

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.
- > 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.
- > Industrial: white goods (eg: Oven, microwave, etc.).



Optical Characteristics at Tj=25°C

Part Ordering Number	Color	Viewing Angle°	Luminous Intensity @ 2mA IV (mcd) <i>Appx. 1.1</i>		
			Min.	Typ.	Max.
SSS-CLD-HJ2-1-I2	Super Red, 632 nm	160	2.80	4.50	7.20
SSO-CLD-JK2-1-I2	Orange, 605 nm	160	4.50	7.20	11.20
SSY-CLD-JK2-1-I2	Yellow, 587 nm	160	4.50	7.20	11.20

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-CLD	1.6	1.8	2.4	5	

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	30	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	110	°C
Operating temperature	-40 ... +100	°C
Storage temperature	-40 ... +100	°C
Power dissipation (at room temperature)	40	mW
Thermal resistance		
- Junction / ambient, R _{th JA}	450	K/W
- Junction / solder point, R _{th JS}	250	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) $I_F = 2\text{mA}; 0\text{ }^\circ\text{C} \leq T \leq 85\text{ }^\circ\text{C}$	$TC_{\lambda_{\text{dom}}}$ (typ)	SSS-CLD	0.04	nm / K
		SSO-CLD	0.08	
		SSY-CLD	0.09	
Temperature coefficient of V_F (typ) $I_F = 2\text{mA}; 0\text{ }^\circ\text{C} \leq T \leq 85\text{ }^\circ\text{C}$	TC_V	SSS-CLD	-2.4	mV / K
		SSO-CLD	-2.4	
		SSY-CLD	-3.3	
Temperature coefficient of I_V (typ) $I_F = 2\text{mA}; 0\text{ }^\circ\text{C} \leq T \leq 85\text{ }^\circ\text{C}$	TC_{I_V}	SSS-CLD	-0.55	% / K
		SSO-CLD	-0.65	
		SSY-CLD	-1.05	

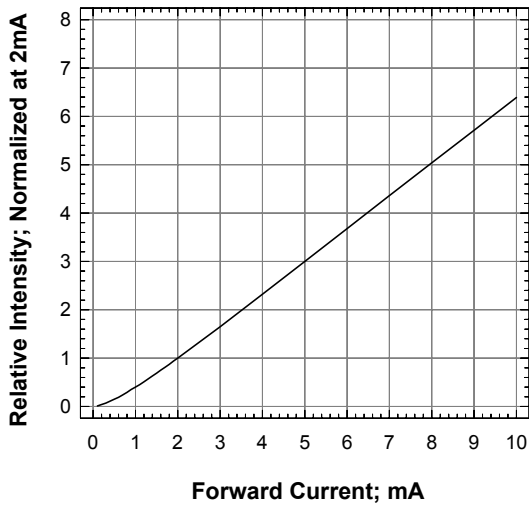
Wavelength Grouping at Tj=25°C

Color	Group	Wavelength distribution (nm) <i>Appx. 2.2</i>
SSS; Super Red	Full	625 - 640
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
	X	588 - 591
	Y	591 - 594

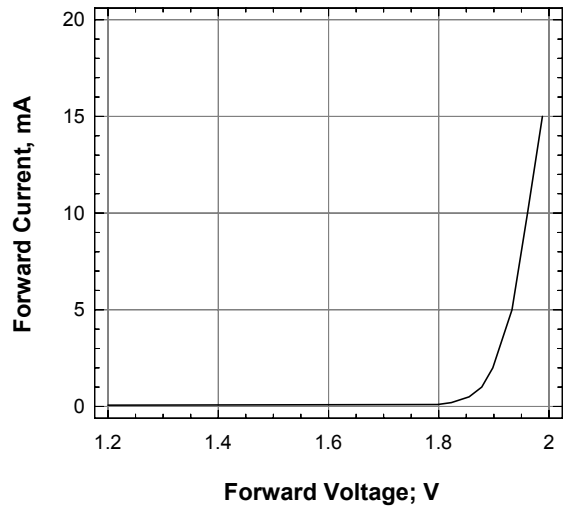
Luminous Intensity Group at Tj=25°C

Brightness Group	Luminous Intensity <i>Appx. 1.1</i> IV (mcd)
H1	2.80 ... 3.55
H2	3.55 ... 4.50
J1	4.50 ... 5.60
J2	5.60 ... 7.20
K1	7.20 ... 9.00
K2	9.00 ... 11.20

