

High-Flux Surface Mount LED

Technical Data

HSMB-HR00-R1T20 HSMB-HA00-R1T2H

Features

- **High-Flux Device**
- **Improved Reliability Through Elimination of Internal Wire Bond**
- **-55°C to 110°C Operating Temperature Range**
- **Compatible with IR and Through-the-Wave Solder Processes**
- **Available in 8 mm Tape on 178 mm (7") Reels**

Applications

- **Telltale Backlighting in Instrument Clusters**
- **LCD Backlighting**
- **General Status Indicators**

Description

The HSMB-HX00 device is designed for applications requiring high-flux in surface mount designs. The product is ideal for telltale backlighting in automotive instrument clusters, LCD backlighting, or general status indication. The high light output lowers the cost of lighting by reducing the number of LEDs required for any application.

The HSMB-HX00 combines high reliability surface mount flip-chip LED construction with the world's brightest red and amber LED materials, HP's TS AlInGaP material.



The package is compatible with IR and convective reflow soldering processes. These parts are also compatible with through-the-wave soldering processes.

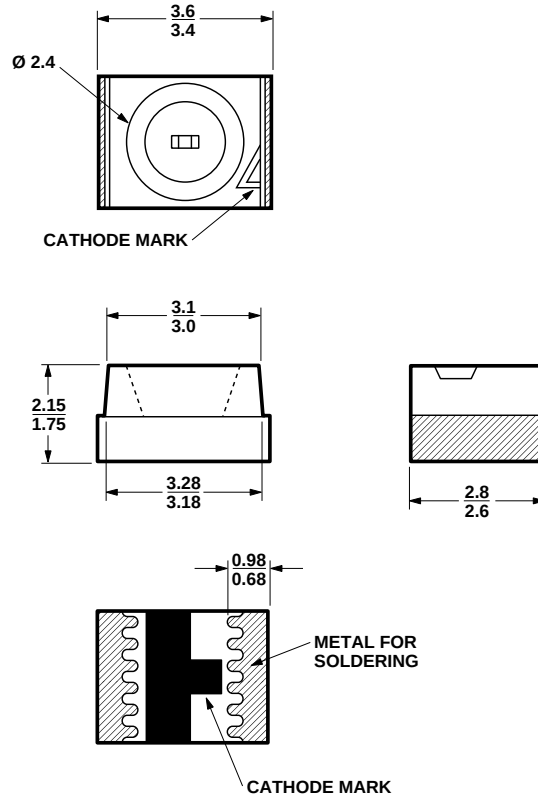
Device Selection Guide

Part Number	Color Typical Dominant Wavelength (nm)	Luminous Intensity I _v (mcd) @ I _F = 20 mA Min.	Luminous Intensity I _v (mcd) @ I _F = 20 mA Typ.	Viewing Angle (2θ _{1/2} , Degrees)
HSMB-HR00-R1T20	Red 630	100	160	120
HSMB-HA00-R1T2H	Amber 590	100	200	120

Notes:

1. The dominant wavelength, λ_d , is derived from the CIE Chromaticity Diagram and represents the perceived color of the device.
4. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is 1/2 the peak intensity.

Package Dimensions



ALL DIMENSIONS IN MILLIMETERS

Absolute Maximum Ratings at $T_A = 25^\circ\text{C}$ for HSMB-HR00/HA00

Parameter	Max. Rating	Units
DC Forward Current ^[1]	30	mA
Power Dissipation ($T_A \leq 70^\circ\text{C}$)	100	mW
Average Forward Current	30	mA
Junction Temperature	120	$^\circ\text{C}$
Reverse Voltage ($I_R = 100 \mu\text{A}$)	5	V
Operating Temperature Range	-55 to 110	$^\circ\text{C}$
Storage Temperature Range	-55 to 110	$^\circ\text{C}$

Note:

1. Derate linearly as shown in Figure 6 for temperatures above 70°C .

Optical Characteristics at $T_A = 25^\circ\text{C}$

Part Number	Color	Color, Dominant Wavelength $\lambda_d^{[2]}$ (nm) Typ.	Peak Wavelength λ_{peak} (nm) Typ.	Luminous Intensity I_V (mcd) @ $I_F = 20\text{ mA}$ Min.	Luminous Intensity I_V (mcd) @ $I_F = 20\text{ mA}$ Typ.
HSMB-HR00-R1T20	Red	630	640	100	160
HSMB-HA00-R1T2H	Amber	590	594	100	200

Note:

2. The dominant wavelength, λ_d , is derived from the CIE Chromaticity Diagram and represents the color of the LED.

Optical Characteristics at $T_A = 25^\circ\text{C}$, continued

Part Number	Color	Luminous Flux ^[3] @ 20 mA (mlum) Min.	Luminous Flux ^[3] @ 20 mA (mlum) Typ.	Viewing Angle ($2\theta_{1/2}$, Degrees) ^[3] Typ.
HSMB-HR00-R1T20	Red	250	400	120
HSMB-HA00-R1T2H	Amber	250	500	120

