

# ENEMAX

## Data Sheet

### 20mA InGaN Warm White-EF3528D- 0201-0483

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#### Features:

- > High brightness surface mount LED.
- > 120° viewing angle.
- > Small package outline (LxWxH) of 3.2 x 2.8 x 1.8mm.
- > Qualified according to JEDEC moisture sensitivity Level 2.
- > Compatible to IR reflow soldering.
- > Environmental friendly; RoHS compliance.

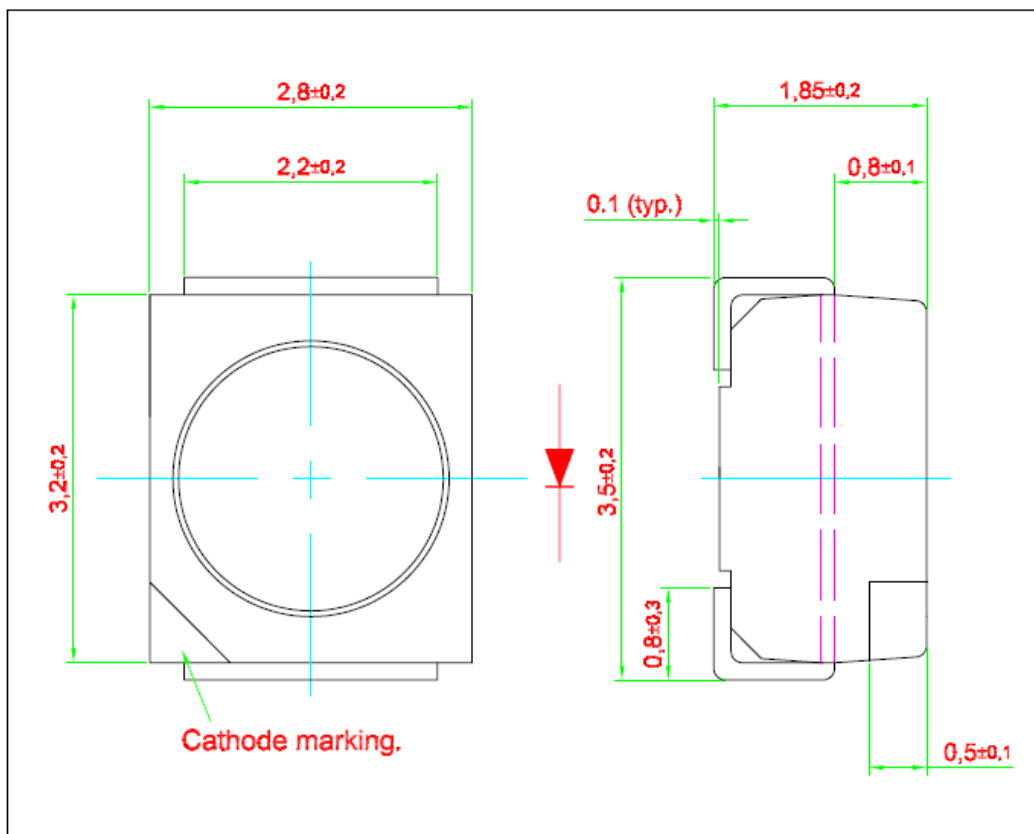


# ENEMAX

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#### Package Outline Dimensions



#### Material

|                 | Material                                 |
|-----------------|------------------------------------------|
| Lead-frame      | Cu Alloy With Ag Plating.                |
| Package         | High Temperature Resistant Plastic, PPA. |
| Encapsulant     | Silicone Resin                           |
| Soldering Leads | Ag-Sn Plating                            |

# ENEMAX

## Data Sheet

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#### Optical Characteristics at Tj=25°C

| Part Number            | Color      | Luminous Intensity @ 20mA IV (mcd) |        |        | Viewing Angle |
|------------------------|------------|------------------------------------|--------|--------|---------------|
|                        |            | Min                                | Typ.   | Max    |               |
| EF3528D-0201-X4X6-0483 | Warm White | 2000.0                             | 2300.0 | 2600.0 | 120°          |

1. Luminous flux is measured with an accuracy of  $\pm 11\%$ .
2. Wavelength binning is carried for all units as per the wavelength-binning table. Only one wavelength group is allowed for each reel.
3. Color binning is carrier for all units as per the color binning table. Only one color group is allowed for each reel.
4. High color rendering Index (CRI). Minimum CRI of 70.