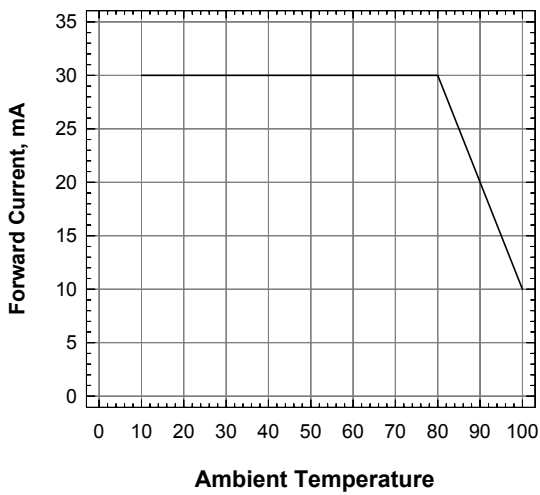
Relative Intensity vs Forward Current



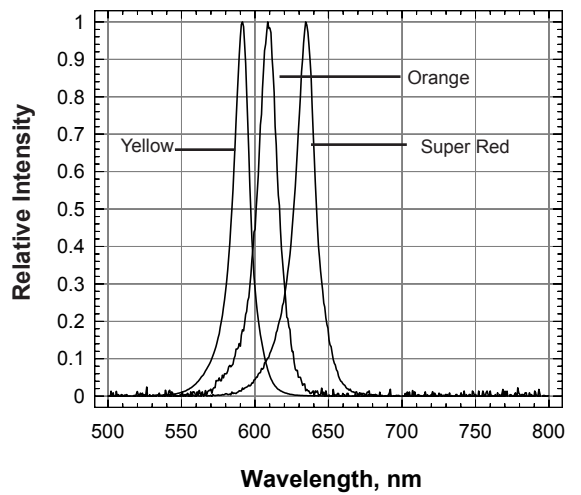
Forward Current Vs Forward Voltage



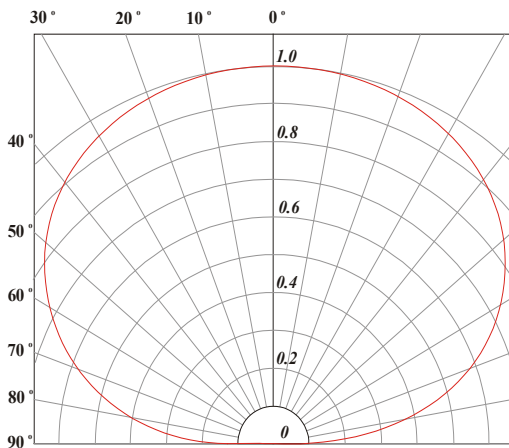
Maximum Current Vs Ambient Temperature



