

SPNova™

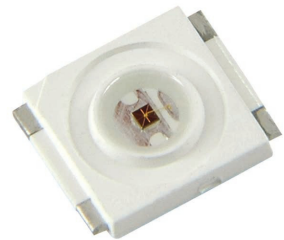
Featuring a staggering brilliance and significant flux output, the SPNova™ showcases the latest technological advent in this range. With its extremely high level of brightness and the ultra low high profile, which is only 1.5 mm are highly suitable for both conventional lighting and specialized application 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; $R_{th(ja)} = 20 \text{ K/W}$.
- > 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 $\pm 11\%$.
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 $\pm 0.1V$.

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

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

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

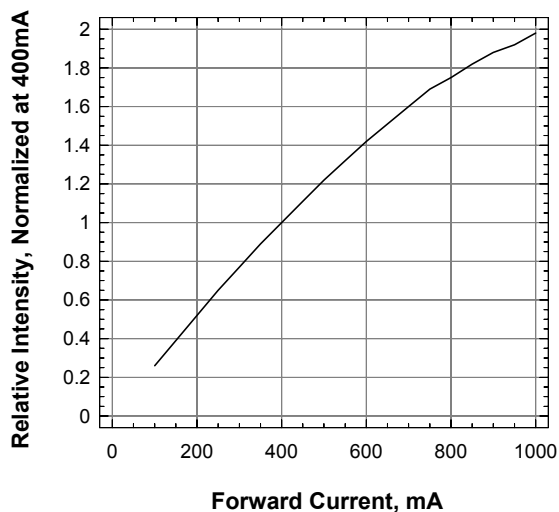
Part Number	Luminous Intensity (mcd)		Total Flux (lm)	
	Min	Max	Min	Max
NPR-MSS				
AA	7150	9000	20.7	26.1
AB	9,000	11,250	26.1	32.6
AC	11,250	14,000	33.8	42.0
AD	14,000	18,000	42.0	54.0
NPY-MSS				
AB	9,000	11,250	27.0	33.8
AC	11,250	14,000	33.8	42.0
NPA-MSS				
AB	9,000	11,250	27.0	33.8
AC	11,250	14,000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

Vf Binning (Optional) at Tj=25°C

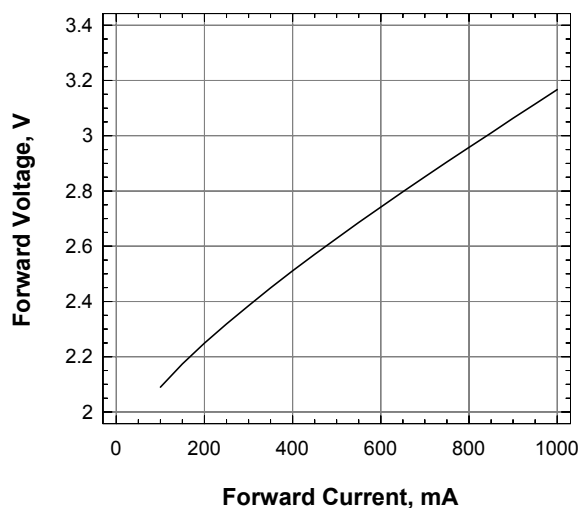
Vf Bin @ 400 mA	Forward Voltage (V)
02	2.2 ... 2.5
03	2.5 ... 2.8

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.

