Agilent HSMA/C/L-C120, HSMD/G/S/H-C120, HSMM/N/Q/R-C120 Right Angle ChipLED

Data Sheet



Features

- **Small size right angle mount**
- **0603 industry standard footprint**
- **Operating temperature range of –30°C to +85°C**
- **Available in various colors**
- **Compatible with IR solder reflow**
- **Available in 8 mm tape on 7" diameter reel**
- **Reel sealed in zip locked moisture barrier bags**

Description

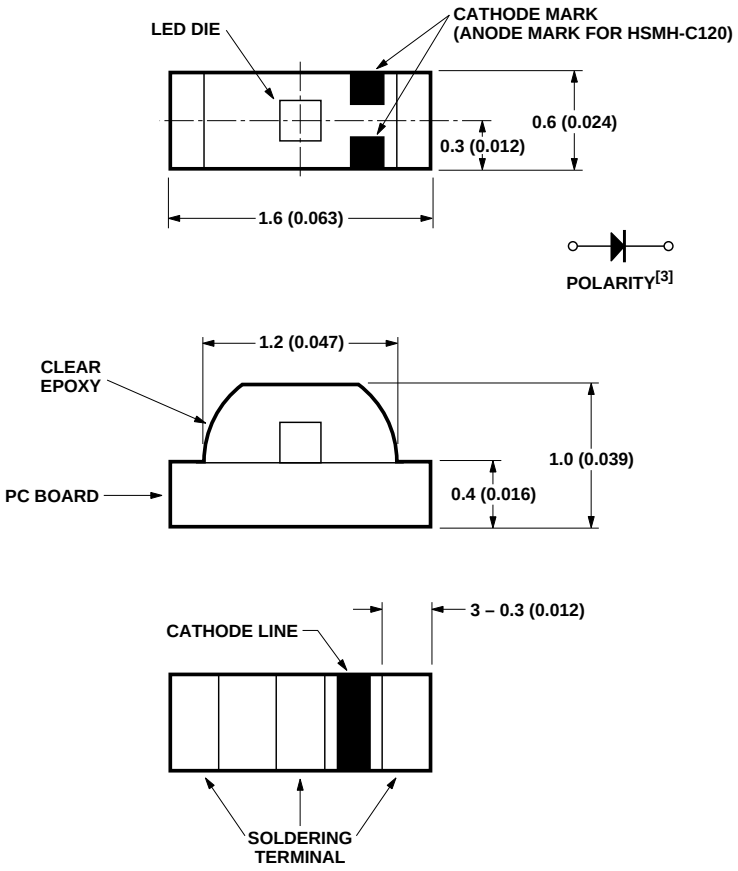
This series of right angle mount ChipLEDs is designed with the smallest footprint to achieve high density of components on board. They have the industry standard footprint of 1.6 mm x 1.0 mm and a height of only 0.6 mm. This makes them very suitable for cellular phone and mobile equipment backlighting and indication application where space is a constraint. They are available in a wide range of color combination. In order to facilitate automated pick and place operation, these ChipLEDs are shipped in tape and reel, with 4000 units per reel. These parts are compatible with IR soldering.

Applications

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

***CAUTION**: HSMM/N/Q/R-C120 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



NOTES:
1. ALL DIMENSIONS IN MILLIMETERS (INCHES).
2. TOLERANCE IS ± 0.1 mm (± 0.004 IN.) UNLESS OTHERWISE SPECIFIED.
3. POLARITY FOR HSMH-C120 WILL BE THE OPPOSITE OF WHAT IS SHOWN ON ABOVE DRAWING.

Device Selection Guide

AS AlInGaP			InGaN		
Amber	**Red**	**Orange**	**Green**	**Blue**	**Package Description**
HSMA-C120	HSMC-C120	HSML-C120	HSMM-C120 HSMQ-C120	HSMN-C120 HSMR-C120	Untinted, Non Diffused

AlGaAs	GaP			
Red	**Green**	**Orange**	**HER**	**Package Description**
HSMH-C120	HSMG-C120	HSMD-C120	HSMS-C120	Untinted, Non Diffused

Absolute Maximum Ratings at T_A = 25°C

Parameter	HSMA/C/L-C120	HSMD/G/S-C120	HSMH-C120	HSMM/N-C120	HSMQ/R-C120	Units
DC Forward Current[1] [2]	25	20	25	20	20	mA
Power Dissipation	60	52	65	78	78	mW
Reverse Voltage (I_R = 100 μA)	5	5	5	5	5	V
LED Junction Temperature	95	95	95	95	95	°C
Operating Temperature Range	–30 to +85					°C
Storage Temperature Range	–40 to +85					°C
Soldering Temperature	See IR soldering profile (Figure 6)					

Notes:
1. Derate linearly as shown in Figure 4.
2. Drive currents above 5 mA are recommended for best long term performance.

