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

Data Sheet



Features

- **White color**
- **Small size**
- **Industry standard footprint**
- **Compatible with IR soldering**
- **Compatible with automatic placement equipment**
- **Operating temperature range –30°C to +85°C**
- **Come in 8 mm tape on 7" diameter reels**

Applications

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

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.

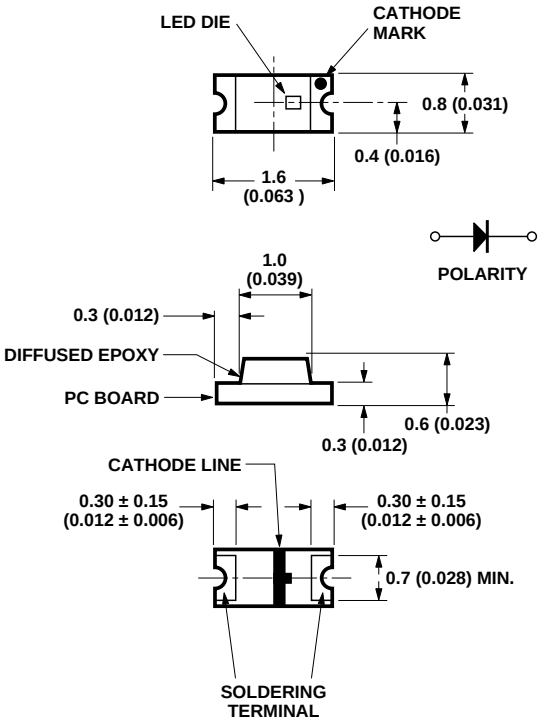
These chipLEDs come in either top emitting packages (HSMW-C191, 130, 265, & 197) or in a side emitting package (HSMW-C120).

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.

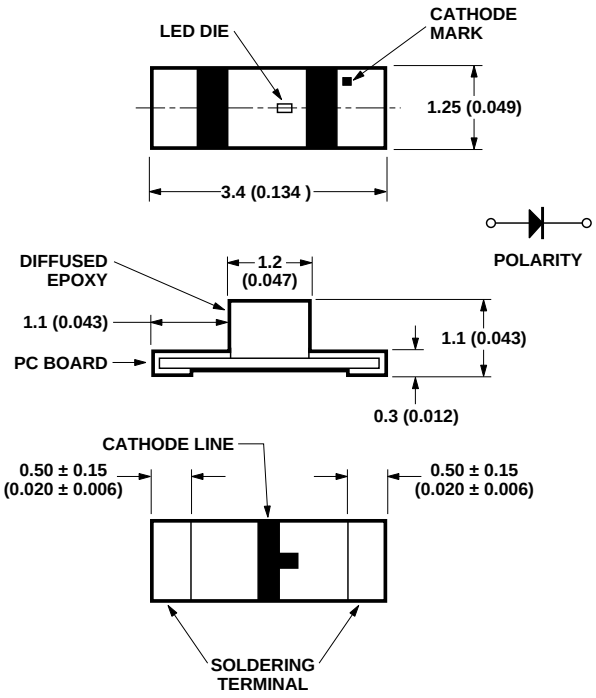
In order to facilitate pick and place operation, these chipLEDs are shipped in tape and reel with 4000 units per reel for HSMW-C191, 130, 197, and 120 packages, and 3000 units per reel for HSMW-C265 package.

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.

