Agilent Technologies
Innovating the HP Way

Surface Mount Chip LEDs

Technical Data

HSMF-C155/C156/C157

Features

- **Small Size**
- **Industry Standard Footprint**
- **Compatible with IR Solder**
- **Diffused Optics**
- **Operating Temperature Range of -30°C to +85°C**
- **Three Color Combinations Available: Red/Green, Yellow/Green, and Orange/Green.**
- **Available in 8 mm Tape on 7 in. (178 mm) Diameter Reels**

Applications

- **Push-Button Backlighting**
- **Symbol Backlighting**
- **Status Indicator**
- **Front Panel Indicator**

Description

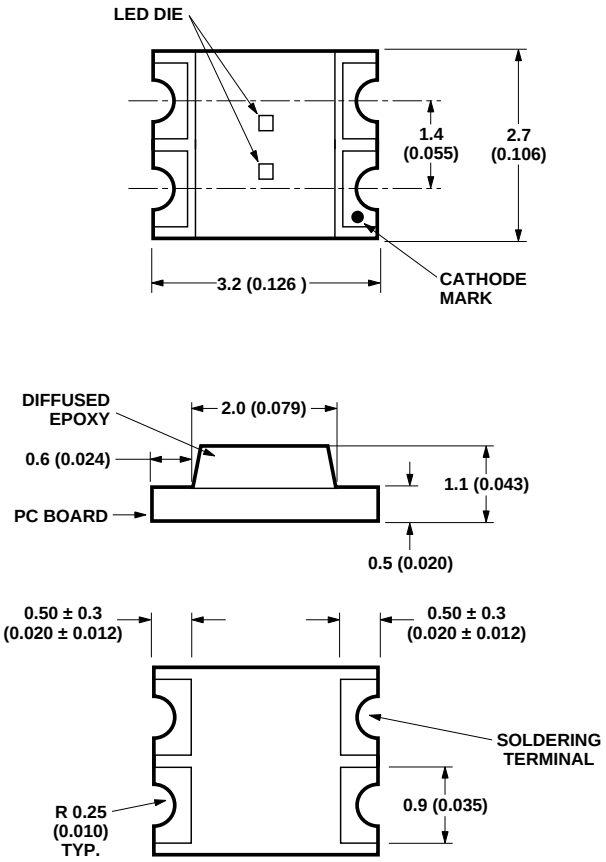
The HSMF-C15x series of bicolor chip-type LEDs is designed in an industry standard package for ease of handling and use. These bicolor LEDs are available as high efficiency red/green, yellow/green and orange/green. The HSMF-C15x has the widely used 3.2 x 2.7 mm footprint and wide viewing angle make this LED exceptional for backlighting applications.

All packages are compatible with IR reflow solder processes. The small size and wide viewing angle make these LEDs prime choices for backlighting applications and front panel indicators especially where space is a premium.

Device Selection Guide

Part Number	Color Combinations	Parts Per Reel
HSMF-C155	High Efficiency Red/Green	3000
HSMF-C156	Yellow/Green	3000
HSMF-C157	Orange/Green	3000

Package Dimensions



POLARITY	PART NUMBER		
	HSMF-C-155	HSMF-C-156	HSMF-C-157
	GREEN	GREEN	GREEN
	RED	YELLOW	ORANGE

POSITION OF COLOR SOURCE ON DEVICE

HSMF-C155/C156/C157

Notes:
1. All dimensions in millimeters (inches).
2. Tolerance is ± 0.1 mm (± 0.004 in.) unless otherwise specified.

Absolute Maximum Ratings at T_A=25°C

Parameter	HSMF-C155/C156/C157	Units
DC Forward Current[1]	25	mA
Peak Pulsing Current[2]	100	mA
Power Dissipation	65	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 IR soldering profile (Figure 6)	

Notes:
1. Derate linearly as shown in Figure 4 for temperature above 25°C.
2. Pulse condition of 1/10 duty and 0.1 msec. width.

