HSMW-C820
High Performance Surface Mount LEDs

AVAGO TECHNOLOGIES

Data Sheet

Description

HSMW-C820 is a low cost medium performance device, which can handle high thermal and drive current, by efficiently dissipating the heat out of the package to the motherboard. These features enable two area of flexibility i.e. higher current driving with the use of dimmer dice or drive lower current with brighter dice for more efficient power saving requirements. The unique feature that enable all this flexibility is the heat sink design that allow the heat from the dice being dissipated out directly down to a motherboard heat sink.

The lamp design for medium angle (70°) radiation pattern enables it to have the maximum light extraction on axis with lens dome and the support of reflector cup design to meet market needs. This package also has flexibility to go for different types of radiation pattern as for future needs by changing the lens dome design. The footprint of the package follows the market standard footprint of 4.5mm x 3.2mm (capacitor 1812 standard) which enables it to be a drop in part for the customer with better performance. It has the standard surface mount requirements for solder re-flow process and reliability standards.

Features

- Very low Thermal Impedance
- Smooth, Consistent Spatial Radiation Pattern
- 70° View Angle
- 4.5L x 3.2W X 1.8H mm Footprint
- Good Intensity Output
- Compatible with IR Solder Reflow
- Colors Available: White (x:0.32; y:0.31)
- Available in 12mm Tape on 13" (330 mm) Diameter Reels
- Clear, Non-diffused Epoxy

Applications

- Telecommunications Handset

Benefits

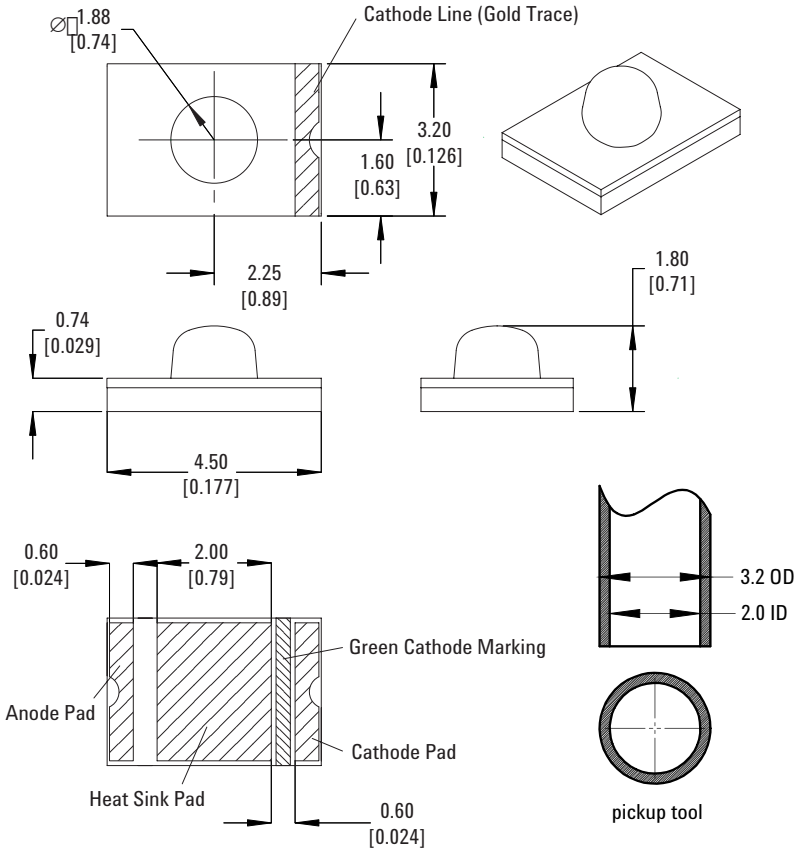
- High thermal dissipation capability
- Medium power device

Device Selection Guide

Part Number	Color	Min. Iv at 50mA (mcd)	Typ. Iv at 50mA (mcd)[1]	Part Per Reel
HSMW-C820	InGaN White	2000	2500	1000

Notes:
1. The luminous intensity I_V, is measured at the mechanical axis of the lamp package. The actual peak of the spatial radiation pattern may not be aligned with this axis.
2. Iv tolerance is ±15%

Package Dimensions



Notes:
1. All Dimensions in millimeters (Inches)
2. Tolerance is ±0.1mm unless otherwise specified

