

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.
- > 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 @ IF = 2mA IV (mcd) <i>Appx. 1.1</i>		
			Min.	Typ.	Max.
SSB-HLD-KL2-1-I2	Blue, 470 nm	160	7.2	11.2	18.0
SST-HLD-P2Q-1-I2	True Green, 525nm	160	56.0	90.0	112.5

Electrical Characteristics at Tj=25°C

Part Number	Min. (V)	Vf @ If = 2mA <i>Appx. 3.1</i>			Vr @ Ir = 10uA Min. (V)
		Typ. (V)	Max. (V)		
SSx-HLD	2.50	2.75	3.00		5

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	20	mA
Peak pulse current; (tp ≤ 10μs, Duty cycle = 0.1)	100	mA
Reverse voltage; Ir _{max} = 10μA	5	V
ESD threshold (HBM)	2000	V
LED junction temperature	120	°C
Operating temperature	-40 ... +110	°C
Storage temperature	-40 ... +110	°C
Power dissipation (at room temperature)	75	mW
Thermal resistance		
- Junction / ambient, R _{th JA}	480	K/W
- Junction / solder point, R _{th JS}	280	K/W
(Mounting on FR4 PCB, pad size ≥ 16 mm ² per pad)		

Wavelength Grouping at Tj=25°C

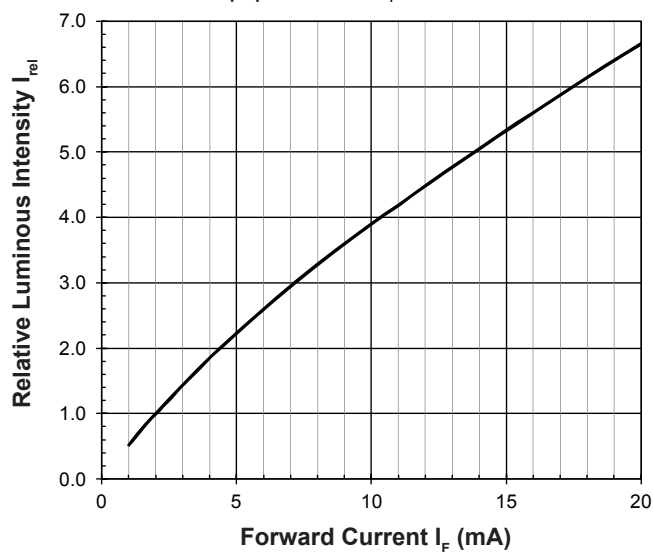
Color	Group	Wavelength distribution (nm) <i>Appx. 2.2</i>
SSB; Blue	Full	464 - 476
	A	464 - 470
	B	470 - 476
SST; True Green	Full	520 - 535
	A	520 - 525
	B	525 - 530
	C	530 - 535

Luminous Intensity Group at Tj=25°C

Brightness Group	Luminous Intensity <i>Appx. 1.1</i> IV (mcd)
K1	7.2 ... 9.0
K2	9.0 ... 11.2
L1	11.2 ... 14.0
L2	14.0 ... 18.0
P2	56.0 ... 71.5
Q1	71.5 ... 90.0
Q2	90.0 ... 112.5

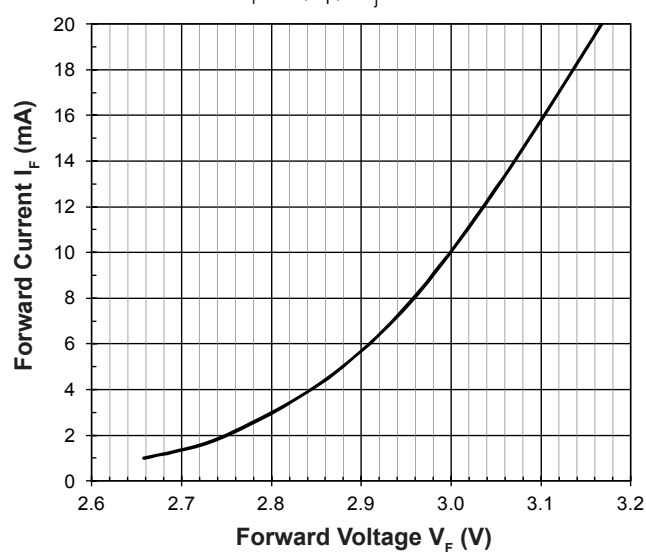
Relative Luminous Intensity Vs Forward Current

