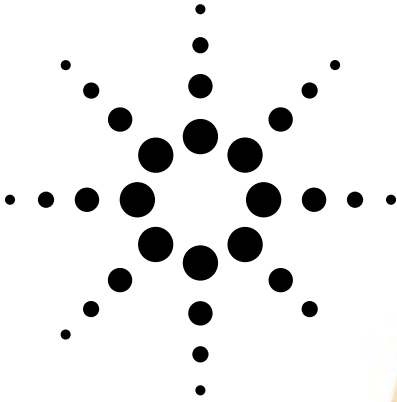


Agilent HSMW-C191/130/265/197/120 White ChipLEDs

Data Sheet



Description

These white ChipLEDs come in unique shades of white and provide product differentiation for backlighting application. They are designed in industry standard package for ease of handling and use.

These chipLEDs come in either top emitting packages (HSMW-C191, 130, 265, & 197) or in a side emitting package (HSMW-C120).

The packages all compatible with IR reflow soldering process and come in 8 mm tape on 7" diameter reel. They are compatible with automatic placement equipment.

In order to facilitate pick and place operation, these chipLEDs are shipped in tape and reel with 4000 units per reel for HSMW-C191, 130, 197, and 120 packages, and 3000 units per reel for HSMW-C265 package.

Features

- White color
- Small size
- Industry standard footprint
- Compatible with IR soldering
- Compatible with automatic placement equipment
- Operating temperature range -30°C to $+85^{\circ}\text{C}$
- Come in 8 mm tape on 7" diameter reels

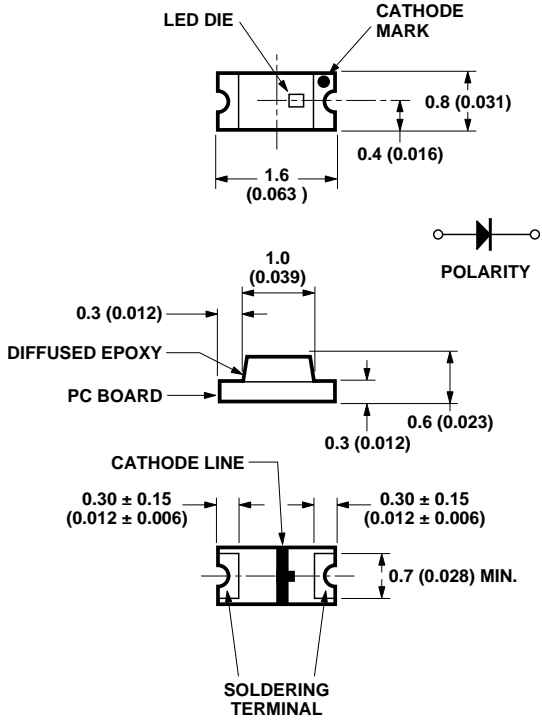
Applications

- LCD backlighting
- Keypad backlighting
- Pushbutton backlighting
- Symbol backlighting

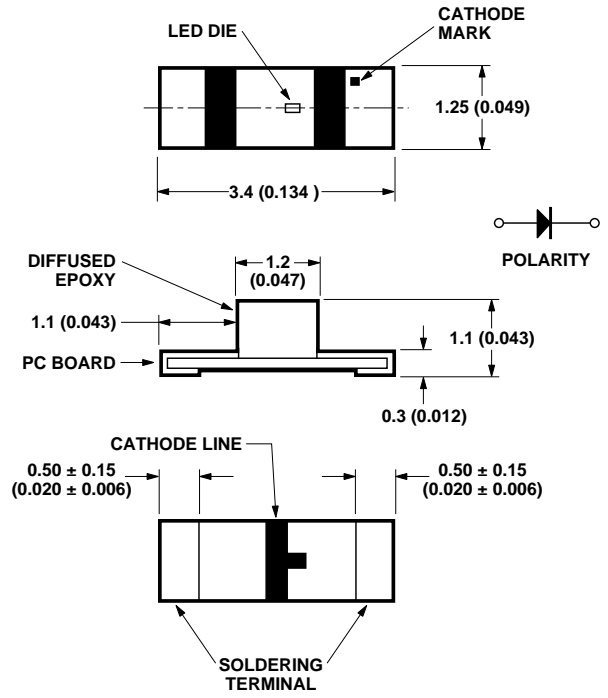
CAUTION: HSMW-Cxxx LEDs are Class 1 ESD sensitive per MIL-STD-1686. Please observe appropriate precautions during handling and processing. Refer to Agilent Technologies Application Note AN-1142 for additional details.



