

SPNova[™]

Featuring a staggering brilliance and significant flux output, the SPNova[™] showcases the latest technological advent in this range. With its extremely high level of brightness and the ultra low high profile, which is only 1.5 mm are highly suitable for both conventional lighting and specialized application such as automotive signal lights, traffic lights, channel lights, tube lights and garden lights among others.

Features:

- > Super high brightness surface mount LED.
- > High flux output.
- > 120° viewing angle.
- > Compact package outline (LxWxH) of 6.0 x 6.0 x 1.5mm.
- > Ultra low height profile - 1.5 mm.
- > Designed for high current drive; typically 400 mA.
- > Low thermal resistance; $R_{th(jc)} = 20 \text{ K/W}$.
- > Qualified according to JEDEC moisture sensitivity Level 2.
- > Compatible to IR reflow soldering.
- > Environmental friendly; RoHS compliance.

Applications:

- > Automotive: exterior applications, eg: signal lighting, Center High Mounted Stop Light (CHMSL)
- > Industrial: illuminated advertising.
- > Lighting: architecture lighting, general lighting, garden light, channel light.



Optical Characteristics at Tj=25°C

| Part Ordering Number | Color | Viewing Angle° | Luminous Intensity @ 400mA (mcd) | | |
|----------------------|-------------|----------------|----------------------------------|---------|---------|
| | | | Min. | Typ. | Max. |
| ● NPR-MSS-ABC-1 | Red, 625 | 120 | 9000.0 | 11250.0 | 14000.0 |
| ● NPR-MSS-AAB-1 | Red, 625 | 120 | 7150.0 | 9000.0 | 11250.0 |
| NPR-MSS-ACD-1 | Red, 625 | 120 | 11250.0 | 14000.0 | 18000.0 |
| NPY-MSS-ABC-1 | Yellow, 587 | 120 | 9000.0 | 11250.0 | 14000.0 |
| NPA-MSS-ABC-1 | Amber, 615 | 120 | 9000.0 | 11250.0 | 14000.0 |

● Not for new design

NOTE

1. Luminous intensity is measured with an accuracy of ± 11%.
2. All optical and electrical data are measured at 25°C. Adequate cooling is important to ensure accurate measurement.
3. Wavelength binning is carried for all units as per the wavelength-binning table. Only one wavelength group is allowed for each reel.

Electrical Characteristics at Tj=25°C

| Part Number | Vf @ If = 400mA | | | Vr @ Ir = 100uA |
|---------------|-----------------|----------|----------|-----------------|
| | Min. (V) | Typ. (V) | Max. (V) | Min. (V) |
| NPR; NPY; NPA | 2.2 | 2.5 | 2.8 | 12 |

Forward voltages are measure using a current pulse of 1 ms and with an accuracy of ± 0.1V.

Absolute Maximum Ratings

| | Maximum Value | Unit |
|--|---------------|------|
| DC forward current | 400 | mA |
| Peak pulse current (tp ≤ 10µs, Duty cycle = 0.1) | 500 | mA |
| Reverse voltage | 12 | V |
| ESD threshold (HBM) | 2000 | V |
| LED junction temperature | 125 | °C |
| Operating temperature | -40 ... +100 | °C |
| Storage temperature | -40 ... +100 | °C |
| Power dissipation | 1200 | mW |

Characteristics

| | Symbol | Part Number | Value | Unit |
|--|----------------------------|-------------|-------|---------|
| Temperature coefficient of λ_{dom} (typ) $I_F = 400mA; 0\text{ }^\circ C \leq T \leq 100\text{ }^\circ C$ | $TC_{\lambda_{dom}}$ (typ) | NPR-MSS | 0.06 | nm / K |
| | | NPY-MSS | 0.09 | |
| | | NPA-MSS | 0.07 | |
| Temperature coefficient of V_F (typ) $I_F = 400mA; 0\text{ }^\circ C \leq T \leq 100\text{ }^\circ C$ | TC_V | NPR-MSS | -5.6 | mV / K |
| | | NPY-MSS | -2.7 | |
| | | NPA-MSS | -5.0 | |
| Temperature coefficient of I_V (typ) $I_F = 400mA; 0\text{ }^\circ C \leq T \leq 100\text{ }^\circ C$ | TC_{I_V} | NPR-MSS | -90 | mcd / K |
| | | NPY-MSS | -130 | |
| | | NPA-MSS | -100 | |

Wavelength Grouping at $T_j=25\text{ }^\circ C$

| Color | Group | Wavelength distribution (nm) |
|-------------|-------|------------------------------|
| NPR; Red | Full | 620 - 630 |
| NPY; Yellow | Full | 585 - 597 |
| | A | 585 - 588 |
| | B | 588 - 591 |
| | C | 591 - 594 |
| | D | 594 - 597 |
| NPA; Amber | A | 612 - 616 |
| | B | 616 - 620 |

Dominant wavelength is measured with an accuracy of ± 1 nm.