Absolute Maximum Ratings at $T_A = 25°C$

Parameter	InGaN White	Unit
DC Forward Current[1]	50	mA
Peak Pulsing Current[2]	150	mA
Power Dissipation	200	mW
Reverse Voltage (IR = 10mA)	-0.6	V
Led Junction Temperature	110	°C
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-40 to +85	°C
Soldering Temperature	See IR Reflow profile (Figure 7)	

Notes:
1. Derate linearly as shown in Figure 5
2. Pulse condition of 10% duty factor and 30msec width with frequencies of 3Hz

Electrical Characteristics at $T_A = 25°C$

	Forward Voltage V_F (Volts) @ I_F = 50mA		Reverse Voltage V_R (Volts) @ I_R = 100mA	Capacitance C(pF), V_F = 0 f = 1MHz	Thermal Resistance $Rq_{J\text{-}PIN}$ (°C/W)
Device	**Typ.**	**Max.**	**Typ**	**Typ**	**Typ.**
InGaN White	4.0	4.5	-0.6	840	140

Notes:
1. Vf tolerance is ±0.1V.

Optical Characteristic at 50mA ($T_A = 25°C$)

	Typical Chromaticity Coordinates[1]		Viewing Angle $2q_{1/2}$[2] (Degrees)	Luminous Efficacy hv[3] (lm/W)	Luminous Intensity/ Total Flux Iv(mcd)/Fv(mlm)
Color	**x**	**y**	**Typ**	**Typ**	**Typ**
White	0.32	0.31	70	265	0.8

Notes:
1. The chromaticity coordinates are derived from the CIE 1931 Chromaticity Diagram and represents the perceived color of the device
2. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is 1/2 the peak intensity.
3. Radiant intensity, I_e in watts/steradian, may be calculated from the equation $I_e = I_v/\eta_v$, where I_v is the luminous intensity in candelas and η_v is the luminous efficacy in lumens/watt.

