

## 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.
- > 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.
- > Industry: 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-CLD-N2P-1	Super Red, 632 nm	160	35.5	56.0	71.5
SSS-CLD-P2Q-1	Super Red, 632 nm	160	56.0	90.0	112.5
SSR-CLD-PQ1-1	Red, 625 nm	160	45.0	71.5	90.0
SSA-CLD-P2Q-1	Amber, 615nm	160	56.0	90.0	112.5
SSO-CLD-P2Q-1	Orange, 605 nm	160	56.0	90.0	112.5
SSO-CLD-QR1-1	Orange, 605 nm	160	71.5	112.5	140.0
SSY-CLD-P2Q-1	Yellow, 587 nm	160	56.0	90.0	112.5
SSY-CLD-Q2R-1	Yellow, 587 nm	160	90.0	135.0	180.0
SSG-CLD-M2N-1	Green, 570 nm	160	22.4	35.5	45.0
SSP-CLD-KL1-1	Pure Green, 560 nm	160	7.2	11.2	14.0

**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-CLD	1.8	2.0	2.4	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	110	°C
Operating temperature	-40 ... +100	°C
Storage temperature	-40 ... +100	°C
Power dissipation (at room temperature)	80	mW
Thermal resistance		
- Junction / ambient, R <sub>th JA</sub>	450	K/W
- Junction / solder point, R <sub>th JS</sub>	250	K/W
(Mounting on FR4 PCB, pad size ≥ 16 mm <sup>2</sup> per pad)		

**Characteristics**

	Symbol	Part Number	Value	Unit
Temperature coefficient of $\lambda_{\text{dom}}$ (typ) $I_F = 20\text{mA}; 0\text{ }^\circ\text{C} \leq T \leq 85\text{ }^\circ\text{C}$	$TC_{\lambda_{\text{dom}}}$ (typ)	SSS-CLD	0.04	nm / K
		SSR-CLD	0.05	
		SSA-CLD	0.07	
		SSO-CLD	0.08	
		SSY-CLD	0.09	
		SSG-CLD	0.10	
		SSP-CLD	0.10	
		Temperature coefficient of $V_F$ (typ) $I_F = 20\text{mA}; 0\text{ }^\circ\text{C} \leq T \leq 85\text{ }^\circ\text{C}$	$TC_V$	
SSR-CLD	-3.3			
SSA-CLD	-3.2			
SSO-CLD	-2.4			
SSY-CLD	-3.3			
SSG-CLD	-1.2			
SSP-CLD	-1.6			
Temperature coefficient of $I_V$ (typ) $I_F = 20\text{mA}; 0\text{ }^\circ\text{C} \leq T \leq 85\text{ }^\circ\text{C}$	$TC_{I_V}$			SSS-CLD
		SSR-CLD	-0.59	
		SSA-CLD	-0.62	
		SSO-CLD	-0.65	
		SSY-CLD	-1.05	
		SSG-CLD	-1.20	
		SSP-CLD	-1.20	

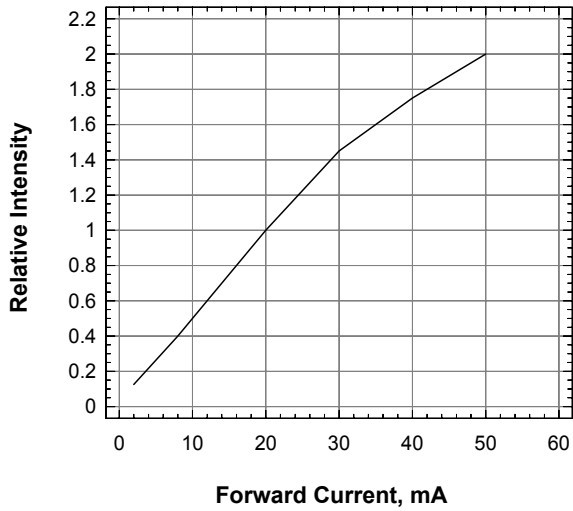
## Wavelength Grouping

Color	Group	Wavelength distribution (nm) <small>Appx. 2.2</small>
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
SSG; Green	Full	564.5 - 576.5
	W	564.5 - 567.5
	X	567.5 - 570.5
	Y	570.5 - 573.5
	Z	573.5 - 576.5
SSP; Pure Green	Full	552.5 - 564.5
	W	552.5 - 555.5
	X	555.5 - 558.5
	Y	558.5 - 561.5
	Z	561.5 - 564.5

