

### SpiceLED™

Like spice, its diminutive size is a stark contrast to its standout performance in terms of brightness, durability and reliability. Despite being the smallest in size yet the SpiceLED™ packs a powerful performance and is a highly reliable design device. Its versatility enables its application in automotive appliances, key-pad illumination, hand-held devices such as PDAs, notebooks, compact back-lighting applications, consumer appliances, office equipment, audio and video equipment.



### Features:

- > High brightness surface mount LED.
- > High operating temperature up to 110°C
- > Super wide viewing angle of 160°.
- > Equivalent to 0603 package outline. Copper lead-frame construction.
- > Qualified according to JEDEC moisture sensitivity Level 2.
- > Compatible to IR reflow soldering.
- > Environmental friendly; RoHS compliance.
- > Compliance to automotive standard; AEC-Q101.



### Applications:

- > Automotive: interior applications, eg: switches, telematics, climate control system, dashboard, etc.
- > Consumer Appliances: LCD illumination as in PDAs, LCD TV.
- > Communication: indicator and backlight in mobilephone.
- > Display: full color display video notice board.
- > Industrial: white goods (eg: Oven, microwave, etc.).



## Optical Characteristics at Tj=25°C

Part Ordering Number	Color	Viewing Angle°	Luminous Intensity @ 20mA IV (mcd)		
			Min.	Typ.	Max.
SSS-NLD-ST1-1	Super Red, 632 nm	160	180.00	285.00	355.00
SSR-NLD-S2T-1	Red, 625 nm	160	224.00	355.00	450.00
SSA-NLD-TU1-1	Amber, 615nm	160	285.00	450.00	560.00
SSO-NLD-TU1-1	Orange, 605 nm	160	285.00	450.00	560.00
SSY-NLD-TU1-1	Yellow, 587 nm	160	285.00	450.00	560.00

### NOTE

1. All part number above comes in a quantity of 3000 units per reel.
2. Luminous intensity is measured with an accuracy of  $\pm 11\%$ .
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	Min. (V)	Vf @ If = 20mA		Vr @ Ir = 10uA	
		Typ. (V)	Max. (V)	Min. (V)	
SSx-NLD	1.8	2.1	2.6	12	

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

## Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	30	mA
Peak pulse current; ( $t_p \leq 10\mu s$ , Duty cycle = 0.1)	250	mA
Reverse voltage	12	V
ESD threshold (HBM)	2000	V
LED junction temperature	125	°C
Operating temperature	-40 ... +110	°C
Storage temperature	-40 ... +110	°C
Power dissipation (at room temperature)	80	mW
Thermal resistance		
- Junction / ambient, $R_{th JA}$	400	K/W
- Junction / solder point, $R_{th JS}$	200	K/W
(Mounting on FR4 PCB, pad size $\geq 16 \text{ mm}^2$ per pad)		

## Characteristics

	Symbol	Part Number	Value	Unit
Temperature coefficient of $I_{dom}$ (typ) $I_F = 20\text{mA}$ ; $0^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$TC_{I_{dom}}$ (typ)	SSS-NLD SSR-NLD SSA-NLD SSO-NLD SSY-NLD	0.06 0.06 0.07 0.08 0.09	nm / K
Temperature coefficient of $V_F$ (typ) $I_F = 20\text{mA}$ ; $0^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$TC_V$	SSS-NLD SSR-NLD SSA-NLD SSO-NLD SSY-NLD	-2.2 -2.3 -2.2 -2.0 -1.7	mV / K
Temperature coefficient of $I_V$ (typ) $I_F = 20\text{mA}$ ; $0^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$TC_{IV}$	SSS-NLD SSR-NLD SSA-NLD SSO-NLD SSY-NLD	-1.8 -2.2 -3.1 -4.0 -4.9	mcd / K