#### Electrical Characteristics at Tj=25°C

| Part Number            | Vf @ If=20mA |          |          |
|------------------------|--------------|----------|----------|
|                        | Min. (V)     | Typ. (V) | Max. (V) |
| EF3528D-0201-X4X6-0483 | 2.9          | 3.2      | 3.5      |

Forward voltage, Vf is measured with a current pulse of 1 ms and an accuracy of  $\pm 0.1$  V.

#### Absolute Maximum Ratings

|                                         | Maximum Value | Unit |
|-----------------------------------------|---------------|------|
| DC forward current.                     | 30            | mA   |
| Peak pulse current                      | 100           | mA   |
| Reverse voltage.                        | 5             | V    |
| LED junction temperature.               | 125           | °C   |
| Operating temperature.                  | -40 ... +100  | °C   |
| Storage temperature.                    | -40 ... +100  | °C   |
| ESD Threshold (HBM)                     | 500           | V    |
| Power dissipation (at room temperature) | 80            | mW   |

# ENEMAX

## Data Sheet

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#### Luminous Intensity Group at Tj=25°C.

| Bin | Luminous Intensity @ 20mA IV (mcd) |        |
|-----|------------------------------------|--------|
|     | Min                                | Max    |
| X4  | 2000.0                             | 2200.0 |
| X5  | 2200.0                             | 2400.0 |
| X6  | 2400.0                             | 2600.0 |

#### Vf Bining

| Vf Bin | Forward Voltage (V) |
|--------|---------------------|
| V1     | 2.90...3.00         |
| V2     | 3.00...3.10         |
| V3     | 3.10...3.20         |
| V4     | 3.20...3.30         |
| V5     | 3.30...3.40         |
| V6     | 3.40...3.50         |

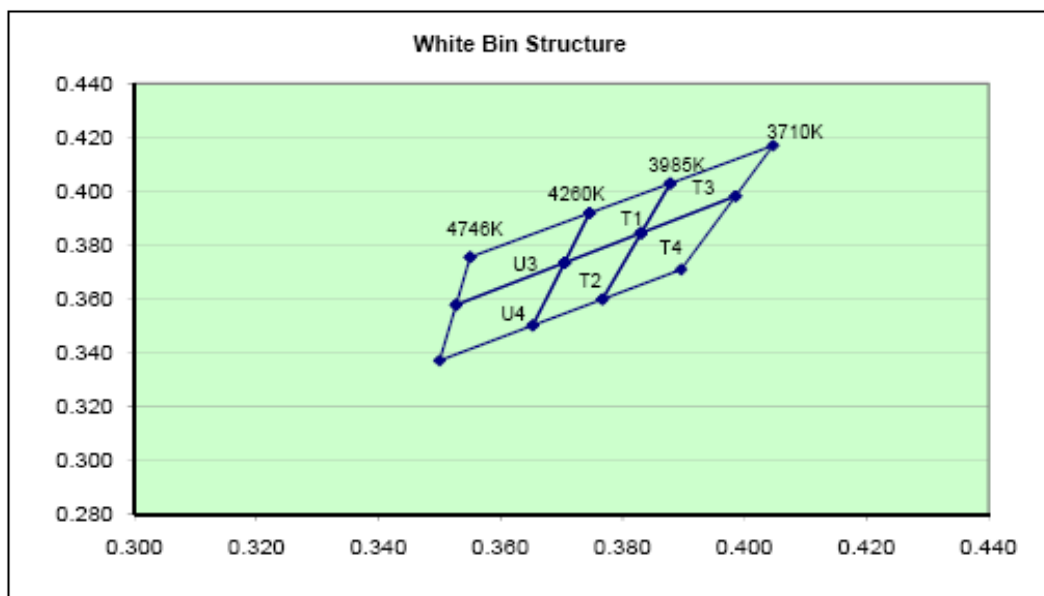
Forward voltage, Vf is measured with an accuracy of  $\pm 0.1$  V.