Correlation Between Luminous Intensity And Luminous Flux at Tj=25°C

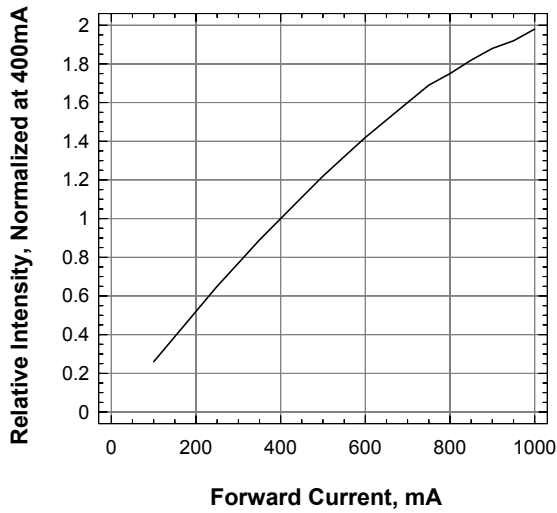
| Part Number | Luminous Intensity (mcd) | | Total Flux (lm) | |
|-------------|--------------------------|--------|-----------------|------|
| | Min | Max | Min | Max |
| NPR-MSS | | | | |
| AA | 7150 | 9000 | 20.7 | 26.1 |
| AB | 9,000 | 11,250 | 26.1 | 32.6 |
| AC | 11,250 | 14,000 | 33.8 | 42.0 |
| AD | 14,000 | 18,000 | 42.0 | 54.0 |
| NPY-MSS | | | | |
| AB | 9,000 | 11,250 | 27.0 | 33.8 |
| AC | 11,250 | 14,000 | 33.8 | 42.0 |
| NPA-MSS | | | | |
| AB | 9,000 | 11,250 | 27.0 | 33.8 |
| AC | 11,250 | 14,000 | 33.8 | 42.0 |

Vf Binning (Optional) at Tj=25°C

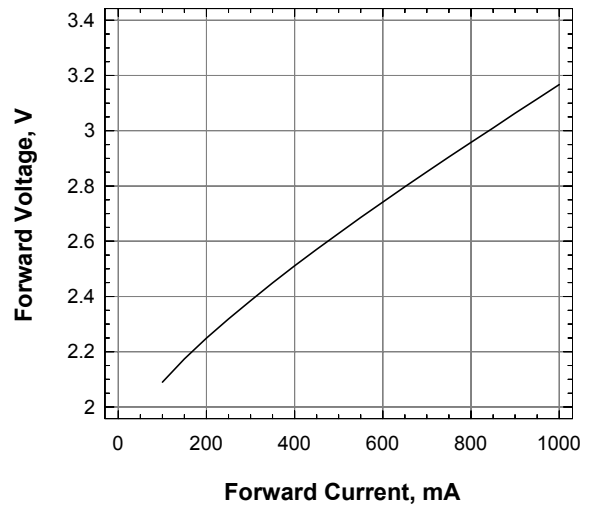
| Vf Bin @ 400 mA | Forward Voltage (V) |
|-----------------|---------------------|
| 02 | 2.2 ... 2.5 |
| 03 | 2.5 ... 2.8 |

Forward voltage, Vf is measured with an accuracy of ±0.1 V.
Please consult sales and marketing for special part number to incorporate Vf binning.