## Wavelength Grouping

Color	Group	Wavelength distribution (nm)
SSS; Super Red	Full	625 - 640
SSR; Red	Full	620 - 630
SSA; Amber	Full	610 - 621
	W	610 - 615
	X	615 - 621
SSO; Orange	Full	600 - 612
	W	600 - 603
	X	603 - 606
	Y	606 - 609
	Z	609 - 612
SSY; Yellow	Full	582 - 594
	W	582 - 585
	X	585 - 588
	Y	588 - 591
	Z	591 - 594

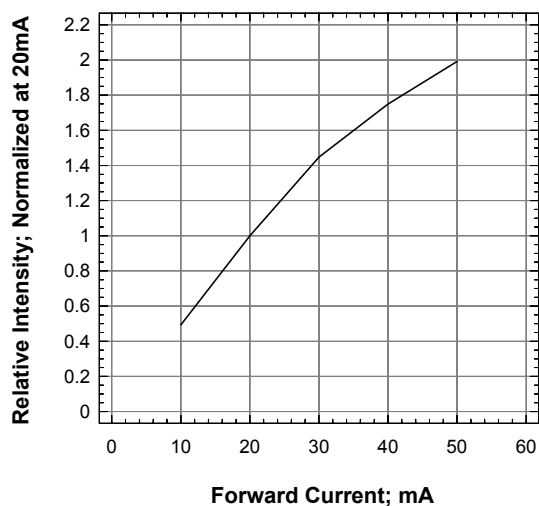
Dominant wavelength is measured with an accuracy of  $\pm 1\text{nm}$ .

## Luminous Intensity Group at $T_j=25^\circ\text{C}$

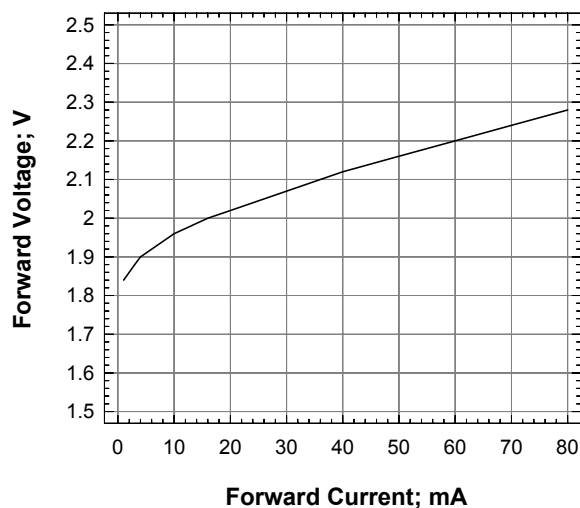
Brightness Group	Luminous Intensity IV (mcd)
S1	180.00...224.00
S2	224.00...285.00
T1	285.00...355.00
T2	355.00...450.00
U1	450.00...560.00

Luminous intensity is measured with an accuracy of  $\pm 11\%$ .

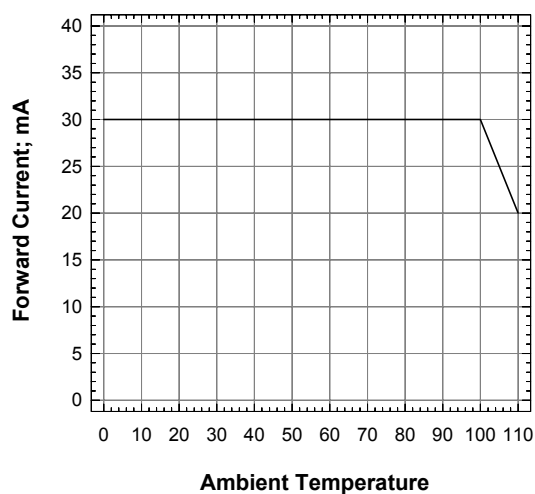
**Relative Intensity Vs Forward Current**



