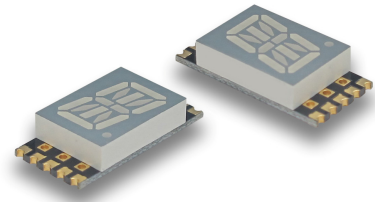


KCPSA04-105

Surface Mount Display



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 character height
- Low current operation
- High contrast and light output
- Categorized for luminous intensity
- Mechanically rugged
- Gray face, white segment
- Package: 400 pcs / reel
- Moisture sensitivity level: 2a
- RoHS compliant

APPLICATIONS

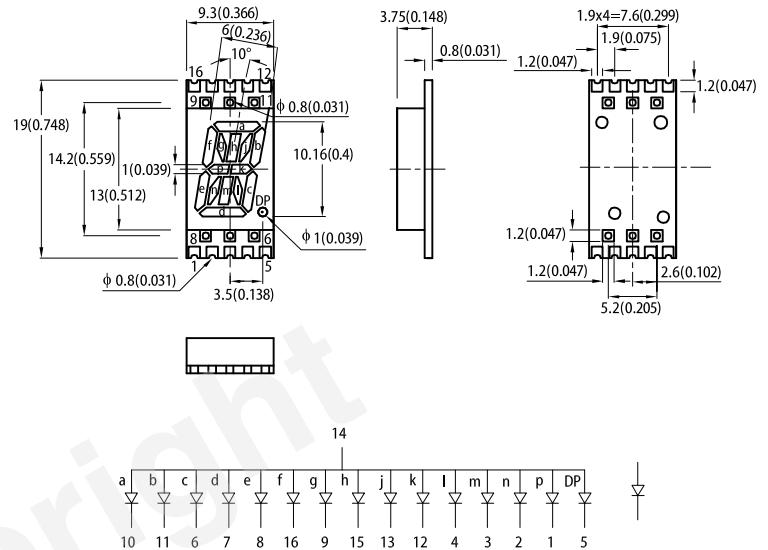
- Home and smart appliances
- Display time and digital combination
- Industrial and instrumental applications
- Numeric status

ATTENTION

Observe precautions for handling electrostatic discharge sensitive devices

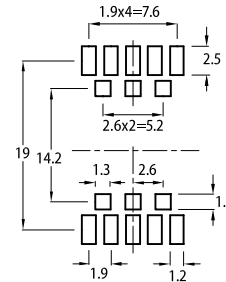


PACKAGE DIMENSIONS



RECOMMENDED SOLDERING PATTERN

(units: mm; tolerance: ± 0.15)



Notes:

1. All dimensions are in millimeters (inches). Tolerance is $\pm 0.25(0.01")$ unless otherwise noted.
2. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
3. The gap between the reflector and PCB shall not exceed 0.25mm.

SELECTION GUIDE

Part Number	Emitting Color (Material)	Lens Type	Iv (ucd) @ 10mA ^[1]		Description
			Min.	Typ.	
KCPSA04-105	■ Hyper Red (AlGaInP)	White Diffused	14000	36000	Common Anode, Rt. Hand Decimal
			*3600	*8300	

Notes:

1. Luminous intensity / luminous Flux: $\pm 15\%$.
- * Luminous intensity value is traceable to CIE127-2007 standards.

ELECTRICAL / OPTICAL CHARACTERISTICS at T_A=25°C

Parameter	Symbol	Emitting Color	Value		Unit
			Typ.	Max.	
Wavelength at Peak Emission I _F = 10mA	λ_{peak}	Hyper Red	645	-	nm
Dominant Wavelength I _F = 10mA	$\lambda_{\text{dom}}^{[1]}$	Hyper Red	630	-	nm
Spectral Bandwidth at 50% Φ REL MAX I _F = 10mA	$\Delta\lambda$	Hyper Red	28	-	nm
Capacitance	C	Hyper Red	35	-	pF
Forward Voltage I _F = 10mA	V _F ^[2]	Hyper Red	1.85	2.35	V
Reverse Current (V _R = 5V)	I _R	Hyper Red	-	10	μA

Notes:1. The dominant wavelength (λ_d) above is the setup value of the sorting machine. (Tolerance λ_d : $\pm 1\text{nm}$.)2. Forward voltage: $\pm 0.1\text{V}$.

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

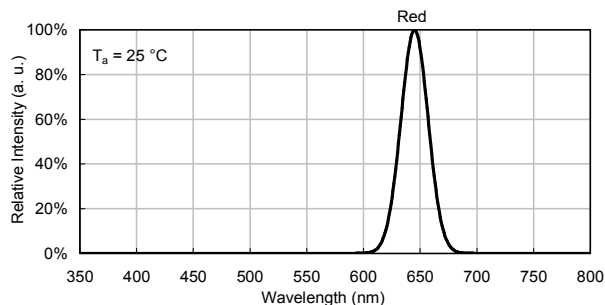
Parameter	Symbol	Value	Unit
Power Dissipation	P _D	75	mW
Reverse Voltage	V _R	5	V
Junction Temperature	T _j	115	°C
Operating Temperature	T _{op}	-40 to +85	°C
Storage Temperature	T _{stg}	-40 to +85	°C
DC Forward Current	I _F	30	mA
Peak Forward Current	I _{FM} ^[1]	185	mA
Electrostatic Discharge Threshold (HBM)	-	3000	V

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.