# ENEMAX

## Data Sheet

### 20mA InGaN Warm White-EF3528D- 0201-0483

#### Color bin structure



Chromaticity coordinate groups are measured with an accuracy of  $\pm 0.01$ .

| Bin |    | 1      | 2      | 3      | 4      |
|-----|----|--------|--------|--------|--------|
| T1  | Cx | 0.3746 | 0.3705 | 0.3831 | 0.3878 |
|     | Cy | 0.3918 | 0.3734 | 0.3845 | 0.4028 |
| T2  | Cx | 0.3705 | 0.3653 | 0.3767 | 0.3831 |
|     | Cy | 0.3734 | 0.3501 | 0.3599 | 0.3845 |
| T3  | Cx | 0.3878 | 0.3831 | 0.3985 | 0.4047 |
|     | Cy | 0.4028 | 0.3845 | 0.3981 | 0.4169 |
| T4  | Cx | 0.3831 | 0.3767 | 0.3896 | 0.3985 |
|     | Cy | 0.3845 | 0.3599 | 0.3709 | 0.3981 |
| U3  | Cx | 0.3550 | 0.3527 | 0.3705 | 0.3746 |
|     | Cy | 0.3755 | 0.3577 | 0.3734 | 0.3918 |
| U4  | Cx | 0.3527 | 0.3500 | 0.3653 | 0.3705 |
|     | Cy | 0.3577 | 0.3370 | 0.3501 | 0.3734 |

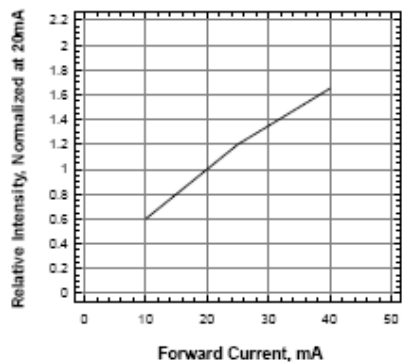
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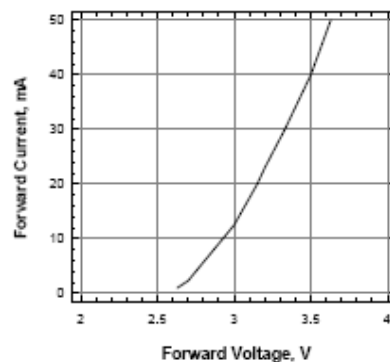
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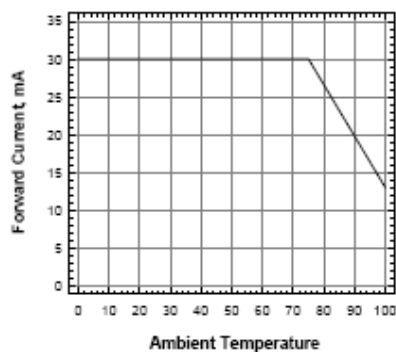
Relative Intensity Vs Forward Current



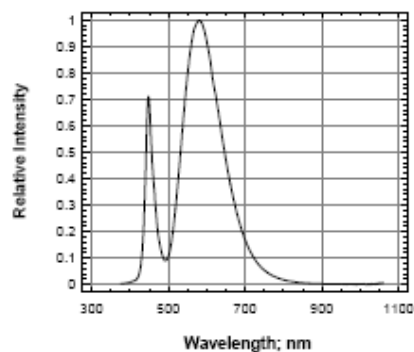
Forward Current Vs Forward Voltage



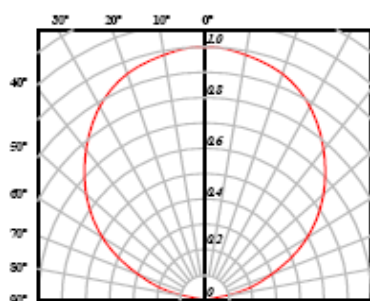
Maximum Forward Current Vs Ambient Temperature



