

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.
- > Superior corrosion resistant.



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) <i>Appx. 1.1</i>		
			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

Electrical Characteristics at Tj=25°C

Part Number	Vf @ If = 20mA <i>Appx. 3.1</i>			Vr @ Ir = 10uA
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
SSx-NLD	1.8	2.1	2.6	12

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	30	mA
Peak pulse current; (tp ≤ 10μs, 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 ≥ 16 mm ² per pad)		

Characteristics

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

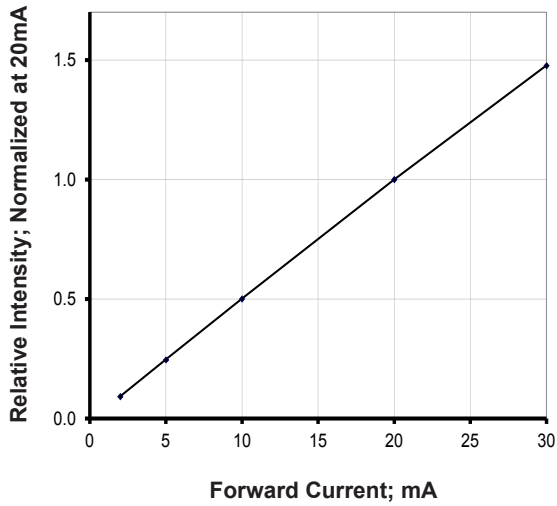
Wavelength Grouping

Color	Group	Wavelength distribution (nm) <i>Appx. 2.2</i>
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

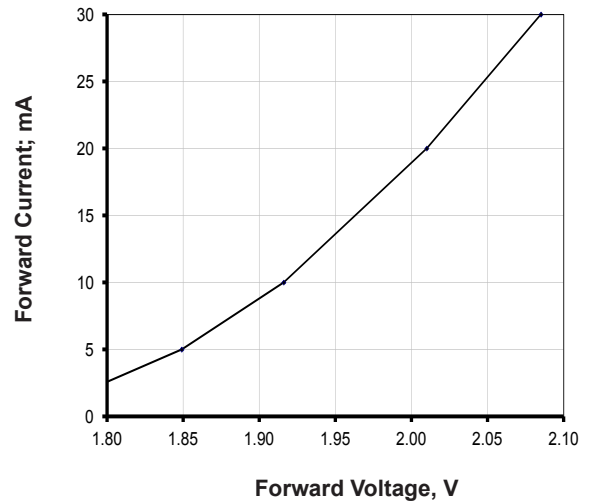
Luminous Intensity Group at Tj=25°C

Brightness Group	Luminous Intensity <i>Appx. 1.1</i> 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

