Forward Current
Condition : Ta = 25 °C

Pulse Width vs. Maximum Tolerable Peak Current
Condition : Ta = 25 °C

Duty (%)
Maximum Forward Current : If MAX. (mA)
IF peak Max./IF DC MAX.
Technical Data (EAA/AA)

Spectral Distribution
Relative Intensity vs. Wavelength
Condition: Ta = 25 °C, I_f = 20mA

Spatial Distribution Example

Forward Voltage vs. Forward Current
Condition: Ta = 25 °C

Forward Current vs. Relative Intensity
Condition: Ta = 25 °C
Technical Data (EAA/AA)

Derating
Ambient Temperature vs. Maximum Forward Current
Repetition Frequency: f = 50Hz

Ambient Temperature vs. Relative Intensity
Condition: I_F = 20mA

Ambient Temperature vs. Forward Voltage

Power Dissipation vs. Ambient Temperature

Ambient Temperature: Ta(°C)

Relative Intensity

Forward Voltage V_F (V)

Power Dissipation: P_d (mW)
Technical Data (EAA/AA)

- **Dynamic Drive Rating**
  - Duty cycle vs. Maximum Forward Current
  - Condition: $T_a = 25^\circ C$

- **Pulse Width vs. Maximum Tolerable Peak Current**
  - Condition: $T_a = 25^\circ C$

---

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Technical Data (EVR/VR)

Spectral Distribution
Relative Intensity vs. Wavelength
Condition: $T_a = 25^\circ$C, $I_f = 20$ mA

Spatial Distribution Example
Condition: $T_a = 25^\circ$C

Forward Voltage vs. Forward Current
Condition: $T_a = 25^\circ$C

Forward Current vs. Relative Intensity
Condition: $T_a = 25^\circ$C
Technical Data (EVR/VR)

Derating
Ambient Temperature vs. Maximum Forward Current
Repetition Frequency: f = 50Hz

Ambient Temperature vs. Relative Intensity
Condition: \( I_F = 20 \text{mA} \)

Ambient Temperature vs. Forward Voltage

Power Dissipation vs. Ambient Temperature
Dynamic Drive Rating
Duty cycle vs. Maximum Forward Current
Condition : Ta = 25 °C

Pulse Width vs. Maximum Tolerable Peak Current
Condition : Ta = 25 °C

Maximum Forward Current : I_FMax. (mA)
IF peak Max./IF DC MAX.
Technical Data (EBR/BR)

- **Spectral Distribution**
  - Relative Intensity vs. Wavelength
  - Condition: \( T_a = 25 \degree C \), \( I_f = 20mA \)

- **Spatial Distribution Example**
  - Condition: \( T_a = 25 \degree C \)

- **Forward Voltage vs. Forward Current**
  - Condition: \( T_a = 25 \degree C \)

- **Forward Current vs. Relative Intensity**
  - Condition: \( T_a = 25 \degree C \)
Derating
Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f = 50Hz

Ambient Temperature : Ta(°C)

Power Dissipation vs. Ambient Temperature

Ambient Temperature : Ta(°C)
Technical Data (EBR/BR)

Dynamic Drive Rating
Duty cycle vs. Maximum Forward Current
Condition : Ta = 25 °C

Pulse Width vs. Maximum Tolerable Peak Current
Condition : Ta = 25 °C

Downloaded from Arrow.com.
Technical Data (PR)

Spectral Distribution
Relative Intensity vs. Wavelength
Condition: \( T_a = 25 \degree C, I_f = 10\, mA \)

Spatial Distribution Example
Condition: \( T_a = 25 \degree C \)

Forward Voltage vs. Forward Current
Condition: \( T_a = 25 \degree C \)

Forward Current vs. Relative Intensity
Condition: \( T_a = 25 \degree C \)

2012.11.09
Technical Data(PR)

Derating
Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f 50Hz

Ambient Temperature vs. Relative Intensity
Condition : iF=10mA

Ambient Temperature vs. Forward Voltage

Power Dissipation vs. Ambient Temperature

Ambient Temperature : Ta(°C)

2012.11.09
Technical Data (PR)

Dynamic Drive Rating
Duty cycle vs. Maximum Forward Current
Condition : Ta = 25 °C