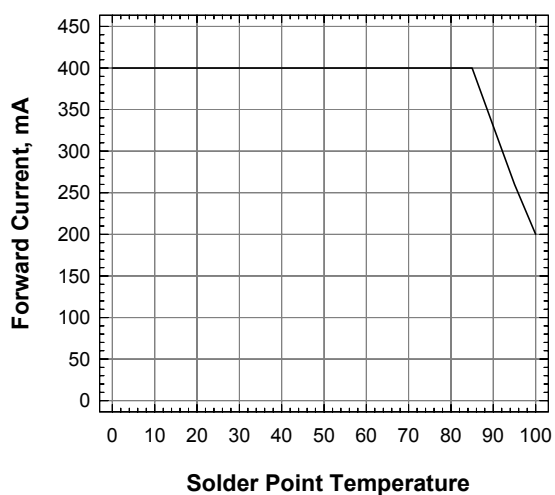
Relative Intensity Vs Forward Current



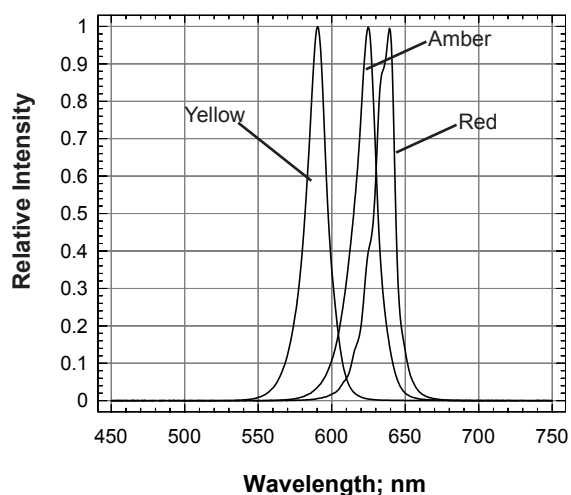
Forward Voltage Vs Forward Current



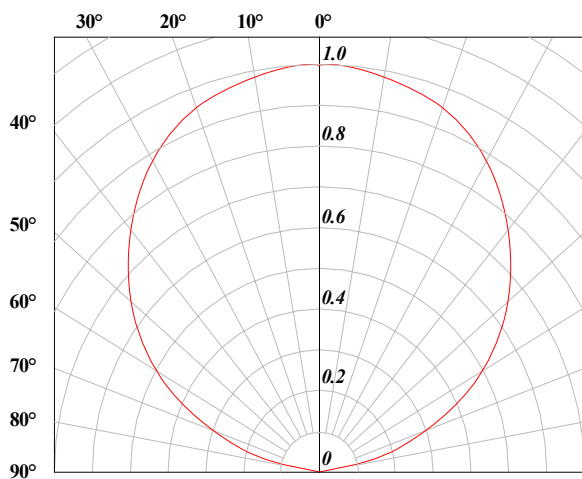
Maximum Current Vs Solder Point Temperature