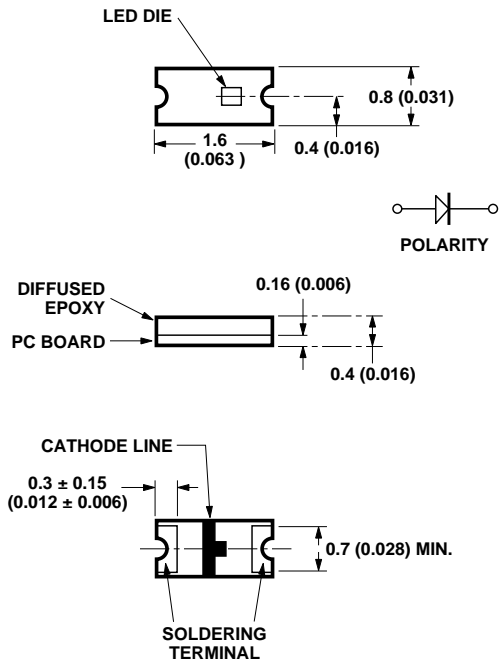
Package Dimensions



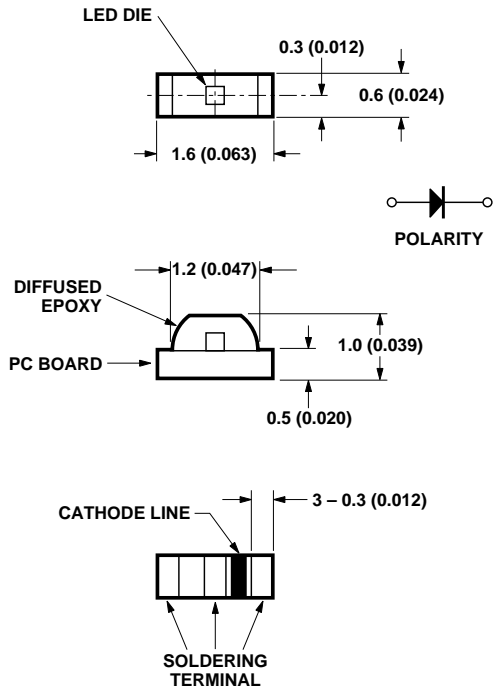
HSMW-C191



HSMW-C265



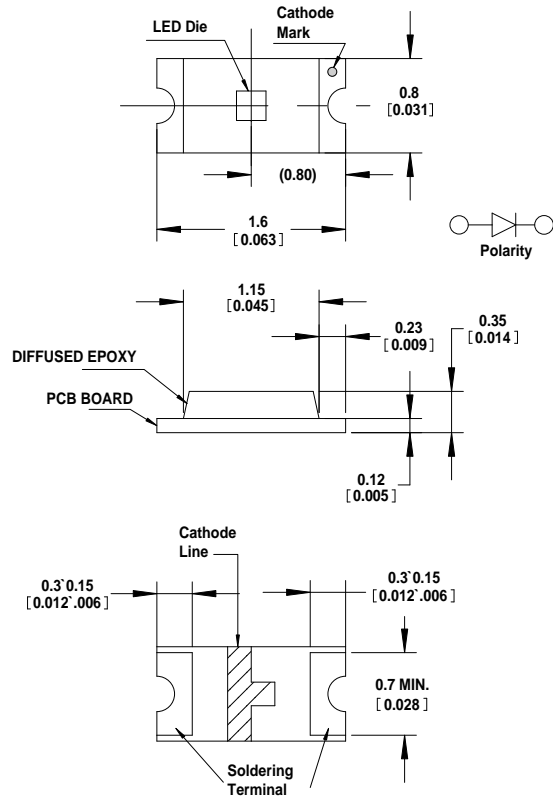
HSMW-C197



HSMW-C120

- NOTES:**
1. DIMENSIONS ARE IN MILLIMETERS (INCHES).
 2. TOLERANCE ±0.1 mm UNLESS OTHERWISE NOTED.

