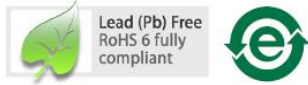


# ASMT-UxB5-Zxxxx

## Surface Mount LED Indicator



### 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 as interior signs application conditions.

These LEDs are compatible with reflow soldering process.

The wide viewing angle at 120° makes these LEDs ideally suited for panel, push button, 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.

#### Features

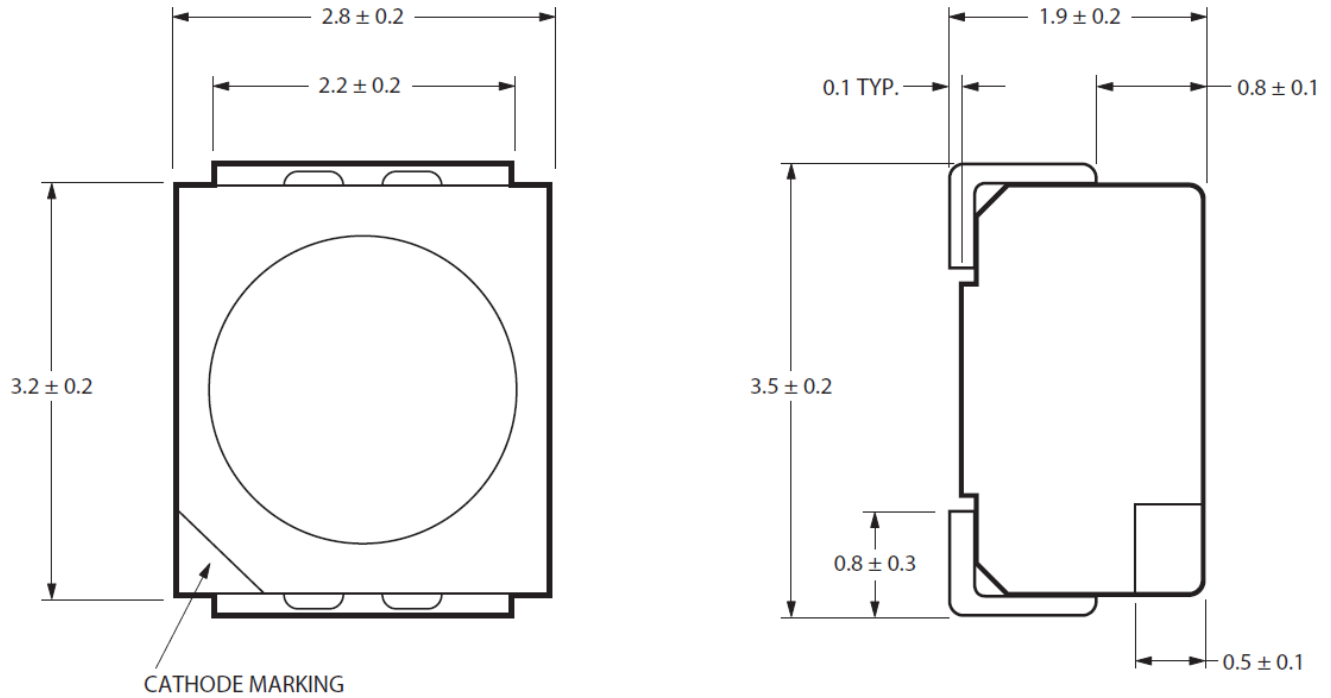
- Industry standard PLCC-2 package
- High reliability LED package
- High brightness using InGaN dice technologies
- Super wide viewing angle at 120°
- Available in 8 mm carrier tape on 7 inch reel
- Stable & Consistent performance with minimum degradation with Silicone Encapsulation
- Compatible with IR soldering process
- JEDEC MSL3

#### Applications

- Electronic signs and signals
  - Interior full color sign
  - Variable message sign
- Office automation, home appliances, industrial equipment
  - Front panel backlighting
  - Push button backlighting
  - Display backlighting

CAUTION: ASMT-UxB5-Zxxxx LEDs are Class 1C ESD sensitive. Please observe appropriate precautions during handling and processing. Refer to Avago Application Note AN-1142 for additional details.