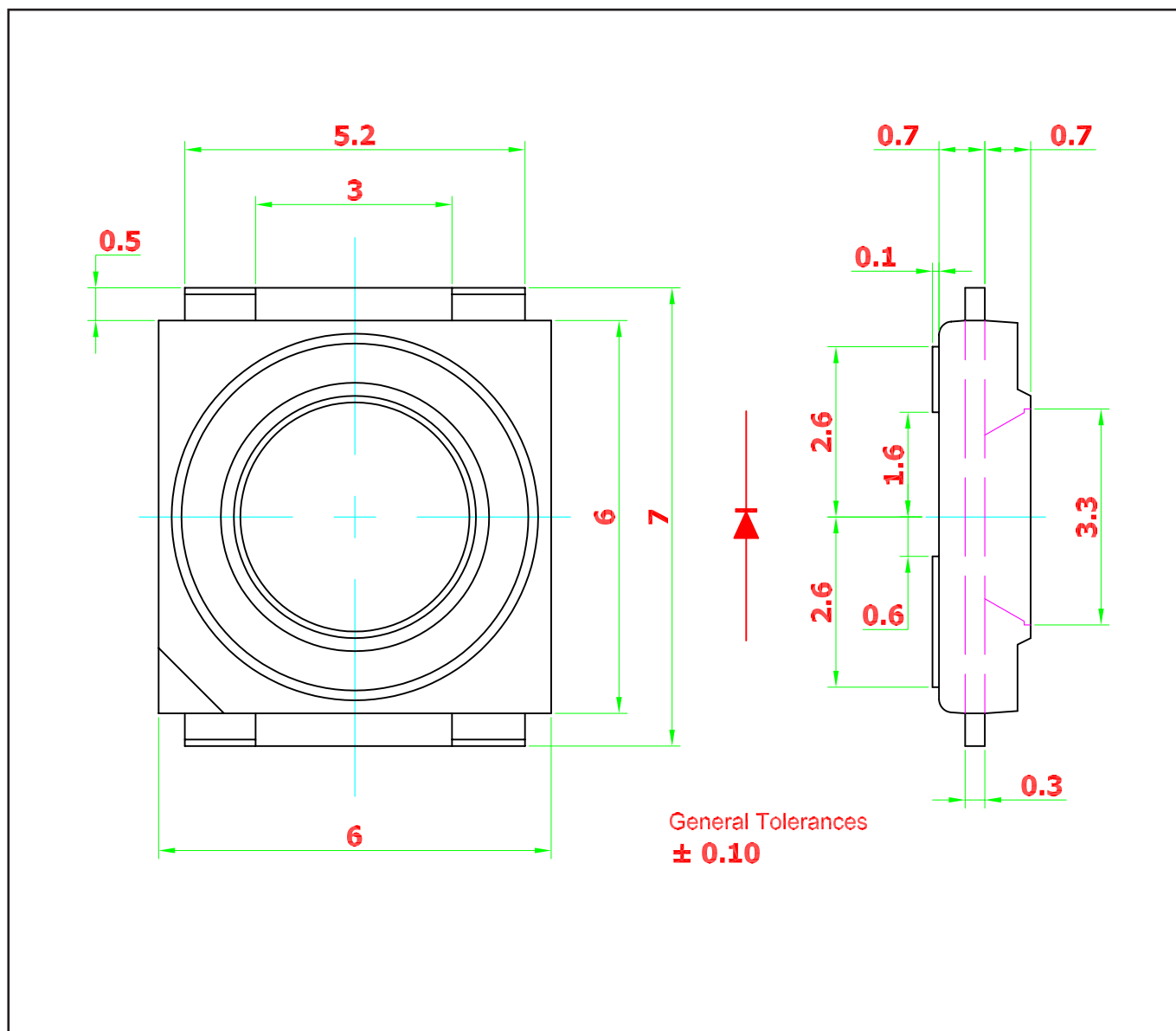
Relative Intensity Vs Wavelength



Radiation Pattern



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

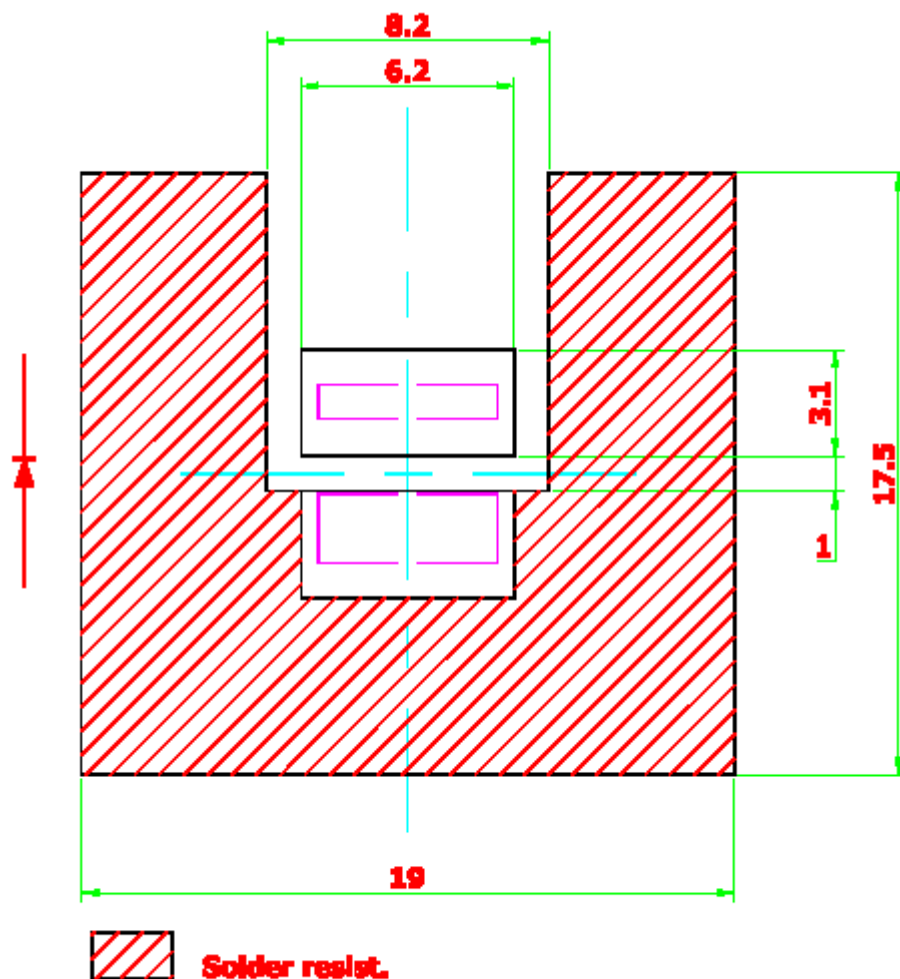