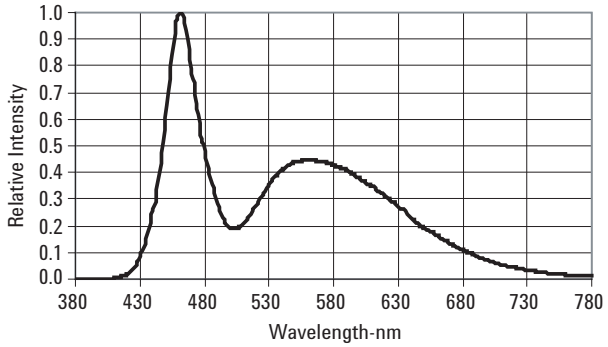


Figure 1. Relative Intensity vs. Wavelength

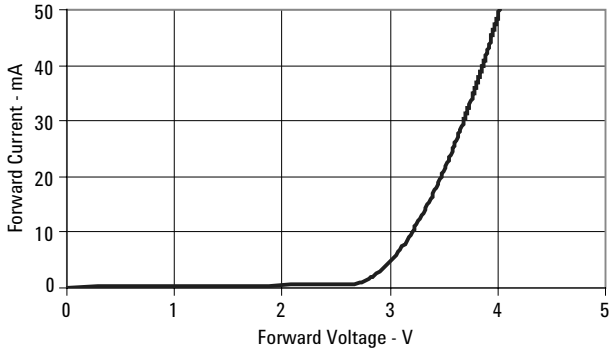


Figure 2. Forward Current vs Forward Voltage

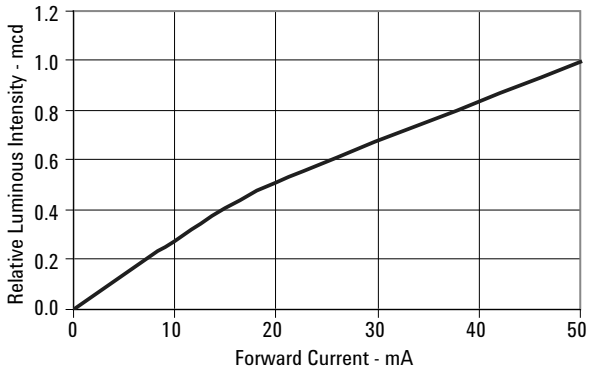


Figure 3. Relative Intensity vs. Forward Current

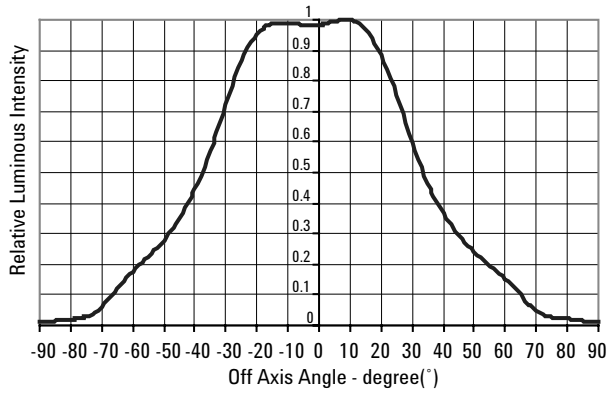


Figure 4. Radiation Pattern

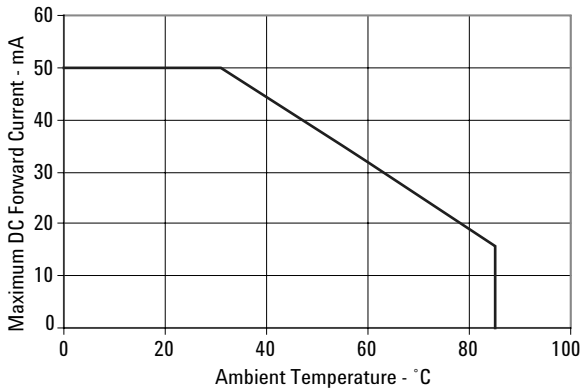


Figure 5. Maximum Forward Current vs. Ambient Temperature. Derated Based on T_JMAX = 110°C, $R\theta_{JA}$ = 350°C/W

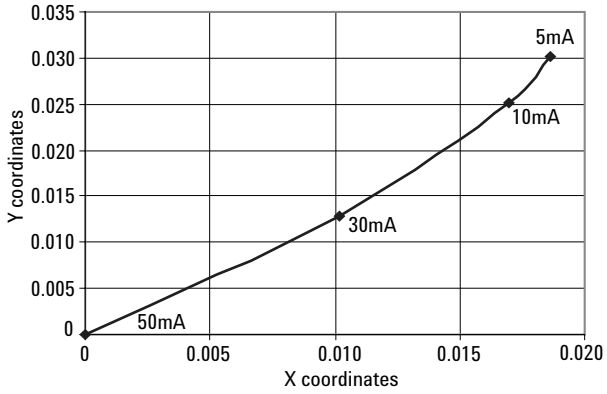


Figure 6. Chromaticity Shift vs. Current

*Note: (x,y) values @ 50mA reference to (0.0)