## Package Dimensions



NOTE: ALL DIMENSIONS IN MILLIMETERS.

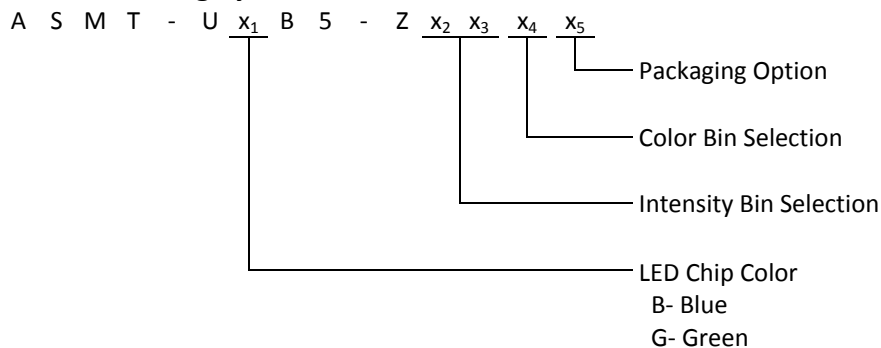
**Table 1. Device Selection Guide**

| Color | Part Number     | Min IV (mcd) | Max. IV (mcd) | Test Current (mA) | Dice Technology |
|-------|-----------------|--------------|---------------|-------------------|-----------------|
| Blue  | ASMT-UBB5-ZS7Q2 | 224.00       | 450.00        | 20                | InGaN           |
| Blue  | ASMT-UBB5-ZS7P2 | 224.00       | 450.00        | 20                | InGaN           |
| Blue  | ASMT-UBB5-ZS7Y2 | 224.00       | 450.00        | 20                | InGaN           |
| Blue  | ASMT-UBB5-ZT3Q2 | 285.00       | 560.00        | 20                | InGaN           |
| Blue  | ASMT-UBB5-ZT3P2 | 285.00       | 560.00        | 20                | InGaN           |
| Blue  | ASMT-UBB5-ZT3Y2 | 285.00       | 560.00        | 20                | InGaN           |
| Green | ASMT-UGB5-ZV7Q2 | 900.00       | 1800.00       | 20                | InGaN           |
| Green | ASMT-UGB5-ZV7Q2 | 900.00       | 1800.00       | 20                | InGaN           |
| Green | ASMT-UGB5-ZV7P2 | 900.00       | 1800.00       | 20                | InGaN           |
| Green | ASMT-UGB5-ZV7Y2 | 900.00       | 1800.00       | 20                | InGaN           |

Notes:

1. The luminous intensity IV, 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 =  $\pm 12\%$

## Part Numbering System



**Table 2. Absolute Maximum Ratings (T<sub>A</sub> = 25 °C)**

| Parameters                          | ASMT-UxB5           |
|-------------------------------------|---------------------|
| DC Forward Current <sup>[1]</sup>   | 20mA                |
| Peak Forward Current <sup>[2]</sup> | 100mA               |
| Power Dissipation                   | 114 mW              |
| Reverse Voltage                     | 5 V                 |
| Junction Temperature                | 110 °C              |
| Operating Temperature               | - 40 °C to + 100 °C |
| Storage Temperature                 | - 40 °C to + 100 °C |

Notes:

1. Derate linearly as shown in Figure 4.
2. Duty Factor = 10%, Frequency = 1kHz.
3. Drive current between 10 mA and 20 mA is recommended for best long term performance.
4. Operation at current below 5 mA is not recommended.

**Table 3. Optical Characteristics (T<sub>A</sub> = 25 °C)**

| Color | Part Number | Dice Technology | Dominant Wavelength <sup>[1]</sup><br>λ <sub>D</sub> (nm) Typ. | Viewing Angle 2θ <sub>½</sub> <sup>[2]</sup><br>(Degrees) Typ. |
|-------|-------------|-----------------|--|--|
| Blue  | ASMT-UBB5   | InGaN           | 470  | 120  |
| Green | ASMT-UGB5   | InGaN           | 525  | 120  |

Notes:

1. The chromaticity coordinates are derived from the CIE 1931 Chromaticity Diagram and represent the perceived color of the device
2. θ<sub>½</sub> is the off-axis angle where the luminous intensity is ½ the peak intensity.