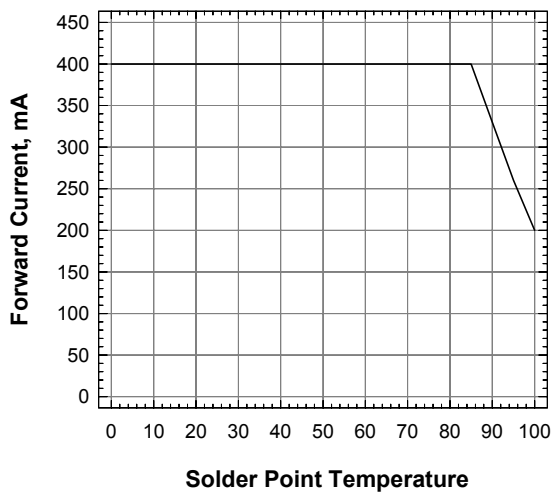
Relative Intensity Vs Forward Current



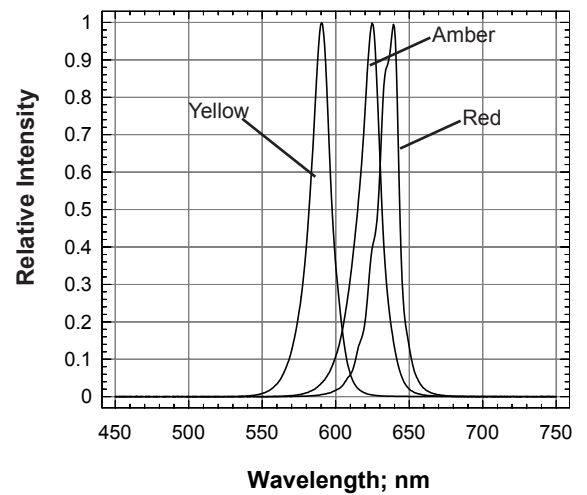
Forward Voltage Vs Forward Current



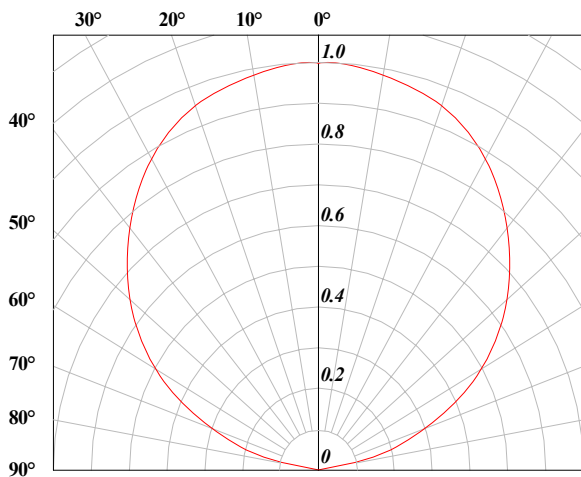
Maximum Current Vs Solder Point Temperature