Material

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

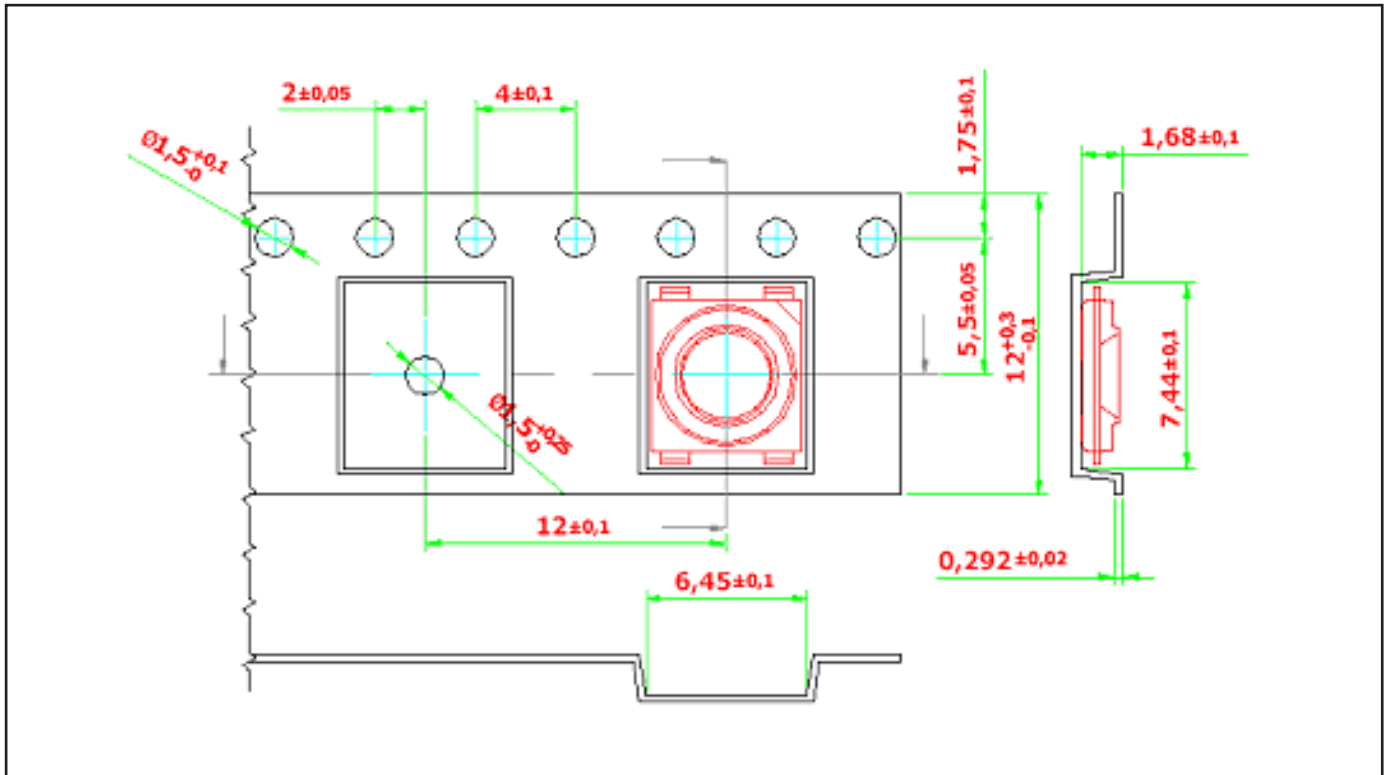
Solder Pad Design

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.

