DESCRIPTIONS
- The Hyper Red source color devices are made with AlGaInP on GaAs substrate Light Emitting Diode
- Electrostatic discharge and power surge could damage the LEDs
- It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs
- All devices, equipments and machineries must be electrically grounded

FEATURES
- 0.4 inch digit height
- Low current operation
- Excellent character appearance
- Mechanically rugged
- Gray face, white segment
- Package: 400 pcs / reel
- Moisture sensitivity level: 2a
- RoHS compliant

APPLICATIONS
- Home and smart appliances
- Display time and digital combination
- Industrial and instrumental applications
- Numeric status

ATTENTION
Observe precautions for handling electrostatic discharge sensitive devices

PACKAGE DIMENSIONS

RECOMMENDED SOLDERING PATTERN
(units: mm; tolerance: ± 0.15)

PART NUMBER | Emitting Color (Material) | Lens Type | Iv (ucd) @ 10mA (1) | Description
--- | --- | --- | --- | ---
ACSC04-41SURKWA-F01 | Hyper Red (AlGaInP) | White Diffused | 21000 | Common Cathode, Rt. Hand Decimal

Notes:
1. Luminous intensity / luminous Flux: +/-15%.
2. Luminous intensity value is traceable to CIE127-2007 standards.
### ELECTRICAL / OPTICAL CHARACTERISTICS at $T_A=25°C$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Emitting Color</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength at Peak Emission $I_F = 10mA$</td>
<td>$\lambda_{\text{peak}}$</td>
<td>Hyper Red</td>
<td>645</td>
<td>nm</td>
</tr>
<tr>
<td>Dominant Wavelength $I_F = 10mA$</td>
<td>$\lambda_{\text{dom}}^{[1]}$</td>
<td>Hyper Red</td>
<td>630</td>
<td>nm</td>
</tr>
<tr>
<td>Spectral Bandwidth at 50% REL MAX $I_F = 10mA$</td>
<td>$\Delta \lambda$</td>
<td>Hyper Red</td>
<td>28</td>
<td>nm</td>
</tr>
<tr>
<td>Capacitance</td>
<td>$C$</td>
<td>Hyper Red</td>
<td>35</td>
<td>pF</td>
</tr>
<tr>
<td>Forward Voltage $I_F = 10mA$</td>
<td>$V_F^{[2]}$</td>
<td>Hyper Red</td>
<td>1.85</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Current ($V_R = 5V$)</td>
<td>$I_R$</td>
<td>Hyper Red</td>
<td>10</td>
<td>$\mu$A</td>
</tr>
</tbody>
</table>

**Notes:**
1. The dominant wavelength ($\lambda_d$) above is the setup value of the sorting machine. (Tolerance $\lambda_d$: ±1nm.)
2. Forward voltage: ±0.1V.
3. Wavelength value is traceable to CIE127-2007 standards.
4. Excess driving current and/or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

### ABSOLUTE MAXIMUM RATINGS at $T_A=25°C$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Dissipation</td>
<td>$P_D$</td>
<td>75</td>
<td>mW</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_R$</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>$T_J$</td>
<td>115</td>
<td>°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>$T_{\text{op}}$</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{\text{stg}}$</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>DC Forward Current</td>
<td>$I_F$</td>
<td>30</td>
<td>mA</td>
</tr>
<tr>
<td>Peak Forward Current</td>
<td>$I_{FM}^{[1]}$</td>
<td>185</td>
<td>mA</td>
</tr>
<tr>
<td>Electrostatic Discharge Threshold (HBM)</td>
<td>-</td>
<td>3000</td>
<td>V</td>
</tr>
</tbody>
</table>

**Notes:**
1. 1/10 Duty Cycle, 0.1ms Pulse Width.
2. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.
TECHNICAL DATA

RELATIVE INTENSITY vs. WAVELENGTH

![Graph showing relative intensity vs. wavelength.](image)

HYPER RED

Forward Current vs. Forward Voltage

![Graph showing forward current vs. forward voltage.](image)

Luminous Intensity vs. Forward Current

![Graph showing luminous intensity vs. forward current.](image)

Forward Current Derating Curve

![Graph showing forward current derating curve.](image)

Luminous Intensity vs. Ambient Temperature

![Graph showing luminous intensity vs. ambient temperature.](image)

REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS

![Graph showing reflow soldering profile.](image)

TAPE SPECIFICATIONS (units: mm)

![Tape specifications diagram.](image)

REEL DIMENSION (units: mm)

![Reel dimension diagram.](image)

Notes:
1. Don’t cause stress to the LEDs while it is exposed to high temperature.
2. The maximum number of reflow soldering passes is 2 times.
3. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.
CIRCUIT DESIGN NOTES
1. Protective current-limiting resistors may be necessary to operate the LEDs within the specified range.
2. LEDs mounted in parallel should each be placed in series with its own current-limiting resistor.
3. The driving circuit should be designed to protect the LED against reverse voltages and transient voltage spikes when the circuit is powered up or shut down.
4. The safe operating current should be chosen after considering the maximum ambient temperature of the operating environment.
5. Prolonged reverse bias should be avoided, as it could cause metal migration, leading to an increase in leakage current or causing a short circuit.

PRECAUTIONARY NOTES
1. The information included in this document reflects representative usage scenarios and is intended for technical reference only.
2. The part number, type, and specifications mentioned in this document are subject to future change and improvement without notice. Before production usage customer should refer to the latest datasheet for the updated specifications.
3. When using the products referenced in this document, please make sure the product is being operated within the environmental and electrical limits specified in the datasheet. If customer usage exceeds the specified limits, Kingbright will not be responsible for any subsequent issues.
4. The information in this document applies to typical usage in consumer electronics applications. If customer's application has special reliability requirements or have life-threatening liabilities, such as automotive or medical usage, please consult with Kingbright representative for further assistance.
5. The contents and information of this document may not be reproduced or re-transmitted without permission by Kingbright.
6. When any special process such as potting is required for LED assembly, please consult with Kingbright representative before proceeding.
7. All design applications should refer to Kingbright application notes available at https://www.KingbrightUSA.com/ApplicationNotes