Electrical Characteristics at T_A = 25°C

Part Number	Forward Voltage V_F (Volts) @ I_F = 20 mA Typ.	Max.	Reverse Breakdown V_R (Volts) @ I_R = 100 μA Min.	Capacitance C (pF), V_F = 0, f = 1 MHz Typ.	Thermal Resistance $R\theta_{J\text{-}PIN}$ (°C/W) Typ.
HSMA-C120	1.9	2.4	5	11	400
HSMC-C120	1.9	2.4	5	15	400
HSML-C120	1.9	2.4	5	20	400
HSMD-C120	2.2	2.6	5	7	350
HSMG-C120	2.2	2.6	5	9	350
HSMS-C120	2.1	2.6	5	5	350
HSMH-C120	1.8	2.6	5	20	400
HSMM-C120	3.4	3.9	5	45	450
HSMN-C120	3.4	3.9	5	45	450
HSMQ-C120	3.4	3.9	5	100	450
HSMR-C120	3.4	3.9	5	100	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] Min.	Typ.	Peak Wavelength λ_{peak}[2] (nm) Typ.	Dominant Wavelength λ_d[2] (nm) Typ.	Viewing Angle 2 $\theta_{1/2}$ Degrees[3] Typ.	Luminous Efficacy η_v (lm/w) Typ.
HSMA-C120	25	90	595	592	155	480
HSMC-C120	25	90	637	626	155	155
HSML-C120	25	90	609	605	155	370
HSMD-C120	2.5	8	605	604	155	380
HSMG-C120	4.0	15	570	572	155	595
HSMS-C120	2.5	10	630	626	155	145
HSMH-C120	4.0	15	660	639	155	70
HSMM-C120	40	120	523	525	155	490
HSMN-C120	10	30	468	470	155	80
HSMQ-C120	40	145	520	527	155	500
HSMR-C120	16	55	469	473	155	85

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 coordinate is derived from the CIE Chromatically 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.

Light Intensity (I_v) 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

Tolerance: ±15%

Color Bin Limits[1]

Green Color Bins

	Dom. Wavelength (nm)	
Bin ID	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: ±0.5 nm

Yellow/Amber Color Bins

	Dom. Wavelength (nm)	
Bin ID	Min.	Max.
A	582.0	584.5
B	584.5	587.0
C	587.0	589.5
D	589.5	592.0
E	592.0	594.5
F	594.5	597.0

Tolerance: ±0.5 nm

Blue Color Bins

	Dom. Wavelength (nm)	
Bin ID	Min.	Max.
A	460.0	465.0
B	465.0	470.0
C	470.0	475.0
D	475.0	480.0

Tolerance: ±1 nm

InGaN Green Color Bins

	Dom. Wavelength (nm)	
Bin ID	Min.	Max.
A	515.0	520.0
B	520.0	525.0
C	525.0	530.0
D	530.0	535.0

Tolerance: ±1 nm

Color Bin Limits

Orange Color Bins

	Dom. Wavelength (nm)	
Bin ID	**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: ±1 nm

Notes:

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.

