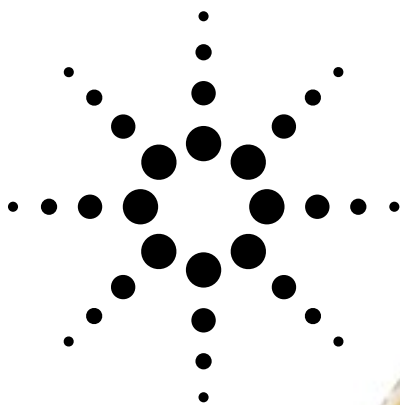


# Agilent HSMW-A10x-xxxxx White Surface Mount LED Indicator SMT PLCC-2 Data Sheet



## Description

This family of SMT LEDs is packaged in the industry standard PLCC-2 package. These SMT LEDs have high reliability performance and are designed to work under a wide range of environmental conditions. This high reliability feature makes them ideally suited to be used under harsh interior automotive as well as interior signs application conditions.

To facilitate easy pick & place assembly, the LEDs are packed in EIA-compliant tape and reel. Every reel will be shipped in single intensity and color bin.

These LEDs are compatible with IR solder reflow process.

The super wide viewing angle at 120° makes these LEDs ideally suited for panel, push button, or general backlighting in automotive interior, office equipment, industrial equipment, and home appliances.

The flat top emitting surface makes it easy for these LEDs to mate with light pipes. With the built-in reflector pushing up the intensity of the light output, these LEDs are also suitable to be used as LED pixels in interior electronic signs.

The super high brightness white PLCC-2 SMT LED is ideal for all kinds of backlighting applications in interior automotive, office automation, electrical appliance and industrial instrument markets to offer a clear and attractive product differentiation. The wide viewing angle at 120° also enables this white PLCC-2 SMT LED to be used in localised area ambience lighting in applications such as vanity mirror light, cabin light, and car door puddle light. The white color backlighting offered by this series of white PLCC-2 SMT LED is suitable to backlight color LCD screen in applications such as GPS (global positioning system) screens in cars.

## Features

- Industry standard PLCC-2 package (plastic leaded chip carrier)
- Super high reliability LED package
- Tight white color binning
- Super wide viewing angle at 120°
- Available in 8 mm carrier tape on 7-inch reel (2000 pieces)
- Compatible with IR and TTW soldering process

## Applications

- Interior automotive
  - Instrument panel backlighting
  - Central console backlighting
  - Cabin backlighting
- Office automation, home appliances, industrial equipment
  - Front panel backlighting
  - Push button backlighting
  - Display backlighting

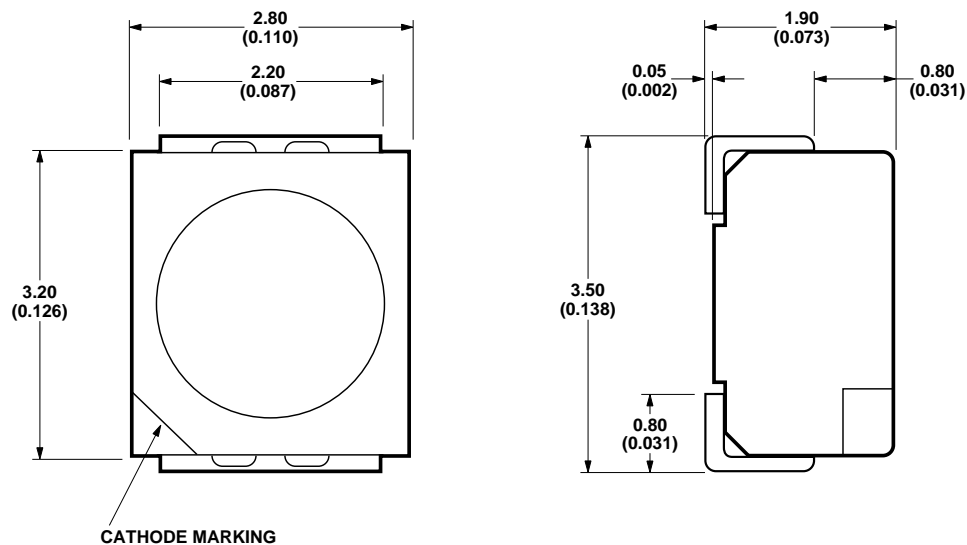
The flat top emitting surface makes it easy for these LEDs to mate with light pipes. With the built-in reflector pushing up the intensity of the light output, these LEDs are also suitable to be used as LED pixels in interior electronic signs.