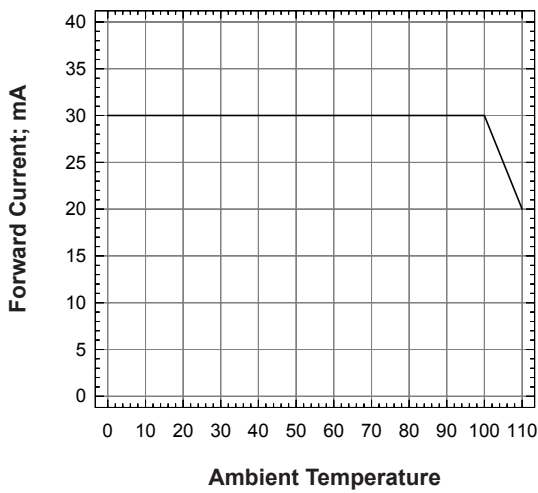
Relative Intensity Vs Forward Current



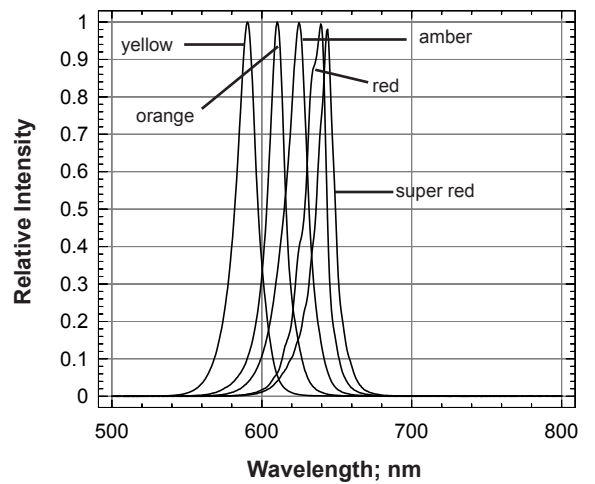
Forward Current Vs Forward Voltage