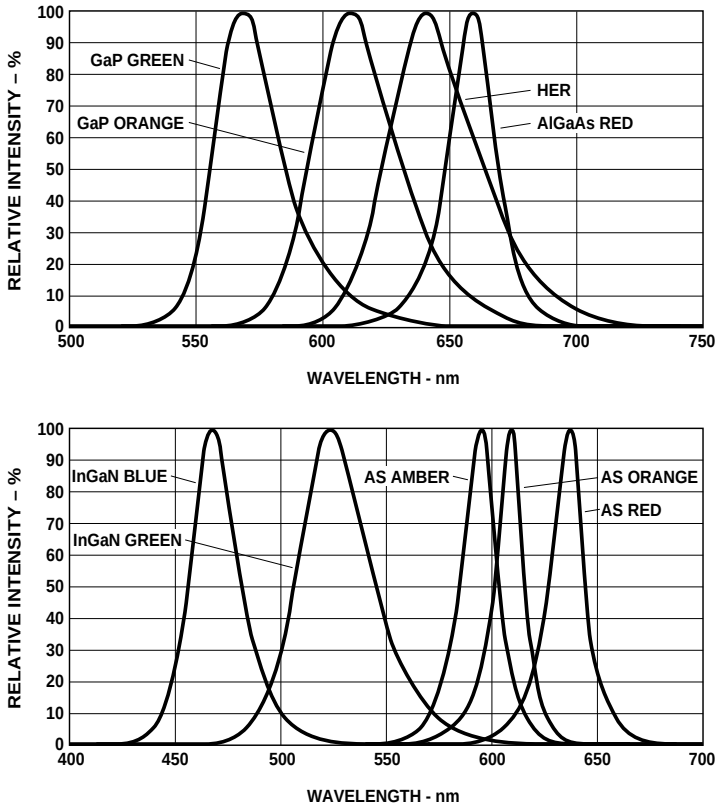


Figure 1. Relative intensity vs. wavelength.

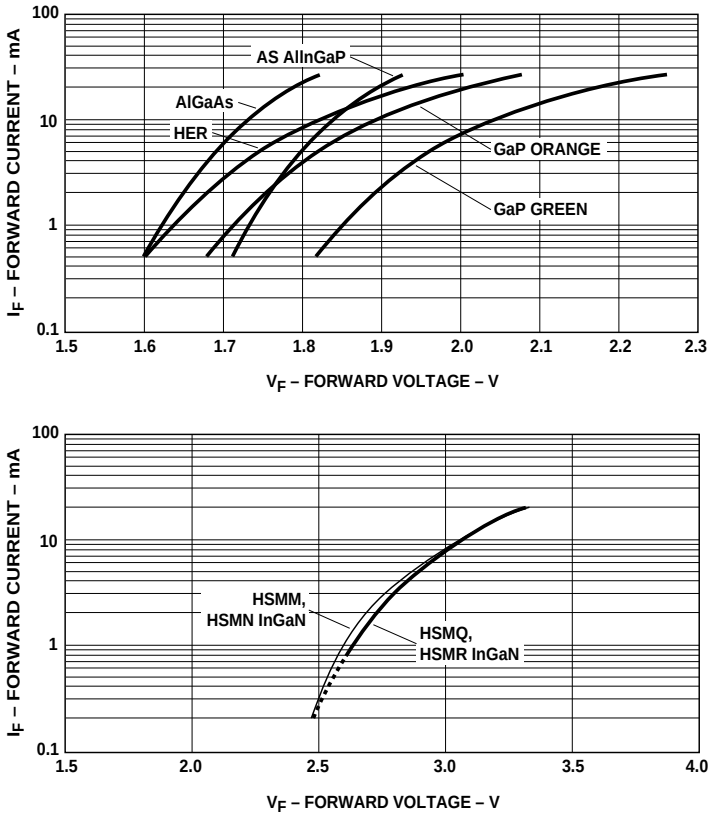


Figure 2. Forward current vs. forward voltage.

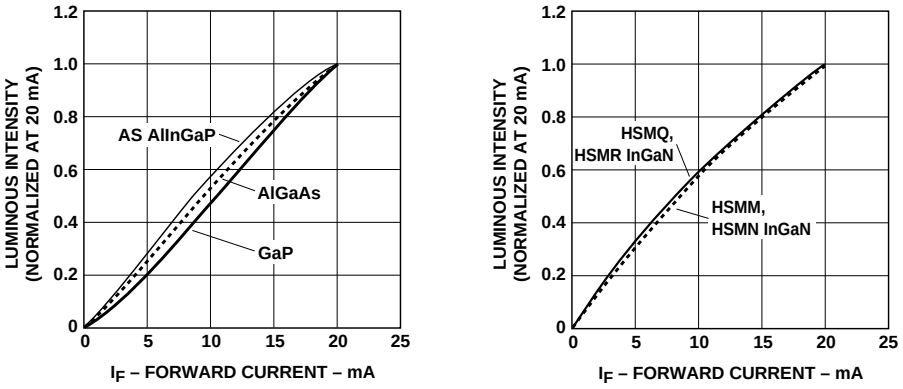


Figure 3. Luminous intensity vs. forward current.