Optical Characteristics at T_A=25°C

Color	Luminous Intensity[1] Iv(mcd) @ 20mA		Peak Wavelength λ_{peak}(nm)	Dominant Wavelength λ_d(nm)	Viewing Angle $2\theta_{1/2}$ Degrees[2]
	Min.	Typ.	Typ.	Typ.	Typ.
HER	2.50	10.0	630	626	170
Orange	2.50	8.0	605	604	170
Yellow	2.50	8.0	589	586	170
Green	4.00	15.0	570	572	170

Notes:
1. The luminous intensity, Iv, 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°C

Color	Forward Voltage V_F(V) @ I_F= 20 mA		Reverse Breakdown V_R(V) @ I_R = 100 μA	Capacitance C(pF) @ V_F = 0, f = 1Mhz	Thermal Resistance $R\theta_{J\text{-}P}$ (°C/W)
	Typ.	Max.	Min.	Typ.	Typ.
HER	2.1	2.6	5	5	325
Orange	2.2	2.6	5	7	325
Yellow	2.1	2.6	5	6	325
Green	2.2	2.6	5	9	325

Note:
The bicolor package contains two individual light sources of different color. The specifications above refer to each color of a particular package.

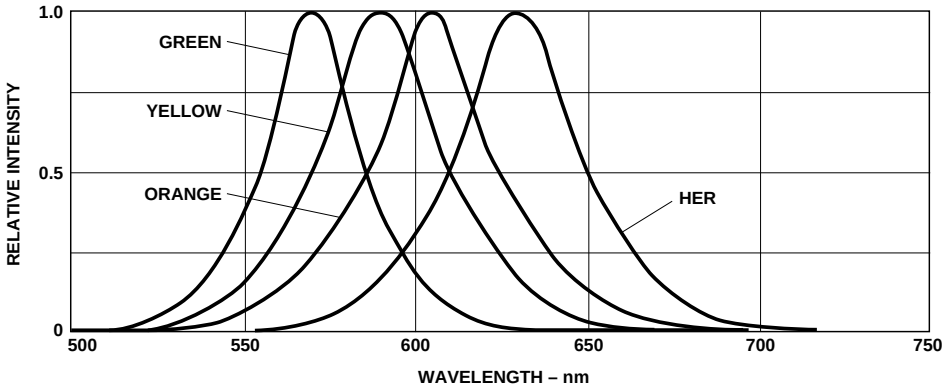


Figure 1. Relative Intensity vs. Wavelength.

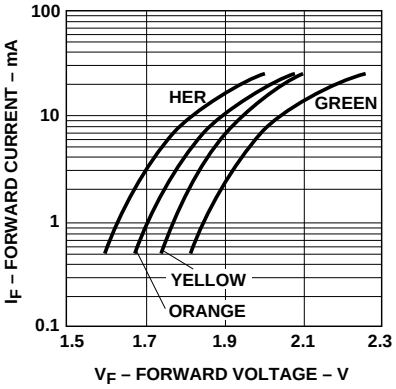


Figure 2. Forward Current vs. Forward Voltage.

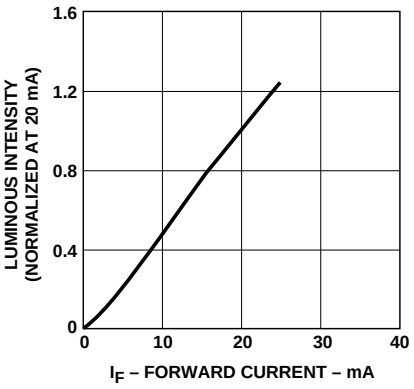


Figure 3. Luminous Intensity vs. Forward Current (All Colors).

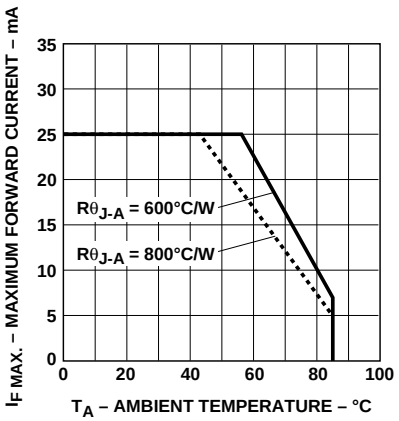


Figure 4. Maximum Forward Current vs. Ambient Temperature.

