

# ASMT-Jx3x

## 3 W Mini Power LED Light Source



### Data Sheet



Lead (Pb) Free  
RoHS 6 fully  
compliant



#### Description

The 3 W Mini Power LED Light Source is a high performance energy efficient device that can handle high thermal and high driving current. Option with electrically isolated metal slug is also available.

The low profile package design and ultra small footprint is suitable for a wide variety of applications especially where space and height is a constraint.

The package is compatible with reflow soldering process. To facilitate easy pick and place assembly, the LEDs are packed in EIA-compliant tape and reel.

#### Features

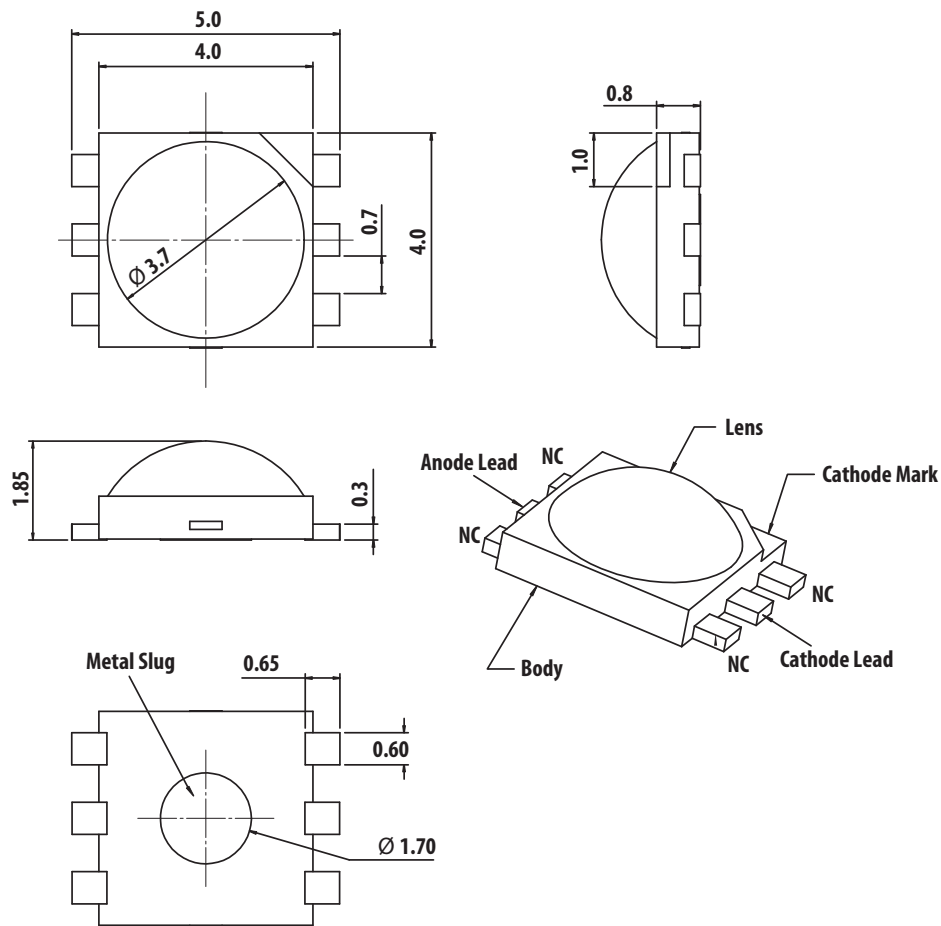
- Available in Deep Red, Red, Red Orange, Amber, Green, Blue, and Royal Blue
- Small footprint and low profile
- Symmetrical outline
- Energy efficient
- Direct heat transfer from metal slug to motherboard
- Compatible with reflow soldering process
- High current operation
- Long operation life
- Wide viewing angle
- Silicone encapsulation
- Non-ESD sensitive (threshold > 16 kV)
- MSL 1 products

#### Applications

- Sign backlight
- Safety, exit and emergency sign lightings
- Specialty lighting such as task lighting and reading lights
- Retail display
- Commercial lighting
- Accent or marker lightings, strip or step lightings
- Portable lightings, bicycle head lamp, torch lights.
- Decorative lighting
- Architectural lighting
- Pathway lighting
- Street lighting
- Pedestrian street lighting
- Tunnel lighting
- Horticulture

**CAUTION:** Customer is advised to keep the LEDs in the MBB when not in use as prolonged exposure to environment might cause the silver plated leads to tarnish, which might cause difficulties in soldering.

## Package Dimensions

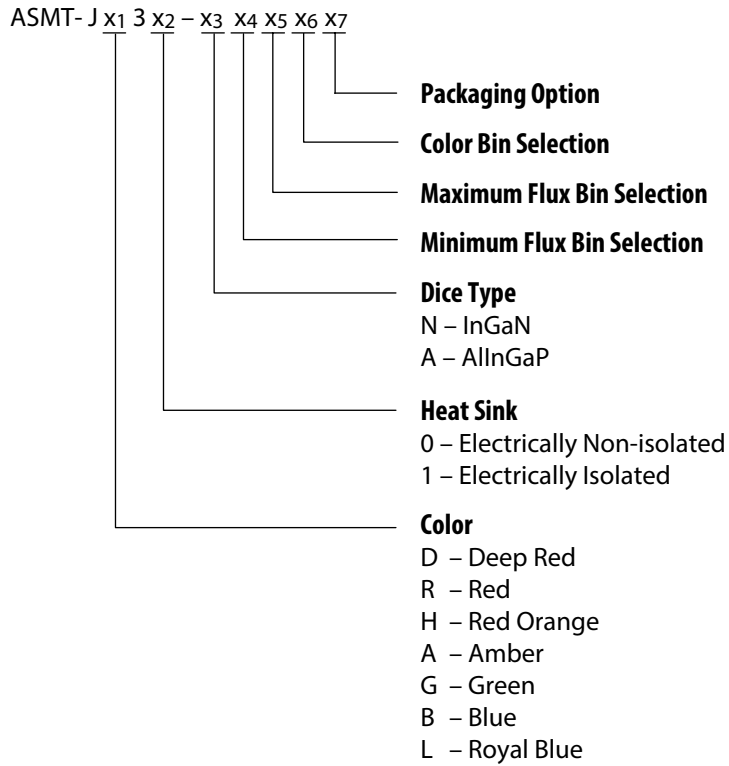


**Figure 1. ASMT-Jx3x package outline drawing**

### Notes:

1. All dimensions in millimeters.
2. Metal slug is connected to anode for electrically non-isolated option.
3. Tolerance is  $\pm 0.1$  mm, unless otherwise specified.
4. Terminal finish: Ag plating.
5. Corresponding NC (No Connection) leads adjacent to anode and cathode leads can be electrically short.