**Table 4. Electrical Characteristics (T<sub>A</sub> = 25 °C)**

| Part Number | Forward Voltage<br>V <sub>F</sub> (Volts) @ I <sub>F</sub> = 20 mA |      |
|-------------|--|------|
|             | Typ.   | Max. |
| ASMT-UBB5   | 3.2  | 4.1  |
| ASMT-UGB5   | 3.2  | 4.1  |

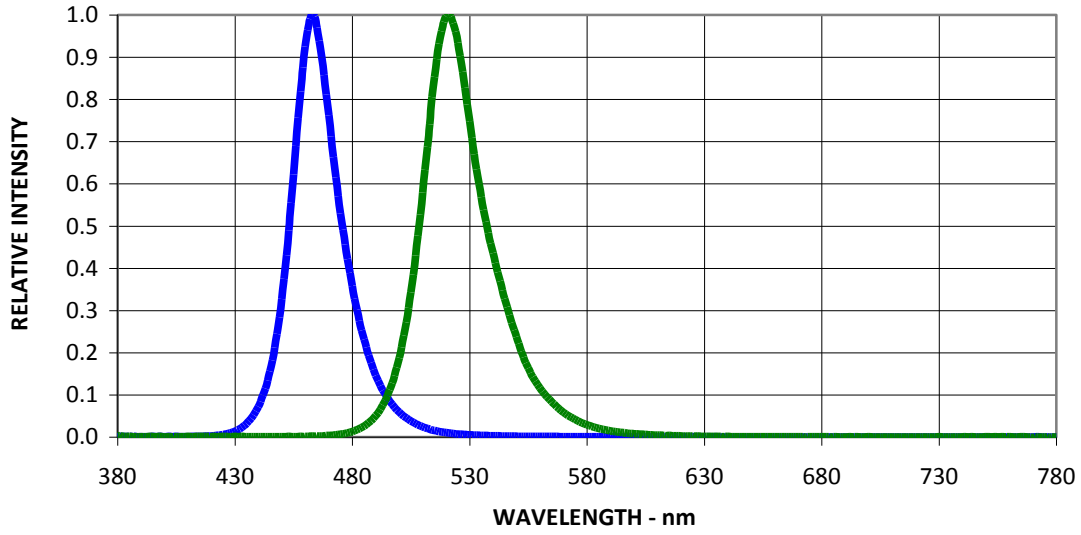


Figure 1. Relative Intensity Vs. Wavelength

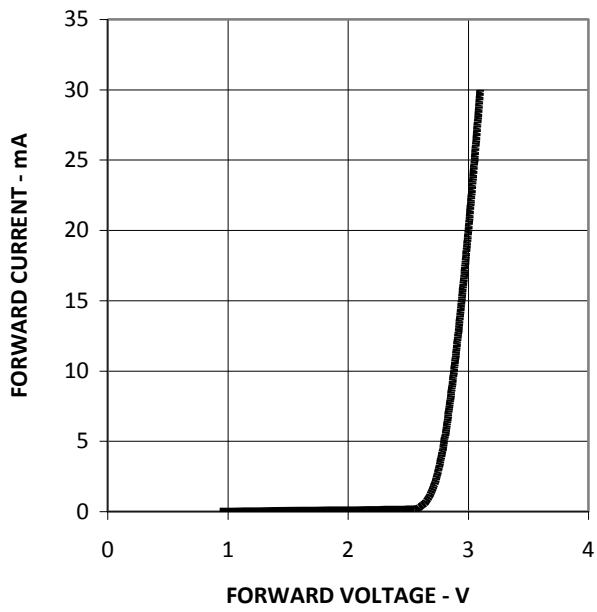
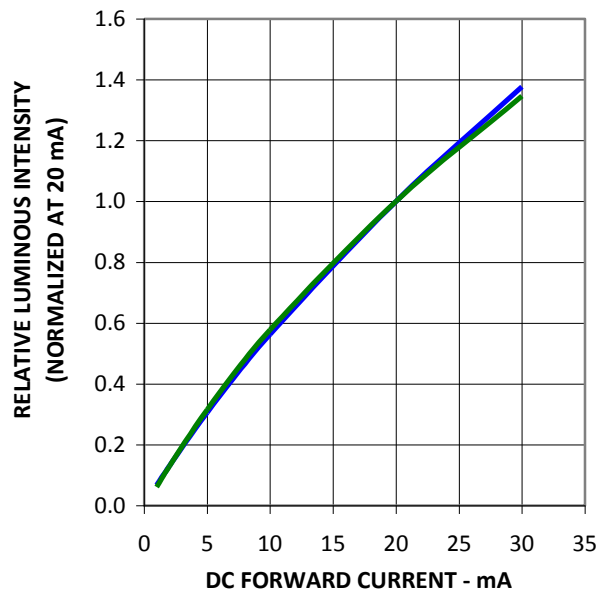