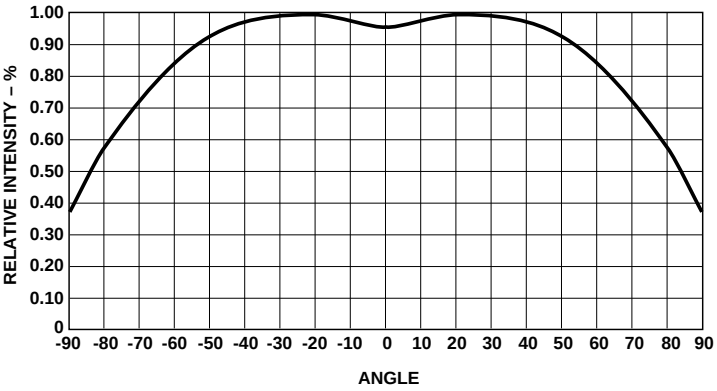


Figure 5. Relative Intensity vs. Angle for HSMx-C155, C156 and C157.

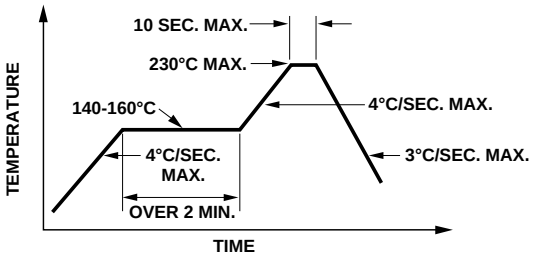


Figure 6. Recommended Reflow Soldering Profile.

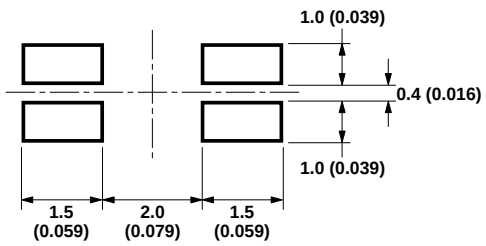


Figure 7. Recommended Solder Pad Pattern.

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

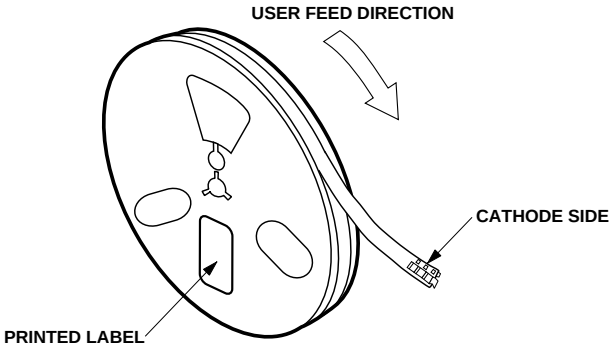
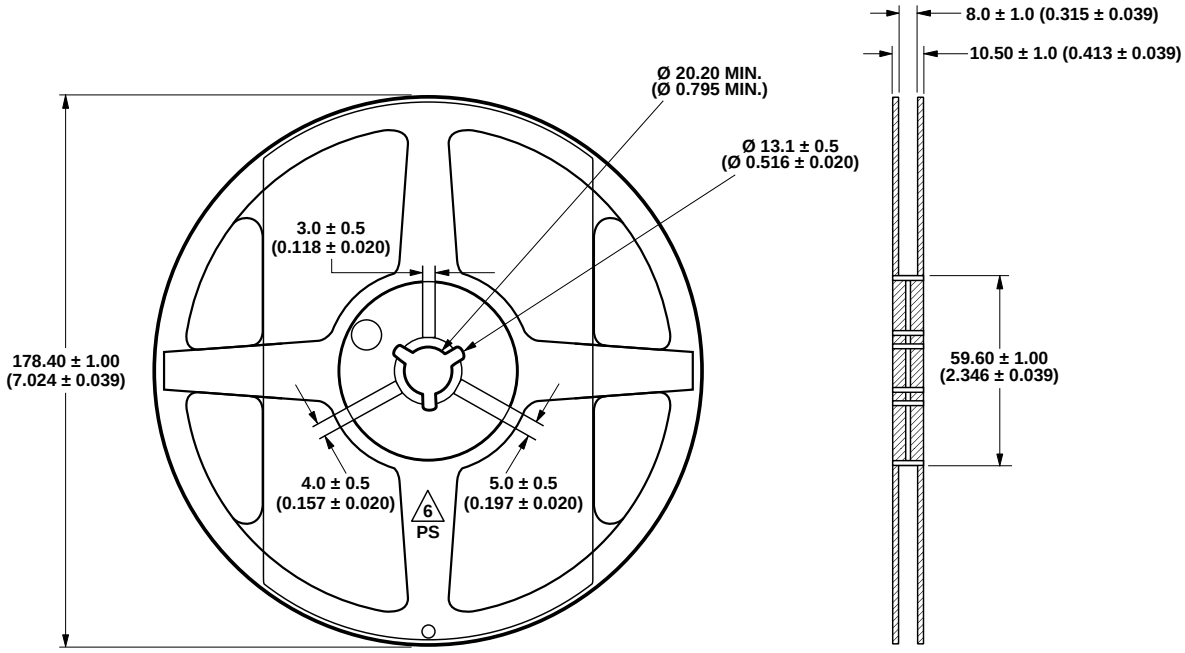