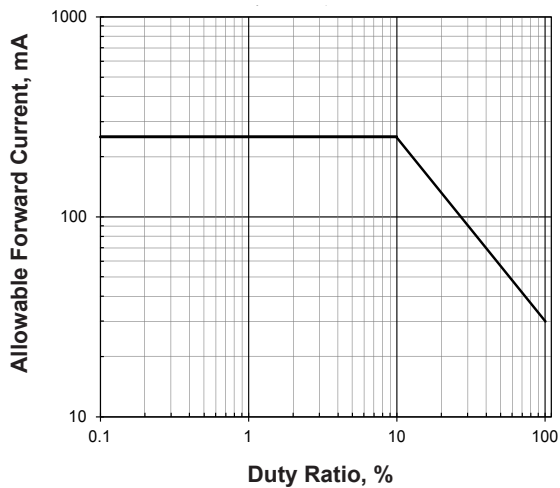
Maximum Current Vs Ambient Temperature



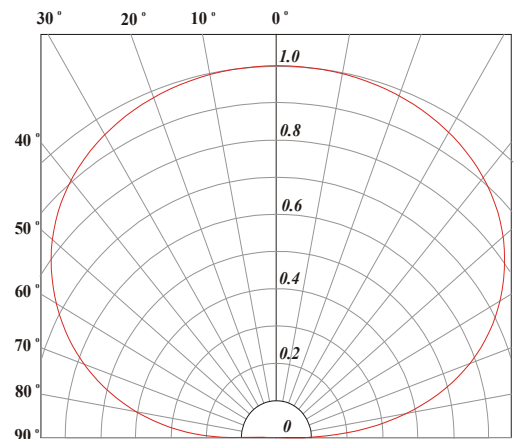