$$I_v/I_v(2\text{mA}) = f(I_F); T_j = 25^\circ\text{C}$$



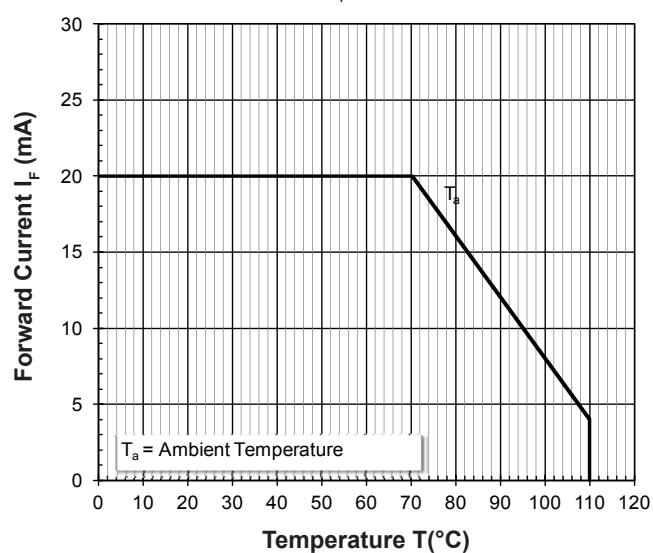
Forward Current Vs Forward Voltage

$$I_F = f(V_F); T_j = 25^\circ\text{C}$$



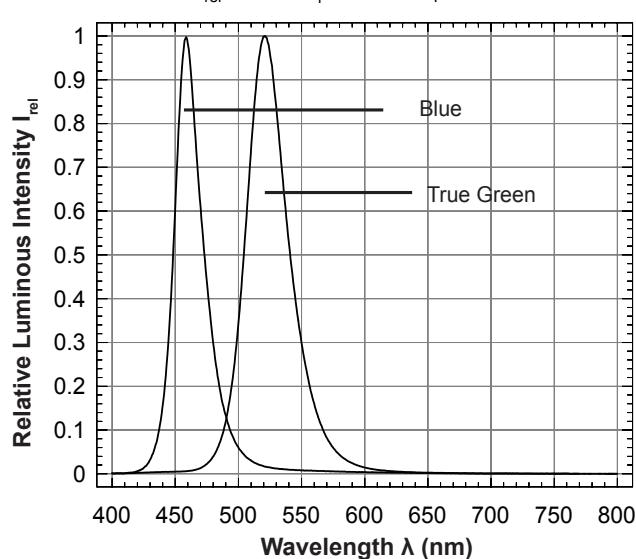
Maximum Current Vs Temperature

$$I_F = f(T)$$



Relative Spectral Emission

$$I_{rel} = f(\lambda); T_j = 25^\circ\text{C}; I_F = 2\text{mA}$$



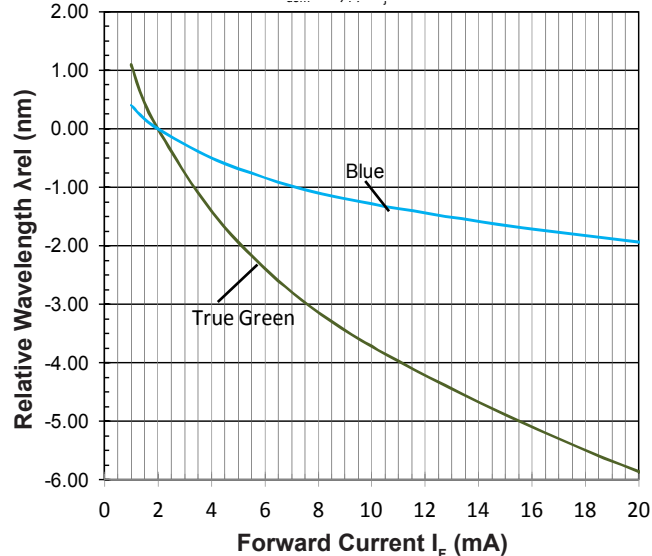
Allowable Forward Current Vs Duty Ratio

$$(T_j = 25^\circ\text{C}; t_p \leq 10\mu\text{s})$$