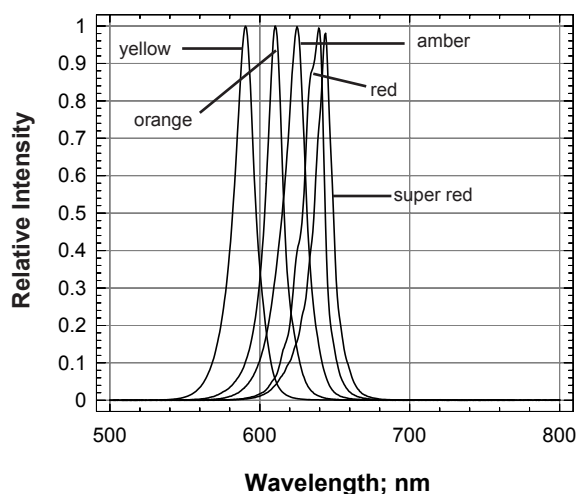
**Forward Voltage Vs Forward Current**



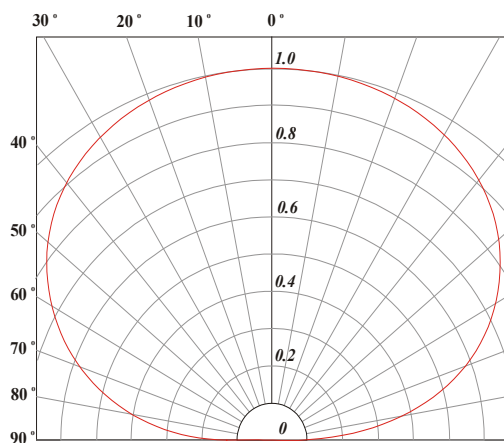
**Maximum Current Vs Ambient Temperature**