**CAUTION:** HSMW-A10x LEDs are Class 2 ESD sensitive. Please observe appropriate precautions during handling and processing. Refer to Agilent Technologies Application Note AN-1142 for additional details.



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Package Dimensions



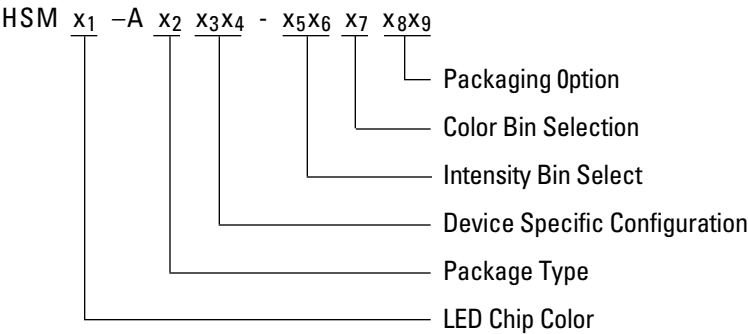
NOTE: ALL DIMENSIONS IN MILLIMETERS (INCHES).

Device Selection Guide

Color	Part Number	Min. I <sub>v</sub> @ 20 mA	Typical I <sub>v</sub> @ 20 mA
White	HSMW-A101-Q00J1	63	200
White	HSMW-A100-R00J1	100	300

**Note:**  
1. The luminous intensity I<sub>v</sub> 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.

Part Numbering System



**Absolute Maximum Ratings at  $T_A = 25^\circ\text{C}$** 

Parameters	InGaN
DC Forward Current <sup>[1]</sup>	30 mA
Peak Forward Current <sup>[2]</sup>	90 mA
Power Dissipation	114 mW
Reverse Voltage	5 V
Junction Temperature	110°C
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C

**Notes:**

1. Derate linearly as shown in Figure 5.
2. Duty factor = 10%, frequency = 1 kHz.

**Optical Characteristics at  $T_A = 25^\circ\text{C}$** 

Color	Typical Chromaticity Coordinates <sup>[1]</sup>		Viewing Angle 2 $\theta_{1/2}$ <sup>[2]</sup> (degrees) Typ.	Luminous Efficacy $\eta_v$ <sup>[3]</sup> (lm/W) Typ.	Luminous Intensity/ Total Flux $I_v(\text{mcd})/\Phi_v(\text{mlm})$ Typ.
	x	y			
White	0.31	0.31	120	260	0.45

**Notes:**

1. The chromaticity coordinates are derived from the CIE 1931 Chromaticity Diagram and represent 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  $\eta_v$  is the luminous efficacy in lumens/watt.

**Electrical Characteristics at  $T_A = 25^\circ\text{C}$** 

Color	Forward Voltage, $V_F$ (Volts) @ $I_F = 20 \text{ mA}$		Reverse Voltage, $V_R$ @ $10 \mu\text{A}$ Min.	Thermal Resistance $R_{\theta_{JP}}$ ( $^\circ\text{C/W}$ )
	Typ.	Max.		
White	3.4	4.05	5	280