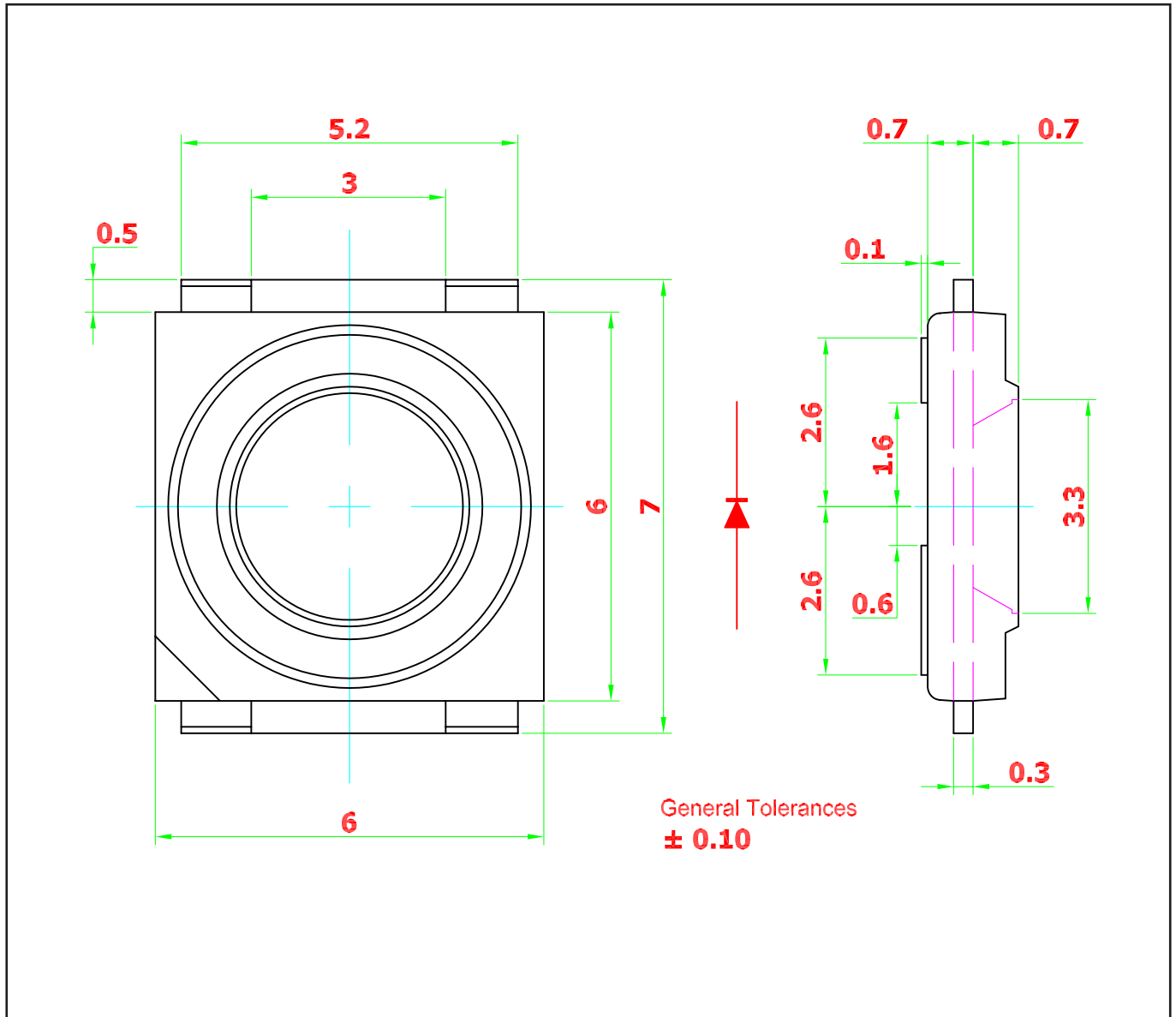
Relative Intensity Vs Wavelength



Radiation Pattern



SPNova™ • AllnGaP : SPNova-1 Watt (400mA) Package Outlines

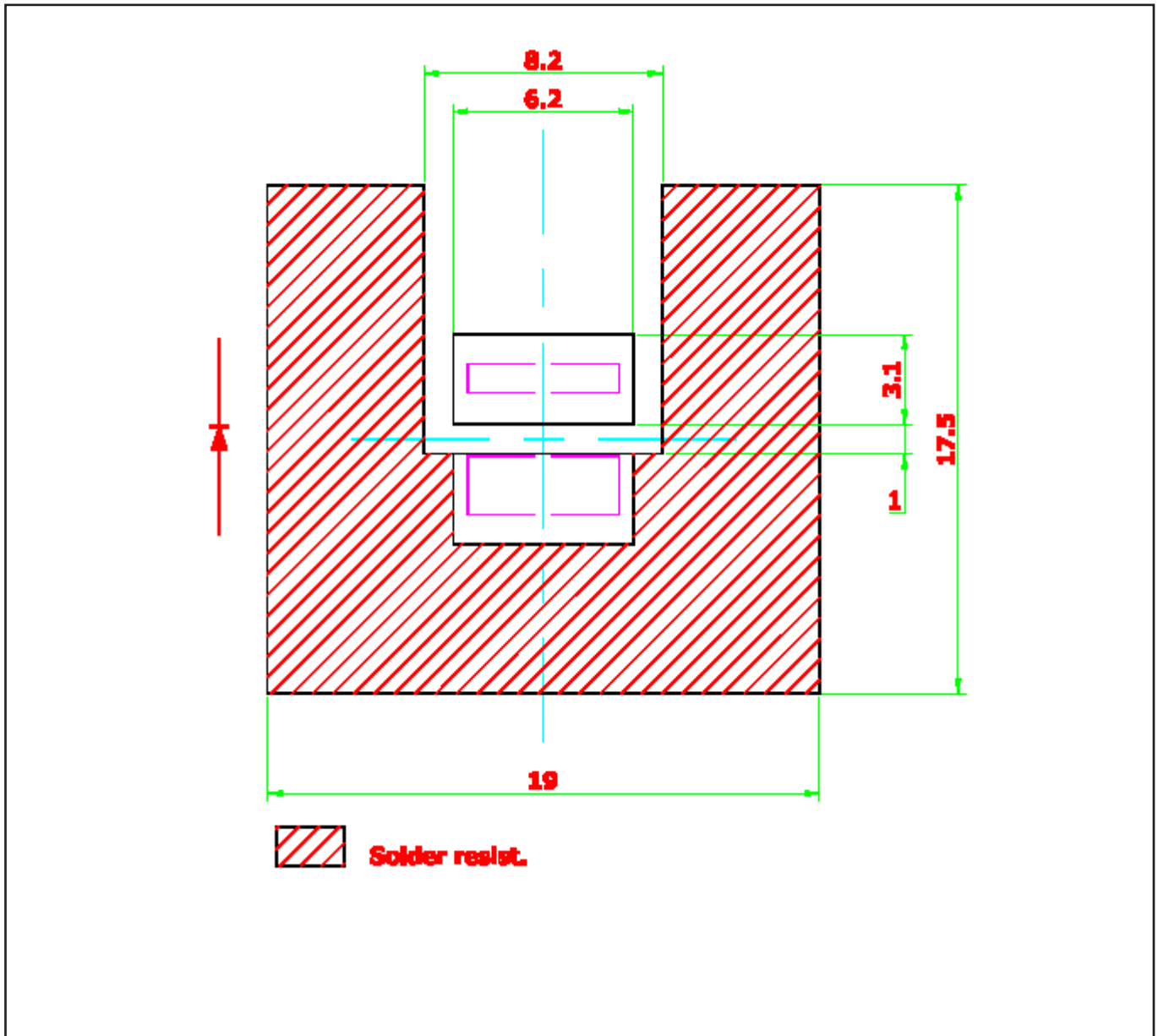


Material

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