Figure 2. Forward Current Vs. Forward Voltage



3. Relative Intensity Vs. Forward Current

Figure

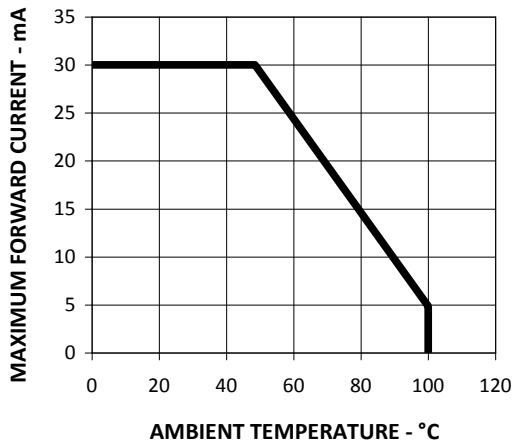


Figure 4. Maximum Forward Current Vs. Ambient Temperature. Derated Based on TJMAX = 110°C, RθJA=500°C/W

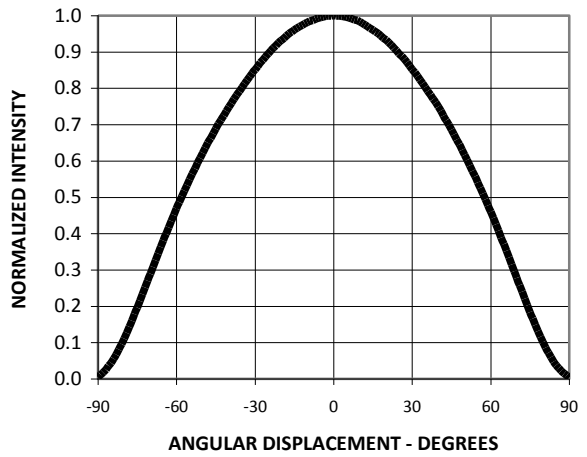
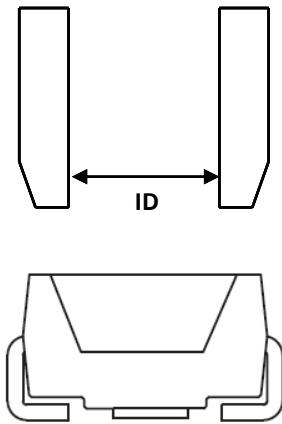
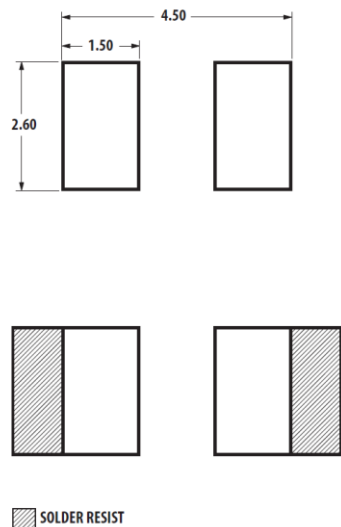