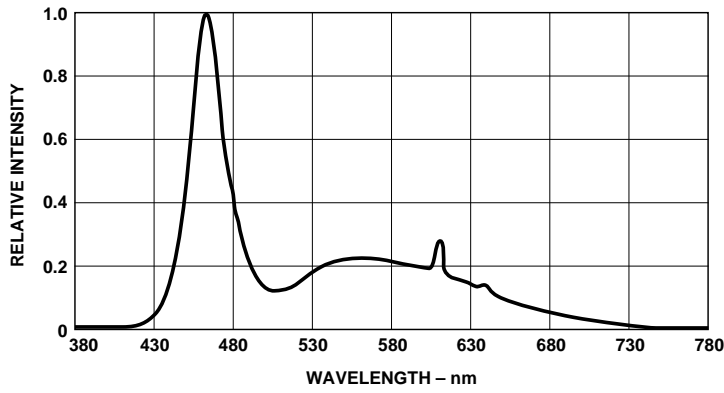


Figure 1. Relative intensity vs. wavelength.

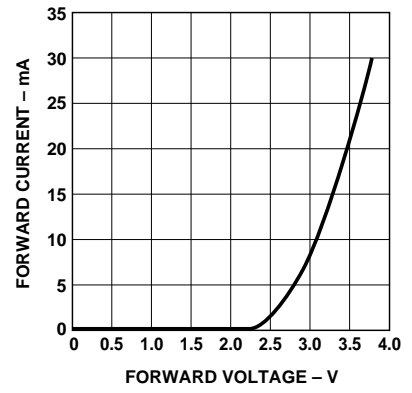


Figure 2. Forward current vs. forward voltage.

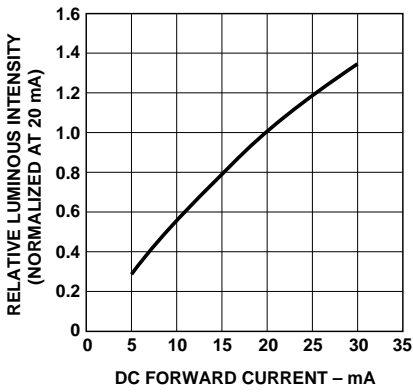


Figure 3. Relative intensity vs. forward current.

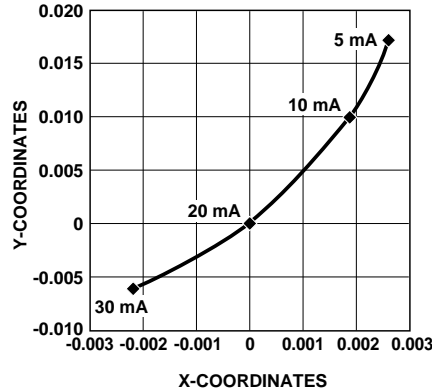


Figure 4. Chromaticity shift vs. current.  
Note: (x,y) values @ 20 mA reference to (0,0)

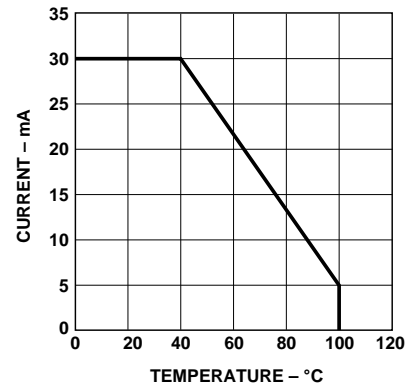


Figure 5. Maximum forward current vs. ambient temperature. Derated based on  $T_{JMAX} = 110^{\circ}C$ ,  $R_{\theta JA} = 500^{\circ}C/W$ .

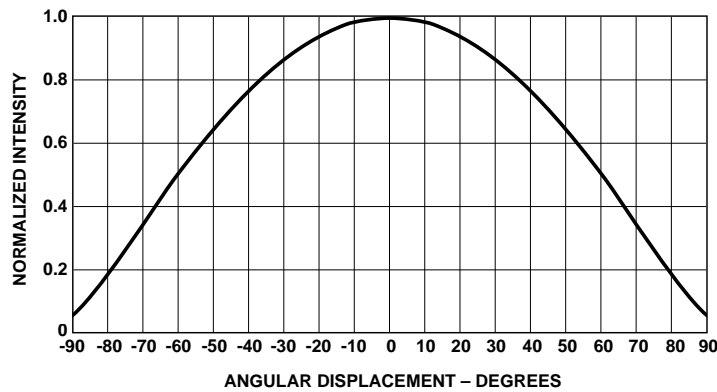


Figure 6. Radiation pattern.