Package Dimensions, continued



HSMW-C130

NOTES:

1. DIMENSIONS ARE IN MILLIMETERS (INCHES).
2. TOLERANCE ± 0.1 mm UNLESS OTHERWISE NOTED.

Device Selection Guide

| Package Dimension (mm) | White | Package Description |
|---|-----------|---------------------|
| 1.6 (L) x 0.8 (W) x 0.6 (H) | HSMW-C191 | Untinted, Diffused |
| 1.6 (L) x 0.8 (W) x 0.35 (H) | HSMW-C130 | Untinted, Diffused |
| 3.4 (L) x 1.25 (W) x 1.1 (H) ^[2] | HSMW-C265 | Untinted, Diffused |
| 1.6 (L) x 0.8 (W) x 0.4 (H) | HSMW-C197 | Untinted, Diffused |
| 1.6 (L) x 0.6 (W) x 1.0 (H) | HSMW-C120 | Untinted, Diffused |

Notes:

1. Right angle package.
2. Reverse mount package.

Absolute Maximum Ratings at T_A = 25 °C

| Parameter | HSMW-Cxxx | Units |
|---|--|-------|
| DC Forward Current ^[1] | 20 | mA |
| Power Dissipation | 78 | mW |
| Reverse Voltage (I _R = 100 μA) | 5 | V |
| LED Junction Temperature | 95 | °C |
| Operating Temperature Range | -30 to +85 | °C |
| Storage Temperature Range | -40 to +85 | °C |
| Soldering Temperature | See reflow soldering profile (Figures 10 & 11) | |

Note:

1. Derate linearly as shown in Figure 4.

Electrical Characteristics at T_A = 25 °C

| Part Number | Forward Voltage V _F (Volts) @ I _F = 20 mA ^[1] | | Reverse Breakdown V _R (Volts) @ I _R = 100 μA | Capacitance C (pF), V _F = 0, f = 1 MHz | Thermal Resistance R _{θJ-PIN} (°C/W) |
|-------------|--|------|---|---|---|
| | Typ. | Max. | Min. | Typ. | Typ. |
| HSMW-Cxxx | 3.6 | 3.9 | 5 | 55 | 450 |

Note:

1. V_F tolerance: ± 0.1 V.

Optical Characteristics at T_A = 25° C

| Part Number | Luminous Intensity I _v (mcd) @ 20 mA ^[1, 4] | | Chromaticity Coordinates ^[2] Typ. | | Viewing Angle 2θ _{1/2} Degrees ^[3] Typ. | Luminous Efficacy η _v (lm/w) Typ. |
|-------------|---|------|--|------|---|--|
| | Min. | Typ. | x | y | | |
| HSMW-C130 | 45 | 150 | 0.29 | 0.27 | 145 | 240 |
| HSMW-C191 | 71.5 | 200 | 0.29 | 0.27 | 140 | 240 |
| HSMW-C265 | 71.5 | 180 | 0.29 | 0.27 | 150 | 240 |
| HSMW-C120 | 45 | 160 | 0.29 | 0.27 | 155 | 240 |
| HSMW-C197 | 45 | 160 | 0.29 | 0.27 | 130 | 240 |

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. The dominant wavelength, λ_d, is derived from the CIE Chromaticity Diagram and represents the perceived color of the device.
3. θ_{1/2} is the off-axis angle where the luminous intensity is 1/2 the peak intensity.
4. Luminous intensity (I_v) tolerance: ± 15%.

Light Intensity (I_v) Bin Limits^[1]

| 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: ± 15%

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.