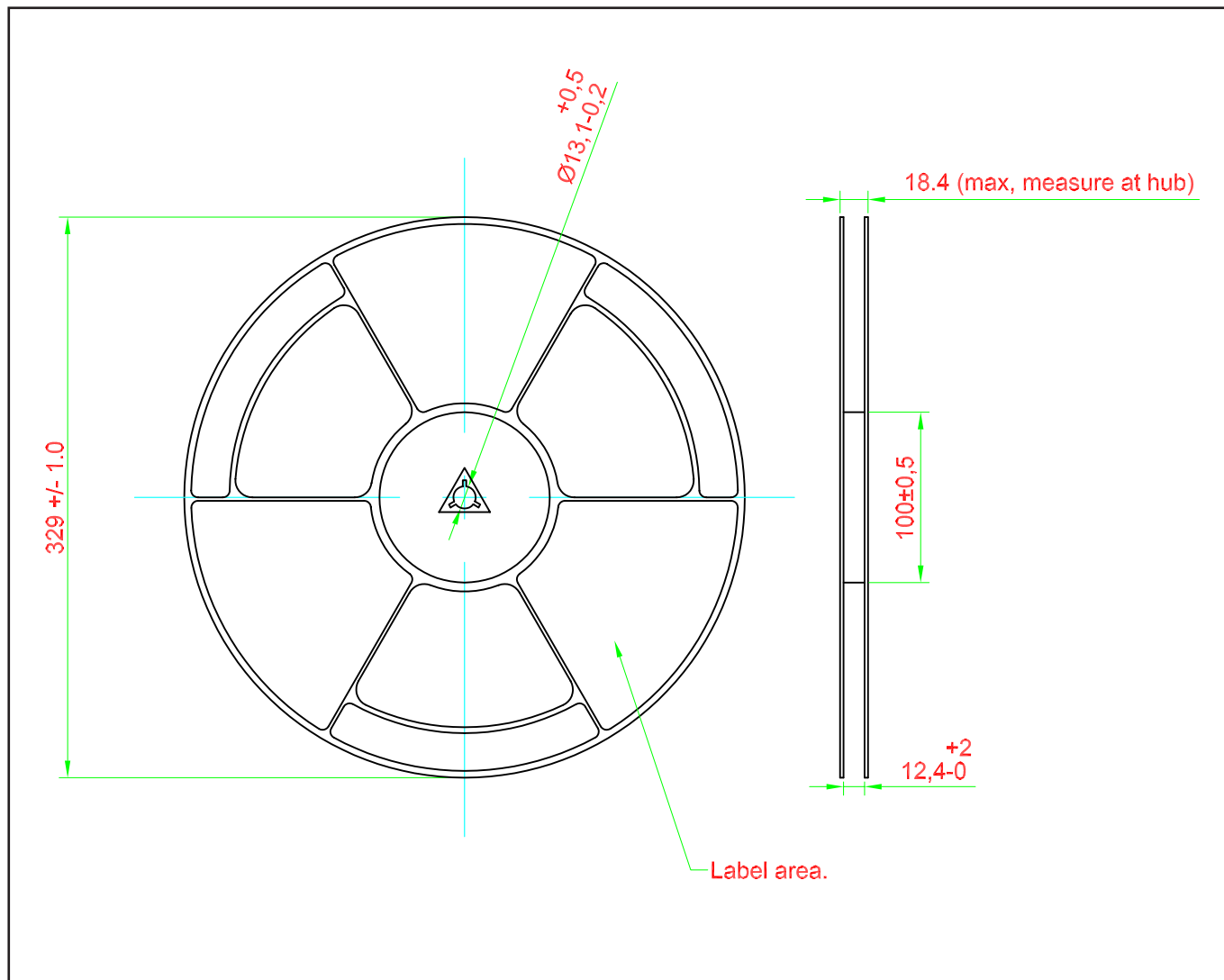


Taping and orientation

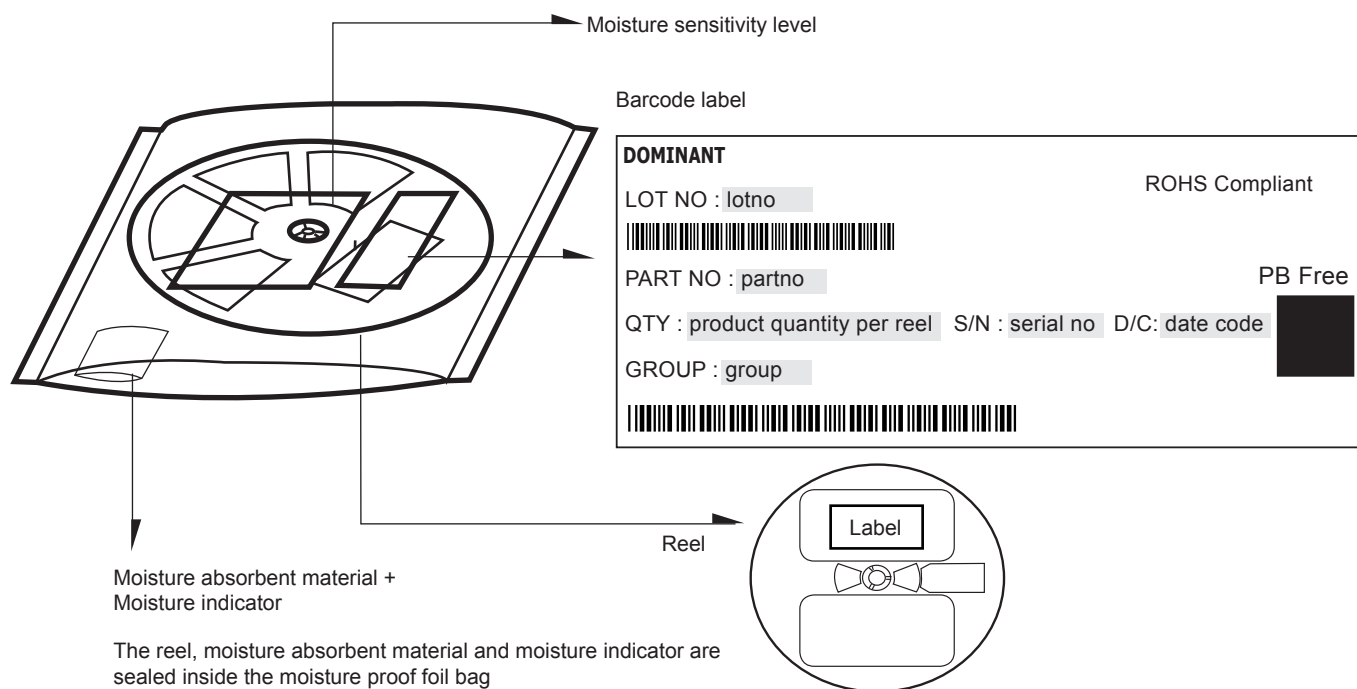
- Reels come in quantity of 2000 units.
- Reel diameter is 330 mm.