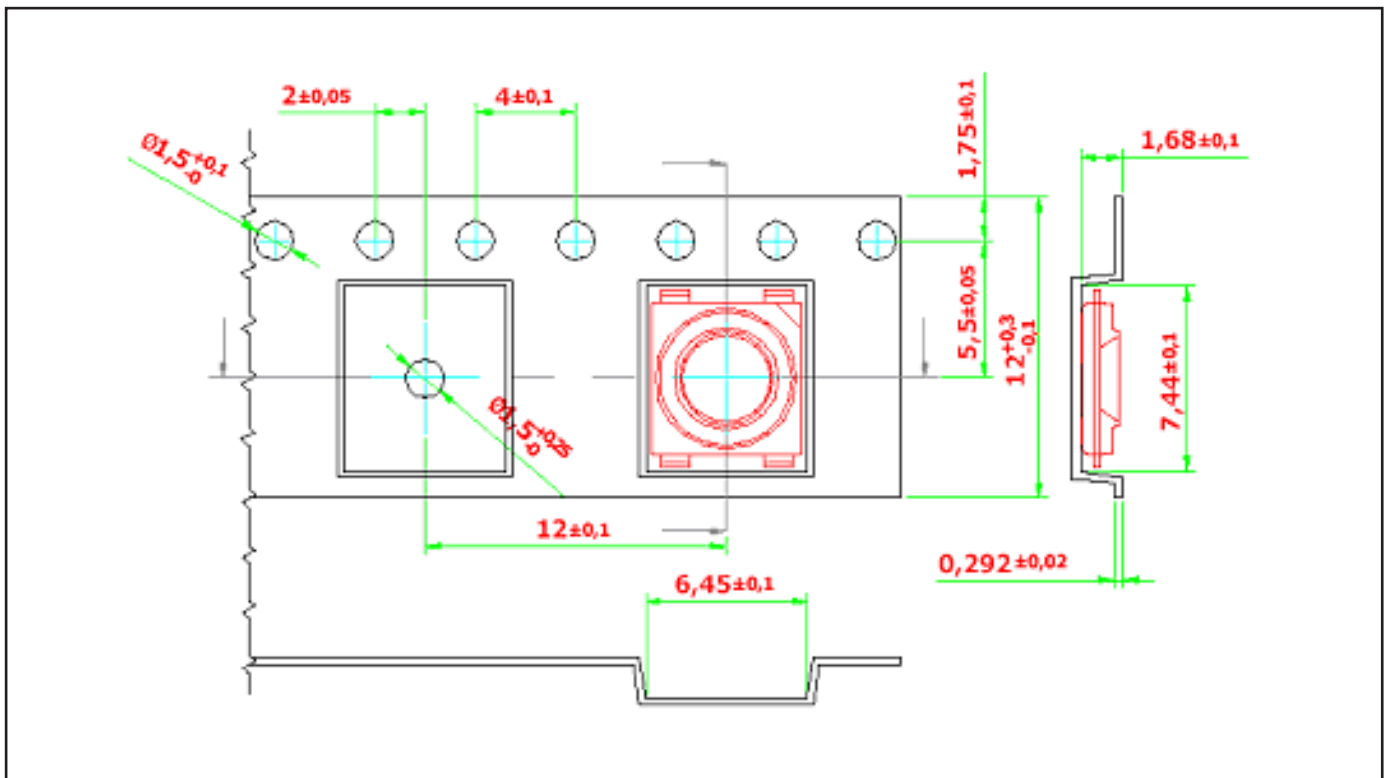
Solder Pad Design

Note: Unit to unit pitching must not be less than 25 mm. Metal core circuit board (MCPCB) is highly recommended for high density applications. Please consult sales and marketing for additional information.