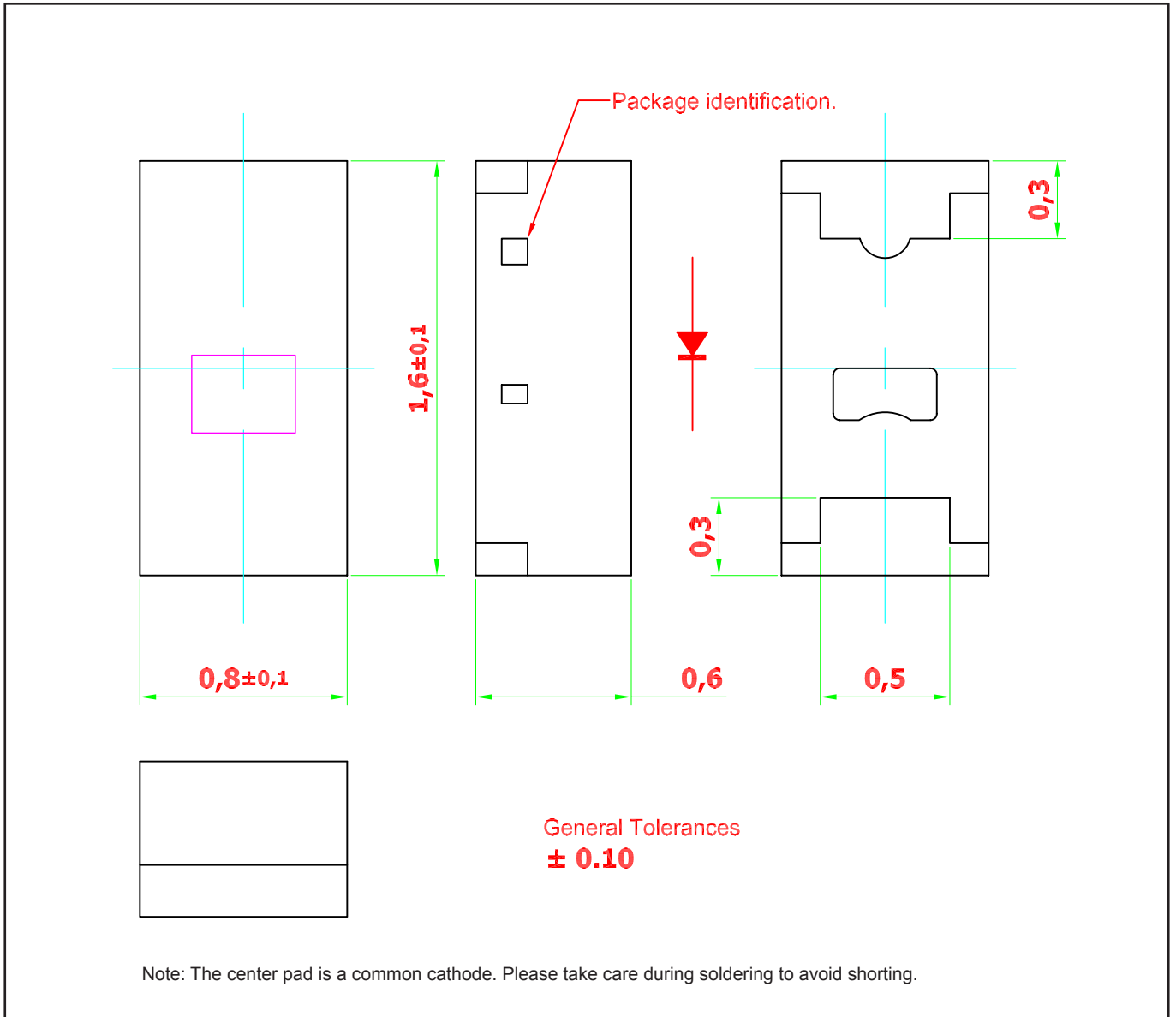
Relative Intensity vs Wavelength



Radiation Pattern



SpiceLED™ • AllnGaP S-Spice : SSx-CLD-I2 Package Outlines

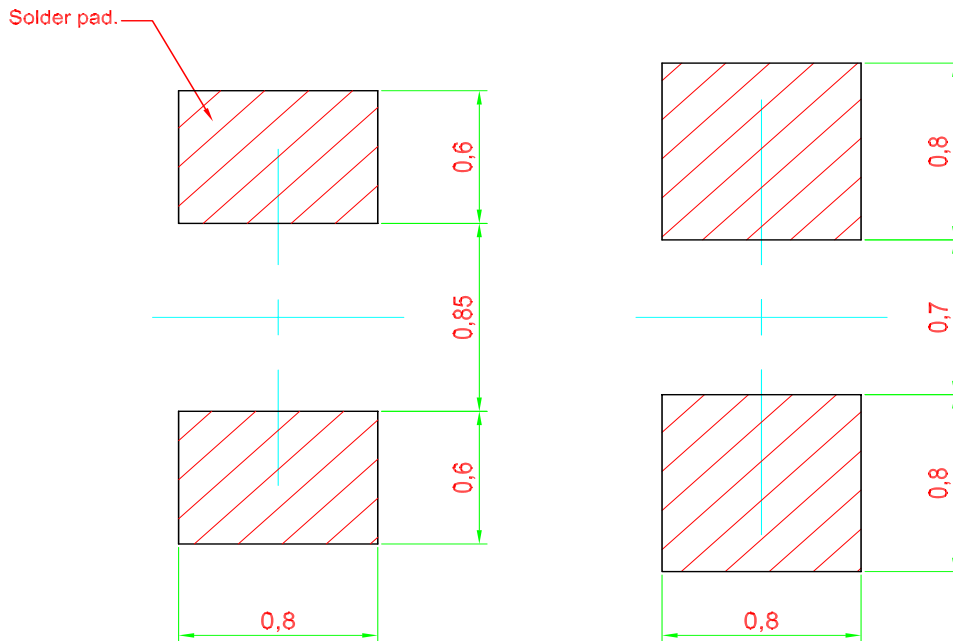


Material