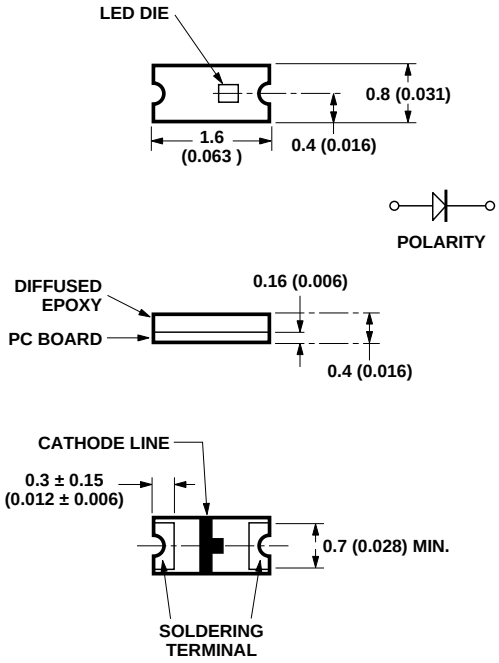
Package Dimensions



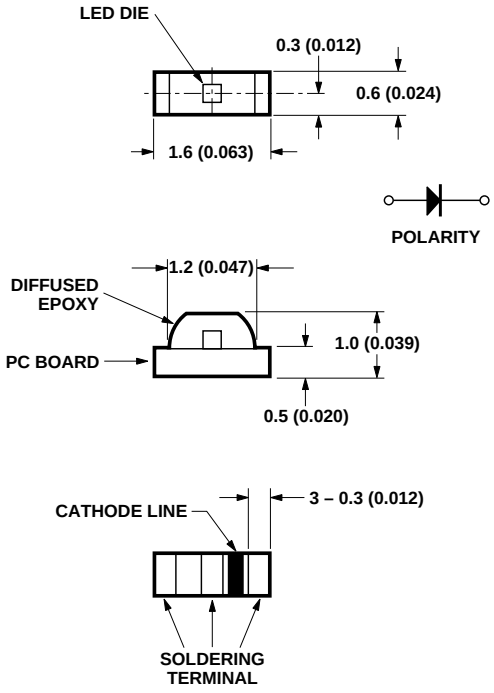
HSMW-C191



HSMW-C265



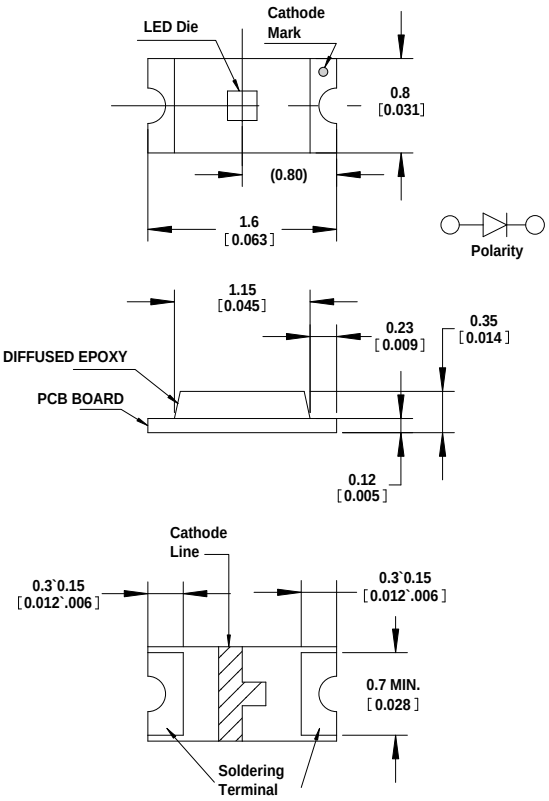
HSMW-C197



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 $T_A = 25^\circ C$

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 $T_A = 25^\circ C$

	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 $R\theta_{J\text{-}PIN}$ (°C/W)
Part Number	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 $T_A = 25^{\circ}C$

Part Number	Luminous Intensity I_v (mcd) @ 20 mA[1, 4] Min.	Typ.	Chromaticity Coordinates[2] Typ. x	y	Viewing Angle $2\theta_{1/2}$ Degrees[3] Typ.	Luminous Efficacy η_v (lm/w) Typ.
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. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is 1/2 the peak intensity.
4. Luminous intensity (I_V) tolerance: ± 15%.

Light Intensity (Iv) Bin Limits[1]

	Intensity (mcd)	
Bin ID	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.