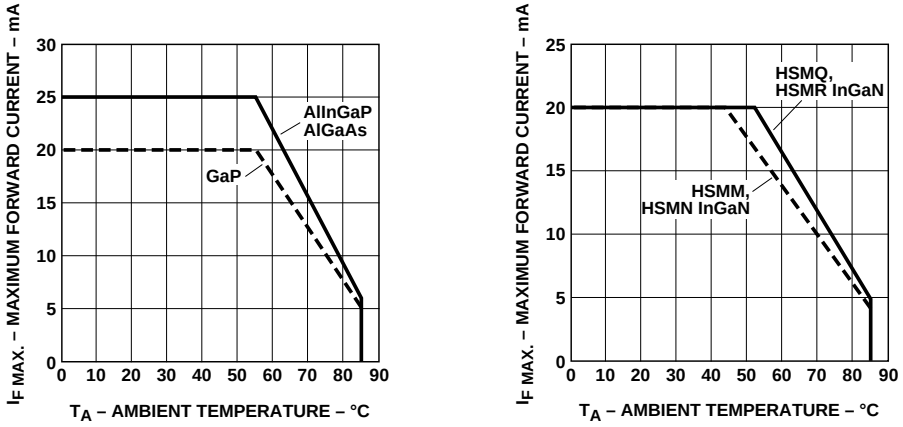


Figure 4. Maximum forward current vs. ambient temperature.

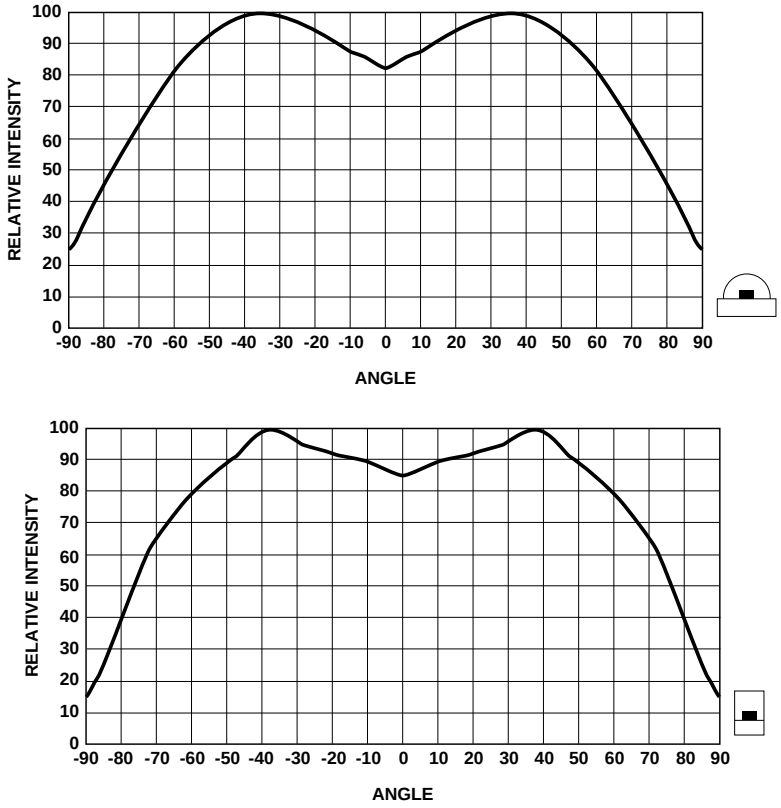


Figure 5. Relative intensity vs. angle.

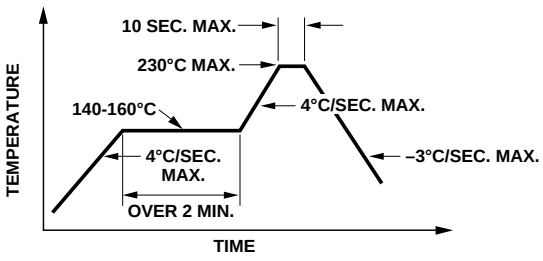


Figure 6. Recommended reflow soldering profile.

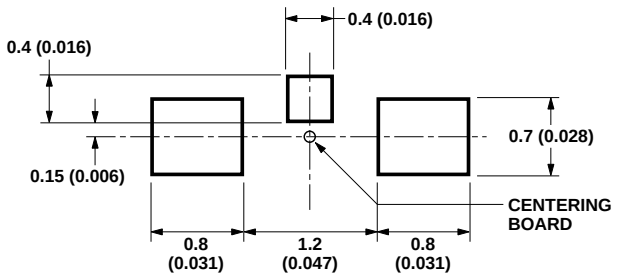


Figure 7. Recommended soldering pattern.