## Part Numbering System



Note:

1. For selection details, see page 10.

## Device Selection Guide ( $T_J = 25^\circ\text{C}$ )

| Part Number     | Color      | Luminous Flux (lm) /<br>Radiometric Power (mW), $\Phi_V^{[1,2]}$ |        |          | Test Current<br>(mA) | Dice<br>Technology | Electrically<br>Isolated<br>Metal Slug |
|-----------------|------------|------------------------------------------------------------------|--------|----------|----------------------|--------------------|----------------------------------------|
|                 |            | Min.                                                             | Typ.   | Max.     |                      |                    |                                        |
| ASMT-JD30-ALN01 | Deep Red   | 175 mW                                                           | 240 mW | 355 mW   | 350                  | AlInGaP            | No                                     |
| ASMT-JR30-AST01 | Red        | 51.7                                                             | 58.0   | 87.4     | 350                  | AlInGaP            | No                                     |
| ASMT-JH30-ARS01 | Red Orange | 39.8                                                             | 48.0   | 67.2     | 350                  | AlInGaP            | No                                     |
| ASMT-JA30-ARS01 | Amber      | 39.8                                                             | 48.0   | 67.2     | 350                  | AlInGaP            | No                                     |
| ASMT-JG31-NUW01 | Green      | 87.4                                                             | 110.0  | 129.5    | 350                  | InGaN              | Yes                                    |
| ASMT-JB31-NNP01 | Blue       | 18.1                                                             | 25.0   | 30.6     | 350                  | InGaN              | Yes                                    |
| ASMT-JL31-NRS01 | Royal Blue | 515 mW                                                           | 600 mW | 685.0 mW | 350                  | InGaN              | Yes                                    |

Notes:

1.  $\Phi_V$  is the total luminous flux / radiometric power output as measured with an integrating sphere at 25 ms mono pulse condition.
2. Flux tolerance is  $\pm 10\%$ .

## Absolute Maximum Ratings

| Parameter                                        | AlInGaP         | InGaN       | Units |
|--------------------------------------------------|-----------------|-------------|-------|
| DC Forward Current <sup>[1]</sup>                | 700             | 700         | mA    |
| Peak Pulsing Current                             | 1500            | 2400        | mA    |
| Power Dissipation                                | 1820            | 2730        | mW    |
| LED Junction Temperature                         | 125             | 135         | °C    |
| Operating Metal Slug Temperature Range at 350 mA | -40 to +115     | -40 to +120 | °C    |
| Operating Metal Slug Temperature Range at 700 mA | -40 to +100     | -40 to +105 | °C    |
| Storage Temperature Range                        | -40 to +120     | -40 to +120 | °C    |
| Soldering Temperature                            | See Figure 24   |             |       |
| Reverse Voltage <sup>[2]</sup>                   | Not recommended |             |       |

Notes:

1. Derate linearly based on Figure 10 for AlInGaP and Figure 20 for InGaN.
2. Not designed for reverse-bias operation.

## Optical Characteristics at 350 mA (T<sub>J</sub> = 25 °C)

| Part Number     | Color      | Peak Wavelength, $\lambda_{PEAK}$ (nm) | Dominant Wavelength, $\lambda_D$ <sup>[1]</sup> (nm) | Viewing Angle, $2\theta_{1/2}$ <sup>[2]</sup> (°) | Luminous Efficiency (lm/W) |
|-----------------|------------|----------------------------------------|------------------------------------------------------|---------------------------------------------------|----------------------------|
|                 |            | Typ.                                   | Typ.                                                 | Typ.                                              | Typ.                       |
| ASMT-JD30-ALN01 | Deep Red   | 660                                    | 640                                                  | 165                                               | Not Applicable             |
| ASMT-JR30-AST01 | Red        | 635                                    | 625                                                  | 165                                               | 79                         |
| ASMT-JH30-ARS01 | Red Orange | 625                                    | 615                                                  | 165                                               | 65                         |
| ASMT-JA30-ARS01 | Amber      | 598                                    | 590                                                  | 165                                               | 65                         |
| ASMT-JG31-NUW01 | Green      | 519                                    | 525                                                  | 165                                               | 98                         |
| ASMT-JB31-NNP01 | Blue       | 454                                    | 460                                                  | 165                                               | 22                         |
| ASMT-JL31-NRS01 | Royal Blue | 450                                    | 455                                                  | 165                                               | Not Applicable             |

## Electrical Characteristic at 350 mA (T<sub>J</sub> = 25 °C)

| Dice Type | Forward Voltage, V <sub>F</sub> (V) |     |      | Thermal Resistance, R <sub>θj-ms</sub> (°C/W) <sup>[1]</sup> |
|-----------|-------------------------------------|-----|------|--------------------------------------------------------------|
|           | Min.                                | Typ | Max. | Typ.                                                         |
| AlInGaP   | 1.7                                 | 2.1 | 2.3  | 9                                                            |
| InGaN     | 2.8                                 | 3.2 | 3.5  | 9                                                            |

Note:

1. R<sub>θj-ms</sub> is Thermal Resistance from LED junction to metal slug.

## Optical and Electrical Characteristic at 700 mA (T<sub>J</sub> = 25 °C)

| Part Number     | Color      | Luminous Flux (lm) / Radiometric Power (mW), $\phi_V$ | Forward Voltage, V <sub>F</sub> (V) |
|-----------------|------------|-------------------------------------------------------|-------------------------------------|
|                 |            | Typ.                                                  | Typ.                                |
| ASMT-JD30-ALN01 | Deep Red   | 480 mW                                                | 2.4                                 |
| ASMT-JR30-AST01 | Red        | 104.0                                                 | 2.4                                 |
| ASMT-JH30-ARS01 | Red Orange | 86.0                                                  | 2.4                                 |
| ASMT-JA30-ARS01 | Amber      | 86.0                                                  | 2.4                                 |
| ASMT-JG31-NUW01 | Green      | 176.0                                                 | 3.6                                 |
| ASMT-JB31-NNP01 | Blue       | 43.0                                                  | 3.6                                 |
| ASMT-JL31-NRS01 | Royal Blue | 1020 mW                                               | 3.6                                 |

## AlInGaP

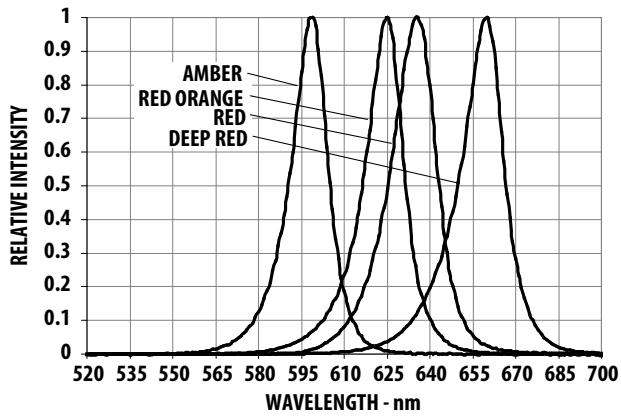


Figure 2. Relative Intensity vs. Wavelength for Deep Red, Red, Red Orange and Amber

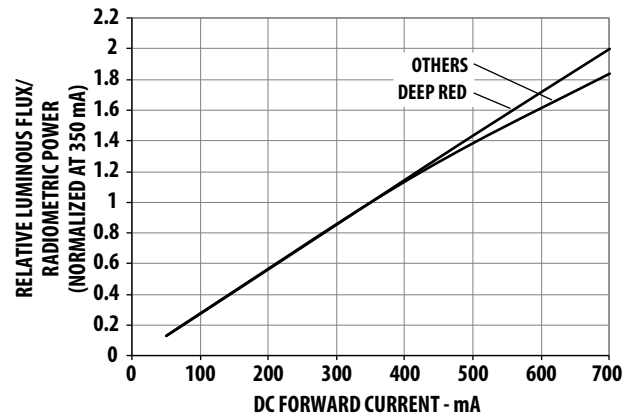


Figure 3. Relative Luminous Flux/ Radiometric Power vs. Mono Pulse Current

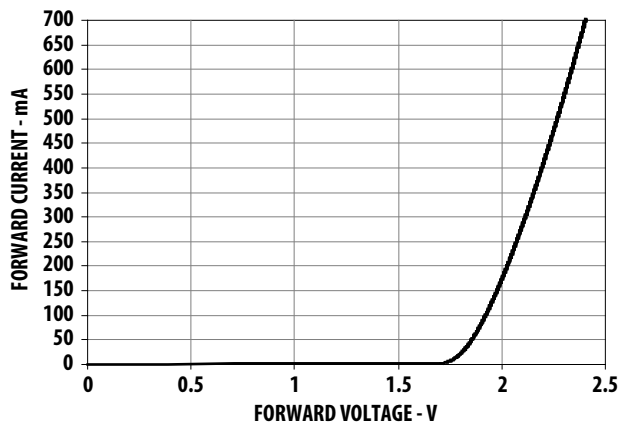


Figure 4. Forward Current vs. Forward Voltage

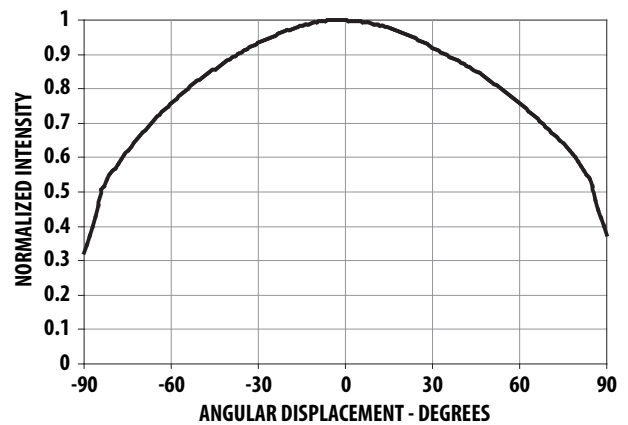


Figure 5. Radiation Pattern Deep Red, Red, Red Orange and Amber

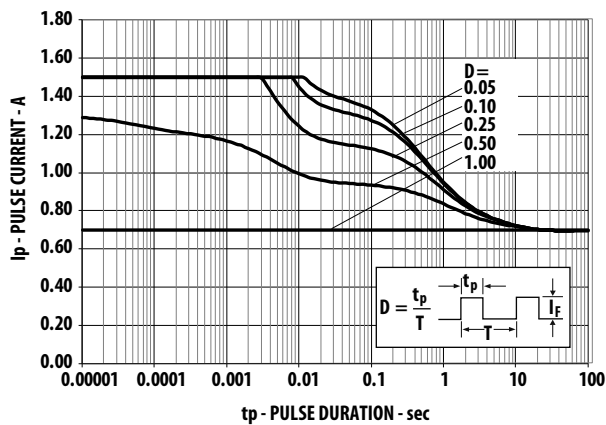


Figure 6. Maximum pulse current vs. ambient temperature. Derated based on  $T_A = 25^\circ\text{C}$ ,  $R_{\theta JA} = 30^\circ\text{C/W}$ .