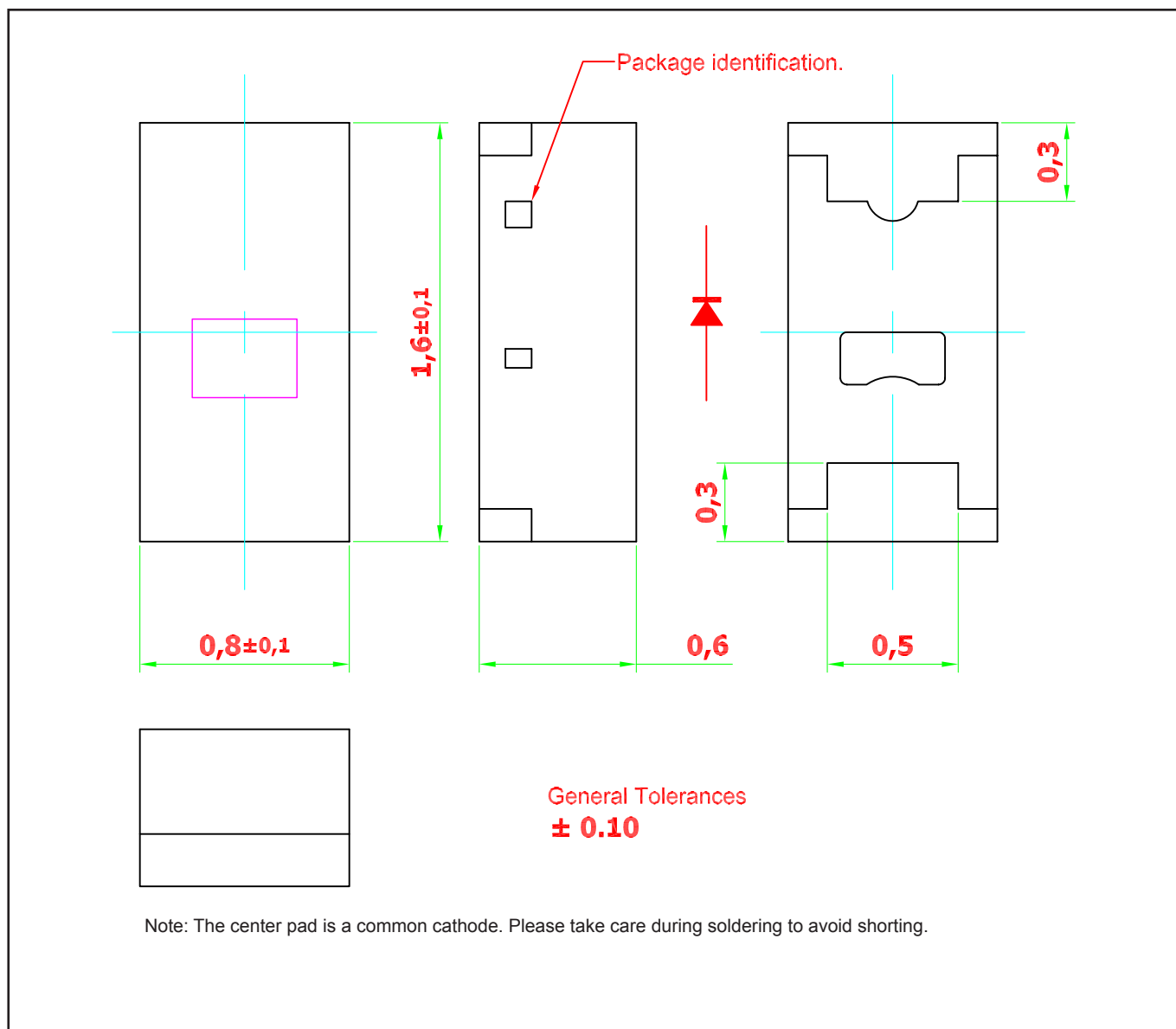
**Relative Intensity Vs Wavelength**



**Radiation Pattern**



**SpiceLED™ • AllnGaP S-Spice : SSx-NLD Package Outlines**

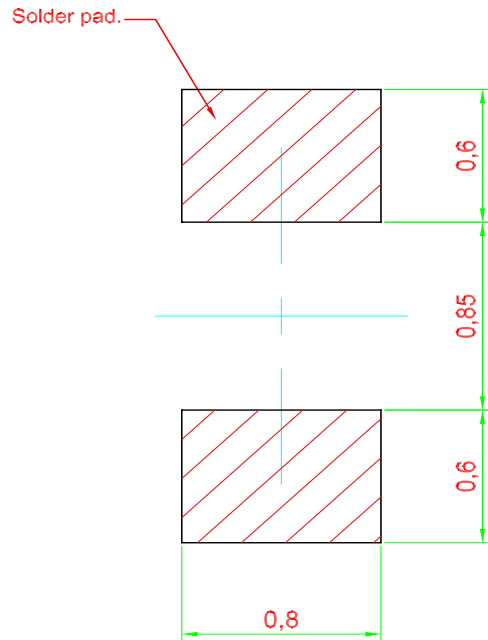


**Material**

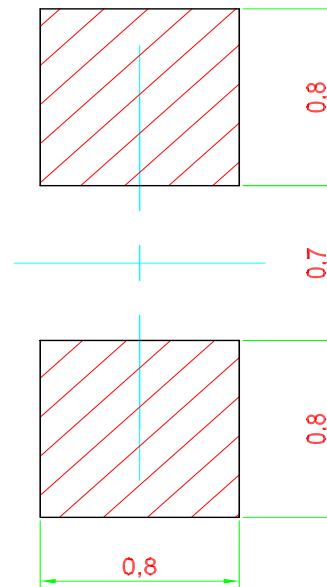
Material	
Lead-frame	Cu Alloy With NiPdAu Plating
Package	High Temperature Resistant Epoxy Resin