Note:

3. Luminous flux values are not measured in production.

Electrical Characteristics at $T_A = 25^\circ\text{C}$

Part Number	Color	Forward Voltage V_F (Volts) @ $I_F = 20\text{ mA}$ Min.	Forward Voltage V_F (Volts) @ $I_F = 20\text{ mA}$ Typ.	Forward Voltage V_F (Volts) @ $I_F = 20\text{ mA}$ Max.	Reverse Breakdown V_R (Volts) @ $I_R = 100\text{ }\mu\text{A}$ Min.
HSMB-HR00-R1T20	Red	1.70	2.30	3.00	5.0
HSMB-HA00-R1T2H	Amber	1.90	2.45	3.20	5.0

Electrical Characteristics at $T_A = 25^\circ\text{C}$, continued

Part Number	Color	Thermal Resistance of Device $R_{\theta J-PIN}$ ($^\circ\text{C/W}$)	Thermal Resistance on PC Board ($\geq 4\text{ mm}^2$ Pad Size, FR4) $R_{\theta J-AIR}$ ($^\circ\text{C/W}$)	Capacitance C (pF) $V_F = 0, f = 1\text{ MHz}$ Typ.
HSMB-HR00-R1T20	Red	280	480	25
HSMB-HA00-R1T2H	Amber	280	480	25

Intensity Bin Definitions, HSMB-HR00, HSMB-HA00

(check with HP Sales Engineer for availability of bin selections)

Bin ID	Intensity (mcd)
R1	100.0 – 165.0
R2	130.0 – 200.0
S1	160.0 – 260.0
S2	205.0 – 320.0
T1	250.0 – 410.0
T2	320.0 – 500.0

Color Bin Definitions, HSMB-HA00 only

Bin ID	Dominant Wavelength (nm)
B	584.0 – 587.5
C	586.5 – 590.0
D	589.0 – 592.5
F	Bins B and C
G	Bins C and D
H	Bins B, C and D

Color and Intensity Option Codes

(check with HP Sales Engineer for availability)

HSMB-HX00 XXXXX

— Last digit identifies the color bin option
(use 0 for red as there are no red color bins)

— First four digits identify the min and max of the
intensity bins

Examples: HSMB-HA00-R1T20 designates HSMB-HA00 with a
178 mm reel, no intensity or
color bin selection

HSMB-HA00-R1S2F designates HSMB-HA00 with
178 mm reel, intensity bins R1
through S2, and color bin F

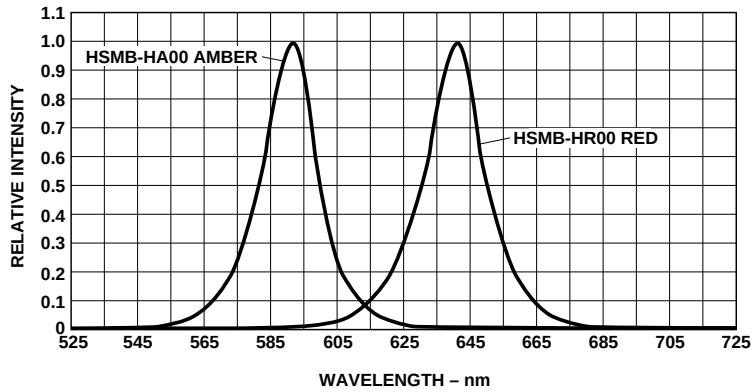


Figure 1. Relative Intensity vs. Wavelength.

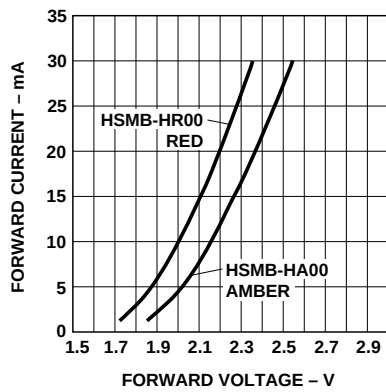


Figure 2. Forward Current vs. Forward Voltage (0 - 30 mA).

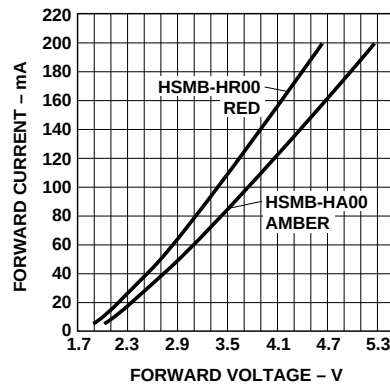


Figure 3. Forward Current vs. Forward Voltage (0 - 200 mA).