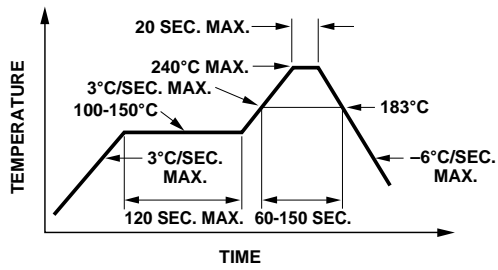


Figure 7. Recommended reflow soldering profile.

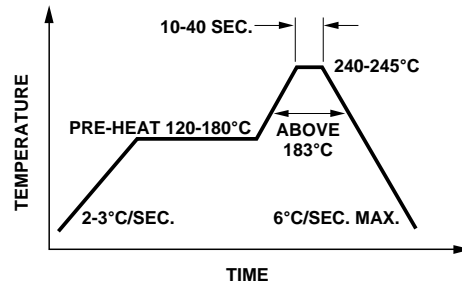
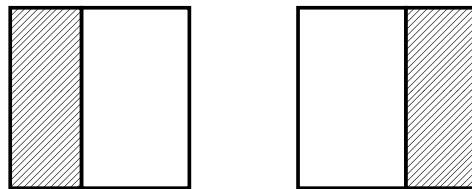
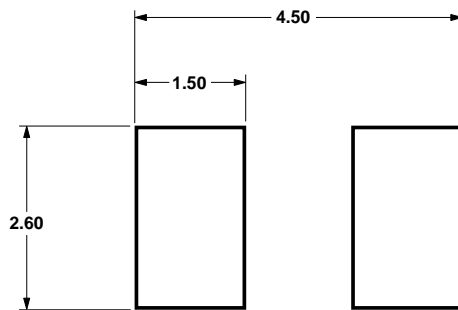


Figure 8. Recommended wave soldering profile.



 SOLDER RESIST

Figure 9. Recommended soldering pad pattern.

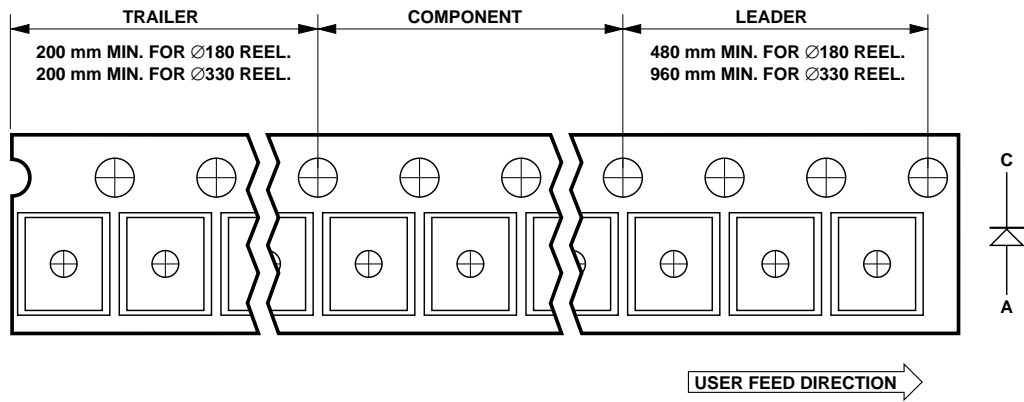


Figure 10. Tape leader and trailer dimension.