Figure 5. Radiation Pattern



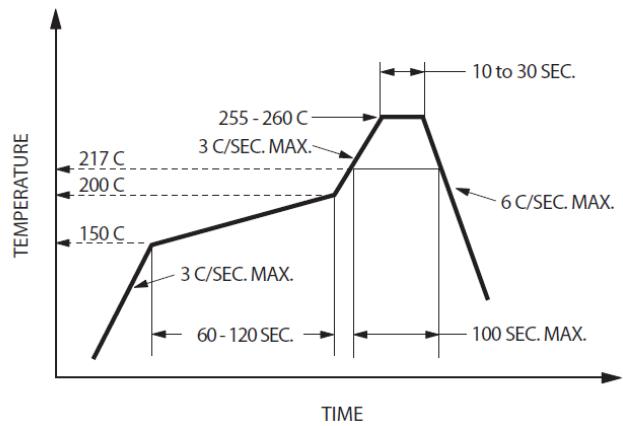
Note : Diameter "ID" should be >1.7mm

Figure 6. Recommended Pick and Place Nozzle Size



■ SOLDER RESIST

Figure 8. Recommended Soldering Pad Pattern



Note: For detail information on reflow soldering of Avago surface mount LEDs, do refer to Avago Application Note AN 1060 Surface Mounting