Relative Intensity Vs Wavelength



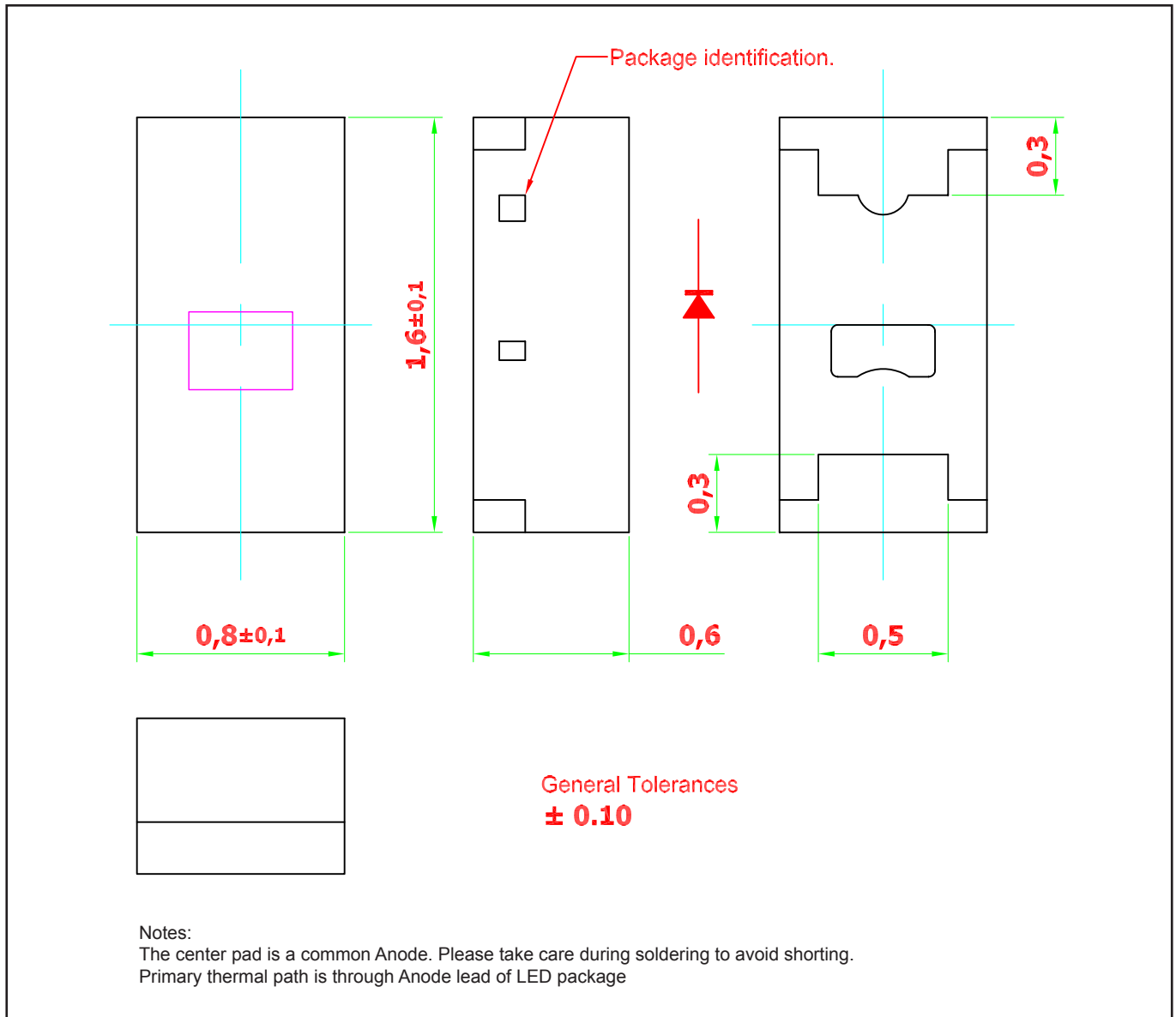
Allowable Forward Current Vs Duty Ratio



Radiation Pattern



