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# Surface Mount Chip LEDs

## Technical Data

### Features

- **Reverse Mountable SMT LED**
- **Diffused Optics**
- **Small 3.4 x 1.25 mm Footprint**
- **Operating Temperature Range of -25°C to +80°C**
- **Compatible with IR Solder**
- **Four Colors Available: Red, Orange, Yellow, and Green**
- **Available in 8 mm tape on 7 in. (178 mm) Diameter Reels**

### Applications

- **Keypad Backlighting**
- **Symbol Backlighting**
- **Status Indication**
- **Front Panel Indicator**

### Description

The HSMx-C260 is a reverse mountable chip-type LED for lighting the non-component side of a PC board. In this reverse mounting configuration, this LED is designed to emit light through a small cut-out hole in the PC board.

The HSMx-C260 is available in four colors. The small size, narrow footprint, and low profile make this series of LEDs excellent for backlighting, status indication, and front panel illumination applications.

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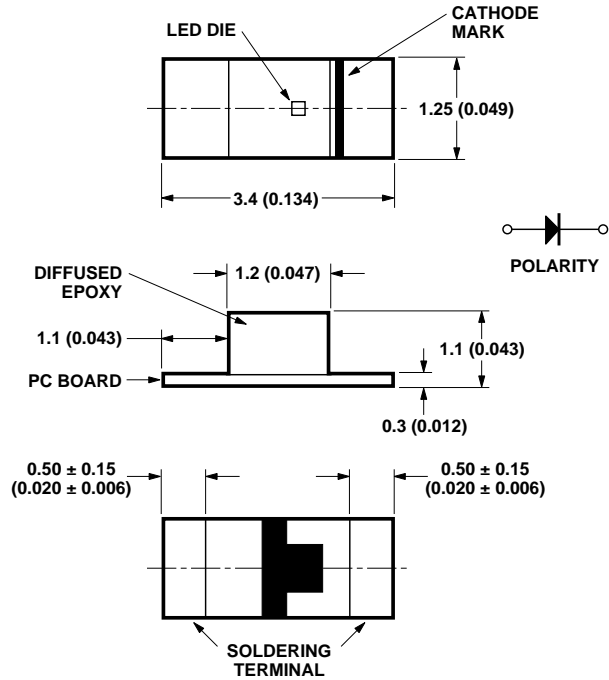
### HSMx-C260



### Device Selection Guide

Part Number	Color	Parts Per Reel
HSMS-C260	High Efficiency Red	3000
HSMD-C260	Orange	3000
HSMY-C260	Yellow	3000
HSMG-C260	Green	3000

## Package Dimensions



### HSMx-C260

#### Notes:

1. All dimensions in millimeters (inches).
2. Tolerance is  $\pm 0.1$  mm ( $\pm 0.004$  in.) unless otherwise specified.

## Absolute Maximum Ratings at $T_A=25^\circ\text{C}$

Parameter	HSMx-C260	Units
DC Forward Current <sup>[1]</sup>	25	mA
Peak Pulsing Current <sup>[2]</sup>	100	mA
Power Dissipation	65	mW
Reverse Voltage ( $I_R = 100 \mu\text{A}$ )	5	V
LED Junction Temperature	95	$^\circ\text{C}$
Operating Temperature Range	-25 to +80	$^\circ\text{C}$
Storage Temperature Range	-30 to +85	$^\circ\text{C}$
Soldering Temperature	See IR soldering profile (Figure 6)	

#### Notes:

1. Derate linearly as shown in Figure 4 for temperature above  $25^\circ\text{C}$ .
2. Pulse condition of 1/10 duty and 0.1 msec. width.