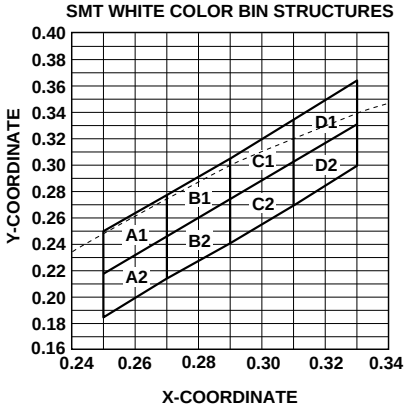


Figure 1. Color bin limits (CIE 1931 Chromaticity Diagram) [Tolerance: ± 0.02].

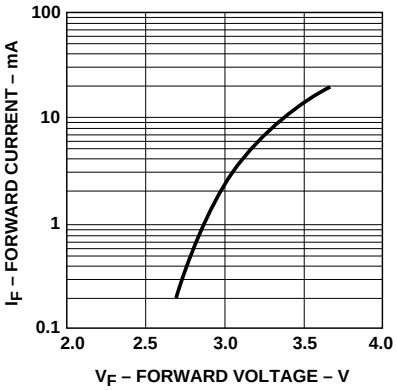


Figure 2. Forward current vs. forward voltage.

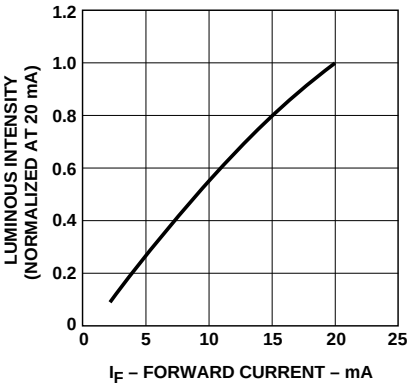


Figure 3. Luminous intensity vs. forward current.

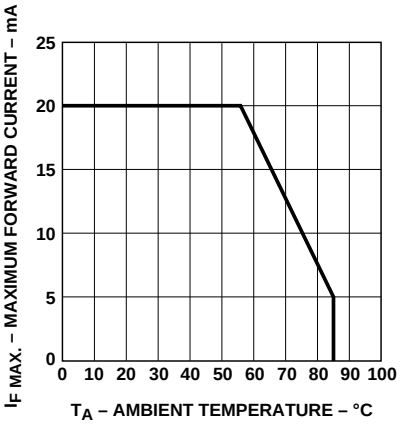


Figure 4. Maximum forward current vs. ambient temperature.

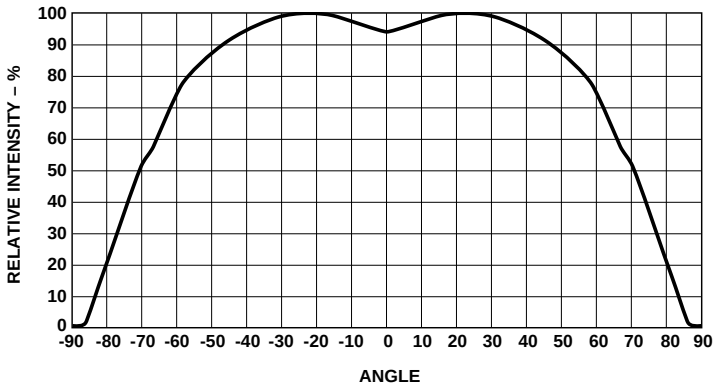


Figure 5. Relative intensity vs. angle for HSMW-C191.