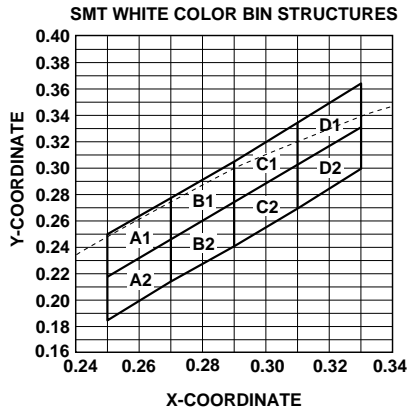


Figure 1. Color bin limits (CIE 1931 Chromaticity Diagram) [Tolerance: ± 0.02].

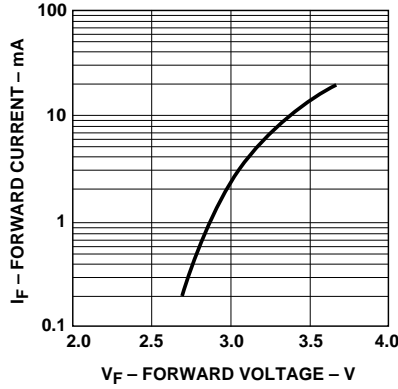


Figure 2. Forward current vs. forward voltage.

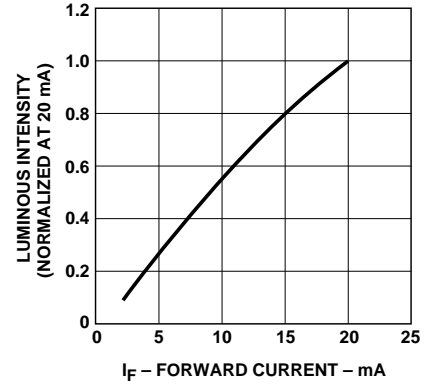


Figure 3. Luminous intensity vs. forward current.

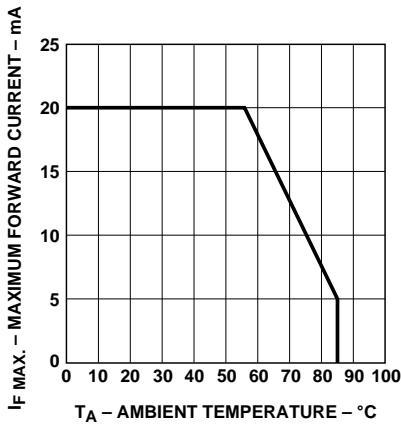


Figure 4. Maximum forward current vs. ambient temperature.

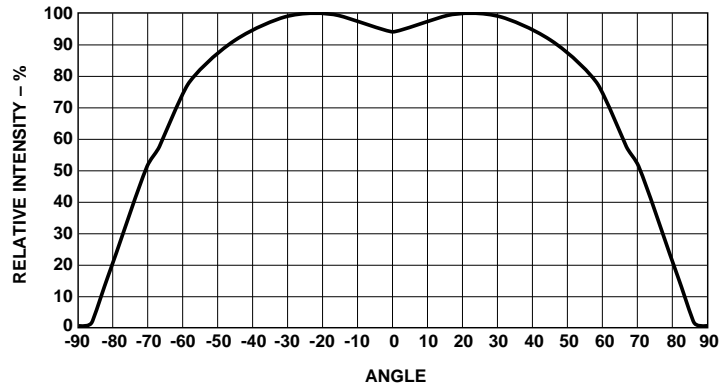


Figure 5. Relative intensity vs. angle for HSMW-C191.

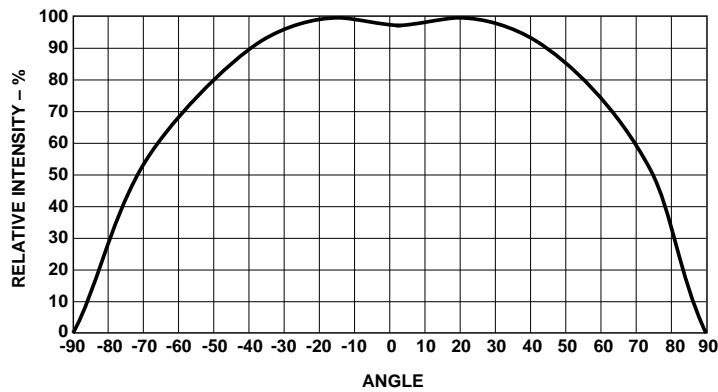


Figure 6. Relative intensity vs. angle for HSMW-C130.