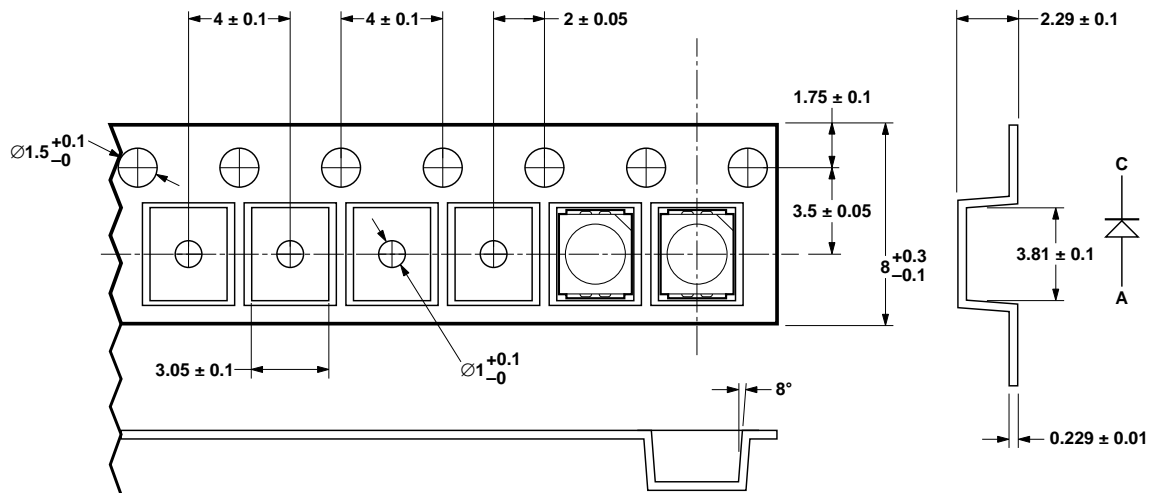


Figure 11. Tape dimension.

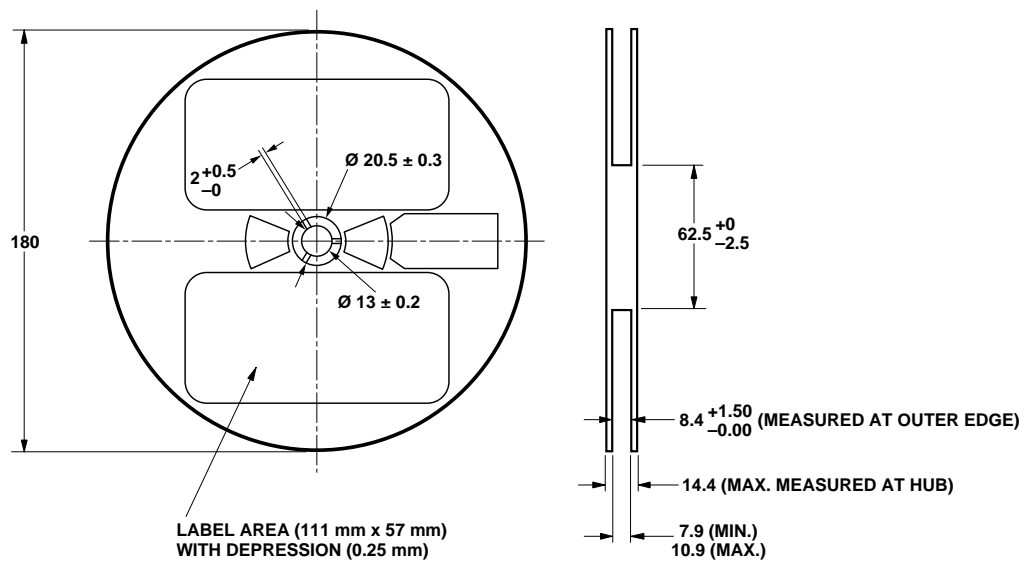


Figure 12. Reel dimensions.