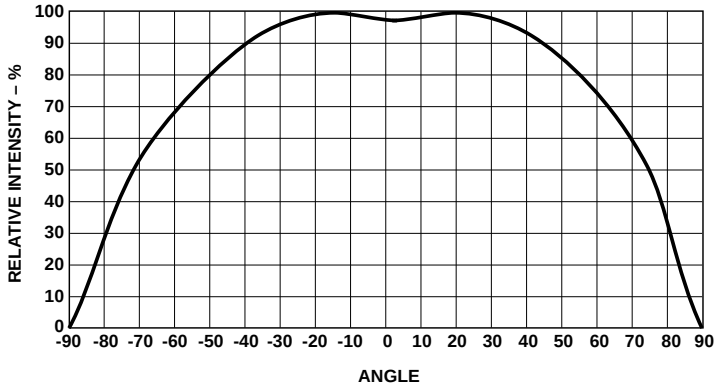


Figure 6. Relative intensity vs. angle for HSMW-C130.

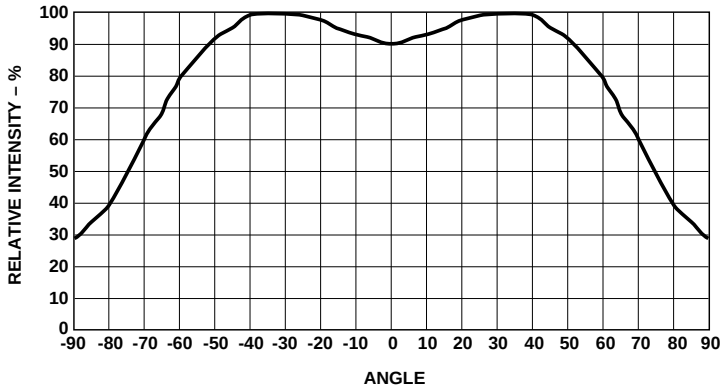


Figure 7. Relative intensity vs. angle for HSMW-C265.

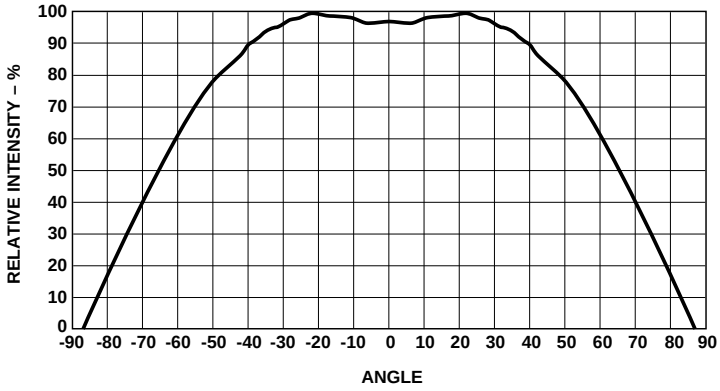


Figure 8. Relative intensity vs. angle for HSMW-C197.

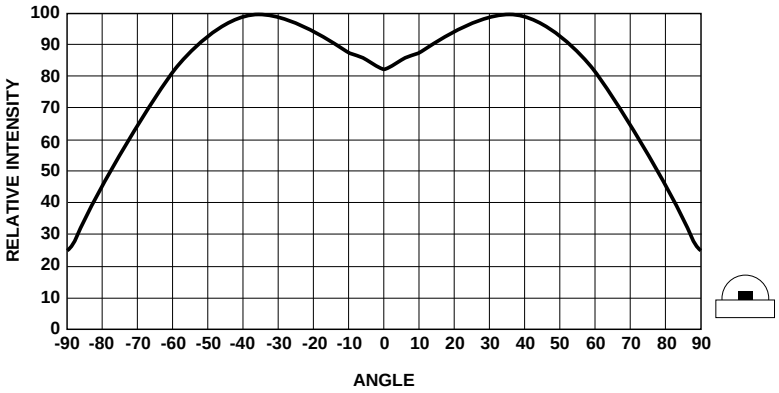




Figure 9. Relative intensity vs. angle for HSMW-C120.