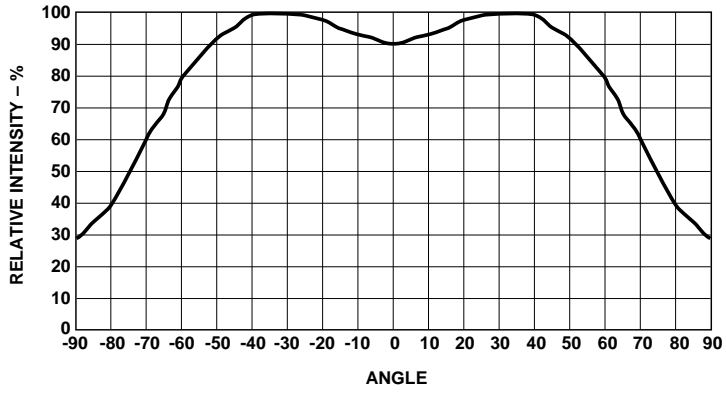


Figure 7. Relative intensity vs. angle for HSMW-C265.

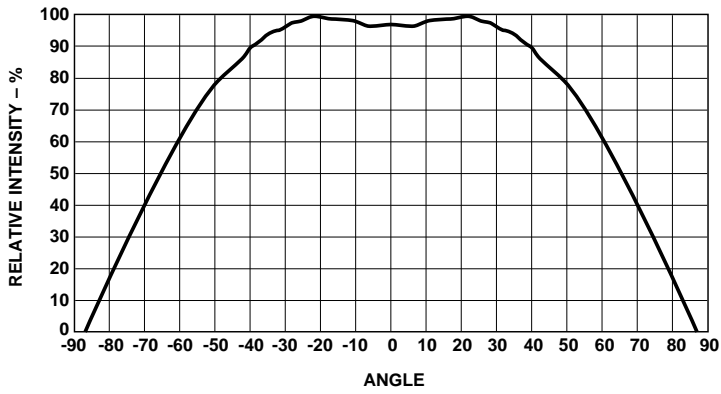


Figure 8. Relative intensity vs. angle for HSMW-C197.

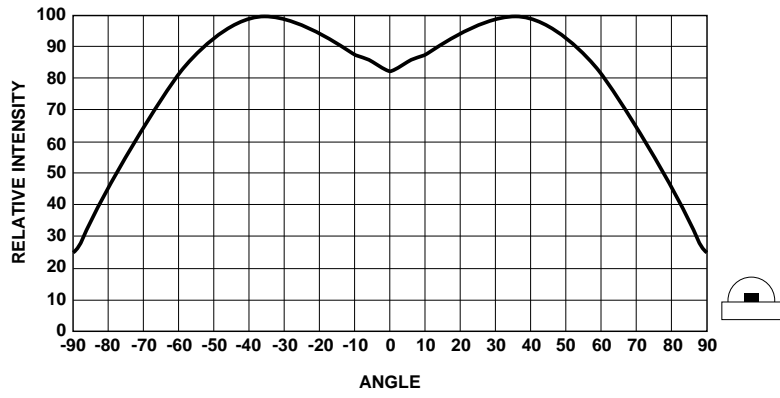


Figure 9. Relative intensity vs. angle for HSMW-C120.

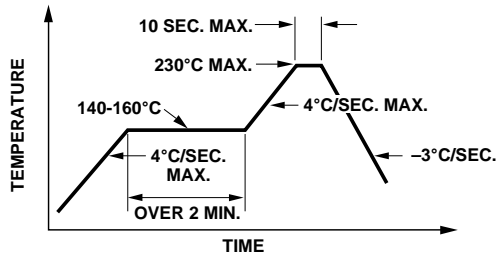
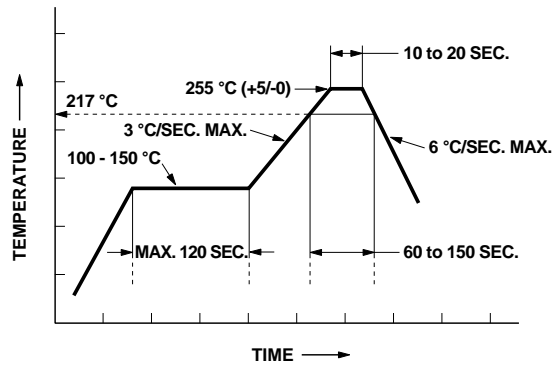


Figure 10. Recommended reflow soldering profile.