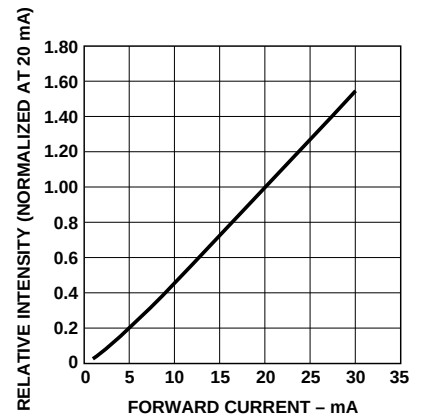


Figure 4. Relative Intensity vs. DC Forward Current (Normalized at 20 mA).

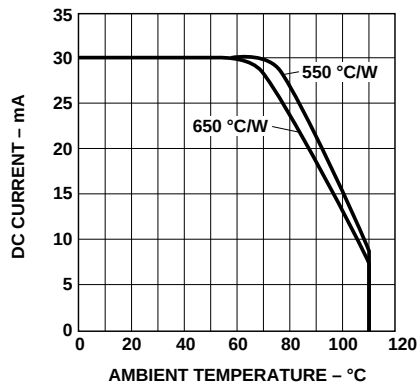


Figure 5. Maximum DC Current vs. Ambient Temperature.

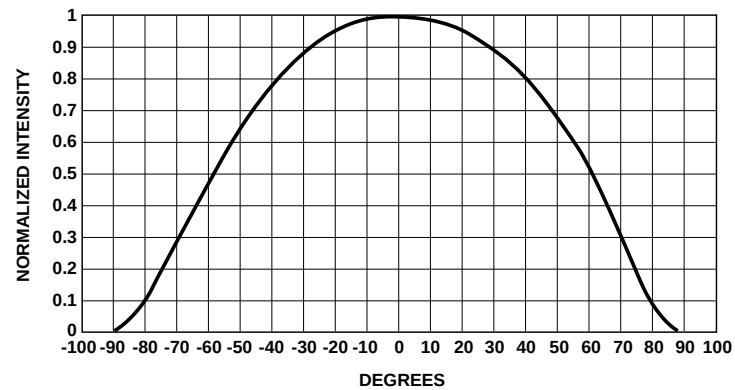


Figure 6. Relative Intensity vs. Angle.

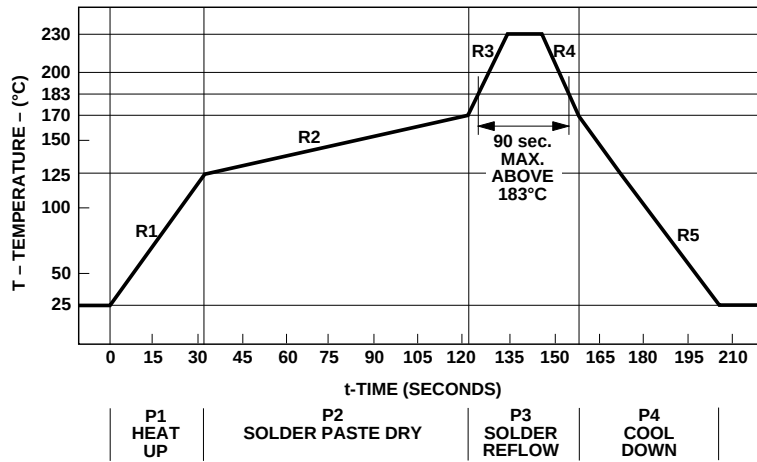
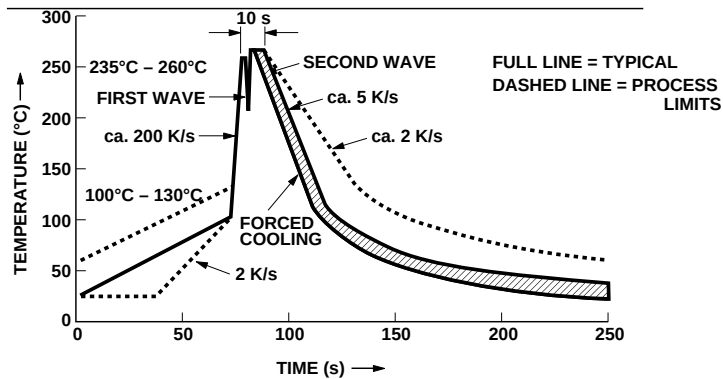
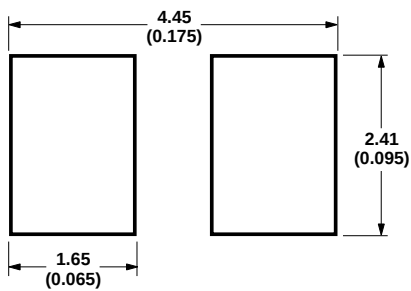


Figure 7. Recommended Infra-Red Reflow Soldering Profile.