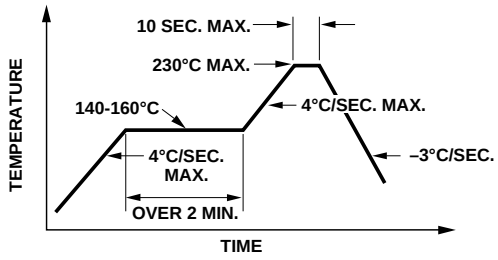
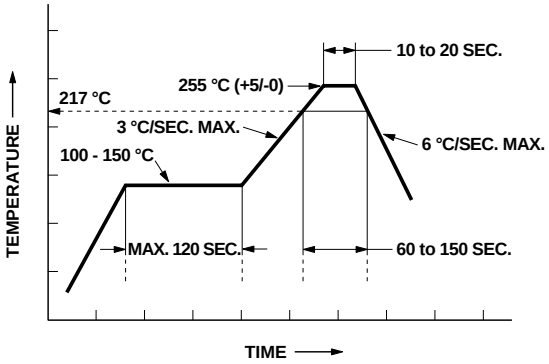


Figure 10. Recommended reflow soldering profile.



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

Figure 11. Recommended Pb-free reflow soldering profile.

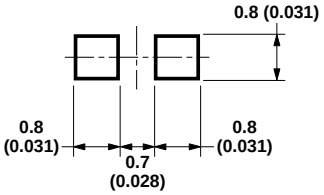


Figure 12. Recommended soldering pattern for HSMW-C191, HSMW-C130, and HSMW-C197.

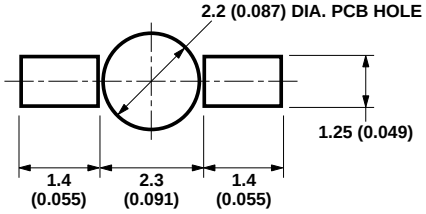


Figure 13. Recommended soldering pad pattern for HSMW-C265.

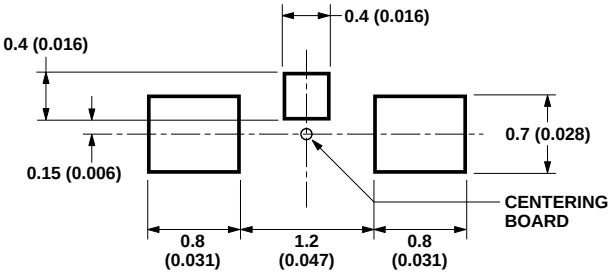


Figure 14. Recommended soldering pad pattern for HSMW-C120.

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

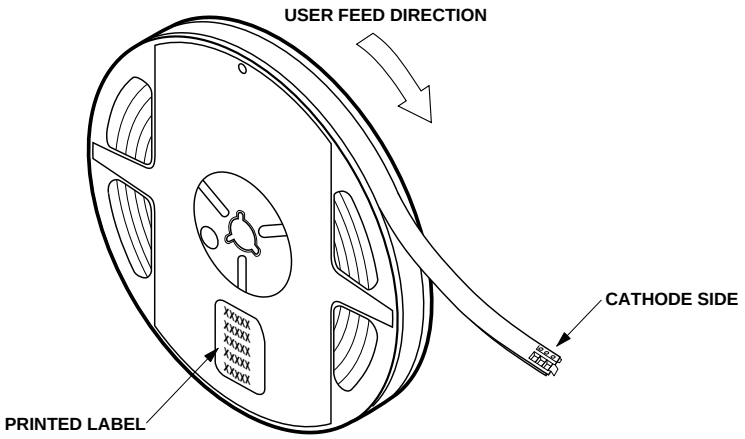


Figure 15. Reeling orientation.