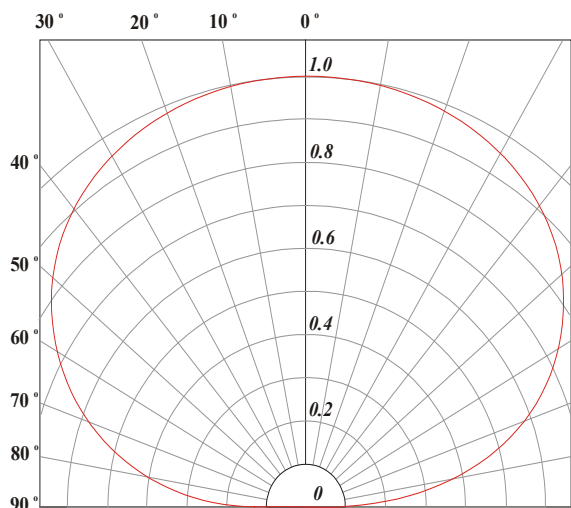


Relative Wavelength Shift Vs Forward Current

$$\lambda_{dom} = f(I_F); T_j = 25^\circ\text{C}$$

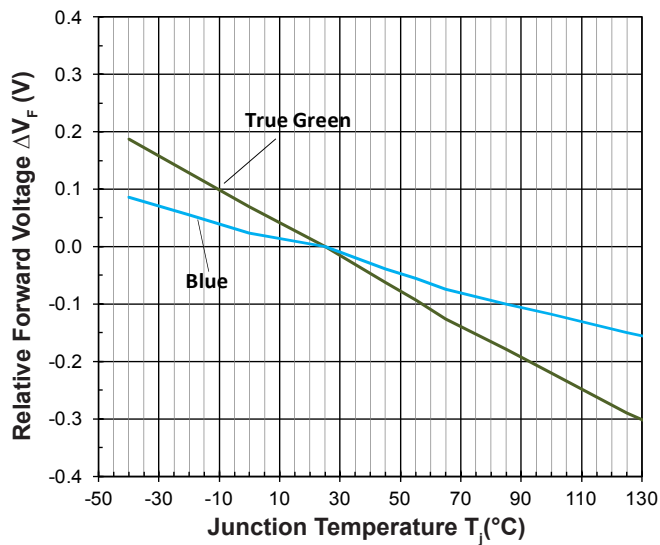


Radiation Pattern



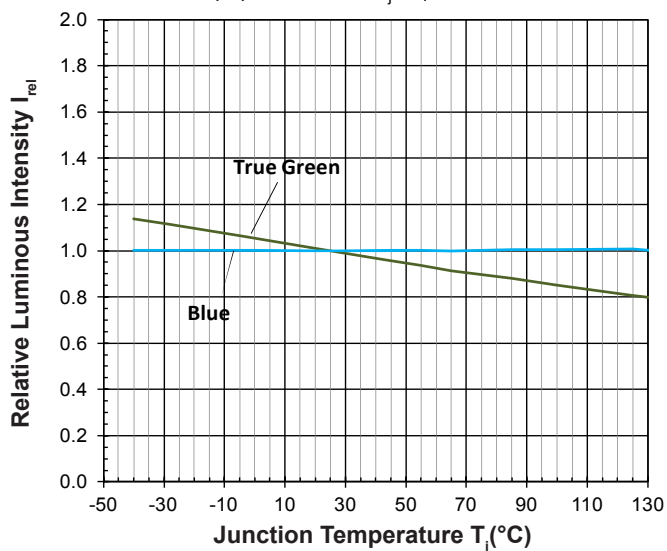
Relative Forward Voltage Vs Junction Temperature

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 2\text{mA}$$



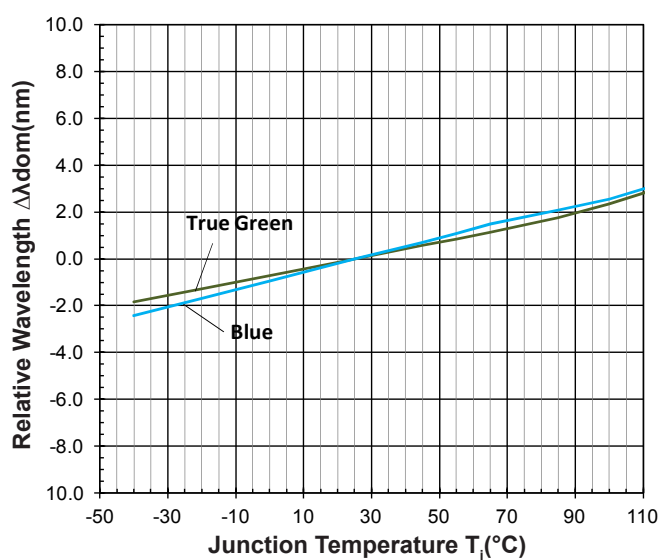
Relative Luminous Intensity Vs Junction Temperature