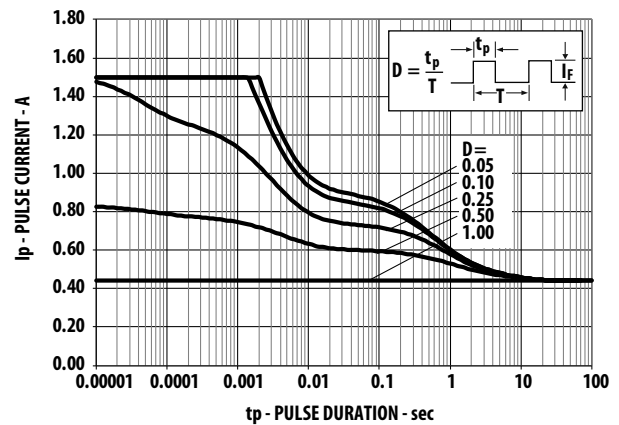


Figure 7. Maximum pulse current vs. ambient temperature. Derated based on  $T_A = 85^\circ\text{C}$ ,  $R_{\theta JA} = 30^\circ\text{C/W}$ .

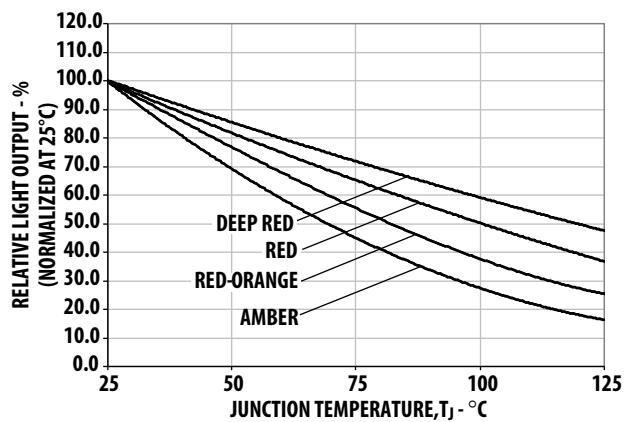


Figure 8. Relative Light Output vs. Junction Temperature

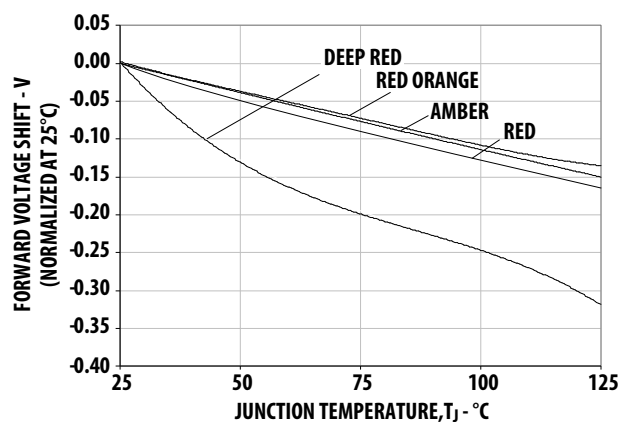


Figure 9. Forward Voltage Shift vs. Junction Temperature

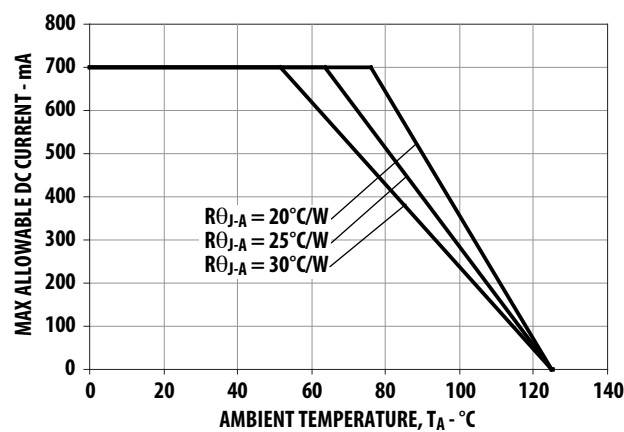


Figure 10. Maximum Forward Current vs. Ambient Temperature.  
Derated based on  $T_{JMAX} = 125^\circ\text{C}$ ,  $R_{\theta JA} = 20^\circ\text{C/W}$ ,  $25^\circ\text{C/W}$  and  $30^\circ\text{C/W}$ .

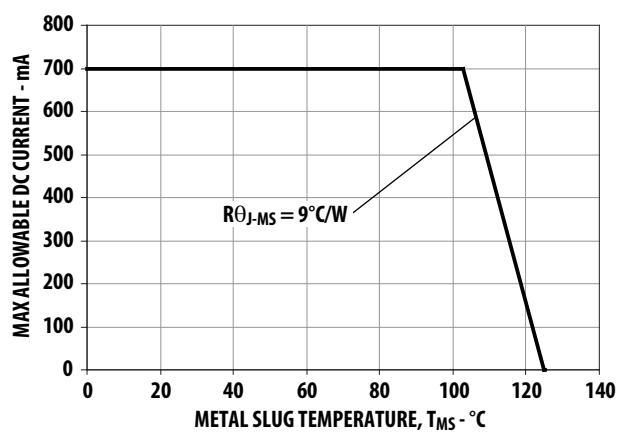


Figure 11. Maximum Forward Current vs. Ambient Temperature.  
Derated based on  $T_{JMAX} = 125^\circ\text{C}$ ,  $R_{\theta JMS} = 9^\circ\text{C/W}$ .