Figure 8. Reeling Orientation.



Note:
All dimensions in millimeters (inches).

Figure 9. Reel Dimensions.

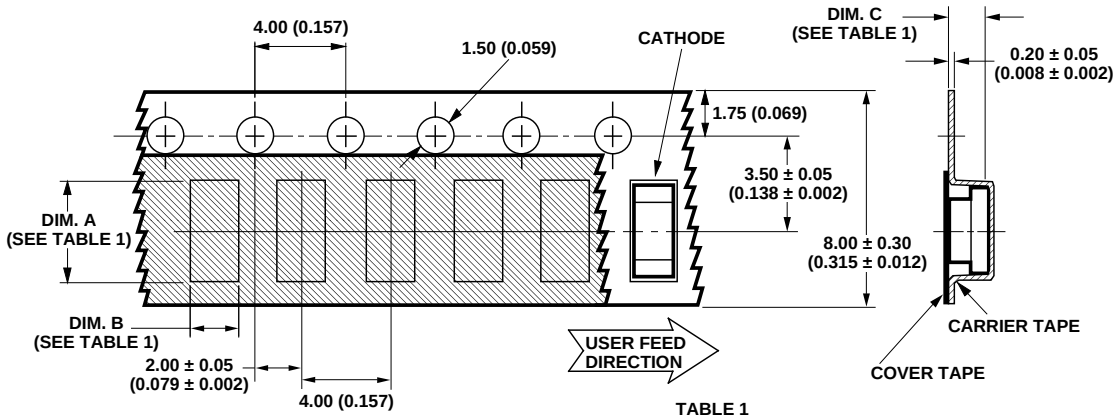


TABLE 1
DIMENSIONS IN MILLIMETERS (INCHES)

PART NUMBER	DIM. A ± 0.10 (0.004)	DIM. B ± 0.10 (0.004)	DIM. C ± 0.10 (0.004)
HSMF-C15x SERIES	3.75 (0.148)	3.15 (0.124)	1.30 (0.051)

Figure 10. Tape Dimensions.

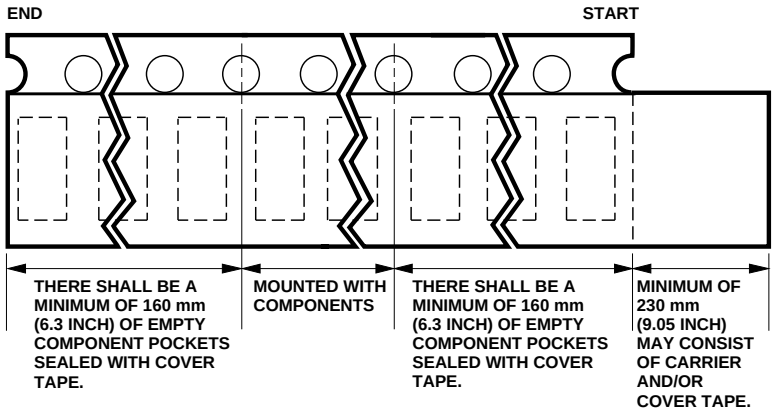


Figure 11. Tape Leader and Trailer Dimensions.

Convective IR Reflow Soldering

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

Notes:
1. All dimensions in millimeters (inches).
2. Tolerance is ± 0.1 mm (± 0.004 in.) unless otherwise specified.

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.

Agilent Technologies
Innovating the HP Way

www.semiconductor.agilent.com

Data subject to change.

Obsoletes 5968-7953E

5980-2423E (9/00)