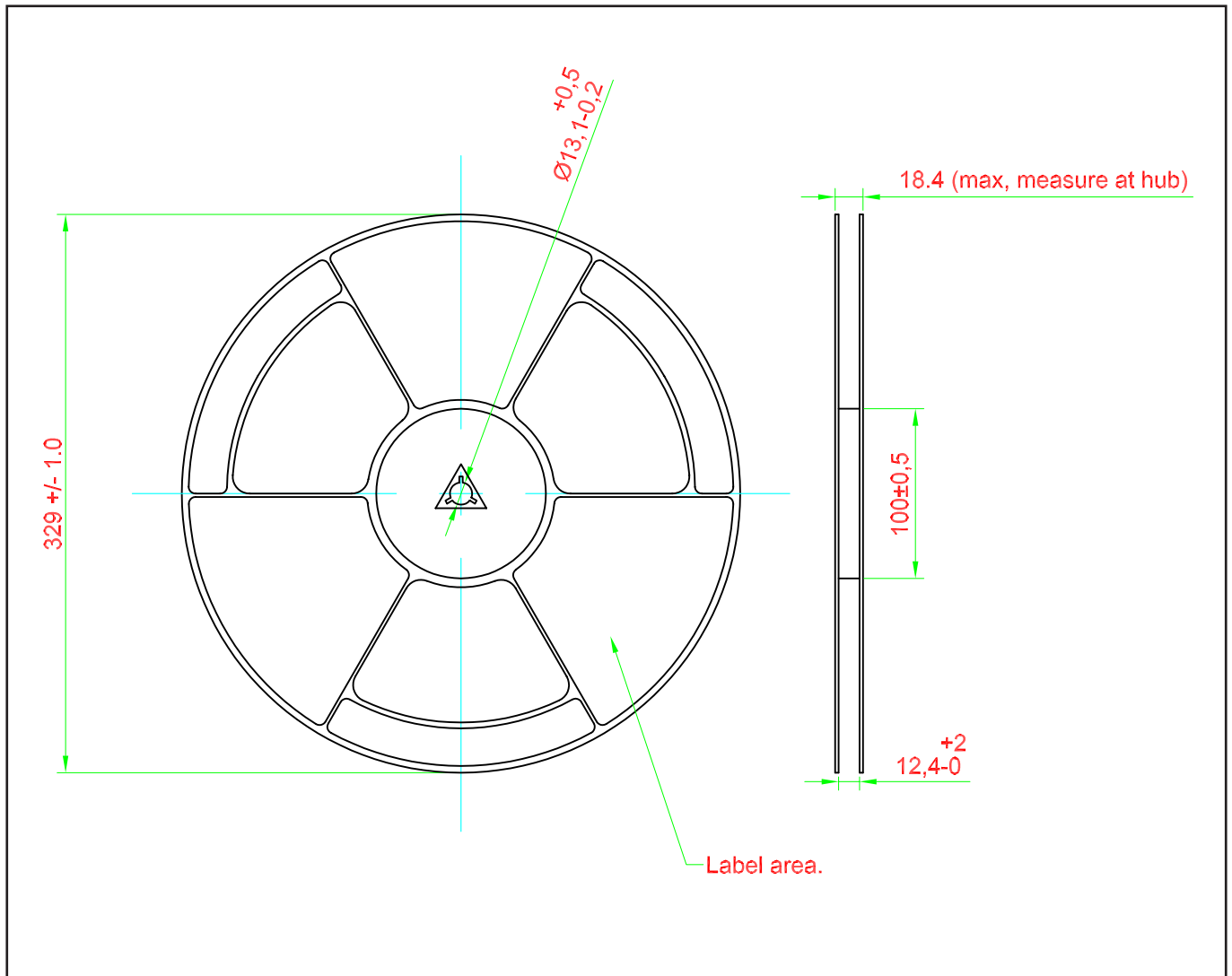


Taping and orientation

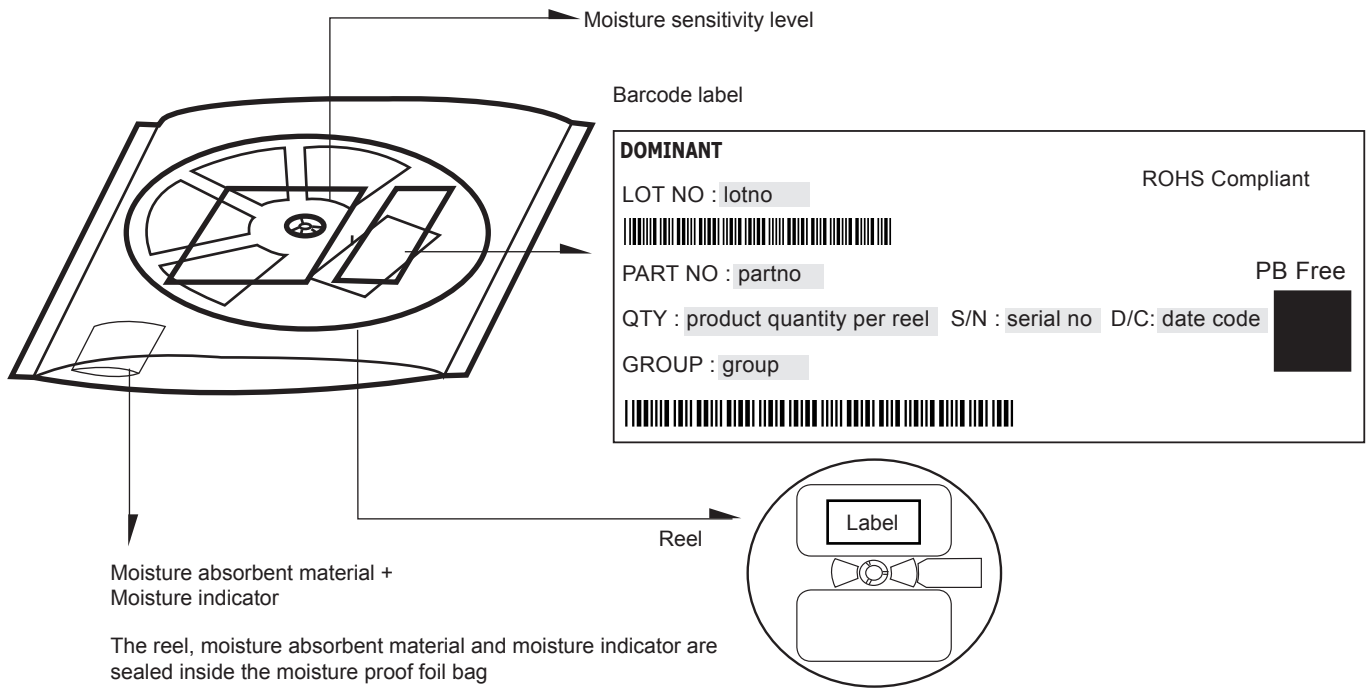
- Reels come in quantity of 2000 units.
- Reel diameter is 330 mm.