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

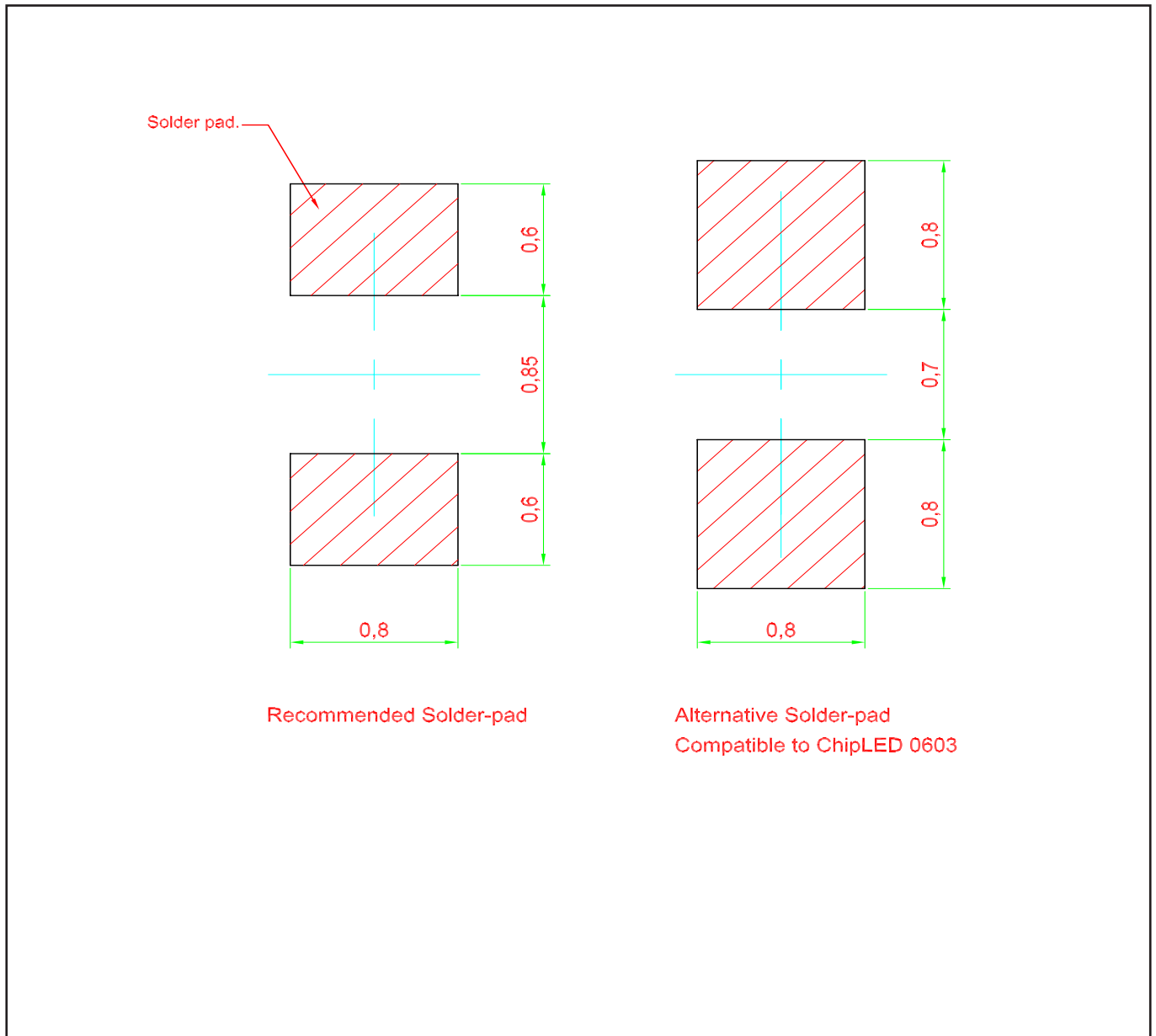


Material

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