## InGaN

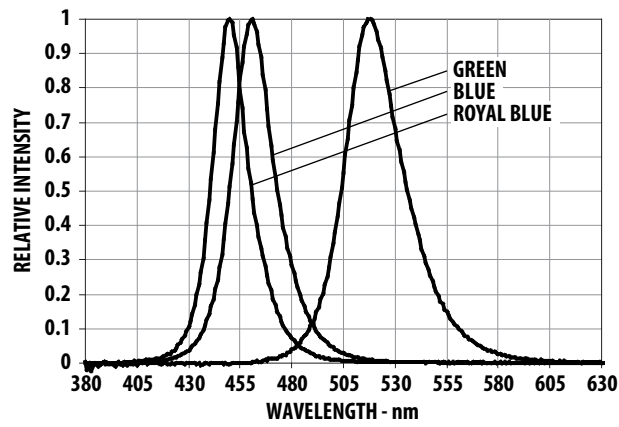


Figure 12. Relative Intensity vs. Wavelength for Blue and Green

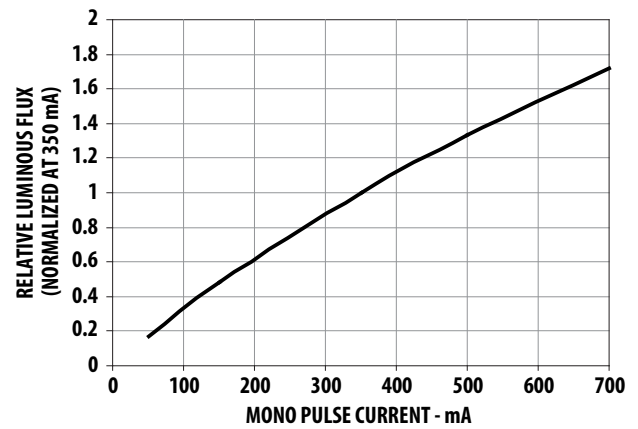


Figure 13. Relative Luminous Flux vs. Mono Pulse Current

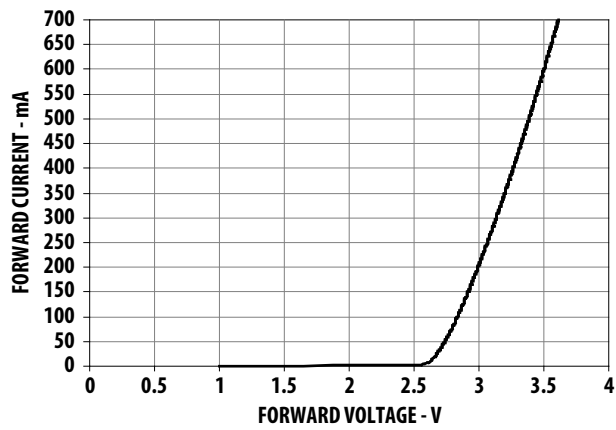


Figure 14. Forward Current vs. Forward Voltage

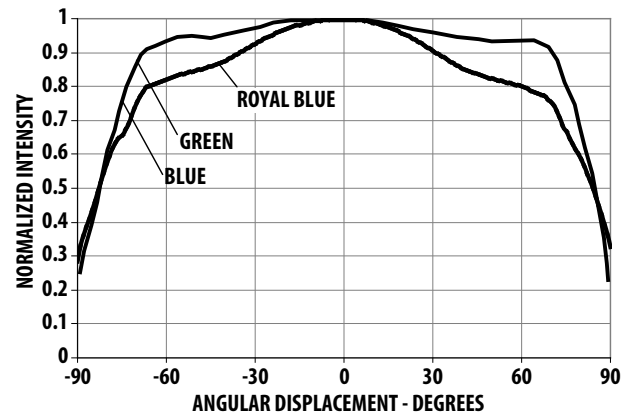


Figure 15. Radiation Pattern for Royal Blue, Blue and Green

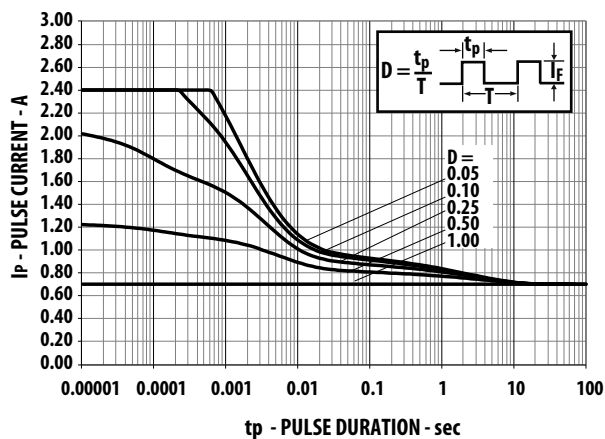


Figure 16. Maximum pulse current vs. ambient temperature.  
Derated based on  $T_A = 25^\circ\text{C}$ ,  $R_{\theta JA} = 30^\circ\text{C/W}$

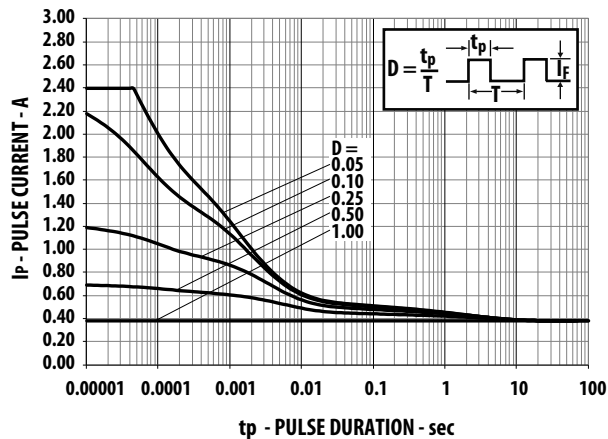


Figure 17. Maximum pulse current vs. ambient temperature.  
Derated based on  $T_A = 85^\circ\text{C}$ ,  $R_{\theta JA} = 30^\circ\text{C/W}$