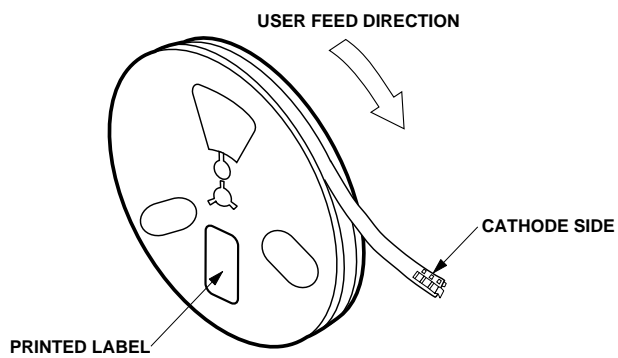


Figure 13. Reeling orientation.

Storage Condition: 5 to 30°C @ 60% RH max. Baking is required under the condition:

- the humidity indicator card becoming pink color
- the pack has been opened for more than 4 weeks.

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

This product is qualified as Moisture Sensitive JEDEC Level 2A.

#### Intensity Bin Select (X<sub>5</sub>X<sub>6</sub>)

Individual reel will contain parts from one half bin only.

X <sub>5</sub>	Min I <sub>v</sub> Bin
X <sub>6</sub>	
0	Full Distribution
3	3 half bins starting from X <sub>5</sub> 1
4	4 half bins starting from X <sub>5</sub> 1
5	5 half bins starting from X <sub>5</sub> 1
7	3 half bins starting from X <sub>5</sub> 2
8	4 half bins starting from X <sub>5</sub> 2
9	5 half bins starting from X <sub>5</sub> 2

#### Intensity Bin Limits

Bin ID	Min. (mcd)	Max. (mcd)
Q1	71.50	90.00
Q2	90.00	112.50
R1	112.50	140.00
R2	140.00	180.00
S1	180.00	224.00
S2	224.00	285.00
T1	285.00	355.00
T2	355.00	450.00
U1	450.00	560.00
U2	560.00	715.00
V1	715.00	900.00
V2	900.00	1125.00

Tolerance of each bin limit = ± 12%.

#### Color Bin Limits

Bin ID		Limits (Chromaticity Coordinates)			
A	x	0.33	0.33	0.37	0.37
	y	0.32	0.365	0.42	0.375
B	x	0.29	0.29	0.33	0.33
	y	0.26	0.306	0.365	0.32
C	x	0.25	0.25	0.29	0.29
	y	0.205	0.25	0.306	0.26
D	x	0.33	0.33	0.37	0.37
	y	0.365	0.416	0.444	0.42
E	x	0.29	0.29	0.33	0.33
	y	0.306	0.376	0.416	0.365
F	x	0.25	0.25	0.29	0.29
	y	0.25	0.332	0.376	0.306

#### Color Bin Select (X<sub>7</sub>)

Individual reel will contain parts from one full bin only.

X <sub>7</sub>	
0	Full Distribution
Z	A and B only
Y	B and C only
V	D and E only
U	E and F only
Q	A, B and C only
M	D, E and F only

#### Packaging Option (X<sub>8</sub>X<sub>9</sub>)

X <sub>8</sub> X <sub>9</sub>	
J1	20 mA Test Current, Top Mount, 7 inch Reel
J2	10 mA Test Current, Top Mount, 7 inch Reel

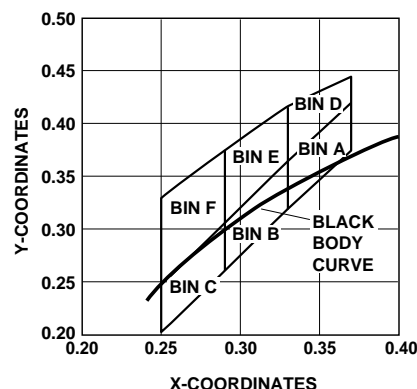


Figure 14.

#### [www.agilent.com/semiconductors](http://www.agilent.com/semiconductors)

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

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Obsoletes 5988-7877EN

November 29, 2002

5988-8451EN



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