Figure 7. Recommended Pb-free Reflow Soldering Profile

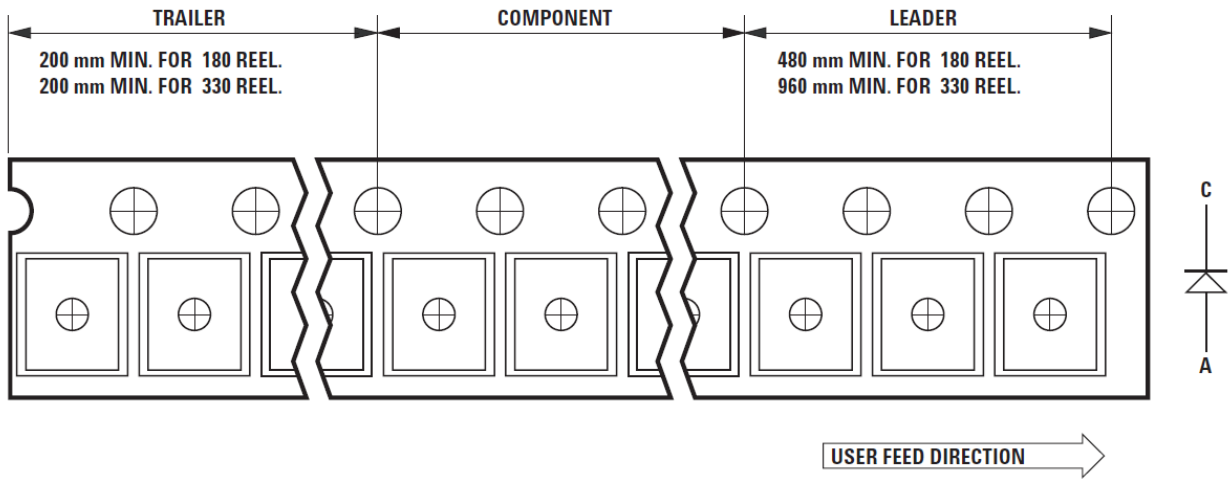


Figure 9. Tape Leader and Trailer Dimensions

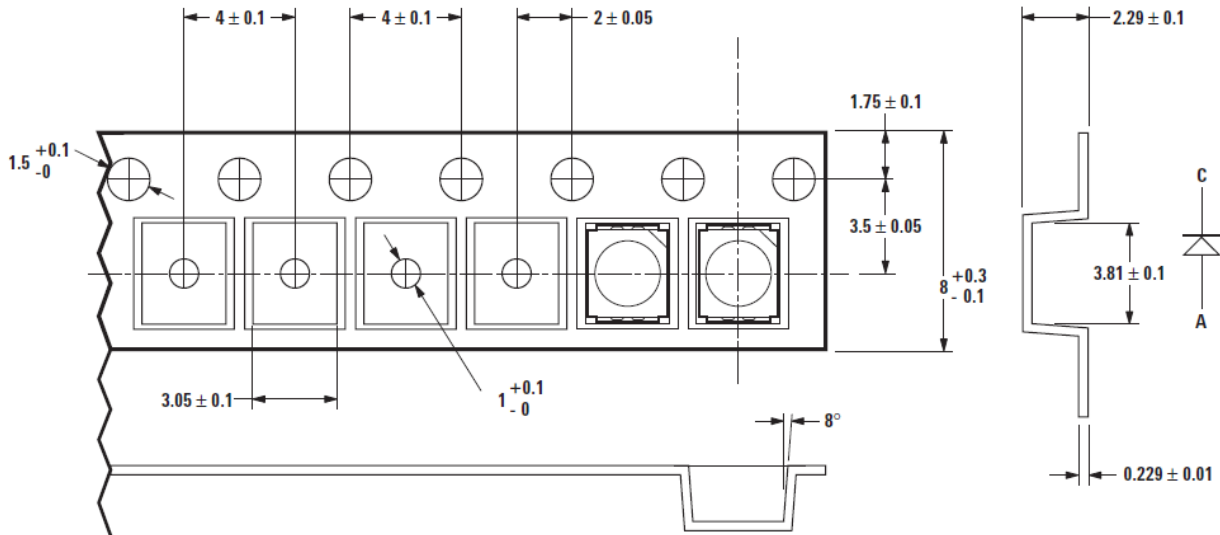


Figure 10. Tape Dimensions

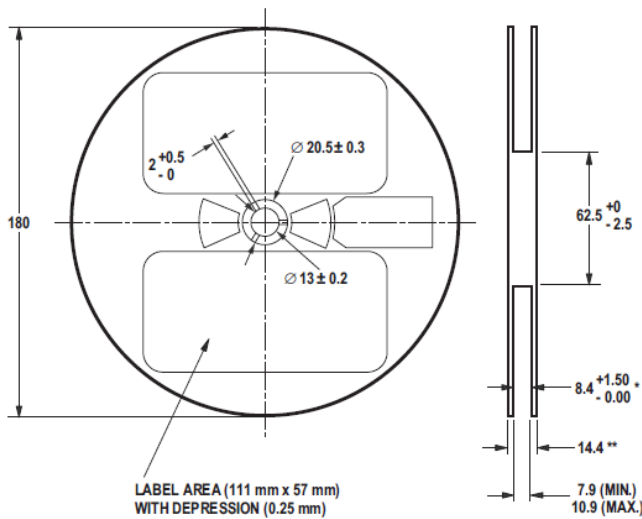


Figure 11. Reel dimensions

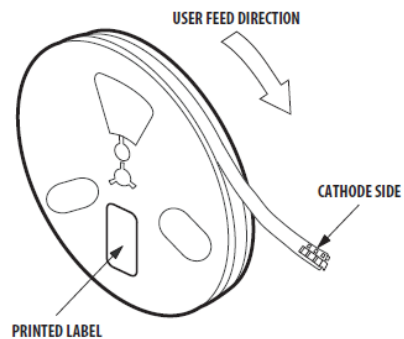


Figure 12. Reeling Orientation

### Intensity Bin Select (X<sub>2</sub>X<sub>3</sub>)

Individual reel will contain parts from one half bin only

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

### Intensity Bin Limits

| Bin ID | Min. (mcd) | Max. (mcd) |
|--------|------------|------------|
| 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    |
| W1     | 1125.00    | 1400.00    |
| W2     | 1400.00    | 1800.00    |
| X1     | 1800.00    | 2240.00    |
| X2     | 2240.00    | 2850.00    |
| Y1     | 2850.00    | 3550.00    |
| Y2     | 3550.00    | 4500.00    |
| Z1     | 4500.00    | 5600.00    |
| Z2     | 5600.00    | 7150.00    |