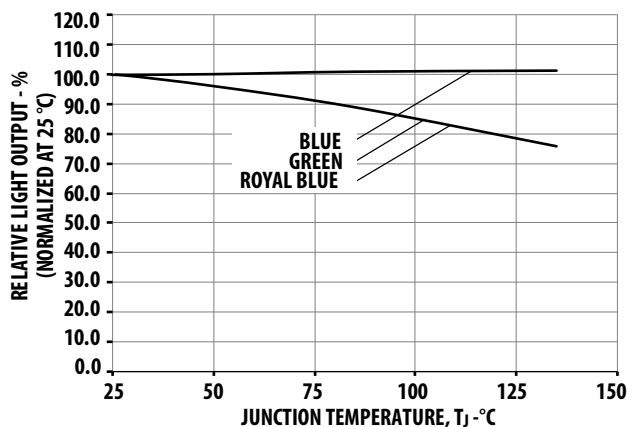


Figure 18. Relative Light Output vs. Junction Temperature

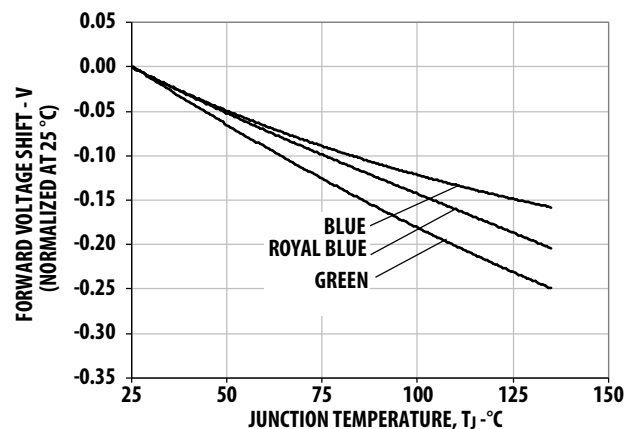


Figure 19. Forward Voltage Shift vs. Junction Temperature

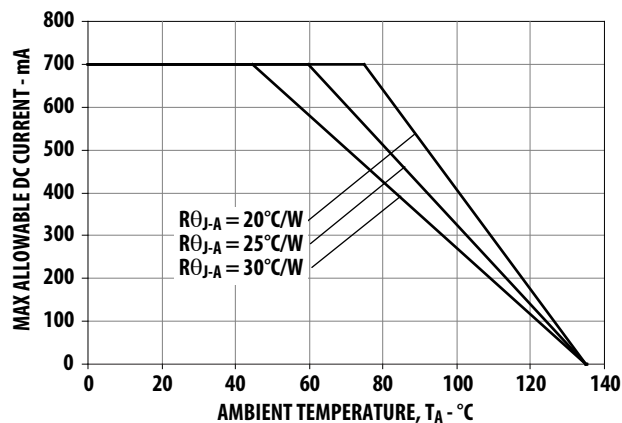


Figure 20. Maximum Forward Current vs. Ambient Temperature.  
Derated based on  $T_{JMAX} = 135^\circ\text{C}$ ,  $R_{\theta JA} = 20^\circ\text{C/W}$ ,  $25^\circ\text{C/W}$  and  $30^\circ\text{C/W}$

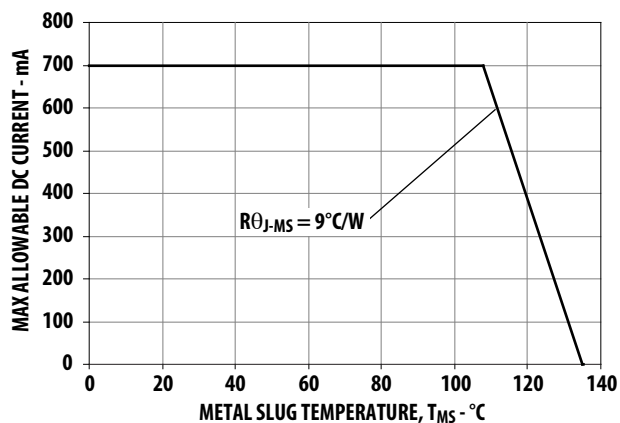


Figure 21. Maximum Forward Current vs. Metal Slug Temperature.  
Derated based on  $T_{JMAX} = 135^\circ\text{C}$ ,  $R_{\theta JMS} = 9^\circ\text{C/W}$



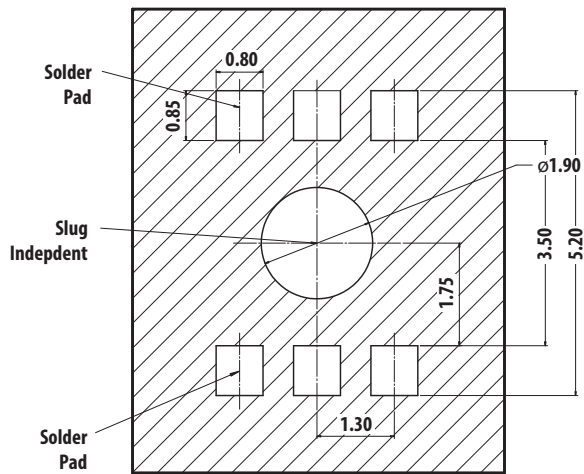


Figure 22. Recommended soldering land pattern

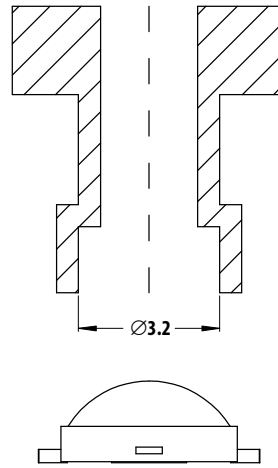


Figure 23. Recommended pick and place nozzle tip. Inner diameter = 3.2 mm

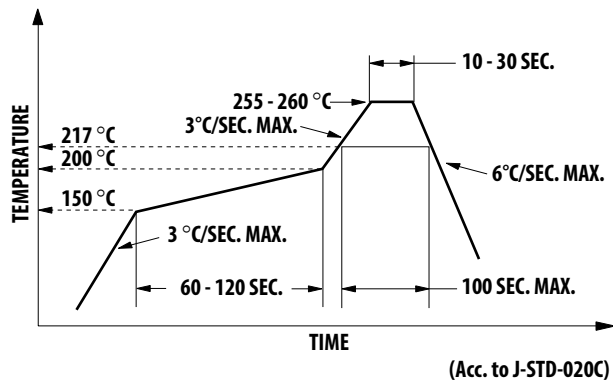


Figure 24. Recommended Reflow Soldering Profile

Note: For detailed information on reflow soldering of Avago surface mount LEDs, refer to Avago Application Note AN 1060 *Surface Mounting SMT LED Indicator Components*.