$$I_V/I_V(25^\circ\text{C}) = f(T_j); I_F = 2\text{mA}$$

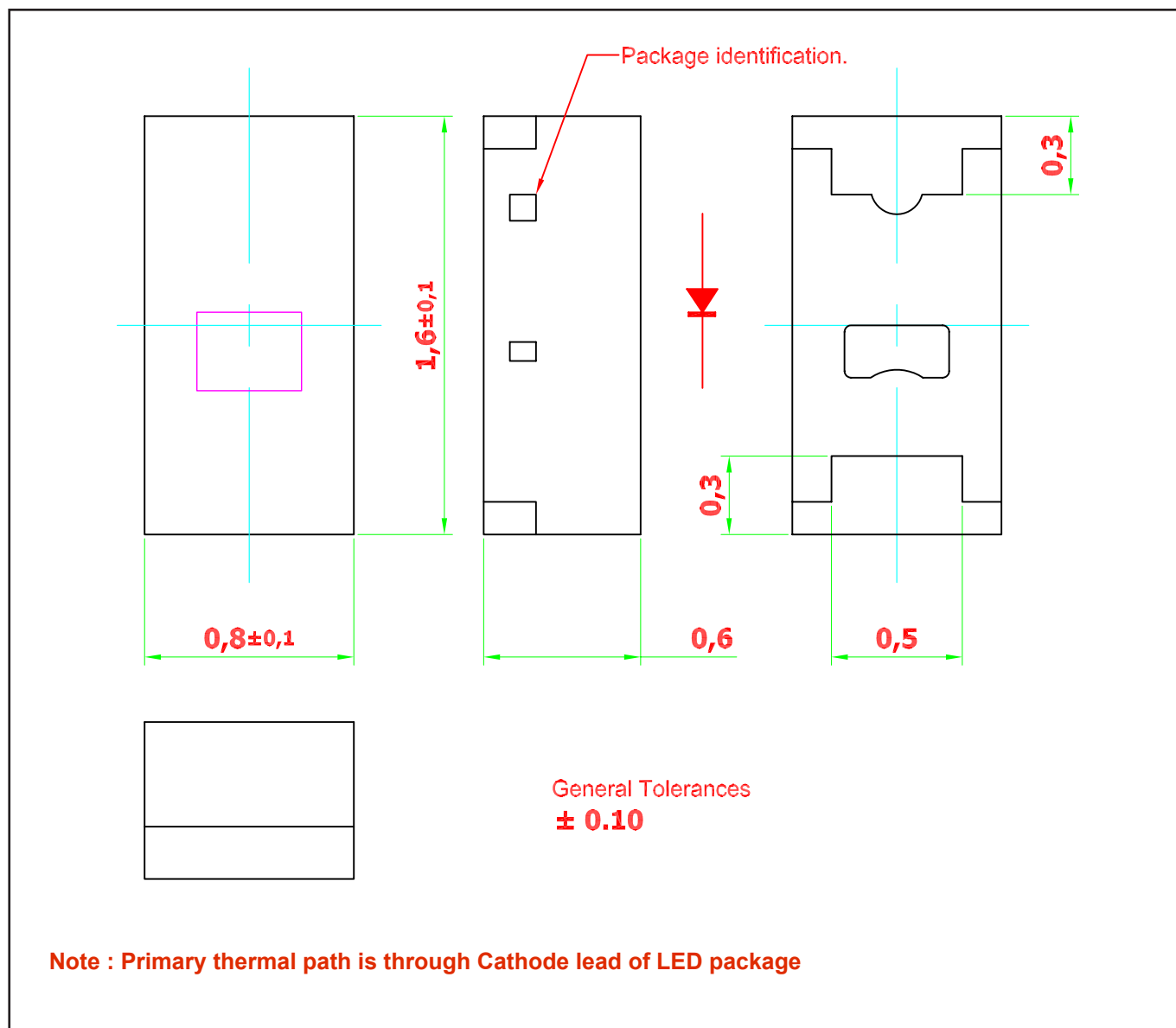


Relative Wavelength Vs Junction Temperature

$$\Delta \lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25^\circ\text{C}) = f(T_j); I_F = 2\text{mA}$$



SpiceLED™ • InGaN S-Spice : SSx-HLD-I2 Package Outlines



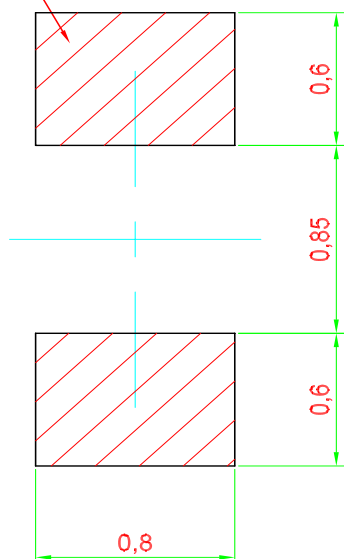
Material

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

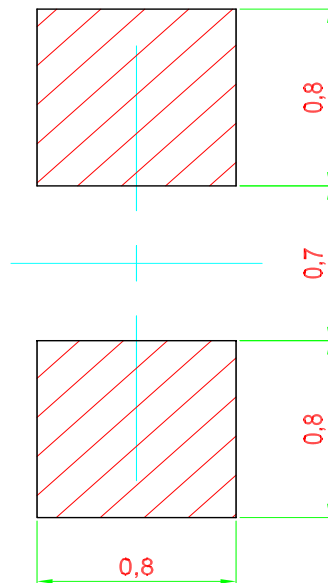
Note: product is Pb free

Recommended Solder Pad

Solder pad.