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

Color	Luminous Intensity <sup>[1]</sup> $I_v(\text{mcd}) @ 20 \text{ mA}$		Peak Wavelength $\lambda_{\text{peak}}(\text{nm})$	Dominant Wavelength $\lambda_d(\text{nm})$	Viewing Angle $2\theta_{1/2}$ Degrees <sup>[2]</sup>
	Min.	Typ.	Typ.	Typ.	Typ.
HER	2.50	8.0	639	626	170
Orange	2.50	8.0	606	604	170
Yellow	2.50	8.0	584	586	170
Green	4.00	15.0	570	572	170

### Notes:

1. The luminous intensity,  $I_v$ , is measured at the peak of the spatial radiation pattern, which may not be aligned with the mechanical axis of the lamp package.
2.  $\theta_{1/2}$  is the off-axis angle where the luminous intensity is 1/2 the peak intensity.

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

Color	Forward Voltage $V_F(\text{V})$ @ $I_F=20 \text{ mA}$		Reverse Breakdown $V_R(\text{V}) @ I_R=100 \mu\text{A}$	Capacitance $C(\text{pF})$ @ $V_F=0 \text{ V}, f = 1 \text{ MHz}$	Thermal Resistance $R\theta_{J-P} (\text{C/W})$
	Typ.	Max.	Min.	Typ.	Typ.
HER	1.9	2.6	5	8	250
Orange	2.1	2.6	5	6	250
Yellow	2.1	2.6	5	7	250
Green	2.2	2.6	5	6	250

## Color Bin Limits<sup>[1]</sup>

Bin ID	Green Color Bins <sup>[1]</sup>	
	Dom. Wavelength [nm]	
	MIN.	MAX.
A	561.5	564.5
B	564.5	567.5
C	567.5	570.5
D	570.5	573.5
E	573.5	576.5

Tolerance:  $\pm 0.5 \text{ nm}$

Bin ID	Orange Color Bins <sup>[1]</sup>	
	Dom. Wavelength [nm]	
	MIN.	MAX.
A	597.0	600.0
B	600.0	603.0
C	603.0	606.0
D	606.0	609.0
E	609.0	612.0
F	612.0	615.0

Tolerance:  $\pm 1 \text{ nm}$

Bin ID	Yellow/Amber Color Bins <sup>[1]</sup>	
	Dom. Wavelength [nm]	
	MIN.	MAX.
A	582.0	584.5
B	584.5	587.0
C	587.0	589.5
D	589.5	592.5
E	592.0	594.5
F	594.5	597.0

Tolerance:  $\pm 0.5 \text{ nm}$

### Note:

1. Bin categories are established for classification of products.  
Products may not be available in all categories.  
Please contact your Agilent representative for information on currently available bins.

### Light Intensity (Iv) Bin Limits<sup>[1]</sup>

Bin ID	Intensity (mcd)	
	Min.	Max.
A	0.11	0.18
B	0.18	0.29
C	0.29	0.45
D	0.45	0.72
E	0.72	1.10
F	1.10	1.80
G	1.80	2.80
H	2.80	4.50
J	4.50	7.20
K	7.20	11.20
L	11.20	18.00
M	18.00	28.50
N	28.50	45.00
P	45.00	71.50
Q	71.50	112.50
R	112.50	180.00
S	180.00	285.00
T	285.00	450.00
U	450.00	715.00
V	715.00	1125.00
W	1125.00	1800.00
X	1800.00	2850.00
Y	2850.00	4500.00

Tolerance:  $\pm 15\%$

**Note:**

- Bin categories are established for classification of products. Products may not be available in all categories. Please contact your Agilent representative for information on currently available bins.

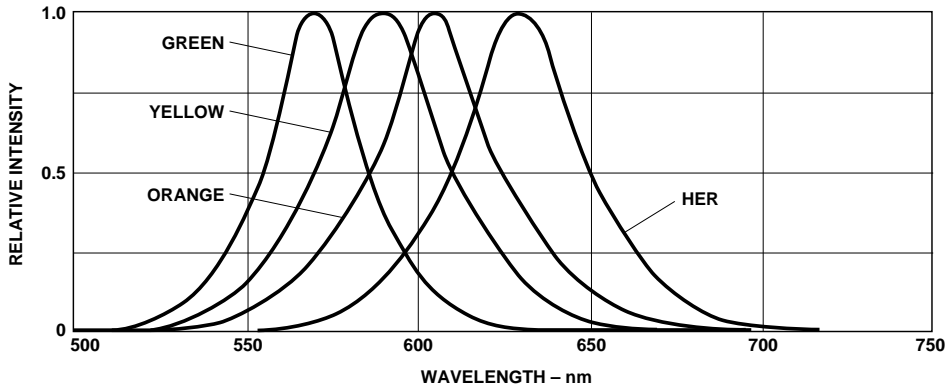


Figure 1. Relative Intensity vs. Wavelength.