## Option Selection Details

### ASMT-J x<sub>1</sub> 3 x<sub>2</sub> – x<sub>3</sub> x<sub>4</sub> x<sub>5</sub> x<sub>6</sub> x<sub>7</sub>

x<sub>4</sub> – Minimum Flux Bin Selection

x<sub>5</sub> – Maximum Flux Bin Selection

x<sub>6</sub> – Color Bin Selection

x<sub>7</sub> – Packaging Option

### Color Bin Selection (x<sub>6</sub>)

Individual reel will contain parts from one color bin selection only.

| Selection | Bin ID            |
|-----------|-------------------|
| 0         | Full Distribution |
| Z         | A and B           |
| Y         | B and C           |
| W         | C and D           |
| V         | D and E           |
| Q         | A, B and C        |
| P         | B, C and D        |
| N         | C, D and E        |
| M         | D, E and F        |

## Color Bin Limits

| Color      | Bin ID | Dominant Wavelength (nm)<br>at 350 mA |       |
|------------|--------|---------------------------------------|-------|
|            |        | Min.                                  | Max.  |
| Red        | –      | 620.0                                 | 635.0 |
| Red Orange | –      | 610.0                                 | 620.0 |
| Amber      | B      | 587.0                                 | 589.5 |
|            | C      | 589.5                                 | 592.0 |
|            | D      | 592.0                                 | 594.5 |
|            | E      | 594.5                                 | 597.0 |
| Blue       | A      | 455.0                                 | 460.0 |
|            | B      | 460.0                                 | 465.0 |
|            | C      | 465.0                                 | 470.0 |
|            | D      | 470.0                                 | 475.0 |
| Green      | A      | 515.0                                 | 520.0 |
|            | B      | 520.0                                 | 525.0 |
|            | C      | 525.0                                 | 530.0 |
|            | D      | 530.0                                 | 535.0 |

Tolerance: ±1 nm

### Packaging Option [x<sub>7</sub>]

| Selection | Option        |
|-----------|---------------|
| 1         | Tape and Reel |

## Flux Bin Limit [x<sub>4</sub>, x<sub>5</sub>]

| Color                         | Bin ID | Luminous Flux (lm)/<br>Radiometric Power (mW)<br>at 350 mA |       |
|-------------------------------|--------|------------------------------------------------------------|-------|
|                               |        | Min.                                                       | Max.  |
| Blue                          | M      | 13.9                                                       | 18.1  |
|                               | N      | 18.1                                                       | 23.5  |
|                               | P      | 23.5                                                       | 30.6  |
|                               | Q      | 30.6                                                       | 39.8  |
| Other Colors                  | R      | 39.8                                                       | 51.7  |
|                               | S      | 51.7                                                       | 67.2  |
|                               | T      | 67.2                                                       | 87.4  |
|                               | U      | 87.4                                                       | 99.6  |
|                               | V      | 99.6                                                       | 113.6 |
|                               | W      | 113.6                                                      | 129.5 |
| Deep Red<br>and<br>Royal Blue | L      | 175.0                                                      | 225.0 |
|                               | M      | 225.0                                                      | 275.0 |
|                               | N      | 275.0                                                      | 355.0 |
|                               | P      | 355.0                                                      | 435.0 |
|                               | Q      | 435.0                                                      | 515.0 |
|                               | R      | 515.0                                                      | 595.0 |
|                               | S      | 595.0                                                      | 685.0 |

Tolerance for each bin limit is ± 10%

| Color      | Bin ID | Peak Wavelength (nm)<br>at 350 mA |       |
|------------|--------|-----------------------------------|-------|
|            |        | Min.                              | Max.  |
| Deep Red   | –      | 650.0                             | 670.0 |
| Royal Blue | C      | 440.0                             | 445.0 |
|            | D      | 445.0                             | 450.0 |
|            | E      | 450.0                             | 455.0 |
|            | F      | 455.0                             | 460.0 |