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

Note: product is Pb free

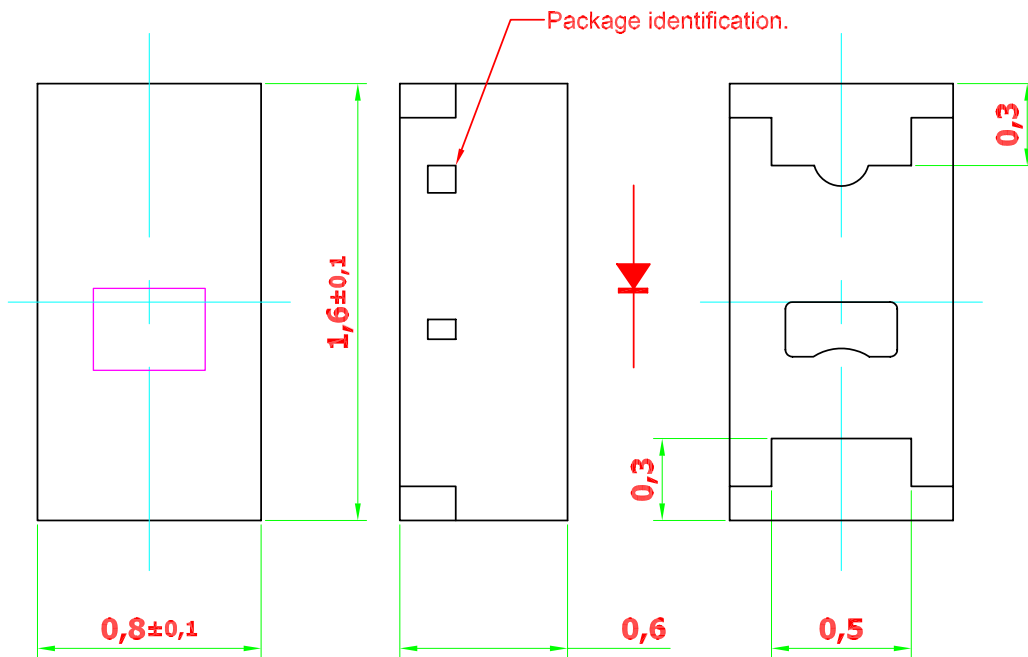
Recommended Solder Pad



Recommended Solder-pad

**Alternative Solder-pad
 Compatible to ChipLED 0603**

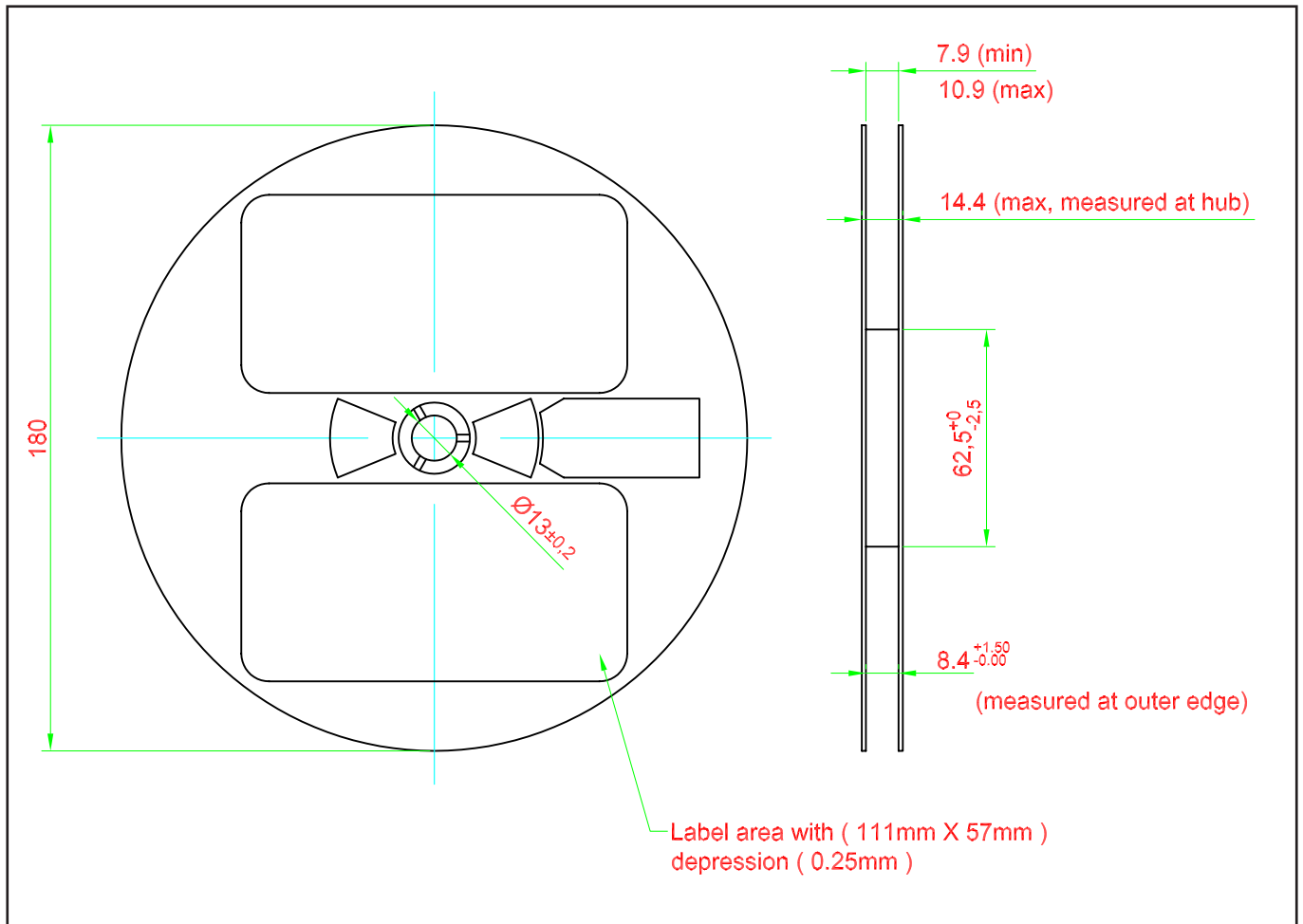
Note: Component is based on a new package platform, which features “Bottom Only Terminations”. Solder joints are only formed at the bottom of the component and solder fillet will not be observable as the sides of the component.