* THE TIME FROM 25 °C TO PEAK TEMPERATURE = 6 MINUTES MAX.

Figure 11. Recommended Pb-free reflow soldering profile.

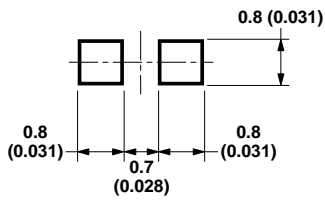


Figure 12. Recommended soldering pattern for HSMW-C191, HSMW-C130, and HSMW-C197.

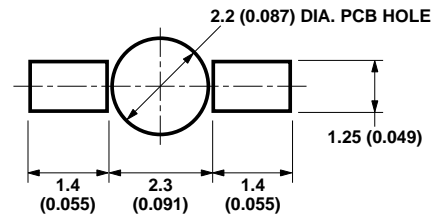


Figure 13. Recommended soldering pad pattern for HSMW-C265.

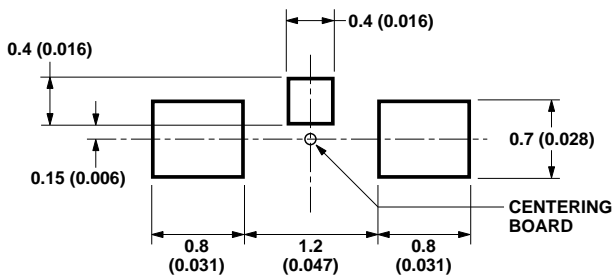


Figure 14. Recommended soldering pad pattern for HSMW-C120.

NOTE:
1. DIMENSIONS ARE IN MILLIMETERS (INCHES).

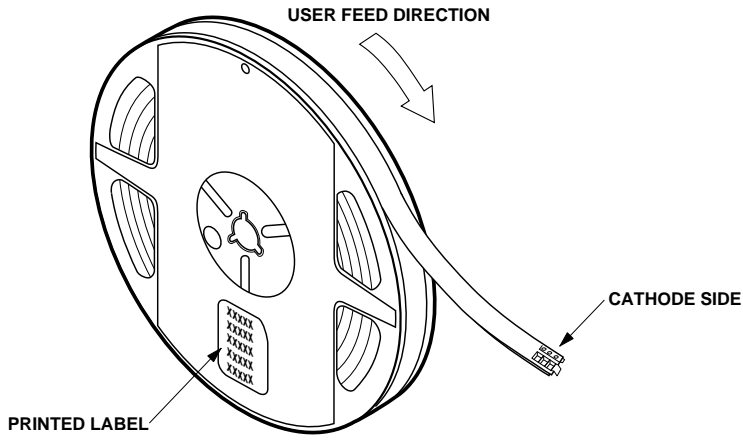


Figure 15. Reeling orientation.