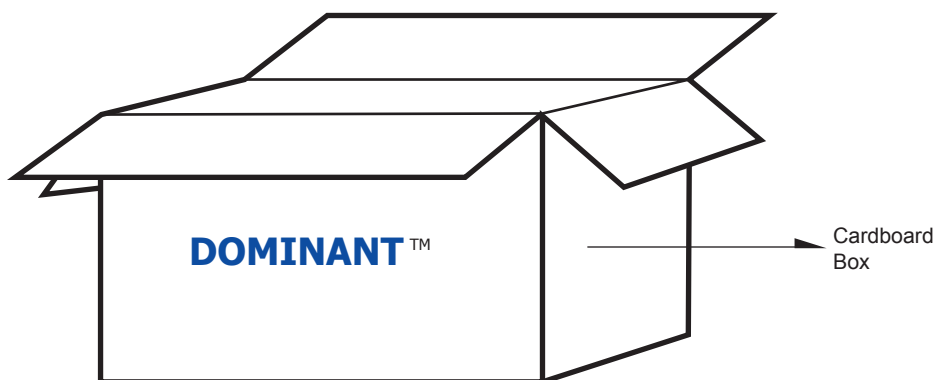
Packaging Specification



Packaging Specification



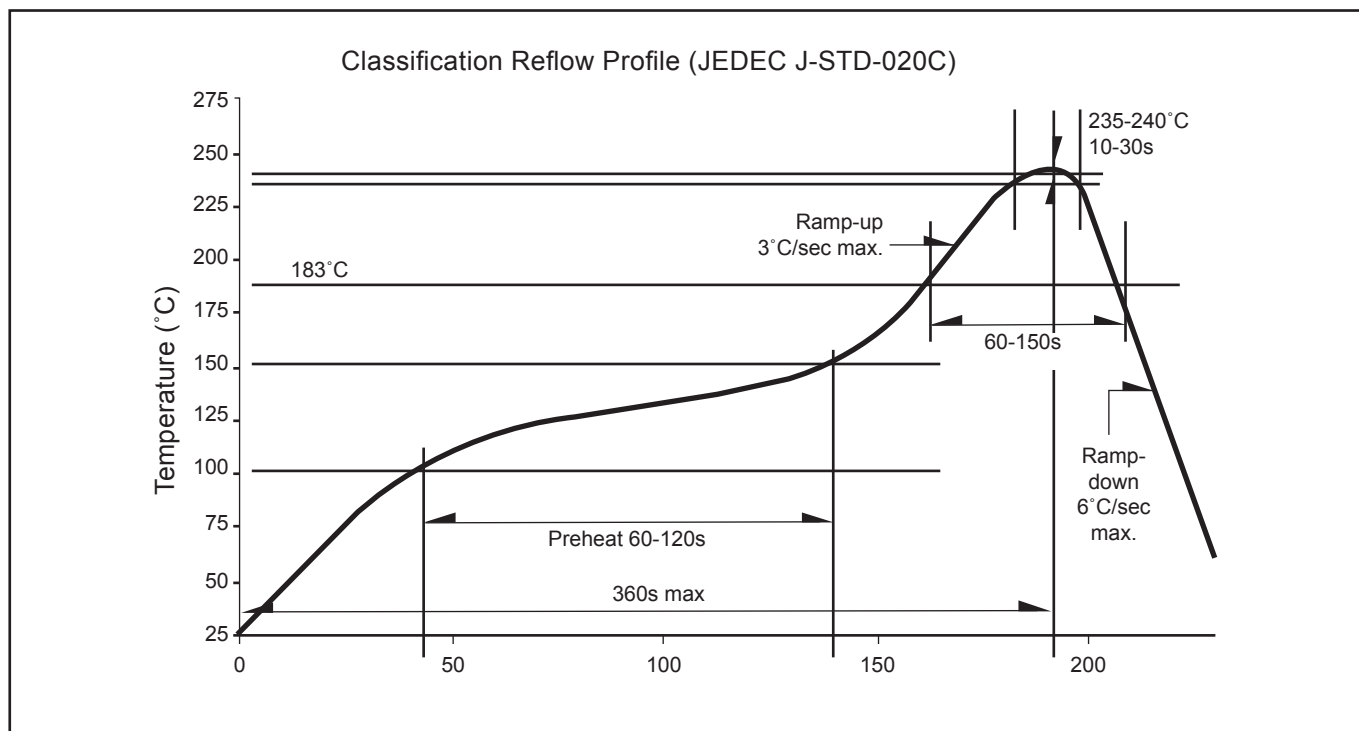
	Average 1pc SPNova	1 completed bag (2000pcs)
Weight (gram)	0.188	800 ± 10