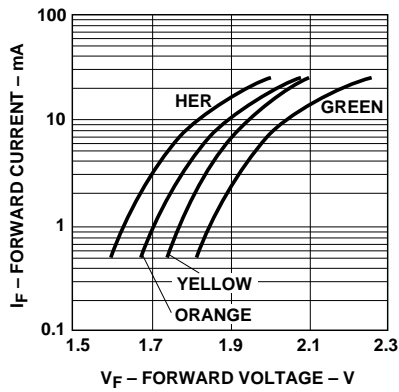


Figure 2. Forward Current vs. Forward Voltage.

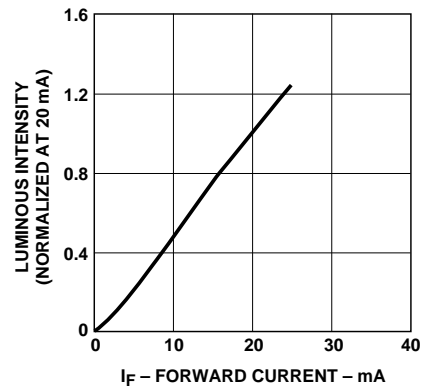


Figure 3. Luminous Intensity vs. Forward Current.

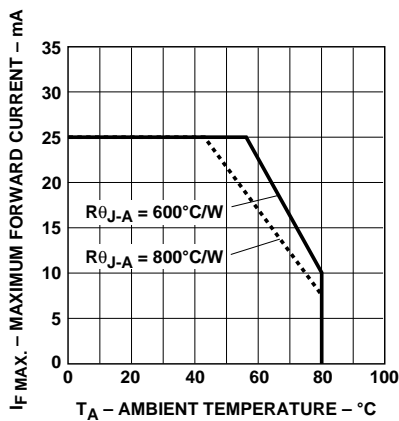


Figure 4. Maximum Forward Current vs. Ambient Temperature.

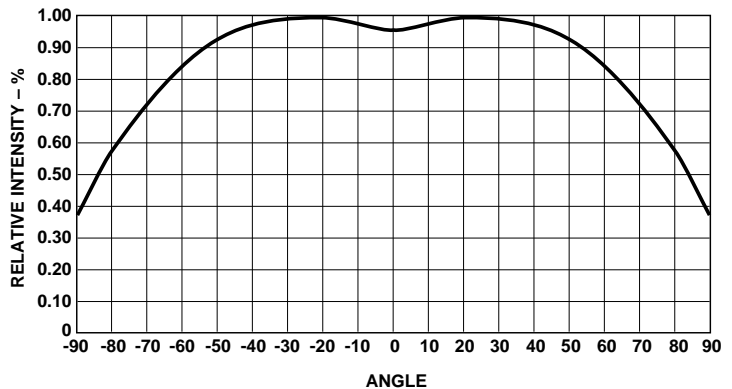


Figure 5. Relative Intensity vs. Angle.

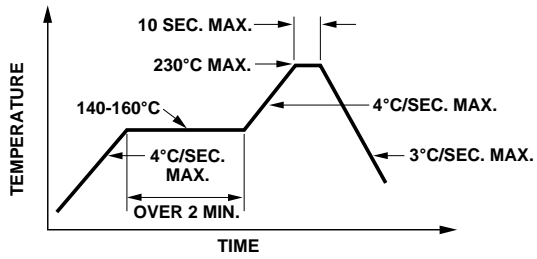


Figure 6. Recommended Reflow Soldering Profile.