Tolerance of each bin limit = ± 12%

### Color Bin Select (X<sub>4</sub>)

Individual reel will contain parts from one full bin only.

| X <sub>4</sub> |                        |
|----------------|------------------------|
| 0              | Full Distribution      |
| Z              | A and B only           |
| Y              | B and C only           |
| W              | C and D only           |
| V              | D and E only           |
| U              | E and F only           |
| T              | F and G only           |
| S              | G and H only           |
| Q              | A, B, and C only       |
| P              | B, C, and D only       |
| N              | C, D, and E only       |
| M              | D, E, and F only       |
| L              | E, F, and G only       |
| K              | F, G, and H only       |
| 1              | A, B, C, and D only    |
| 2              | E, F, G, and H only    |
| 3              | B, C, D, and E only    |
| 4              | C, D, E, and F only    |
| 5              | A, B, C, D, and E only |
| 6              | B, C, D, E, and F only |

### Color Bin Limits

| Blue  | Min.(nm) | Max.(nm) |
|-------|----------|----------|
| A     | 460.0    | 465.0    |
| B     | 465.0    | 470.0    |
| C     | 470.0    | 475.0    |
| D     | 475.0    | 480.0    |
| Green | Min.(nm) | Max.(nm) |
| A     | 515.0    | 520.0    |
| B     | 520.0    | 525.0    |
| C     | 525.0    | 530.0    |
| D     | 530.0    | 535.0    |

Tolerance of each bin limit = ± 1 nm.

### Packaging Option (X<sub>5</sub>)

| Option | Test Current | Package Type | Reel Size |
|--------|--------------|--------------|-----------|
| 2      | 20mA         | Top Mount    | 7 inch    |

## Handling Precaution

The encapsulation material of the product is made of silicone for better reliability of the product. As silicone is a soft material, please do not press on the silicone or poke a sharp object onto the silicone. These might damage the product and cause premature failure. During assembly or handling, the unit should be held on the body only. Please refer to Avago Application Note AN 5288 for detail information.

## Moisture Sensitivity

This product is qualified as Moisture Sensitive Level 3 per Jedec J-STD-020. Precautions when handling this moisture sensitive product is important to ensure the reliability of the product. Do refer to Avago Application Note AN5305 Handling of Moisture Sensitive Surface Mount Devices for details.

## A. Storage before use

- Unopen moisture barrier bag (MBB) can be stored at <math> < 40^{\circ}\text{C} / 90\% \text{RH}</math> for 12 months. If the actual shelf life has exceeded 12 months and the HIC indicates that baking is not required, then it is safe to reflow the LEDs per the original MSL rating.
- It is not recommended to open the MBB prior to assembly (e.g. for IQC).

## B. Control after opening the MBB

- The humidity indicator card (HIC) shall be read immediately upon opening of MBB.
- The LEDs must be kept at <math> < 30^{\circ}\text{C} / 60\% \text{RH}</math> at all time and all high temperature related process including soldering, curing or rework need to be completed within 168 hours.

## C. Control for unfinished reel

- For any unuse LEDs, they need to be stored in sealed MBB with desiccant or desiccator at <math> < 5\% \text{RH}</math>.
- 

## D. Control of assembled boards

- If the PCB soldered with the LEDs is to be subjected to other high temperature processes, the PCB need to be stored in sealed MBB with desiccant or desiccator at <math> < 5\% \text{RH}</math> to ensure no LEDs have exceeded their floor life of 168 hours.

## E. Baking is required if:

- The HIC indicator is not GREEN at 10% and is AZURE at 5%.
- The LEDs are exposed to condition of <math> > 30^{\circ}\text{C} / 60\% \text{RH}</math> at any time.
- The LEDs floor life exceeded 168 hours.

Recommended baking condition:  $60 \pm 5^{\circ}\text{C}$  for 20 hours.

For product information and a complete list of distributors, please go to our web site:  
[www.avagotech.com](http://www.avagotech.com)

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September 7, 2012