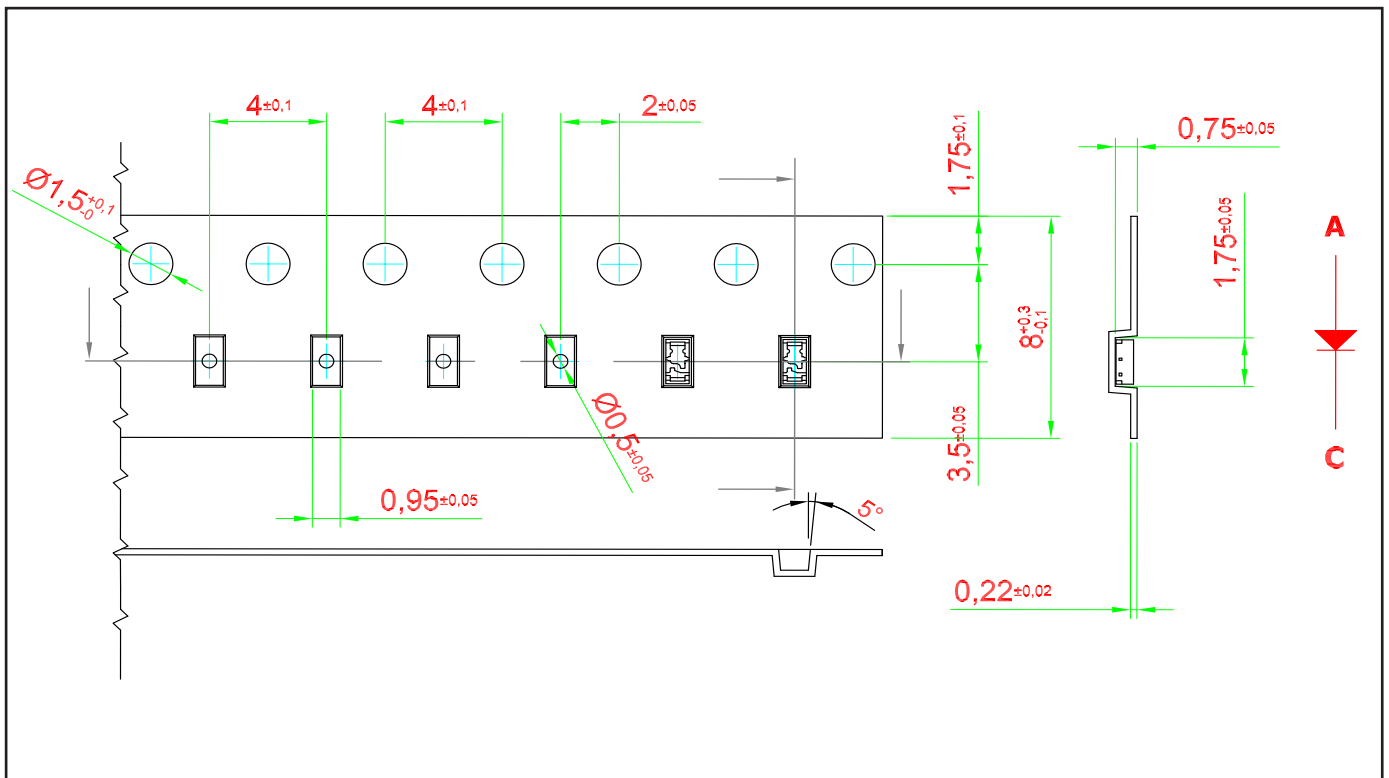
Note: product is Pb free

Recommended Solder Pad

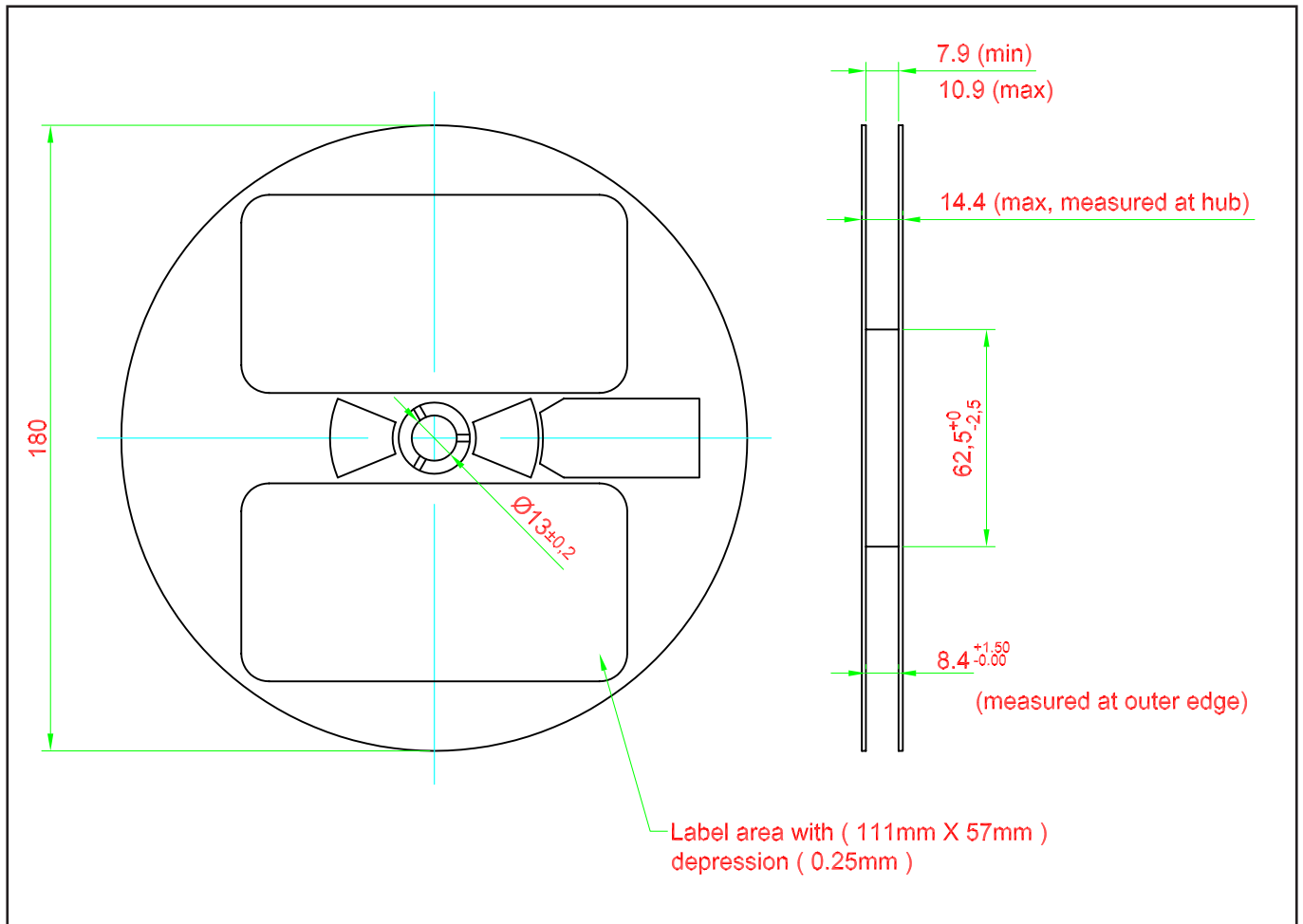