Note: All dimensions in millimeters (inches).

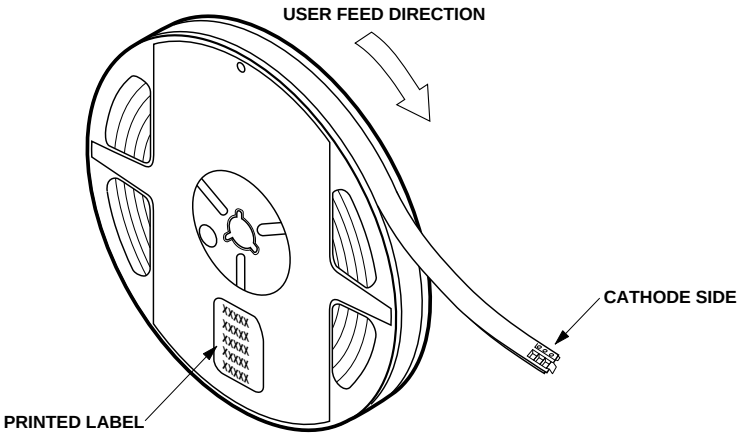
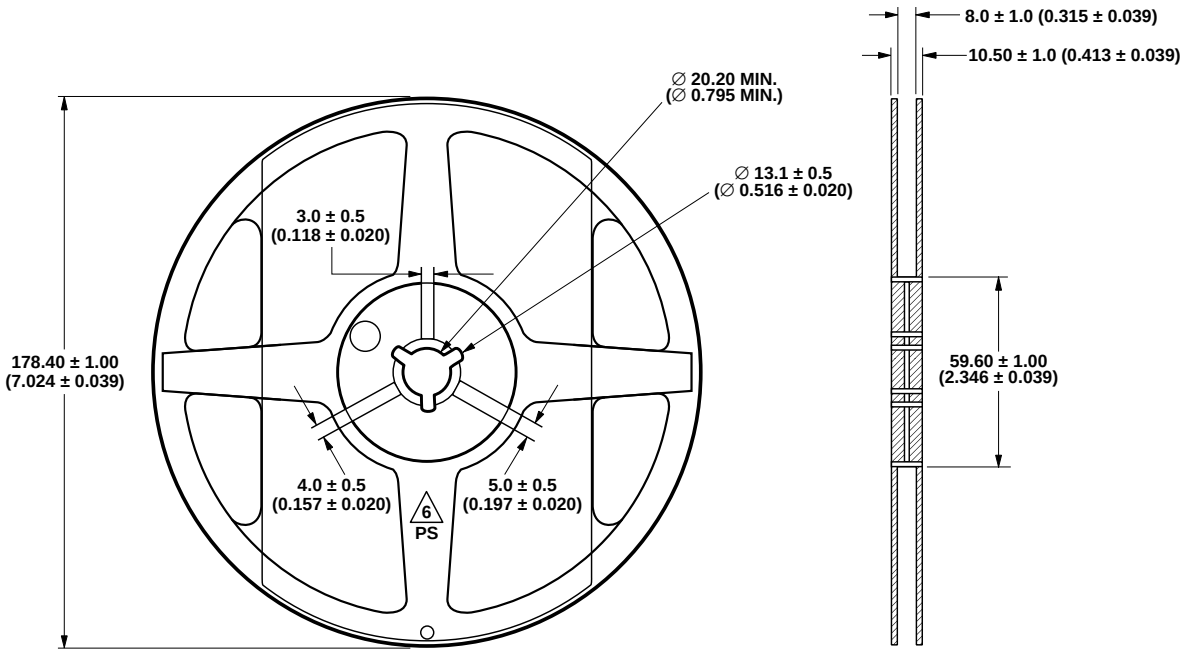


Figure 8. Reeling orientation.



NOTE: ALL DIMENSIONS IN MILLIMETERS (INCHES).

Figure 9. Reel dimensions.