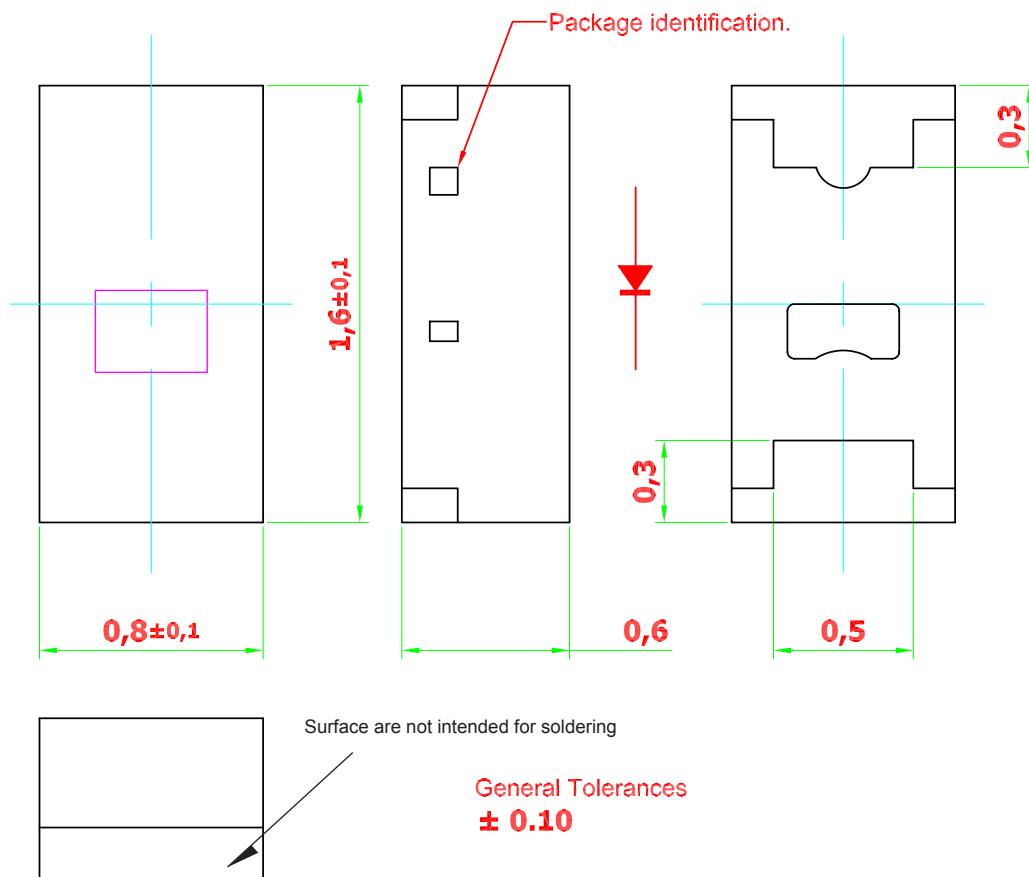


Recommended Solder-pad



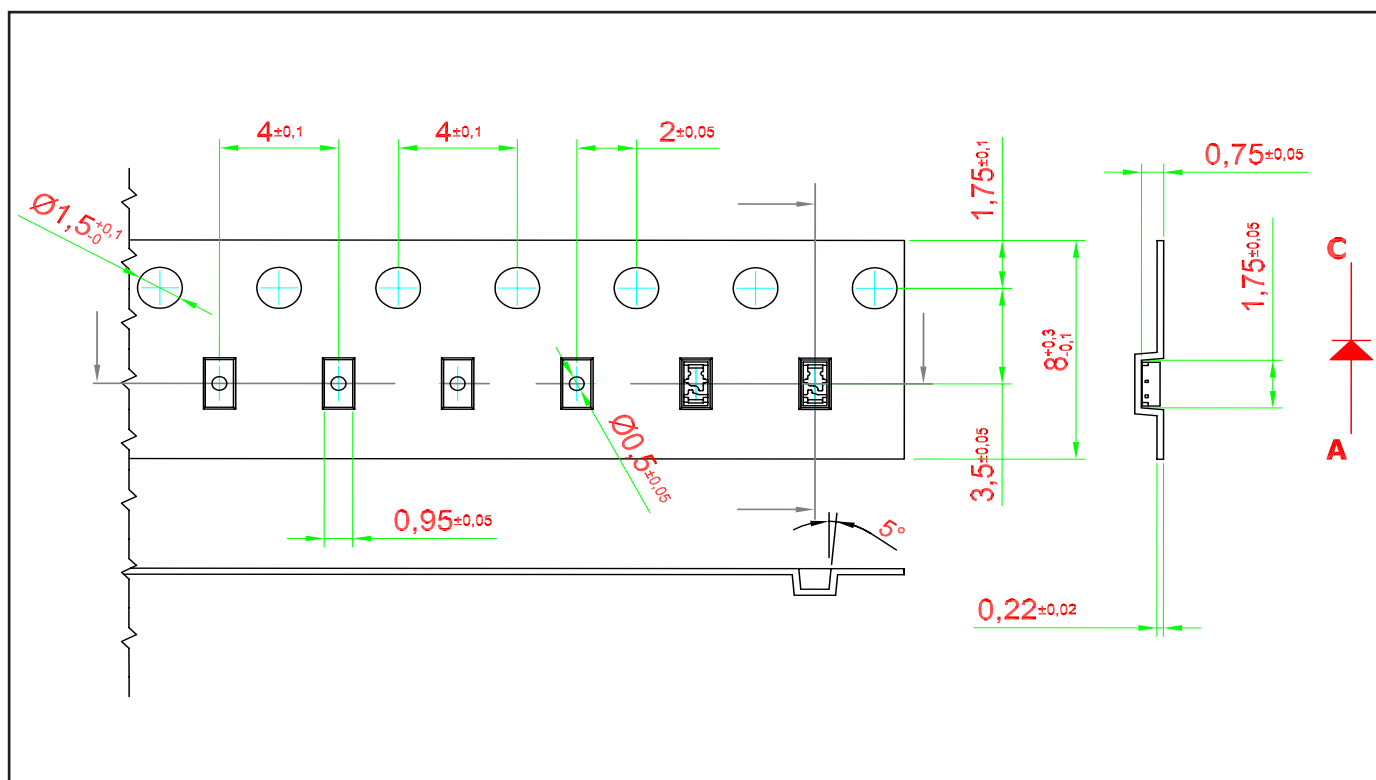
Alternative Solder-pad
 Compatible to ChipLED 0603

Note: Component is based on a new package platform, which features "Bottom Only Terminations". Solder joints are only formed at the bottom of the component and solder fillet will not be observable as the sides of the component.