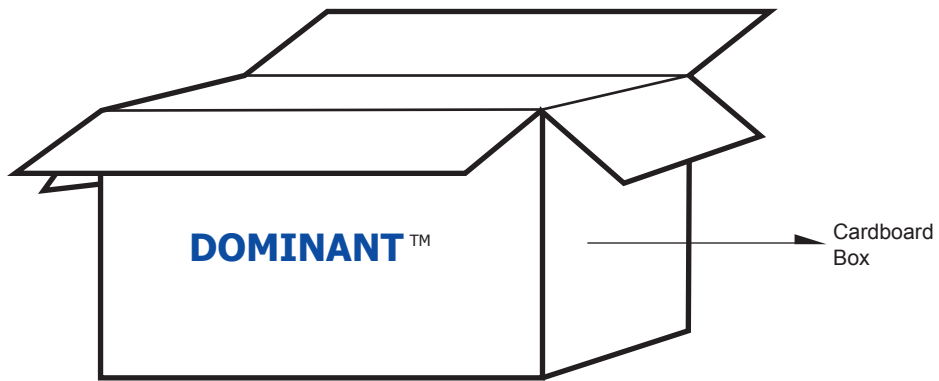
Packaging Specification



Packaging Specification



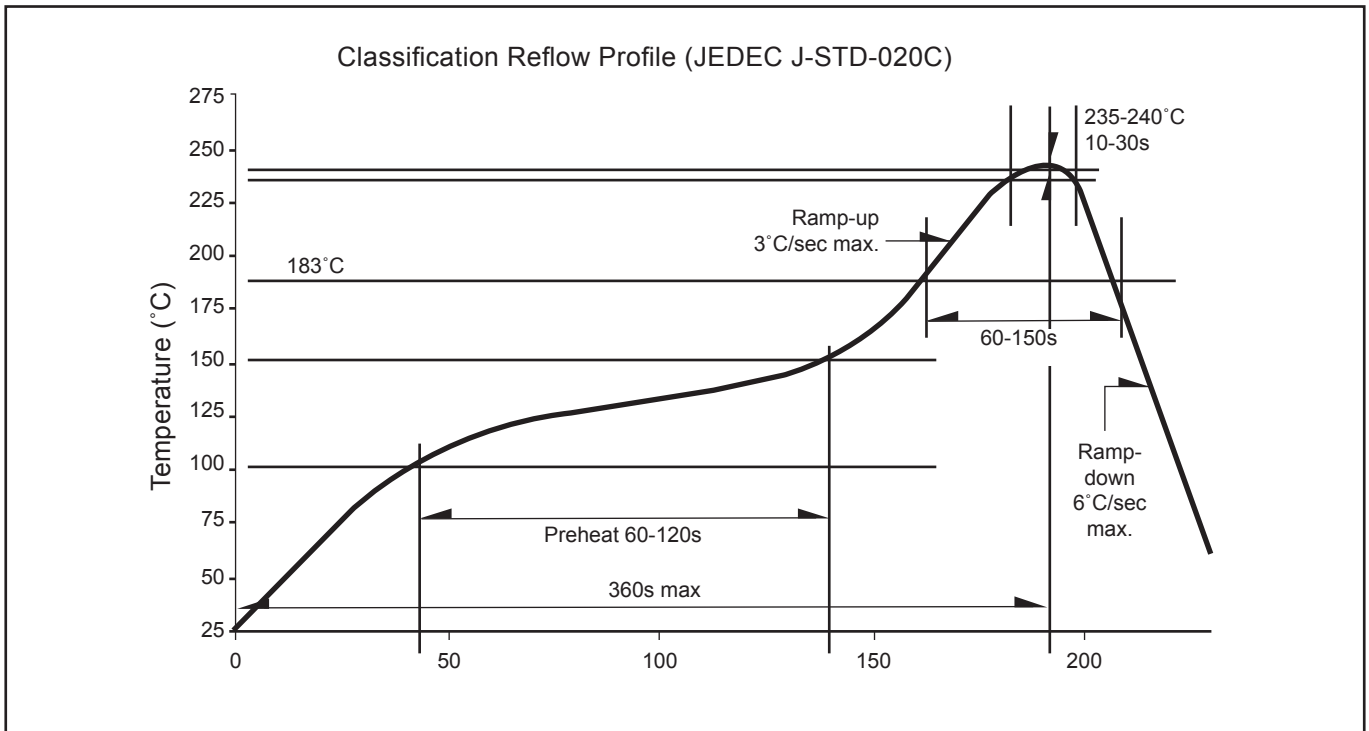
| | Average 1pc SPNova | 1 completed bag (2000pcs) |
|---------------|--------------------|---------------------------|
| Weight (gram) | 0.188 | 800 ± 10 |