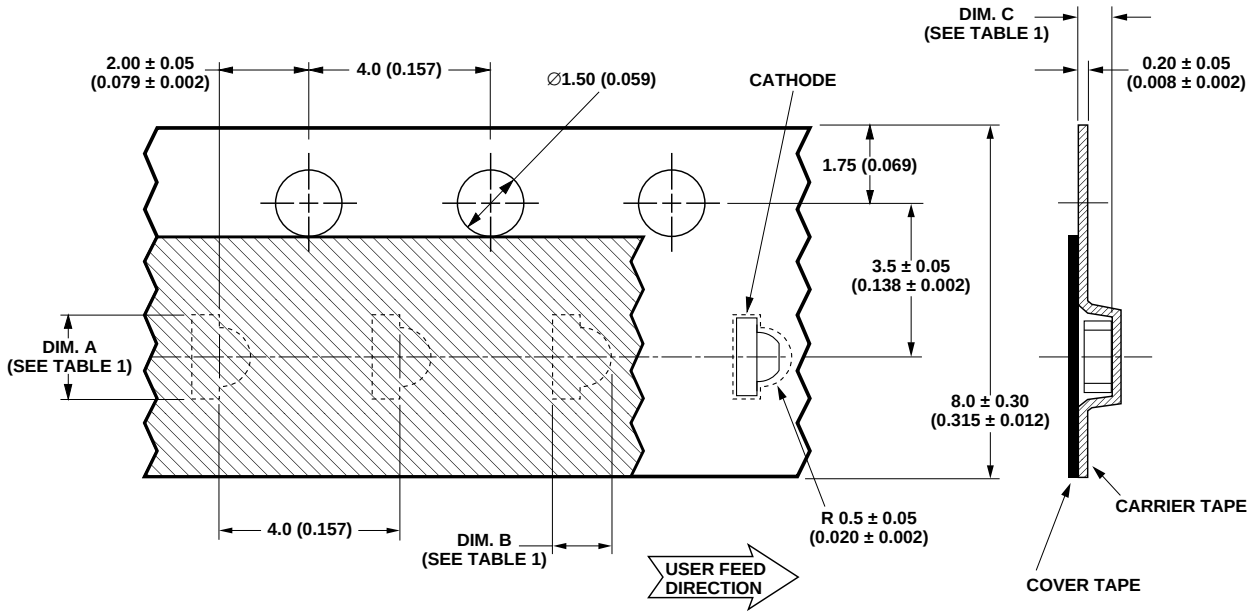


TABLE 1
DIMENSIONS IN MILLIMETERS (INCHES)

PART NUMBER	DIM. A ± 0.10 (0.004)	DIM. B ± 0.10 (0.004)	DIM. C ± 0.10 (0.004)
HSMx-C120 SERIES	1.90 (0.075)	1.15 (0.045)	0.75 (0.030)

Figure 10. Tape dimensions.

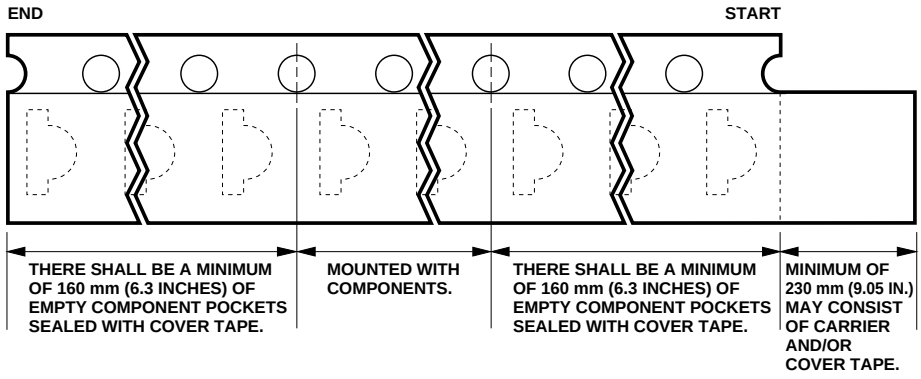


Figure 11. Tape leader.

Notes:
1. All dimensions in millimeters (inches).
2. Tolerance is ±0.1 mm (±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 +/– 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 (408) 654-8675

Europe: +49 (0) 6441 92460

China: 10800 650 0017

Hong Kong: (+65) 6271 2451

India, Australia, New Zealand: (+65) 6271 2394

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

Korea: (+65) 6271 2194

Malaysia, Singapore: (+65) 6271 2054

Taiwan: (+65) 6271 2654

Data subject to change.

Copyright © 2002 Agilent Technologies, Inc.

April 6, 2002
5988-5401EN



Agilent Technologies