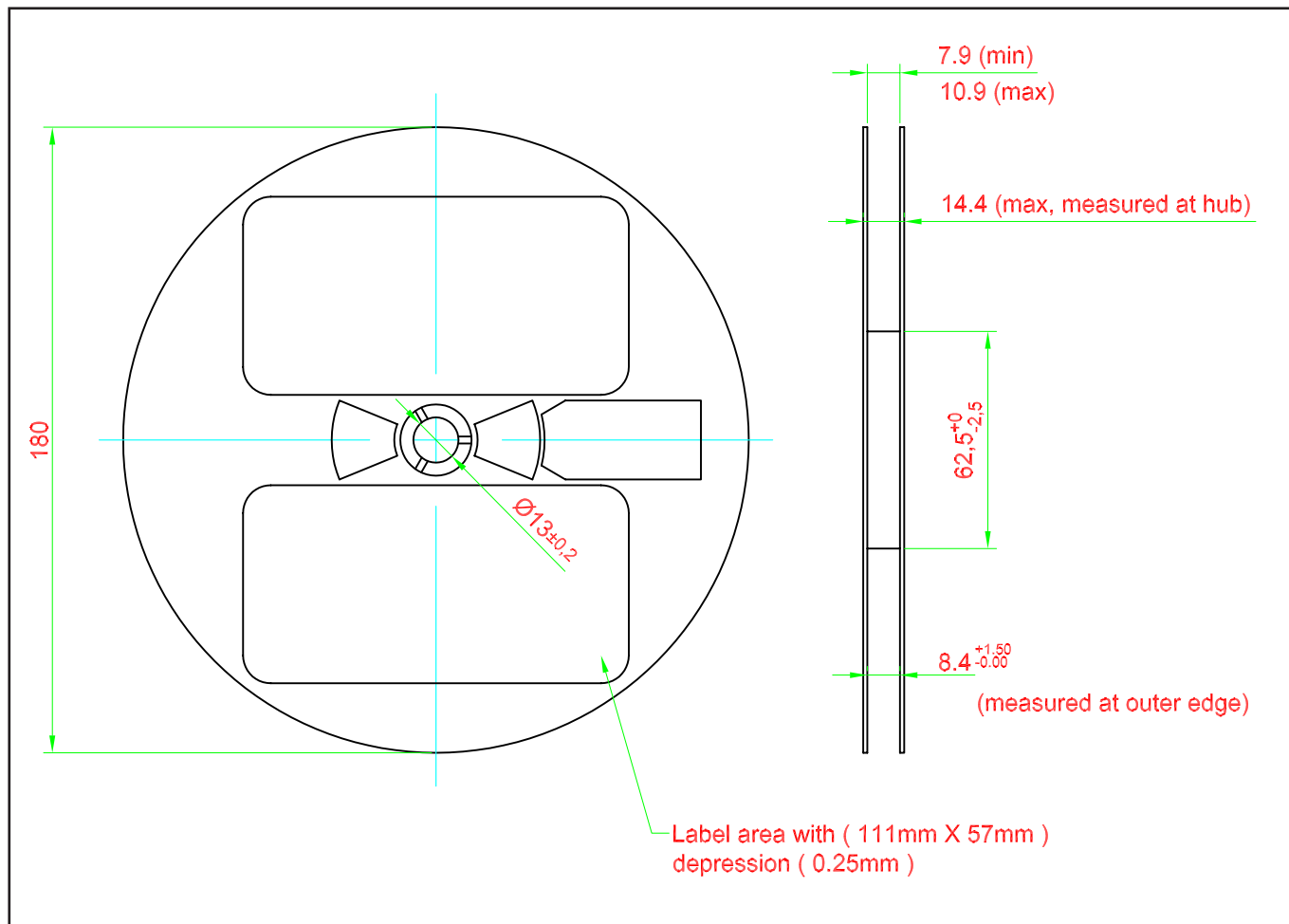


Taping and orientation

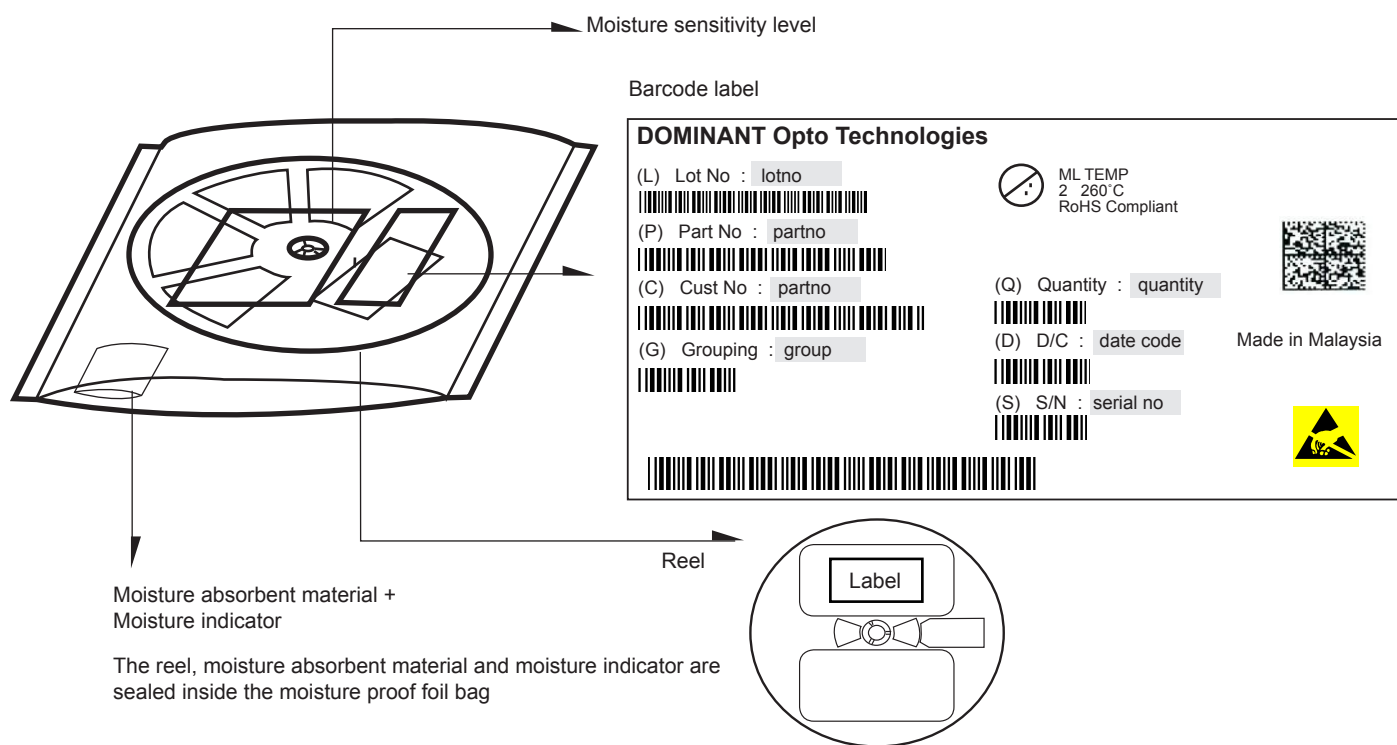
- Reels come in quantity of 3000 units.
- Reel diameter is 180 mm.