Relative Intensity Vs Wavelength



Radiation Pattern



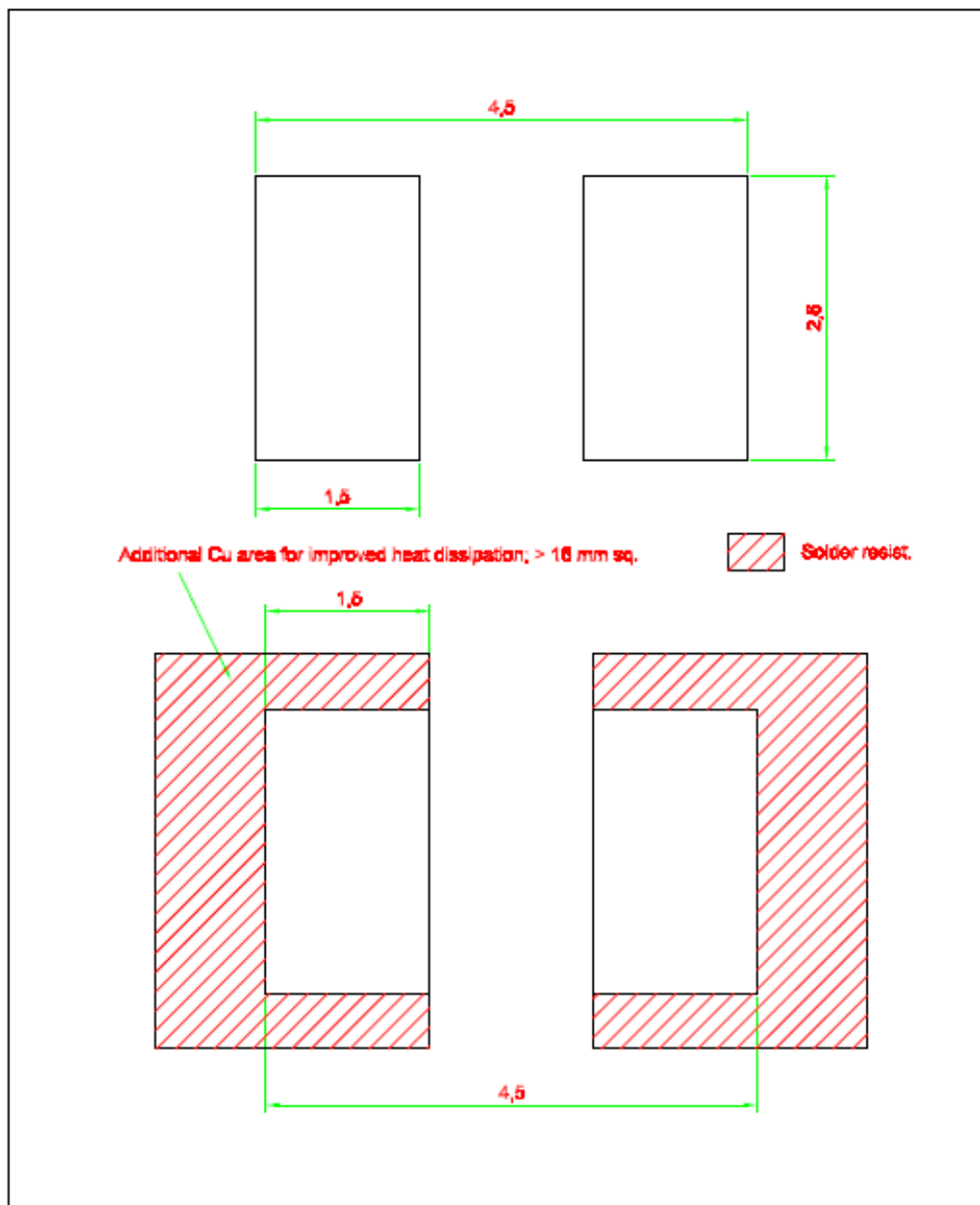
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## Data Sheet