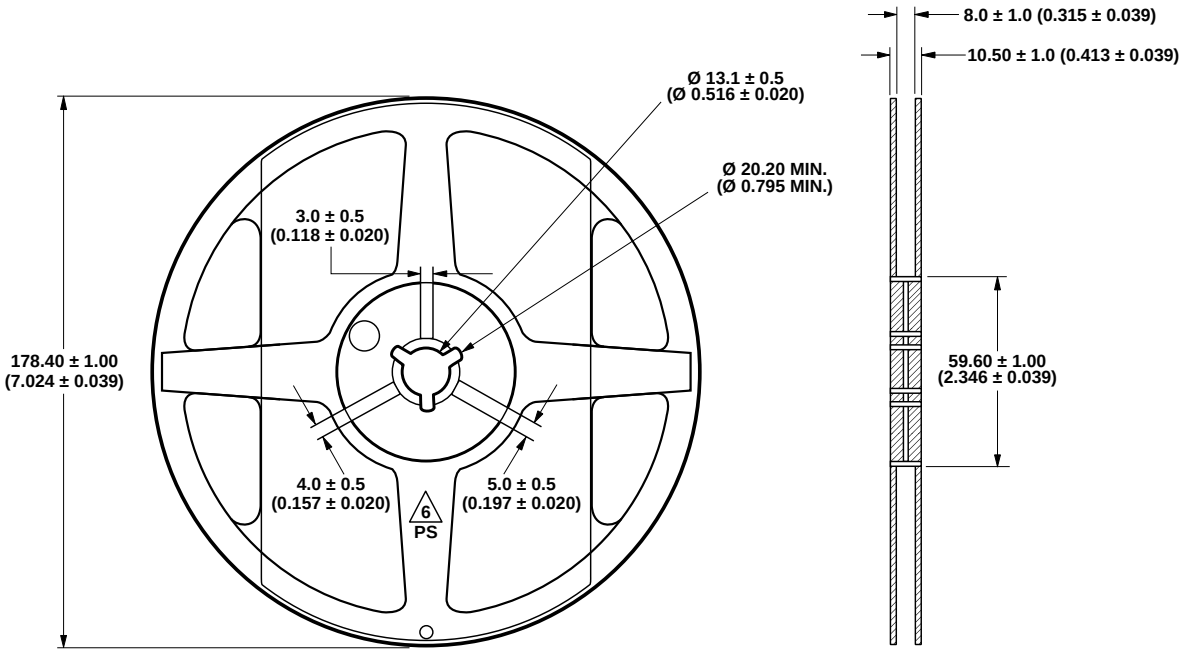


Figure 16. Reel dimensions.

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

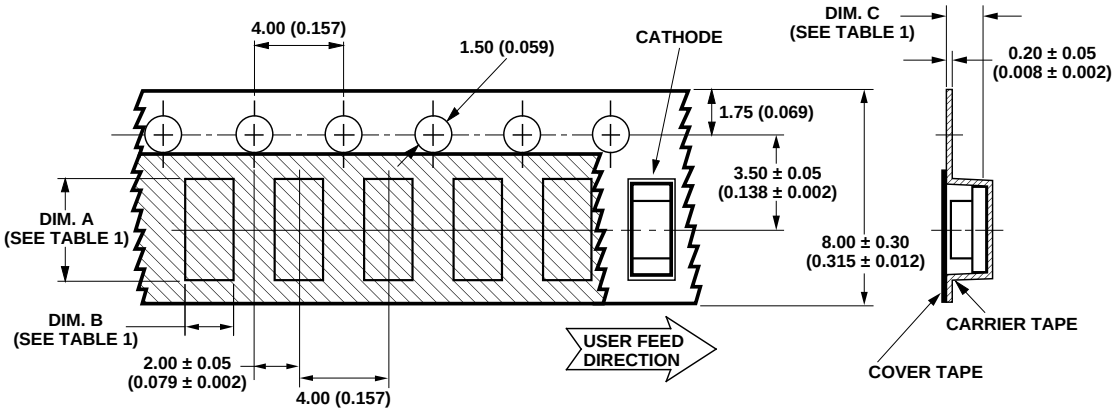
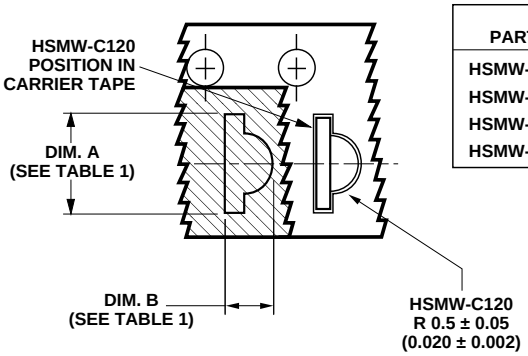