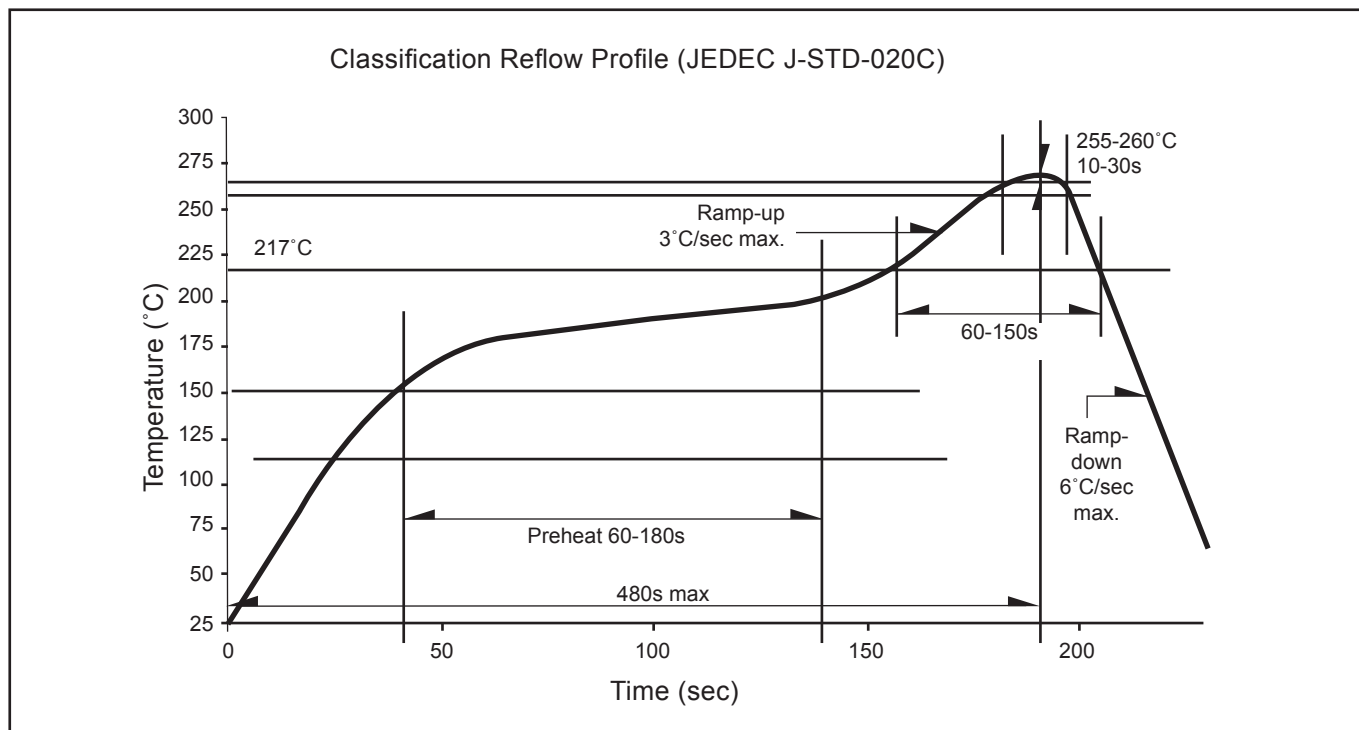
For SPNova™

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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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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SPNovaLED MCPCB Module

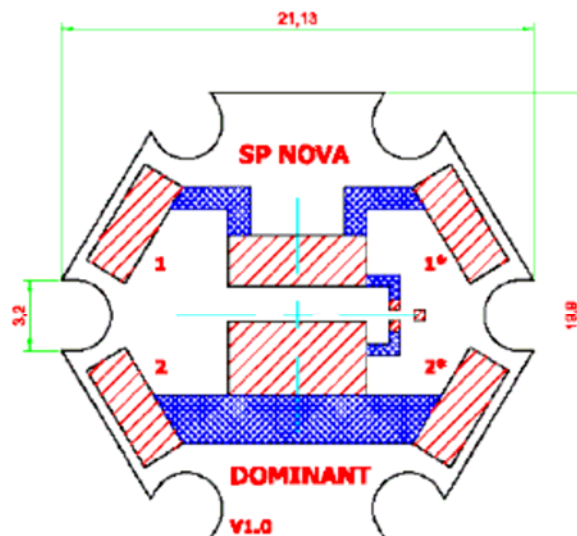


- Customized for Dominant's SPNovaLED.
- Good light thermal conductivity with metal core PCB.
- Soldering points are provided for electrical connections.
- Easily mounted with the locating slots.

Material

	Material
Substrate	Metal core PCB with Al substrate
Solder Paste	SnCuAg (Pb free)

Dimension



Substrate thickness = 1.50 ± 0.05 mm. Slots on MC PCB for location with M3 screws.

Electrical connection pads are labeled with “1” and “2”. Two pads are available for each polarity. Polarity definition is as follows

	1 or 1*	2 or 2*
NPH-USS, NPR-MSS, NPA-MSS, NPY-MSS, NPW-TSD, NPW-WSD, NPW-RSD, NPW-RSZ, NPF-TSD, NPF-WSD, NPF-RSD, NPF-RSZ	-ve	+ve
NPT-USS, NPB-USS	+ve	-ve

NOTE: All electrical and optical characteristics of the LED are maintained the same as per committed by the corresponding datasheets.

Each module will be individually packed in an ESD shielded bag.

NOTE.

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