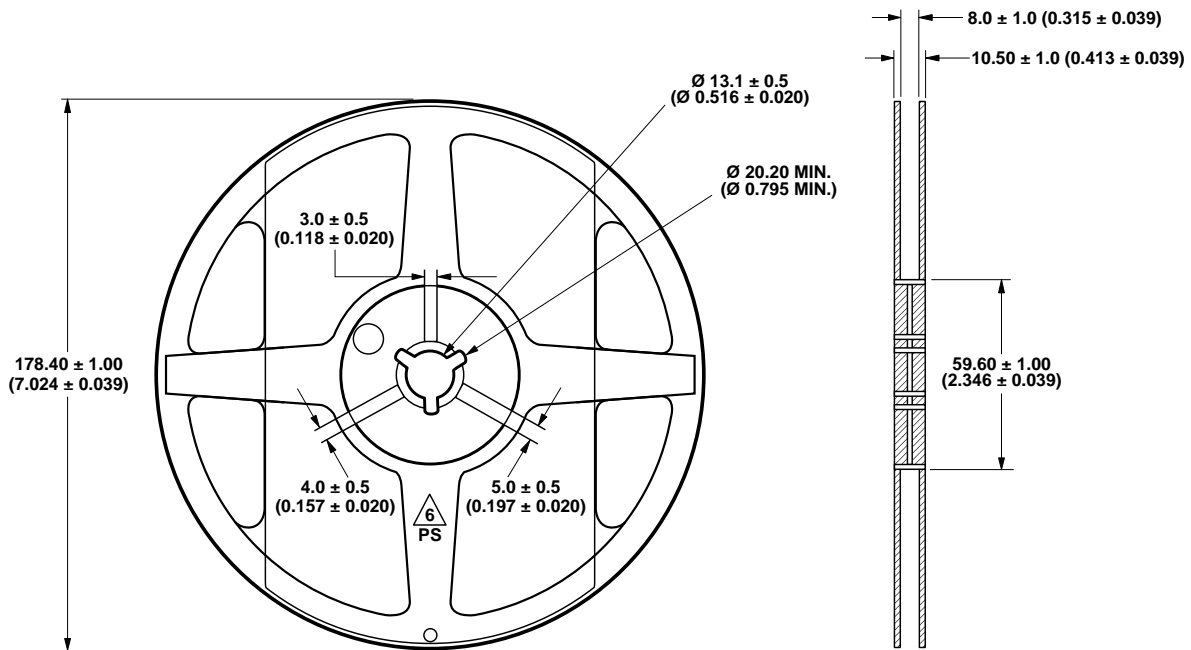


Figure 16. Reel dimensions.

NOTE:
1. DIMENSIONS ARE IN MILLIMETERS (INCHES).

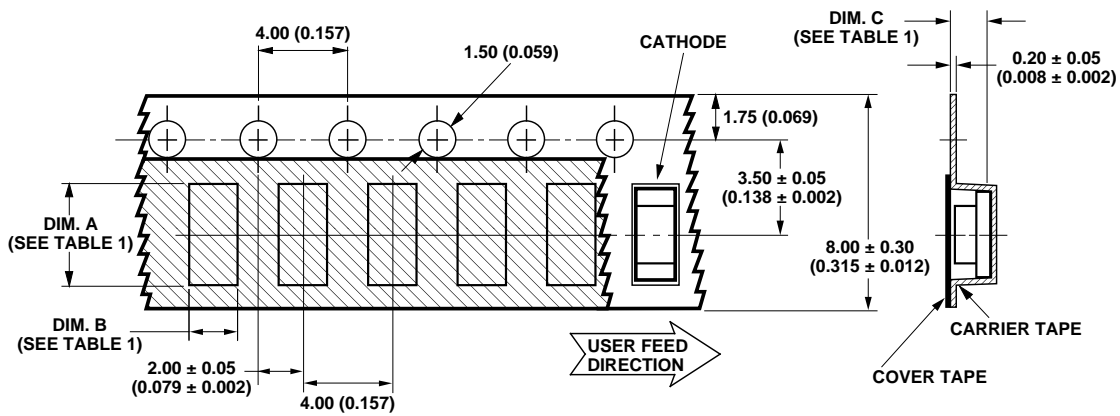


TABLE 1
DIMENSIONS IN MILLIMETERS (INCHES)

| PART NUMBER | DIM. A ± 0.10 (± 0.004) | DIM. B ± 0.10 (± 0.004) | DIM. C ± 0.10 (± 0.004) |
|------------------|----------------------------|----------------------------|----------------------------|
| HSMW-C191 SERIES | 1.85 (0.073) | 0.88 (0.035) | 0.85 (0.033) |
| HSMW-C197 SERIES | 1.75 (0.069) | 0.95 (0.037) | 0.60 (0.024) |
| HSMW-C120 SERIES | 1.90 (0.075) | 1.15 (0.045) | 0.80 (0.031) |
| HSMW-C130 SERIES | 1.75 (0.069) | 0.90 (0.035) | 0.60 (0.024) |