Tolerance: ± 2 nm

## Example

### ASMT-JG31-NST01

ASMT-JG31-Nxxxx – Green, InGaN, Electrically isolated Heat Sink

X<sub>4</sub> = S

– Minimum Flux Bin S

X<sub>5</sub> = T

– Maximum Flux Bin T

X<sub>6</sub> = 0

– Full Distribution

X<sub>7</sub> = 1

– Tape and Reel Option

## Tape and Reel – Option 1

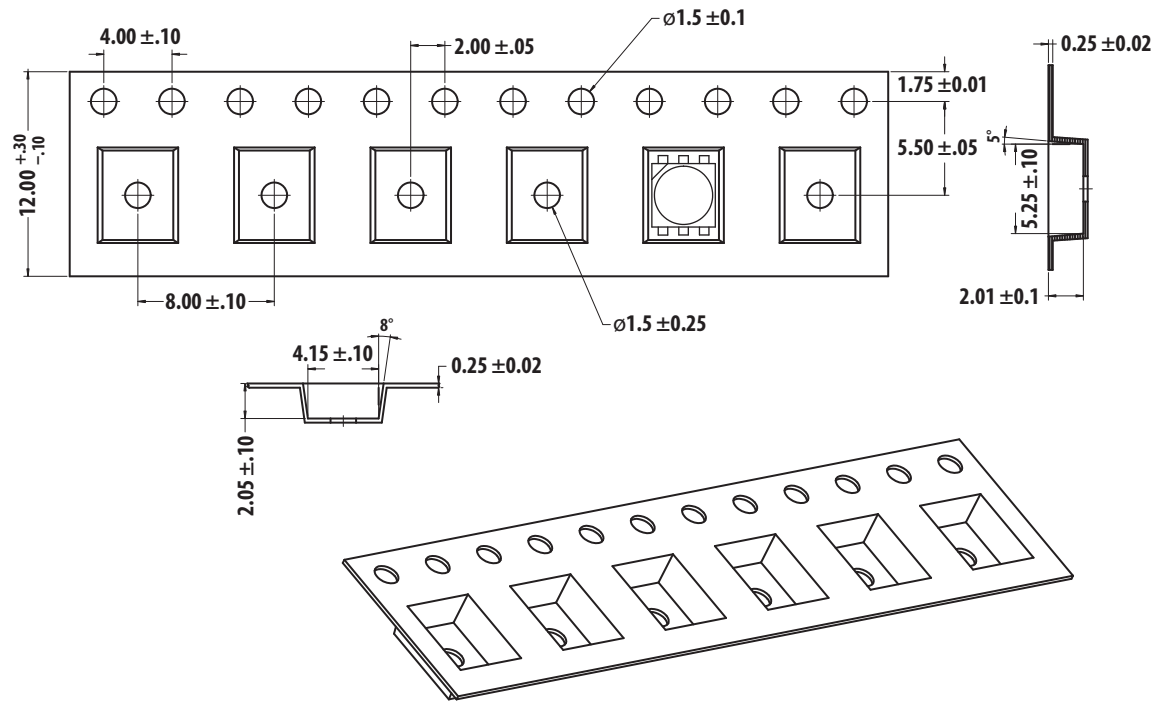
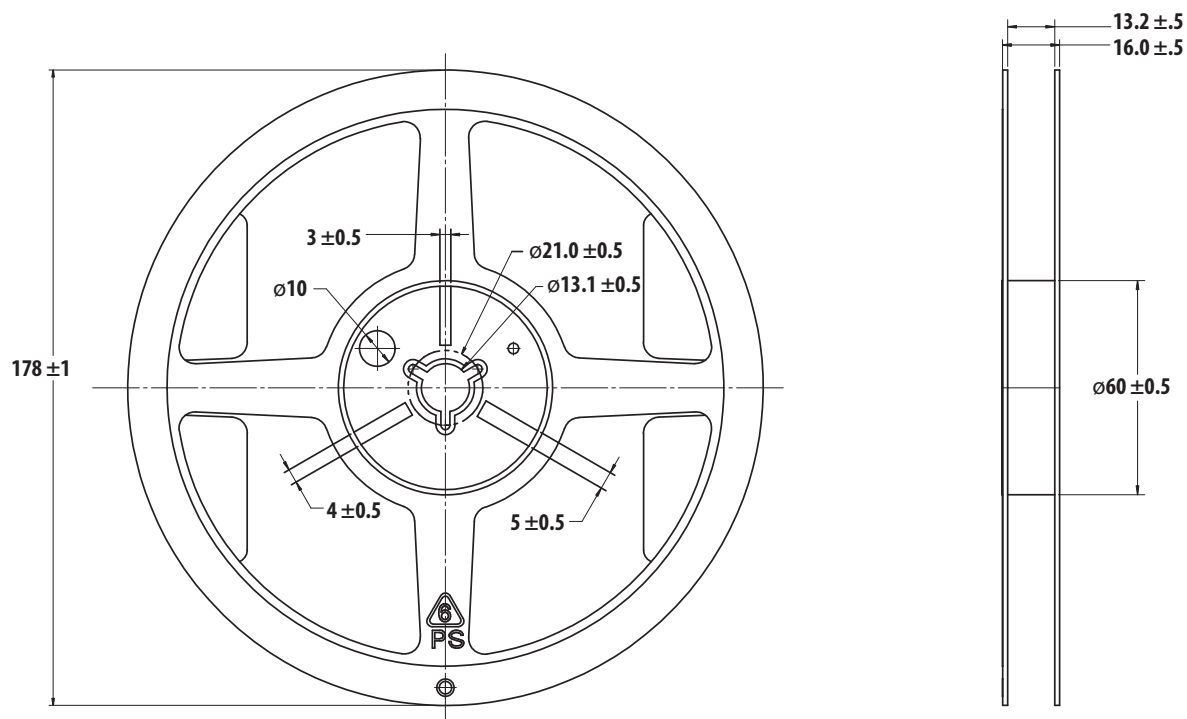


Figure 25. Carrier Tape Dimensions



### Notes:

1. Empty component pockets sealed with top cover tape.
2. 250 or 500 pieces per reel.
3. Drawing not to scale.
4. All dimensions are in millimeters.

Figure 26. Reel dimensions

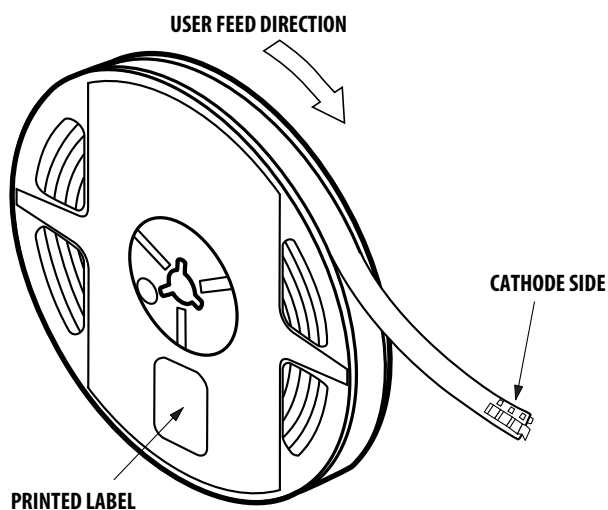


Figure 27. Reeling Orientation

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