TABLE 1
DIMENSIONS IN MILLIMETERS (INCHES)

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)



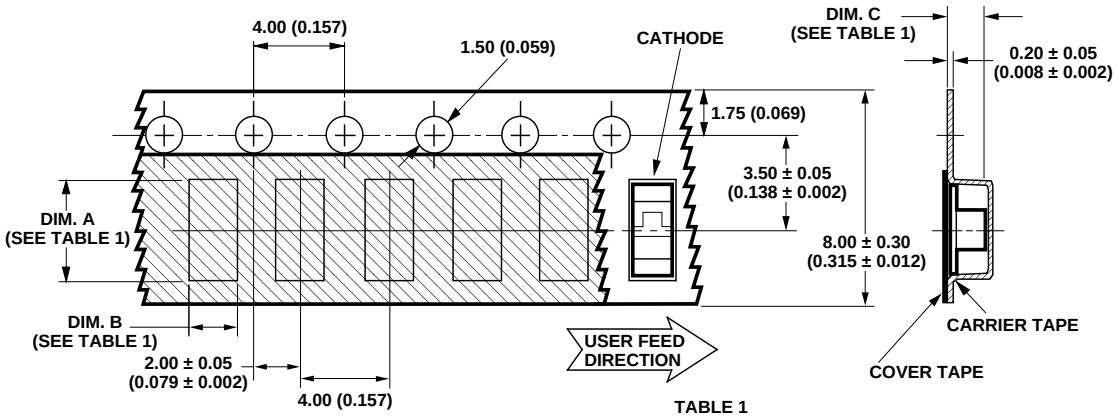


TABLE 1
DIMENSIONS IN MILLIMETERS (INCHES)

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).

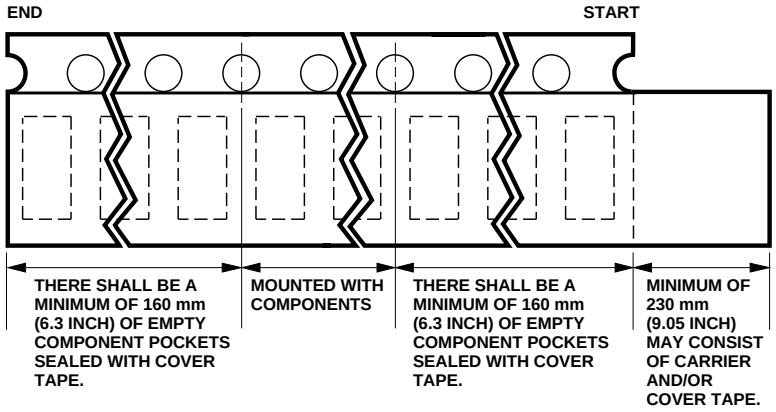


Figure 18. Tape leader and trailer dimensions.

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.

www.agilent.com/semiconductors

For product information and a complete list of distributors, please go to our web site.

For technical assistance call:

Americas/Canada: +1 (800) 235-0312 or (916) 788-6763

Europe: +49 (0) 6441 92460

China: 10800 650 0017

Hong Kong: (+65) 6756 2394

India, Australia, New Zealand: (+65) 6755 1939

Japan: (+81 3) 3335-8152 (Domestic/International), or 0120-61-1280 (Domestic Only)

Korea: (+65) 6755 1989

Singapore, Malaysia, Vietnam, Thailand, Philippines, Indonesia: (+65) 6755 2044

Taiwan: (+65) 6755 1843

Data subject to change.

Copyright © 2004 Agilent Technologies, Inc.

Obsoletes 5988-9580EN
April 29, 2004
5989-0395EN

Agilent Technologies