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#### Recommended Solder Pad



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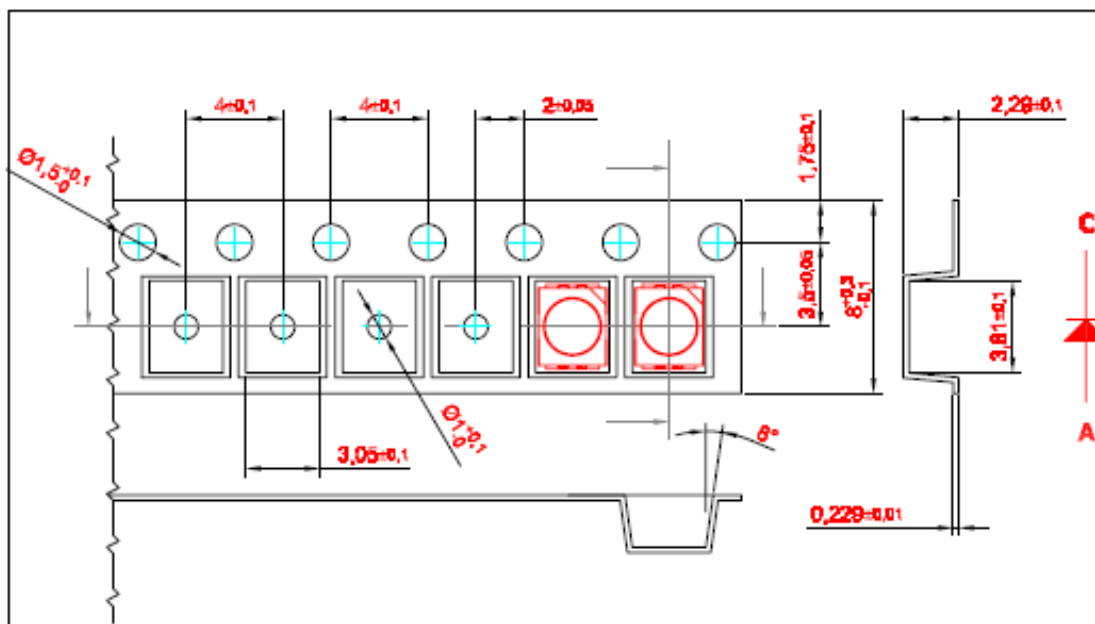
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#### Taping And Orientation

Reels come in quantity of 2000 units.

Reel diameters are 180 mm.

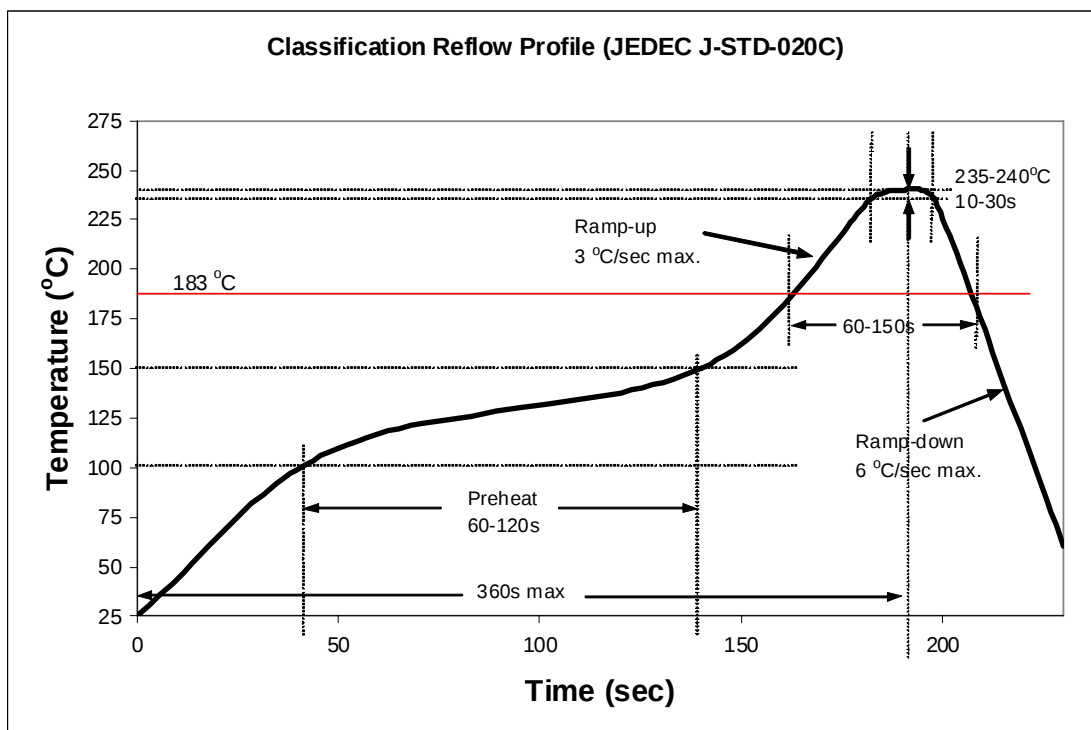


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### 20mA InGaN Warm White-EF3528D- 0201-0483

#### Recommended Sn-Pb IR-Reflow Soldering Profile



#### Recommended Pb Free IR-Reflow Soldering Profile.