Taping and orientation

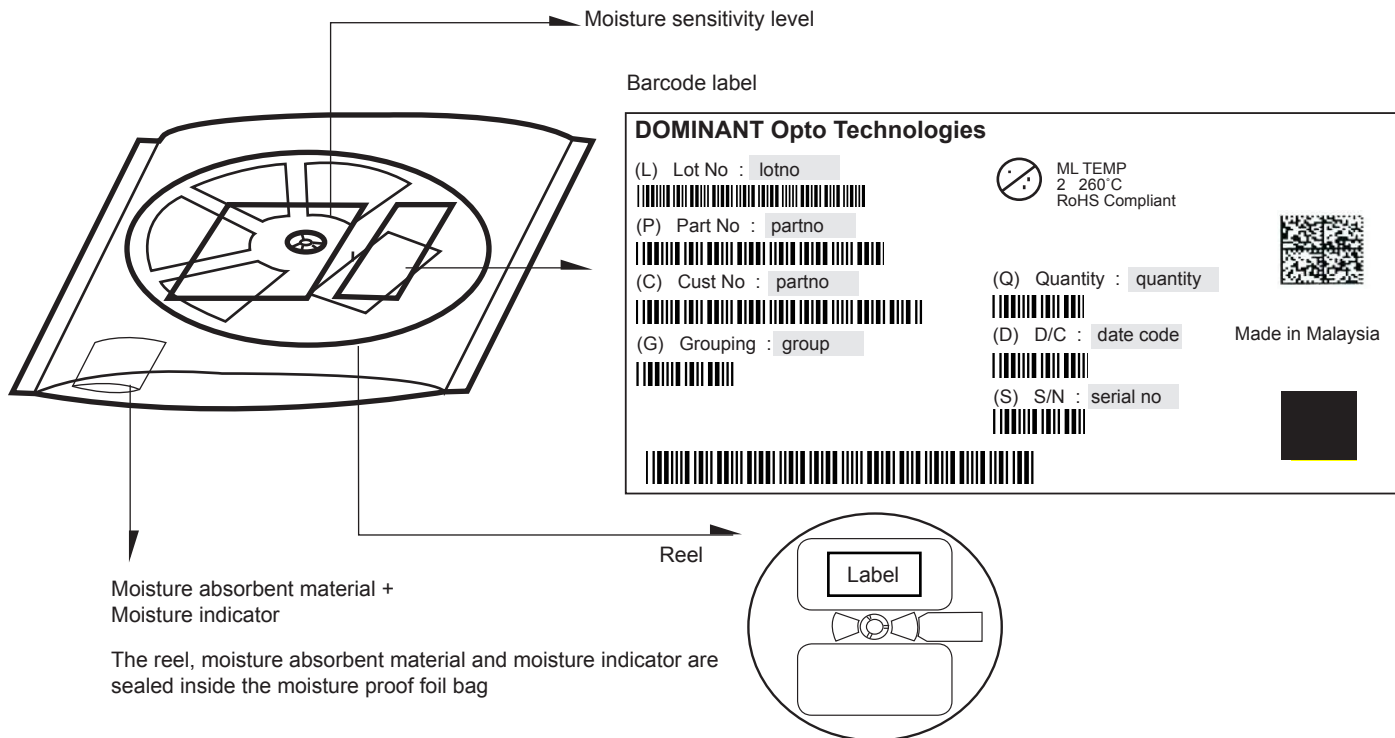
- Reels come in quantity of 3000 units.
- Reel diameter is 180 mm.