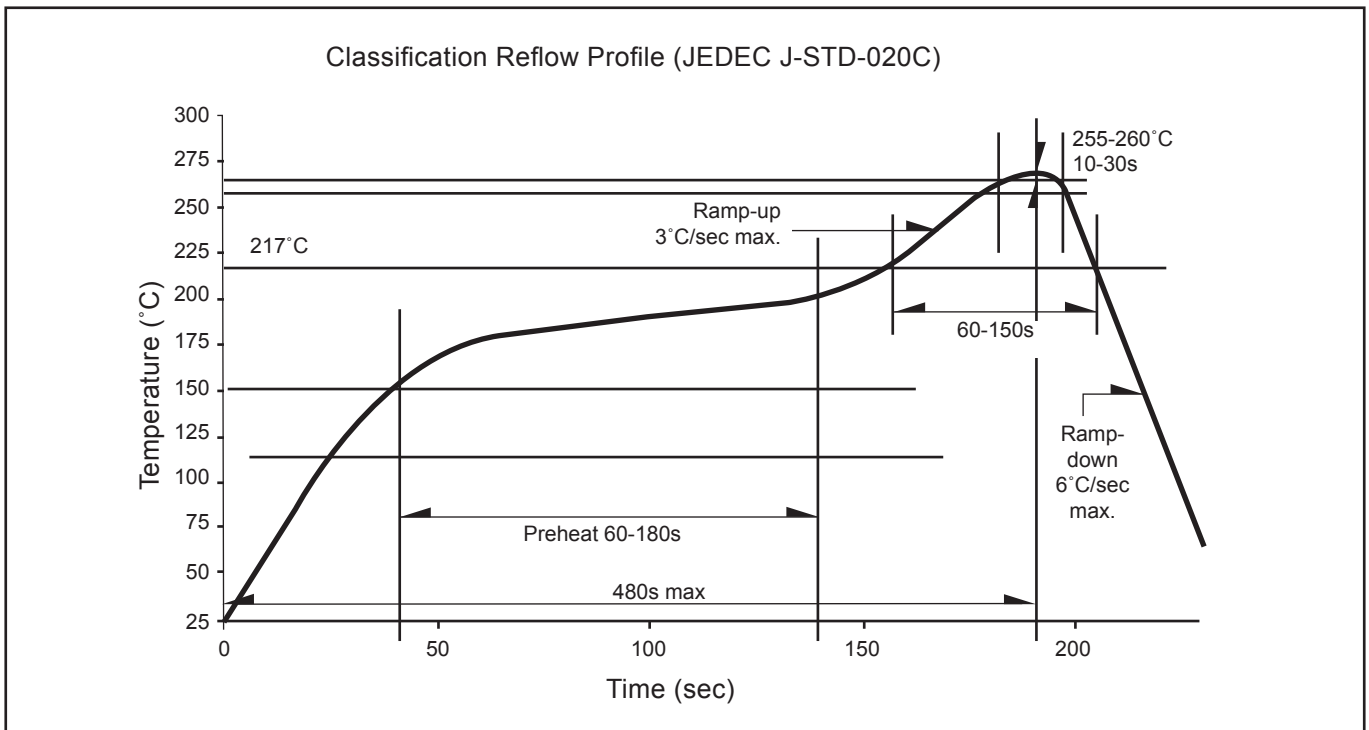
For SPNova™

| Cardboard Box Size | Dimensions (mm) | Empty Box Weight (kg) | Reel / Box | Quantity / Box (pcs) |
|--------------------|-----------------|-----------------------|--------------|----------------------|
| Large | 416 x 516 x 476 | 1.74 | 20 reels MAX | 40,000 MAX |

Recommended Sn-Pb IR-Reflow Soldering Profile



Recommended Pb-free Soldering Profile



Revision History

| Page | Subjects | Date of Modification |
|-------------|--|-----------------------------|
| - | New Format | 20 Jun 2006 |
| 4 | Add Characteristics Value Add new part number: NPA-MSS-ABC-1 | 14 Jan 2008 |
| 2 | Add new partno: NPR-MSS-ABC-1 Not for new design: NPR-MSS-AAB-1 | 15 Dec 2009 |
| - | Update company name | 05 Apr 2010 |
| 2 | Add new partno: NPR-MSS-ACD-1 Not for new design: NPR-MSS-ABC-1 | 01 Sep 2010 |
| 2 | Typo error on Luminous Intensity | 25 Nov 2010 |
| - | Correction on SPNova | 07 Jul 2011 |
| 1,6 | Correction on SPNova | 22 Aug 2011 |

NOTE

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About Us

DOMINANT Opto Technologies is a dynamic Malaysian Corporation that is among the world's leading SMT LED Manufacturers. An excellence – driven organization, it offers a comprehensive product range for diverse industries and applications. Featuring an internationally certified quality assurance acclaim, DOMINANT's extra bright LEDs are perfectly suited for various lighting applications in the automotive, consumer and communications as well as industrial sectors. With extensive industry experience and relentless pursuit of innovation, DOMINANT's state-of-art manufacturing, research and testing capabilities have become a trusted and reliable brand across the globe. More information about DOMINANT Opto Technologies can be found on the Internet at <http://www.dominant-semi.com>.

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