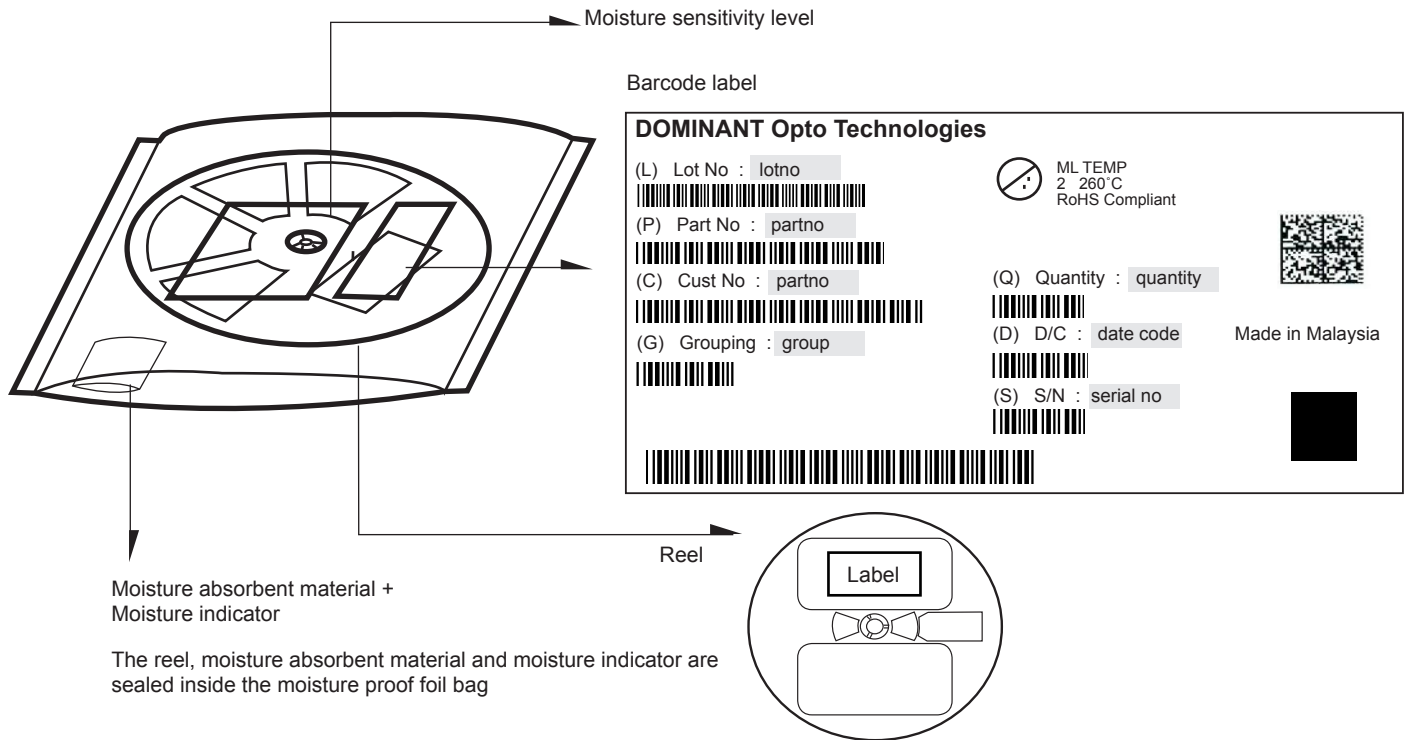
Surface are not intended for soldering

**General Tolerances
 ± 0.10**

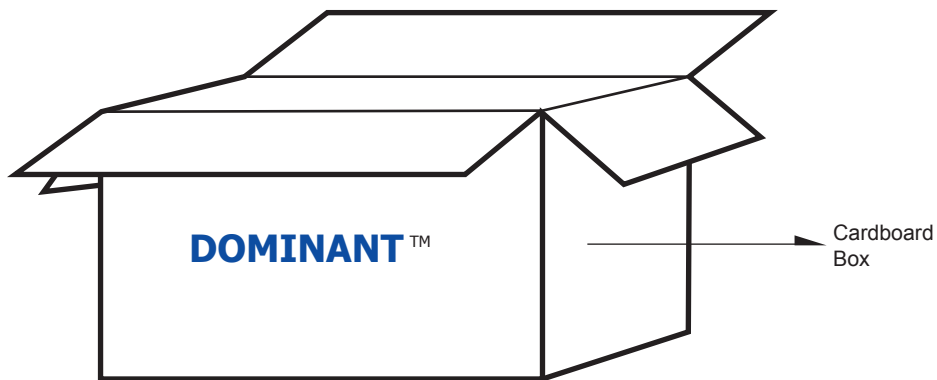
Packaging Specification



Packaging Specification



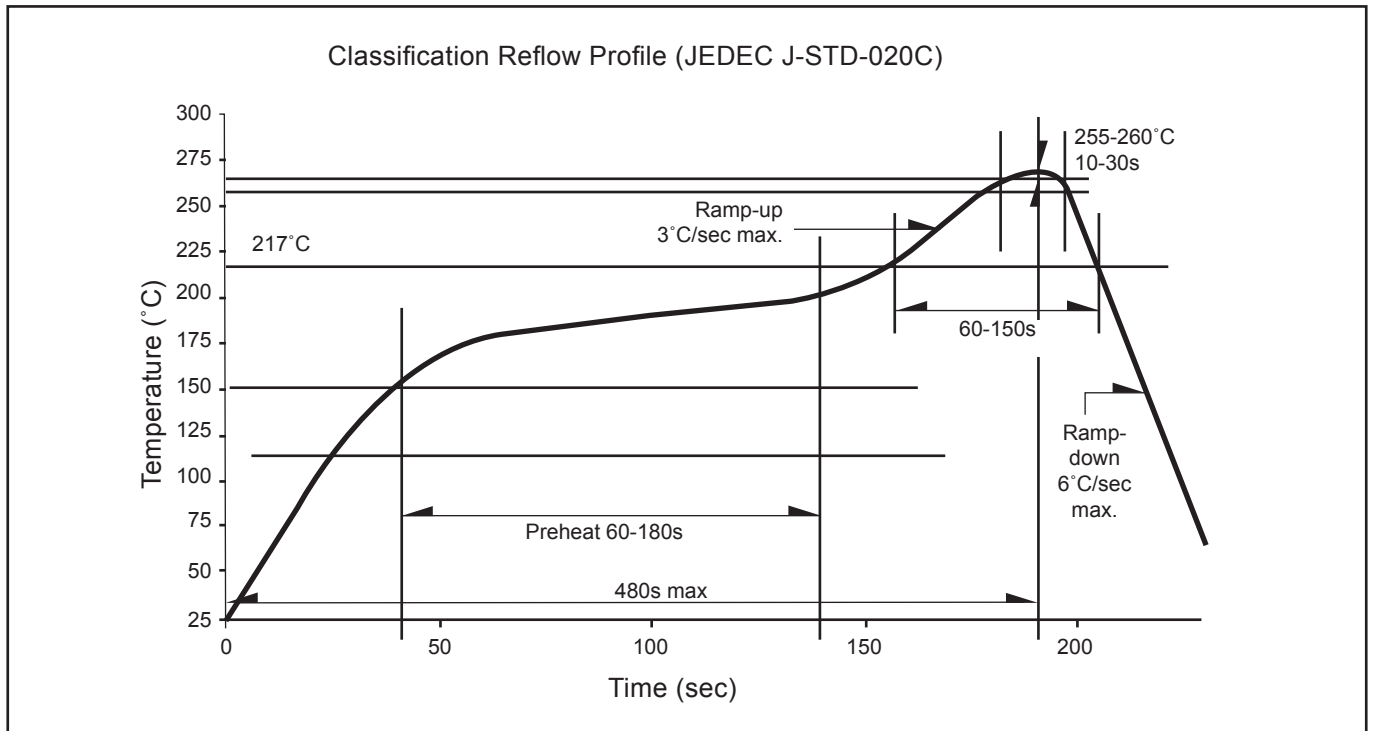
	Average 1pc SpiceLED	1 completed bag (3000pcs)
Weight (gram)	0.002	140 ± 10



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
-	New Format	10 Mar 2006
4	Add Relative Intensity vs Forward Current Graph	24 Jun 2008
2	Update DC Forward Current --> 30mA	10 Sep 2009
-	Update Company Name	29 Mar 2010
3	Add Luminous Intensity Group Add Thermal Resistance	23 Aug 2011
7	Update Carrier Tape	13 Feb 2014
3	Add Characteristics	24 Nov 2014
1, 8, 10, 12	Add Features Error on Taping and Orientation Update Package Specification Add Appendix	26 Oct 2016

NOTE

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