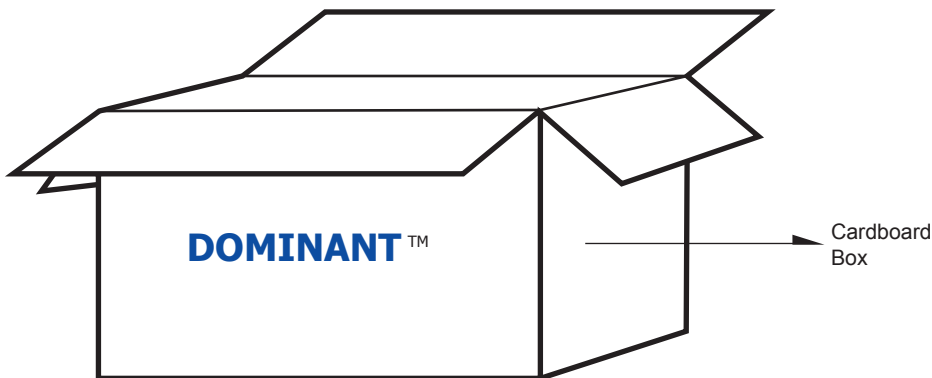
Packaging Specification



Packaging Specification



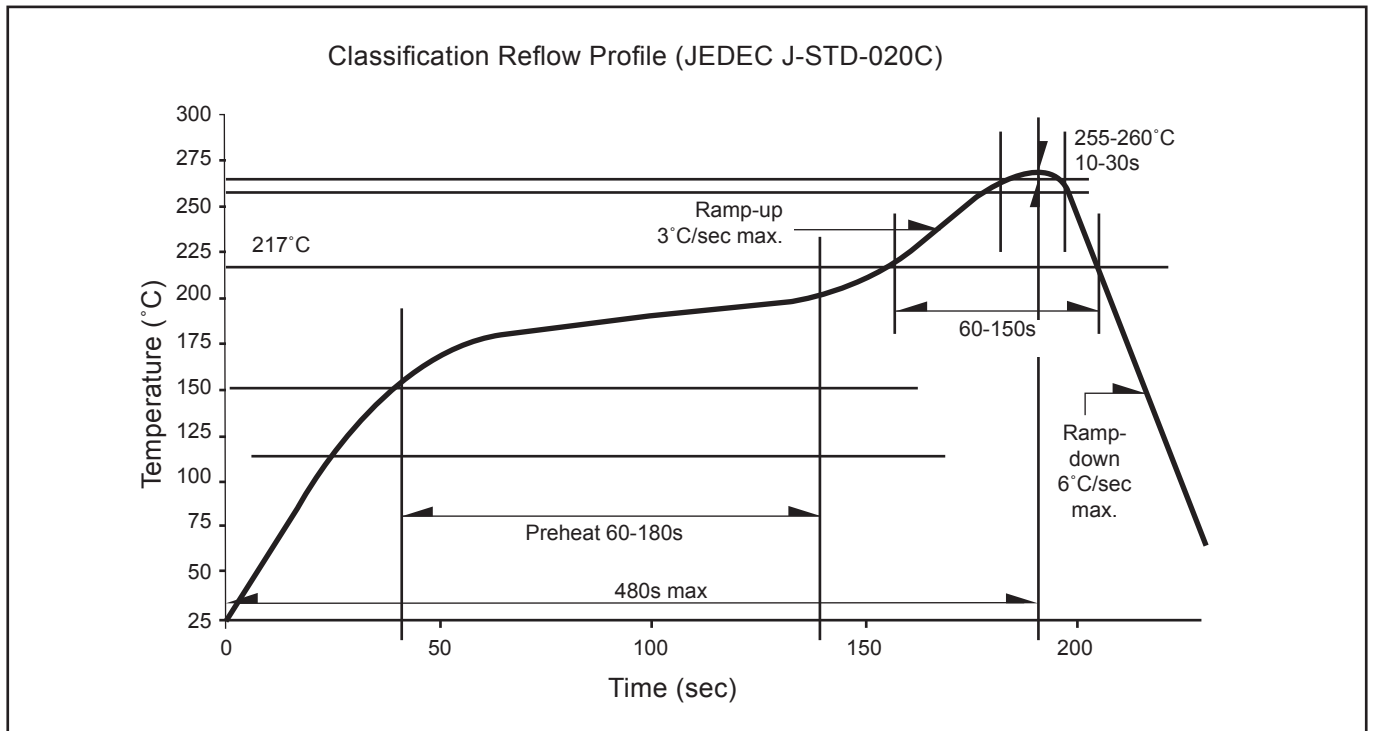
	Average 1pc SpiceLED	1 completed bag (3000pcs)
Weight (gram)	0.001	140 ± 10



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



Appendix

1) **Brightness:**

- 1.1 Luminous intensity is measured with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (according to GUM with a coverage factor of $k=3$).
- 1.2 Luminous flux is measured with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (according to GUM with a coverage factor of $k=3$).

2) **Color:**

- 2.1 Chromaticity coordinate groups are measured with an internal reproducibility of ± 0.005 and an expanded uncertainty of ± 0.01 (accordingly to GUM with a coverage factor of $k=3$).
- 2.2 DOMINANT wavelength is measured with an internal reproducibility of $\pm 0.5\text{nm}$ and an expanded uncertainty of $\pm 1\text{nm}$ (accordingly to GUM with a coverage factor of $k=3$).

3) **Voltage:**

- 3.1 Forward Voltage, V_f is measured with an internal reproducibility of $\pm 0.05\text{V}$ and an expanded uncertainty of $\pm 0.1\text{V}$ (accordingly to GUM with a coverage factor of $k=3$).

Revision History

Page	Subjects	Date of Modification
-	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
1, 5, 6	Add Features Update Graph: Relative Intensity Vs Forward Current & Forward Current Vs Forward Voltage Update Notes in Package Outline	17 Feb 2016
5	Add Graph: Allowable Forward Current Vs Duty Ratio	24 Jun 2016
8, 12	Error on Taping and Orientation Add Appendix	26 Oct 2016

NOTE

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About Us

DOMINANT Opto Technologies is a dynamic company that is amongst the world's leading automotive LED manufacturers. With an extensive industry experience and relentless pursuit of innovation, DOMINANT's state-of-art manufacturing and development capabilities have become a trusted and reliable brand across the globe. More information about DOMINANT Opto Technologies, a ISO/TS 16949 and ISO 14001 certified company, can be found under <http://www.dominant-semi.com>.

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