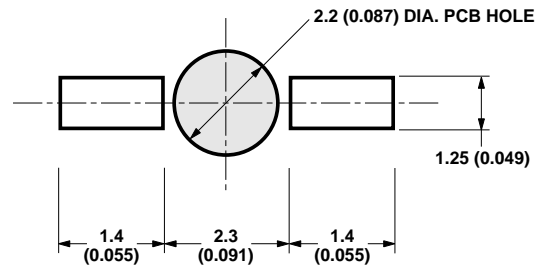


Figure 7. Recommended Solder Pad Pattern.

**Note:**

1. All dimensions in millimeters (inches).

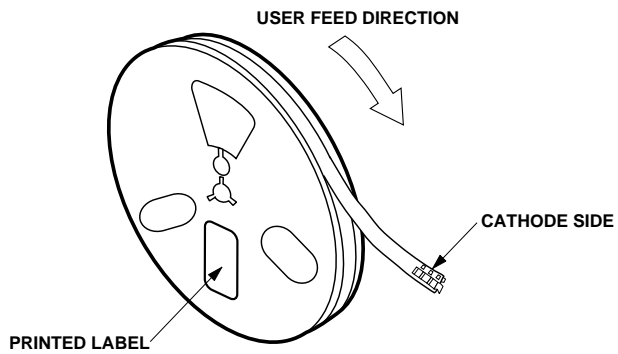
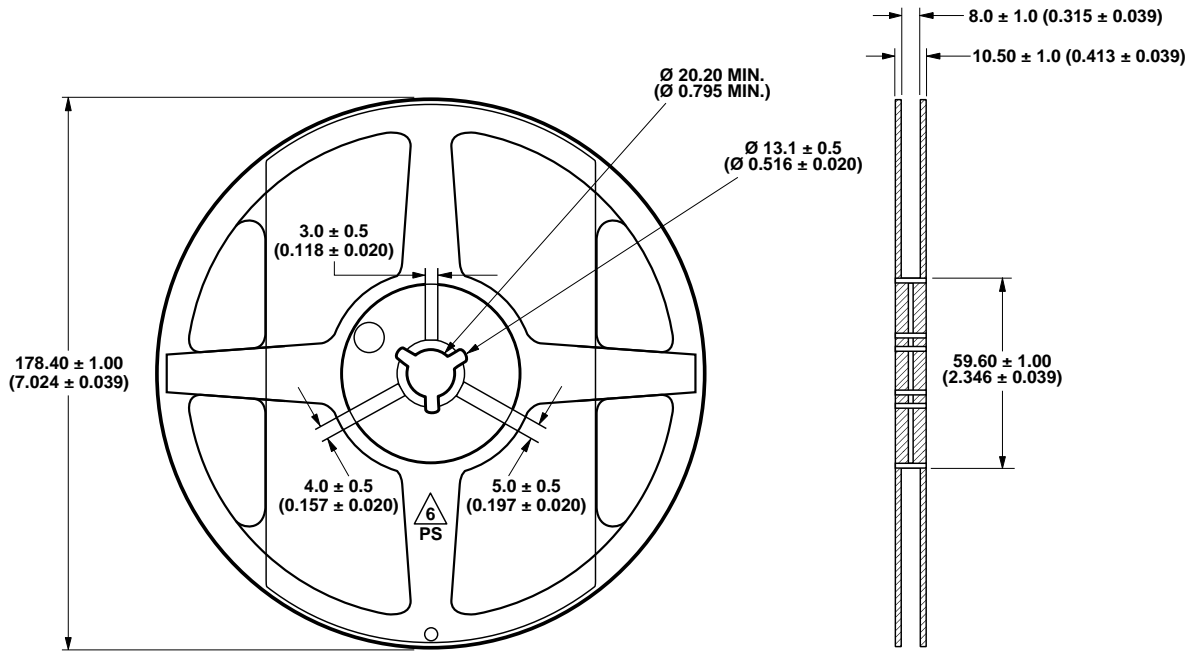


Figure 8. Reeling Orientation.