RELATIVE INTENSITY vs. WAVELENGTH



The figure contains four graphs illustrating the characteristics of the LED:

- Forward Current vs. Forward Voltage:** A graph showing Forward current (mA) on the y-axis (0 to 20) versus Forward voltage (V) on the x-axis (1.6 to 2.1). The curve shows an exponential relationship, starting near 0 mA at 1.7 V and rising to 20 mA at approximately 1.95 V. The ambient temperature is $T_a = 25^\circ\text{C}$.
- Luminous Intensity vs. Forward Current:** A graph showing Luminous intensity normalised at 10 mA on the y-axis (0.0 to 2.5) versus Forward current (mA) on the x-axis (0 to 20). The relationship is linear, starting at (0, 0) and reaching (20, 2.0). The ambient temperature is $T_a = 25^\circ\text{C}$.
- Forward Current Derating Curve:** A graph showing Permissible forward current (mA) on the y-axis (0 to 50) versus Ambient temperature ($^\circ\text{C}$) on the x-axis (-40 to 100). The current is constant at 30 mA from -40 $^\circ\text{C}$ to 25 $^\circ\text{C}$, then derates linearly to 0 mA at 85 $^\circ\text{C}$, and remains at 0 mA up to 100 $^\circ\text{C}$.
- Luminous Intensity vs. Ambient Temperature:** A graph showing Luminous intensity normalised at $T_a = 25^\circ\text{C}$ on the y-axis (0.0 to 2.5) versus Ambient temperature ($^\circ\text{C}$) on the x-axis (-40 to 100). The intensity decreases as temperature increases, starting at 2.0 at -40 $^\circ\text{C}$ and reaching approximately 0.5 at 85 $^\circ\text{C}$.

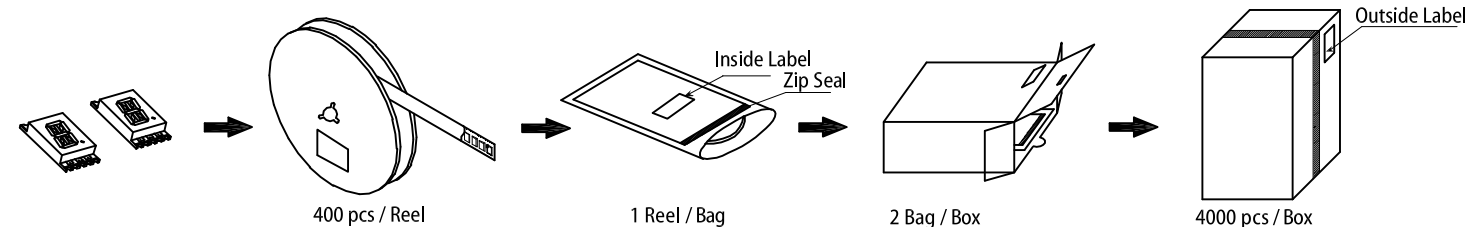
Figure 1 is a graph showing the temperature profile of a polymer solution during the synthesis of polyacrylonitrile. The Y-axis represents Temperature ($^{\circ}\text{C}$) from 0 to 300, and the X-axis represents Time (sec) from 0 to 300. The profile starts at 25°C , rises to 150°C at approximately 40 seconds, then continues to rise to 200°C at approximately 160 seconds. This segment is labeled "pre-heating" and "150~200°C 60~120s". Above 200°C , the heating rate is 3°C/s max. . The temperature reaches a plateau above 255°C for a maximum of 30 seconds, then rises to a peak of 260°C max. for a maximum of 10 seconds. Finally, the temperature decreases at a rate of 6°C/s max. . A region above 217°C is marked as "above 217°C 60~150s".

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.

[illegible]

PACKING & LABEL SPECIFICATIONS



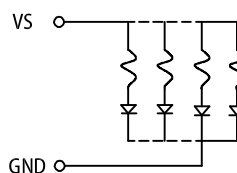
Kingbright
 PINO: XXXXXXXX
 QTY: XXXXXpcs
 S/N: XXXX
 CODE: XX
 COUNTRY: CN
 LOT NO:
 XXXXXXXXXXXXXXXX
 (SP)XXXXXXXXXX

XXXXXXXXXXX-XXXX
 QC DATE: XXX XX XXXX PASSED
 RoHS Compliant

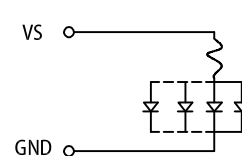
CIRCUIT DESIGN NOTES

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.

Recommended Set-up



invalid Set-up



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.Kingbright.com/application_notes