Pulse Width vs. Maximum Tolerable Peak Current
Condition : Ta = 25 °C
Package Dimensions

(Unit: mm)

Weight : (0.34)g
## TTW (Through The Wave) soldering Conditions

<table>
<thead>
<tr>
<th>Pre-heating</th>
<th>100 ºC (MAX.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solder Bath Temp.</td>
<td>265 ºC (MAX.)</td>
</tr>
<tr>
<td>Dipping Time</td>
<td>5 s (MAX.)</td>
</tr>
</tbody>
</table>

1) The dip soldering process shall be 2 times maximum.
2) The product shall be cooled to room temp. before the second dipping process.

- The detail is described to LED and Photodetector handling precautions of home page:
  "Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation, please.

## Manual Soldering Conditions

<table>
<thead>
<tr>
<th>Iron tip temp.</th>
<th>360 ºC (MAX.)</th>
</tr>
</thead>
</table>
| Soldering time and frequency | 3 s (MAX.)
2 times (MAX.) |

- The detail is described to LED and Photodetector handling precautions of home page:
  "Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation, please.
## Reliability Testing Result

<table>
<thead>
<tr>
<th>Reliability Testing Result</th>
<th>Applicable Standard</th>
<th>Testing Conditions</th>
<th>Duration</th>
<th>Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room Temp. Operating Life</td>
<td>EIAJ ED-4701/100(101)</td>
<td>Ta = 25°C, If = Maximum Rated Current</td>
<td>1,000 h</td>
<td>0/25</td>
</tr>
<tr>
<td>Resistance to Soldering Heat</td>
<td>EIAJ ED-4701/300(302)</td>
<td>260±5°C, 3mm from package base</td>
<td>10s</td>
<td>0/25</td>
</tr>
</tbody>
</table>
| Temperature Cycling       | EIAJ ED-4701/100(105) | Minimum Rated Storage Temperature(30min)  
~Normal Temperature(15min)  
~Maximum Rated Storage Temperature(30min)  
~Normal Temperature(15min) | 5 cycles | 0/25    |
| Wet High Temp. Storage Life | EIAJ ED-4701/100(103) | Ta = 60±2°C, RH = 90±5%                                                            | 1,000 h  | 0/25    |
| High Temp. Storage Life   | EIAJ ED-4701/200(201) | Ta = Maximum Rated Storage Temperature                                              | 1,000 h  | 0/25    |
| Low Temp. Storage Life    | EIAJ ED-4701/200(202) | Ta = Minimum Rated Storage Temperature                                              | 1,000 h  | 0/25    |
| Lead Tension              | EIAJ ED-4701/400(401) | 10N, 1time (□0.4 and Flat Package : 5N)                                             | 10s      | 0/10    |
| Vibration, Variable Frequency | EIAJ ED-4701/400(403) | 98.1m/s² (10G), 100  2KHz sweep for 20min., XYZ each direction                    | 2 h      | 0/10    |

## Failure Criteria

<table>
<thead>
<tr>
<th>Items</th>
<th>Symbols</th>
<th>Conditions</th>
<th>Failure criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luminous Intensity</td>
<td>Iv</td>
<td>If Value of each product Luminous Intensity</td>
<td>Testing Min. Value &lt; Spec. Min. Value x 0.5</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>Vf</td>
<td>If Value of each product Forward Voltage</td>
<td>Testing Max. Value &gt; Spec. Max. Value x 1.2</td>
</tr>
<tr>
<td>Reverse Current</td>
<td>Ir</td>
<td>Vr = Maximum Rated Reverse Voltage</td>
<td>Testing Max. Value &gt; Spec. Max. Value x 2.5</td>
</tr>
<tr>
<td>Cosmetic Appearance</td>
<td>-</td>
<td>-</td>
<td>Occurrence of notable decoloration, deformation and cracking</td>
</tr>
</tbody>
</table>
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2) For the purpose of product improvement, the specifications, characteristics and technical data described in the data sheets are subject to change without prior notice. Therefore it is recommended that the most updated specifications be used in your design.

3) When using the products described in the data sheets, please adhere to the maximum ratings for operating voltage, heat dissipation characteristics, and other precautions for use. We are not responsible for any damage which may occur if these specifications are exceeded.

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