Note: product is Pb free

## Recommended Solder Pad



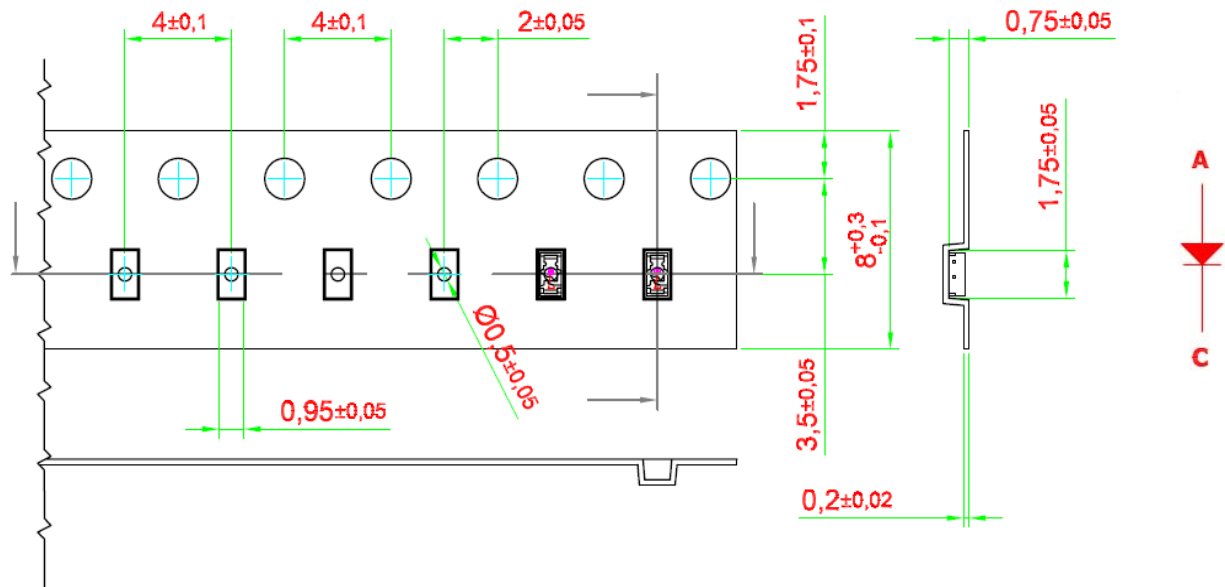
Recommended Solder-pad



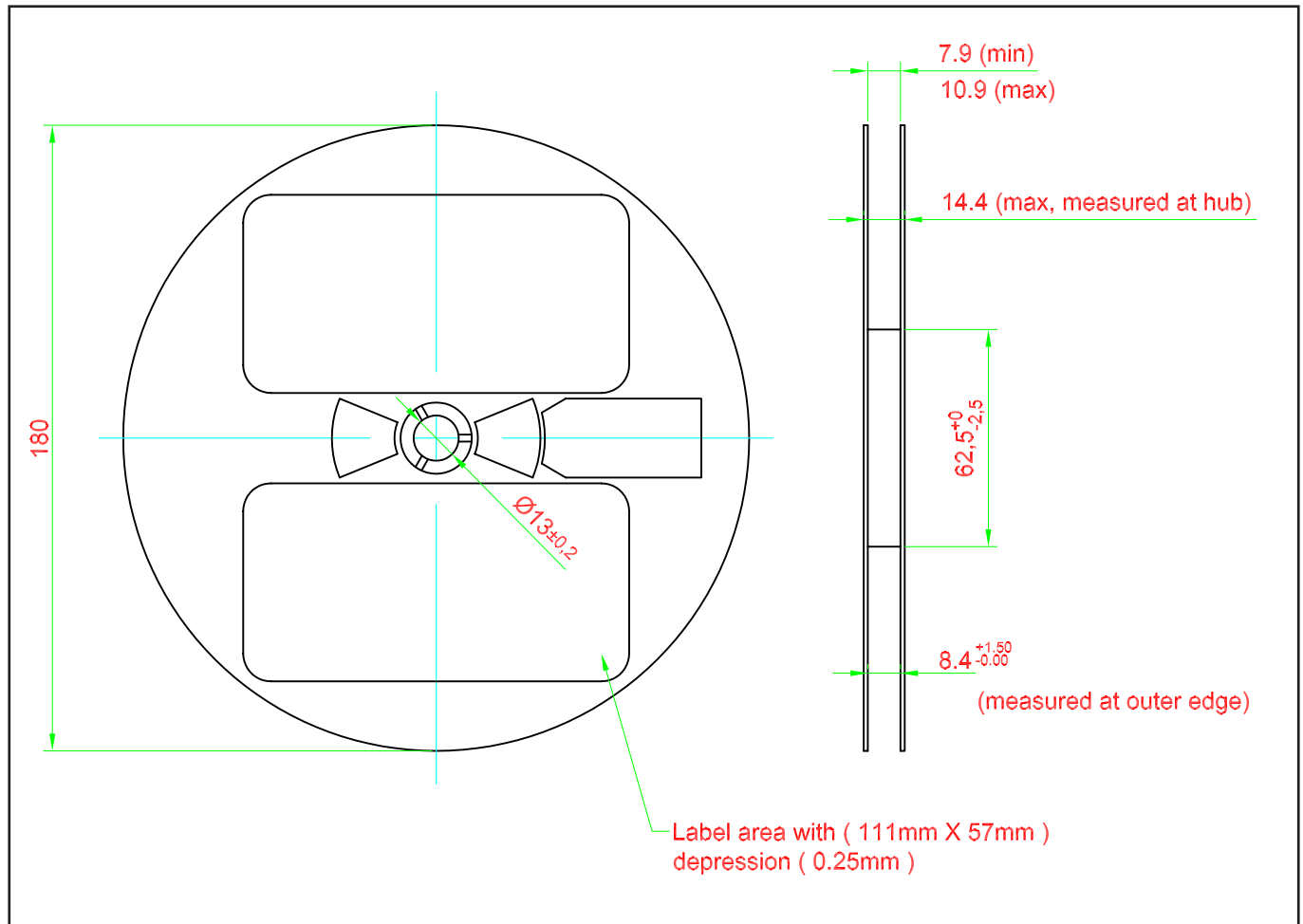
Alternative Solder-pad  
Compatible to ChipLED 0603