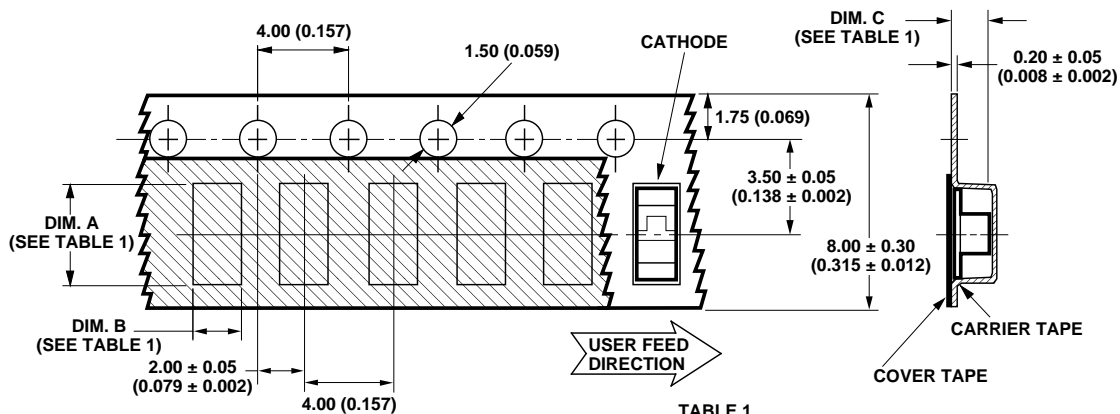
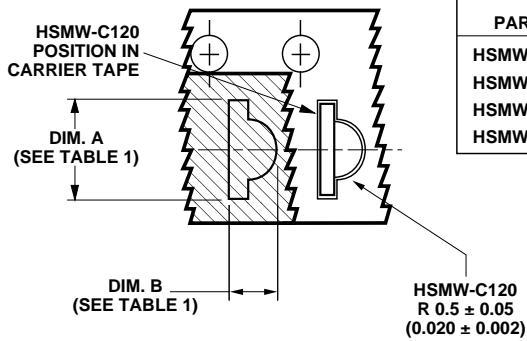


TABLE 1
DIMENSIONS IN MILLIMETERS (INCHES)

| PART NUMBER | DIM. A ± 0.10 (0.004) | DIM. B ± 0.10 (0.004) | DIM. C ± 0.10 (0.004) |
|------------------|--------------------------|--------------------------|--------------------------|
| HSMx-C265 SERIES | 3.70 (0.146) | 1.45 (0.057) | 1.30 (0.051) |

Figure 17. Tape dimensions.

NOTE:
1. DIMENSIONS ARE IN MILLIMETERS (INCHES).

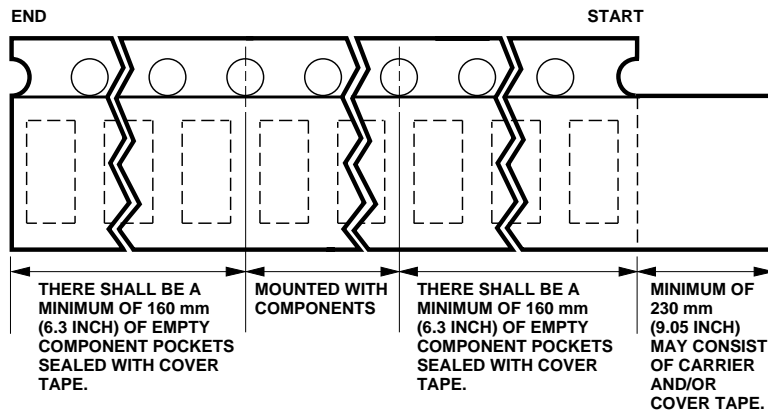


Figure 18. Tape leader and trailer dimensions.

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 open for more than 1 week

Baking recommended condition:
60 ± 5°C for 20 hours.

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Obsoletes 5988-9580EN

April 29, 2004

5989-0395EN



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