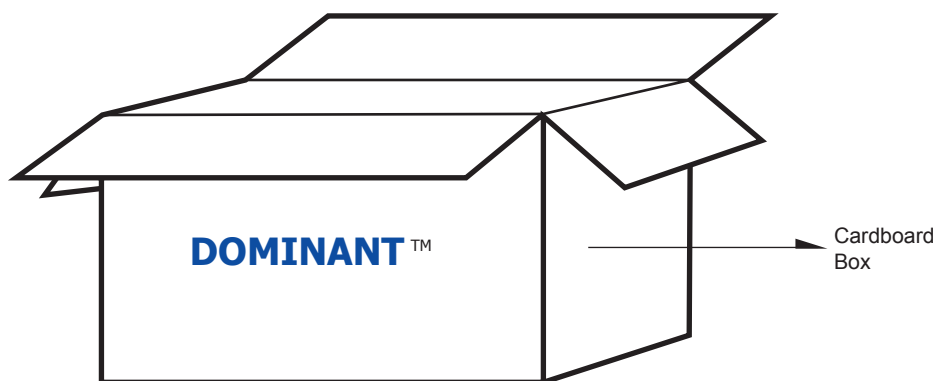
Packaging Specification



Packaging Specification



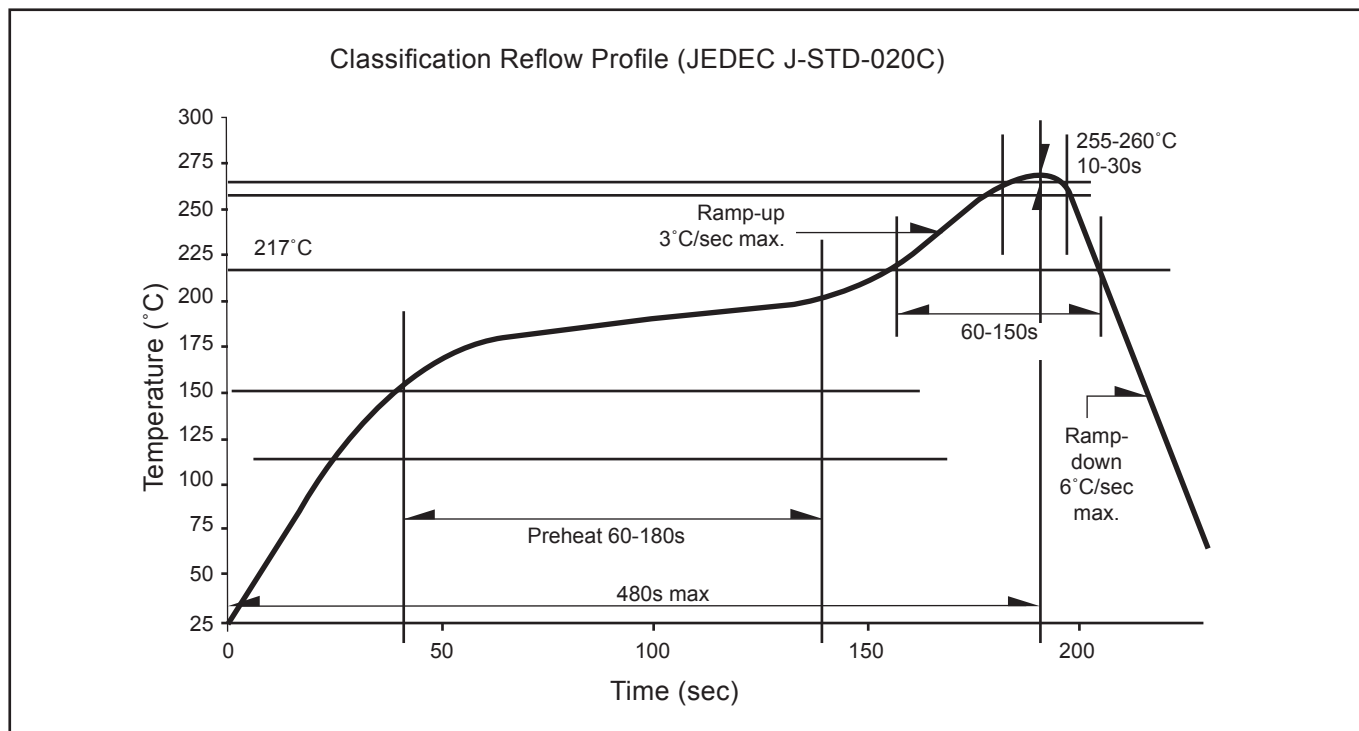
	Average 1pc SpiceLED	1 completed bag (3000pcs)
Weight (gram)	0.002	140 ± 10



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
-	Initial release	15 Aug 2016

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>.

Please contact us for more information:

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