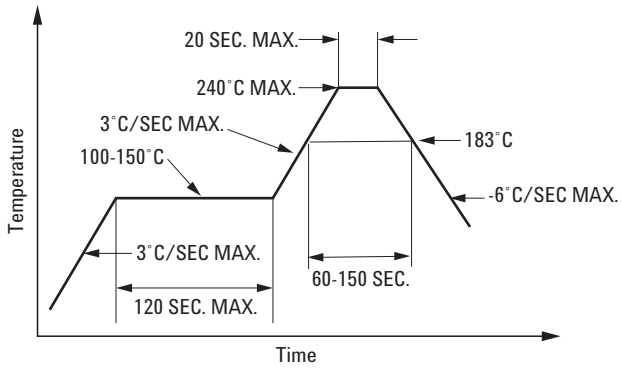


Figure 7. Recommended Reflow soldering Profile

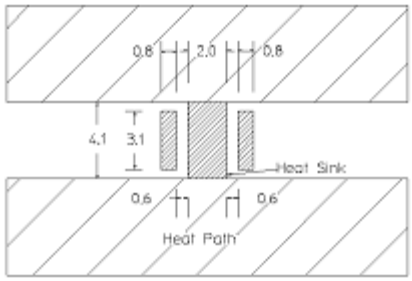


Figure 8. Recommended Soldering Pad Pattern

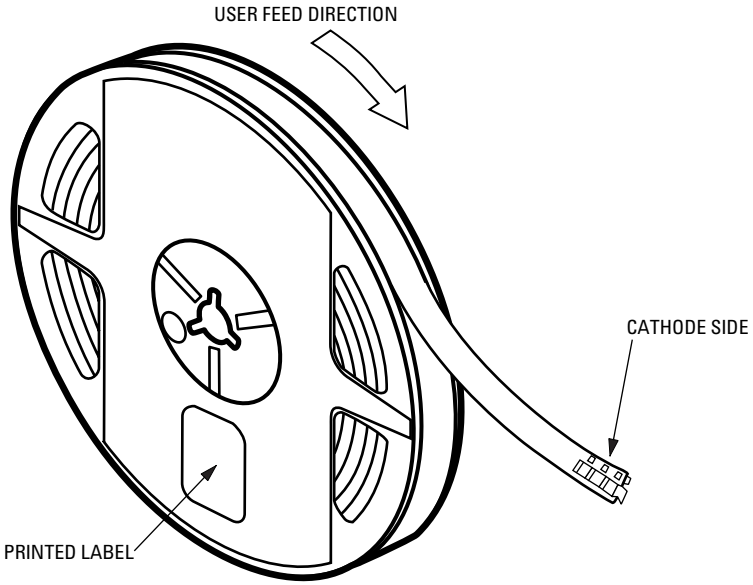


Figure 9: Reeling Orientations

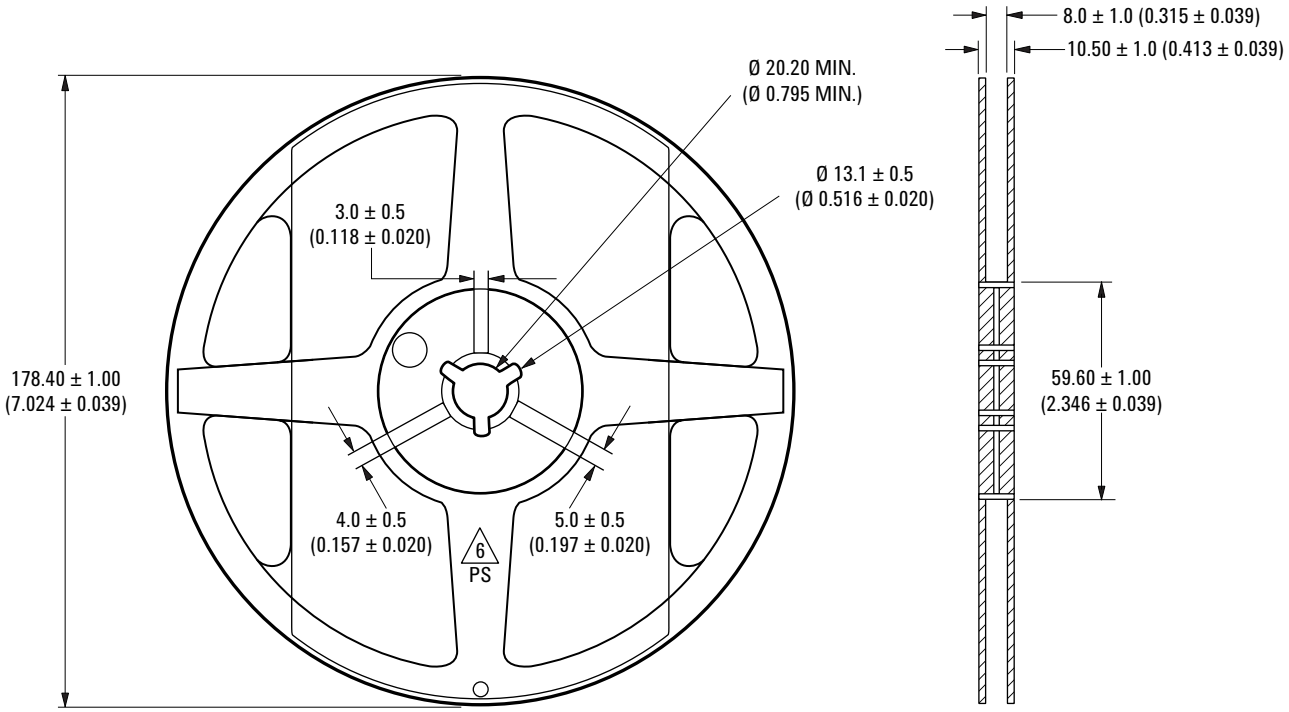


Figure 10: Reel Dimensions

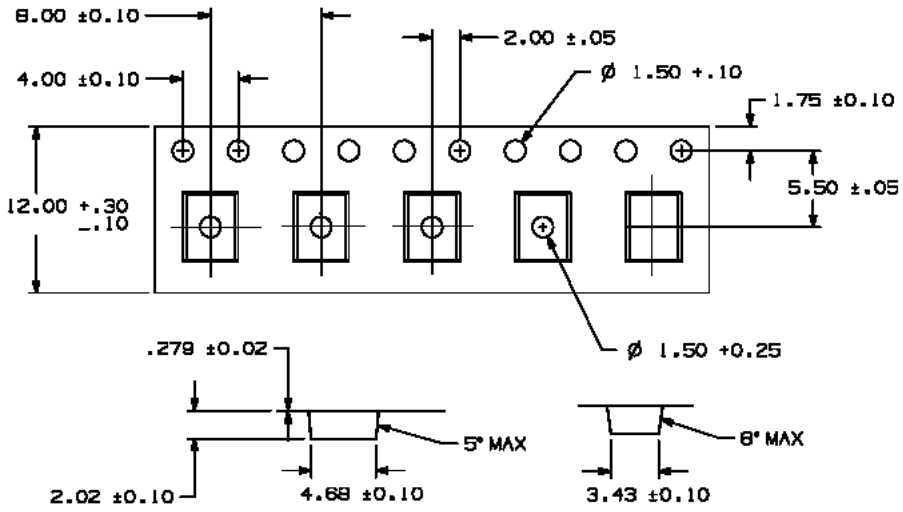


Figure 11: Tape Dimensions

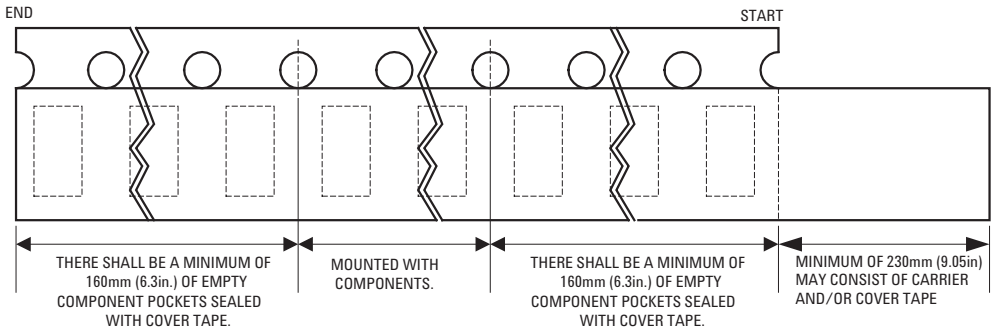


Figure 12: Tape Leader and Trailer Dimensions.

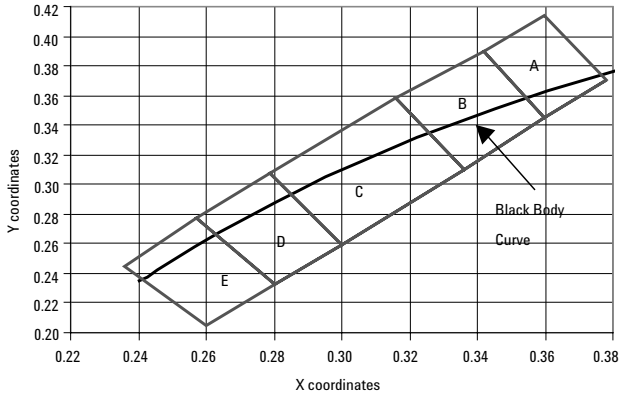
Notes:
1. All dimensions in millimeters.
2. Tolerance is ± 0.1 mm unless otherwise specified.

Intensity Bin Limit

Tolerance for each bin limits is ±15 %

Bin	Intensity (mcd) at 50mA	
	Min	**Max**
S	2000	2500
T	2500	3200
U	3200	4200
V	4200	5500
W	5500	7200

Color Bin Limits



Bin	Limits(Chromaticity Coordinates)				
Bin A	X	0.342	0.360	0.378	0.360
	Y	0.390	0.345	0.370	0.414
Bin B	X	0.316	0.336	0.360	0.342
	Y	0.358	0.310	0.345	0.390
Bin C	X	0.279	0.300	0.336	0.316
	Y	0.308	0.259	0.310	0.358
Bin D	X	0.257	0.280	0.300	0.279
	Y	0.277	0.233	0.259	0.308
Bin E	X	0.236	0.260	0.280	0.257
	Y	0.245	0.205	0.233	0.277

Tolerances ± 0.02

For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**

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