**Note:**  
1. All dimensions in millimeters (inches).

Figure 9. Reel Dimensions.

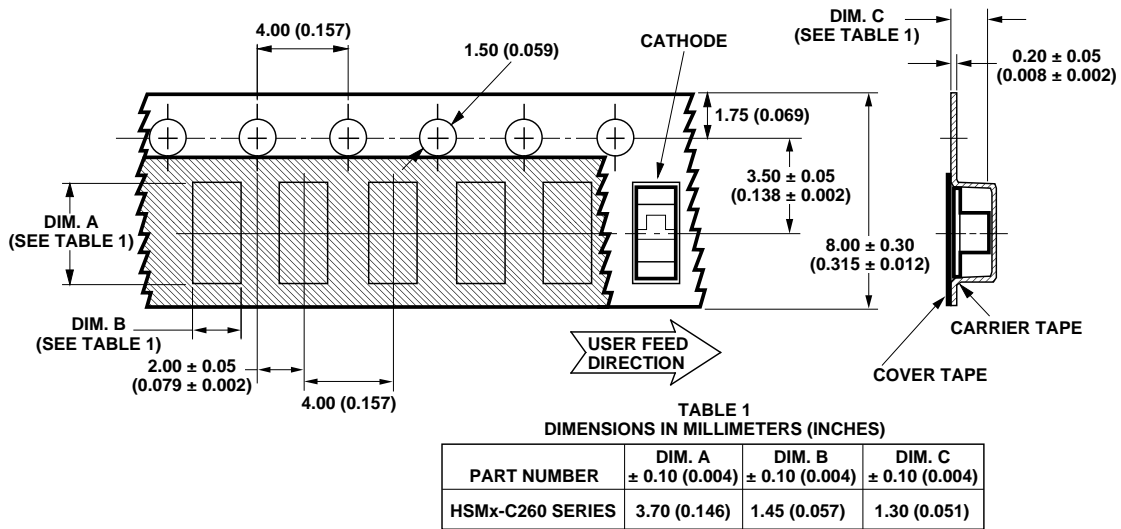
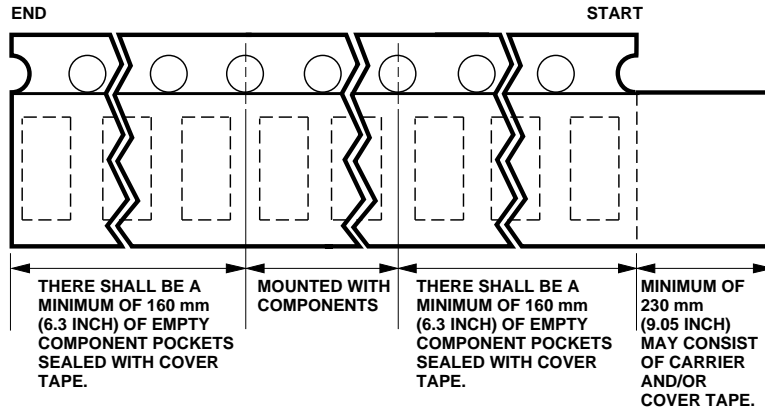


Figure 10. Tape Dimensions.



**Figure 11. Tape Leader and Trailer Dimensions.**

**Notes:**

1. All dimensions in millimeters (inches).
2. Tolerance is  $\pm 0.1$  mm ( $\pm 0.004$  in.) unless otherwise specified.

## Convective IR Reflow Soldering

For more information on IR reflow soldering, refer to Application Note 1060, *Surface Mounting SMT LED Indicator Components*.

Storage Condition: 5 to 30° C @ 60% RH max.

Baking is required under the condition:

- a) the blue silica gel indicator becoming white/transparent color
- b) the pack has been opened for more than 1 week

Baking recommended condition: 60  $\pm$  5° C for 20 hours.

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