## Taping and orientation

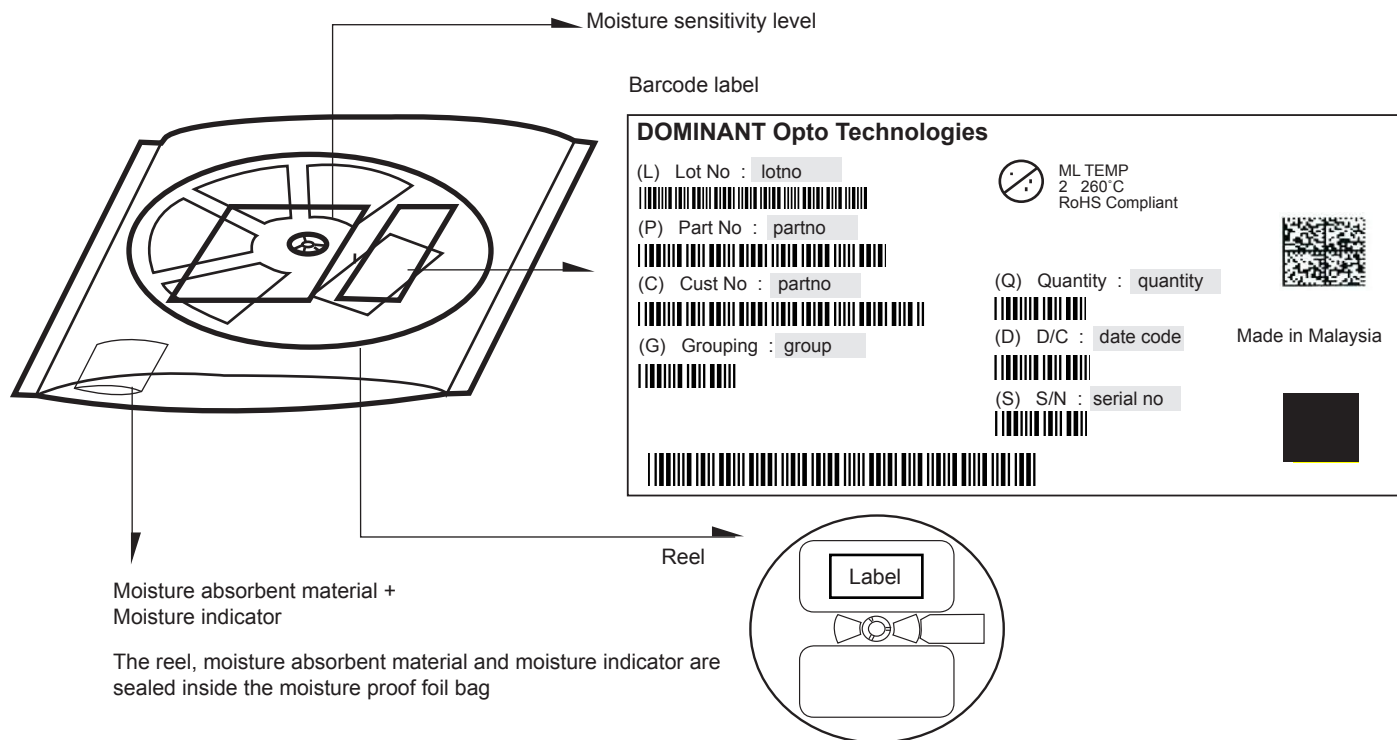
- Reels come in quantity of 3000 units.
- Reel diameter is 180 mm.