NOTE: ALL TEMPERATURES MEASURED ON BOTTOM OF PC BOARD.

Figure 8. Recommended Wave-Soldering Profile.



DIMENSIONS IN MILLIMETERS (INCHES)

Figure 9. Recommended Solder Pad Dimensions.

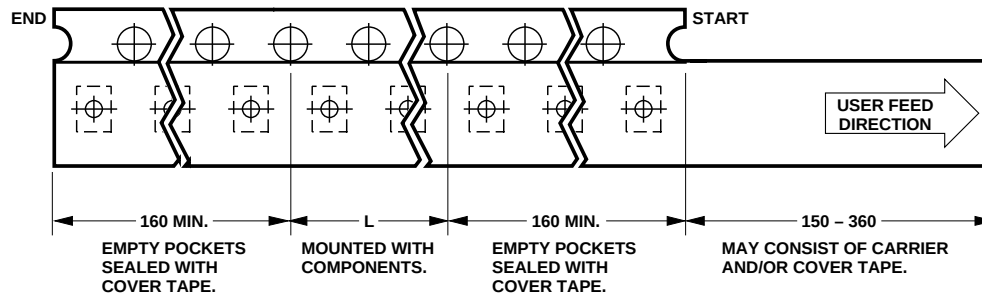
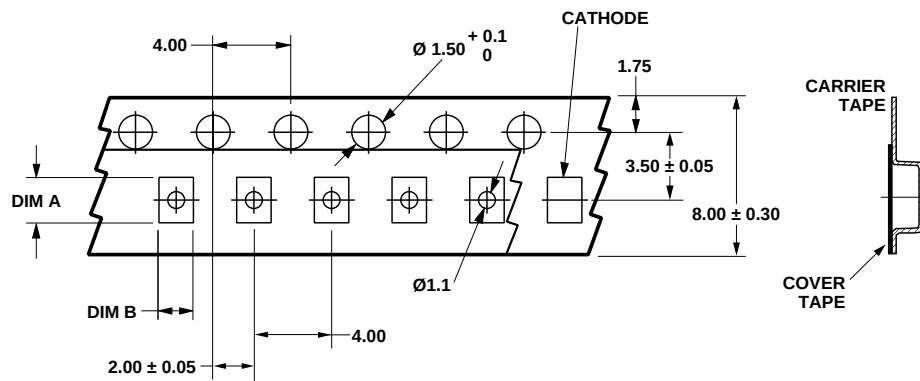
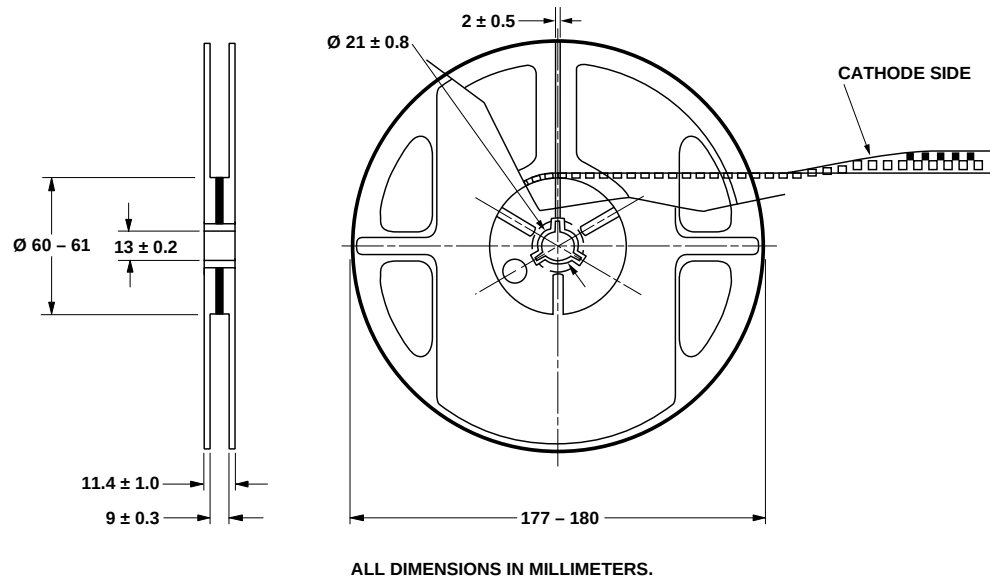


Figure 10. Tape and Reel Dimensions.



www.hp.com/go/led

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Data subject to change.

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Obsoletes 5968-5087E

5968-6664E (8/99)