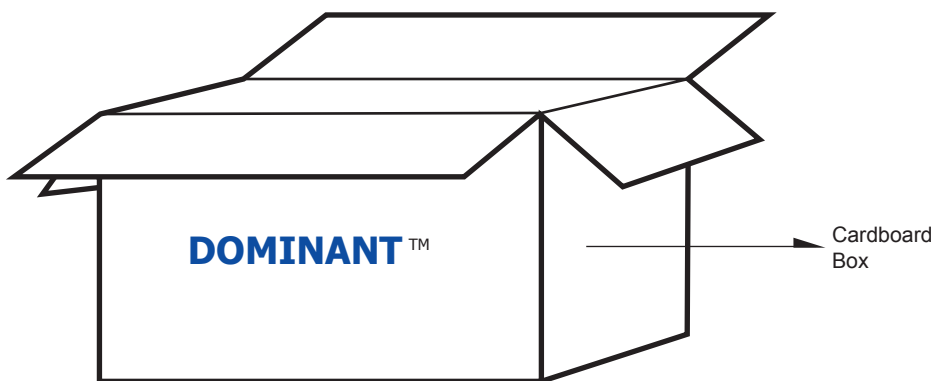
## Packaging Specification



## Packaging Specification



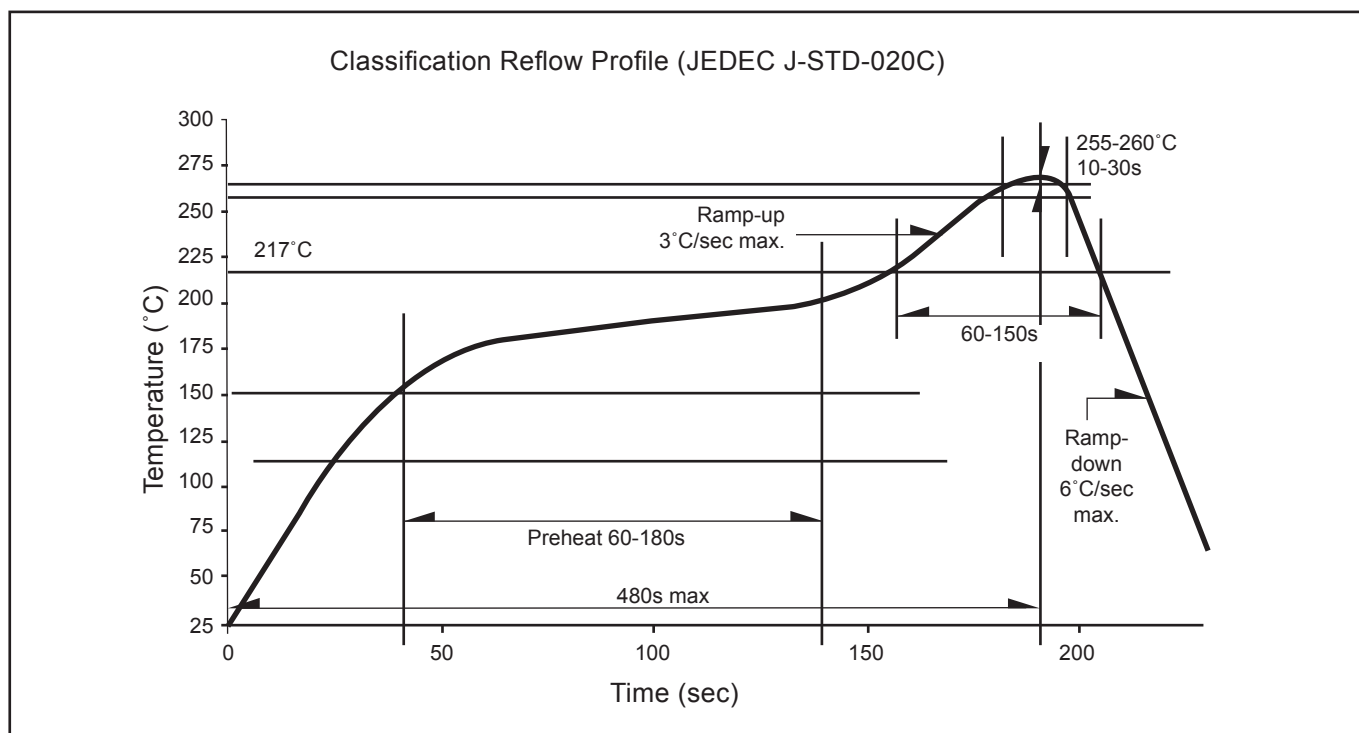
	Average 1pc SpiceLED	1 completed bag (3000pcs)
Weight (gram)	0.001	140 ± 10



### For SpiceLED™

Cardboard Box Size	Dimensions (mm)	Empty Box Weight (kg)	Reel / Box
Super Small	325 x 225 x 190	0.38	9 reels MAX
Small	325 x 225 x 280	0.54	15 reels MAX
Medium	570 x 440 x 230	1.46	60 reels MAX
Large	570 x 440 x 460	1.92	120 reels MAX

## Recommended Pb-free Soldering Profile



## Revision History

Page	Subjects	Date of Modification
-	Initial Release	08 Apr 2009
3	Add Characteristics	09 Jun 2009
-	Update company name	29 Mar 2010
4	Typo error in luminous intensity	11 May 2011
3	Add Thermal resistance	15 May 2012
6	Update Package Outline	28 Nov 2012
8	Update Carrier Tape	13 Feb 2014
1, 10	Add Features Update Package Specification	26 Oct 2015

### NOTE

All the information contained in this document is considered to be reliable at the time of publishing. However, DOMINANT Opto Technologies does not assume any liability arising out of the application or use of any product described herein.

DOMINANT Opto Technologies reserves the right to make changes to any products in order to improve reliability, function or design.

DOMINANT Opto Technologies products are not authorized for use as critical components in life support devices or systems without the express written approval from the Managing Director of DOMINANT Opto Technologies.

## 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>.

**Please contact us for more information:**

### Head Quarter

DOMINANT Opto Technologies Sdn. Bhd  
Lot 6, Batu Berendam, FTZ Phase III, 75350 Melaka, Malaysia.  
Tel: +606 283 3566 Fax: +606 283 0566  
E-mail: [sales@dominant-semi.com](mailto:sales@dominant-semi.com)