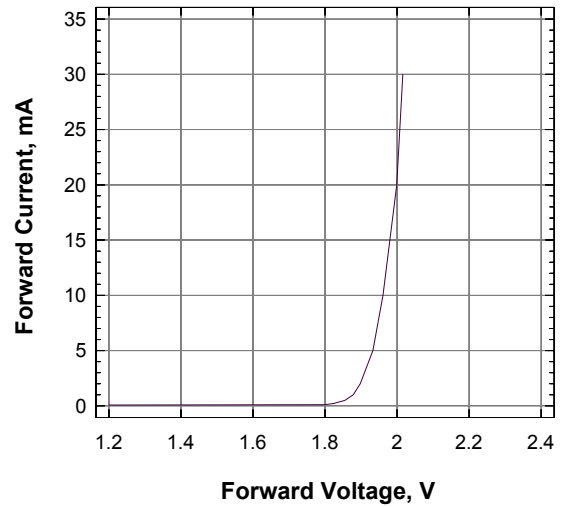
**Luminous Intensity Group at Tj=25°C**

<b>Brightness Group</b>	<b>Luminous Intensity <sup>Appx. 1.1</sup> IV (mcd)</b>
K1	7.20...9.00
K2	9.00...11.20
L1	11.20...14.00
M2	22.40...28.50
N1	28.50...35.50
N2	35.50...45.00
P1	45.00...56.00
P2	56.00...71.50
Q1	71.50...90.00
Q2	90.00...112.50
R1	112.50...140.00
R2	140.00...180.00

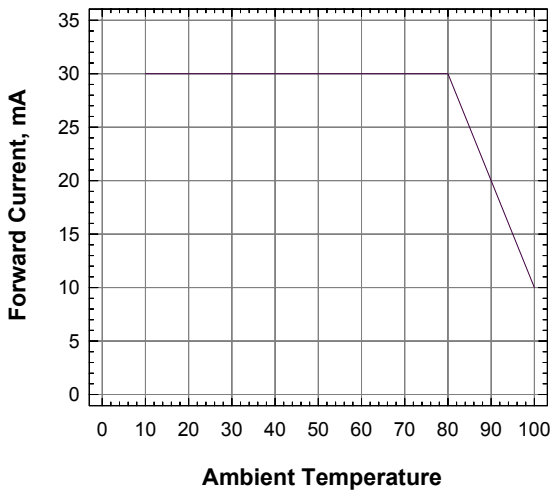
**Relative Intensity Vs Forward Current**



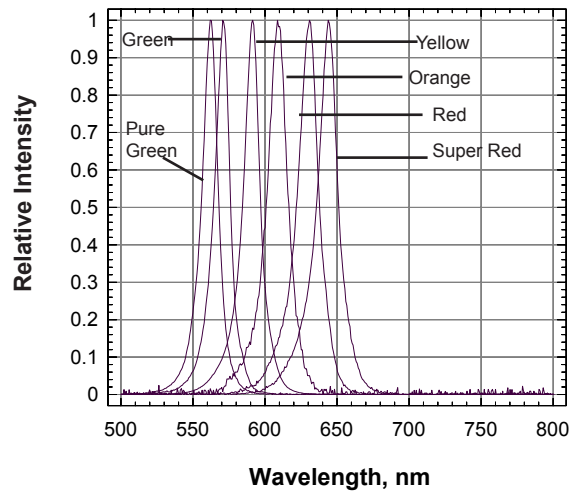
**Forward Current Vs Forward Voltage**



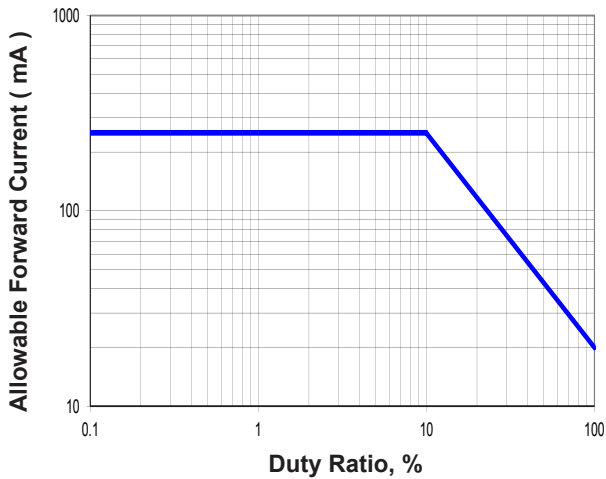
**Maximum Current Vs Ambient Temperature**



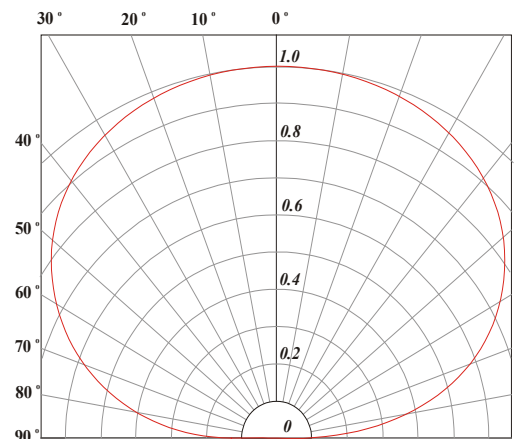
**Relative Intensity Vs Wavelength**



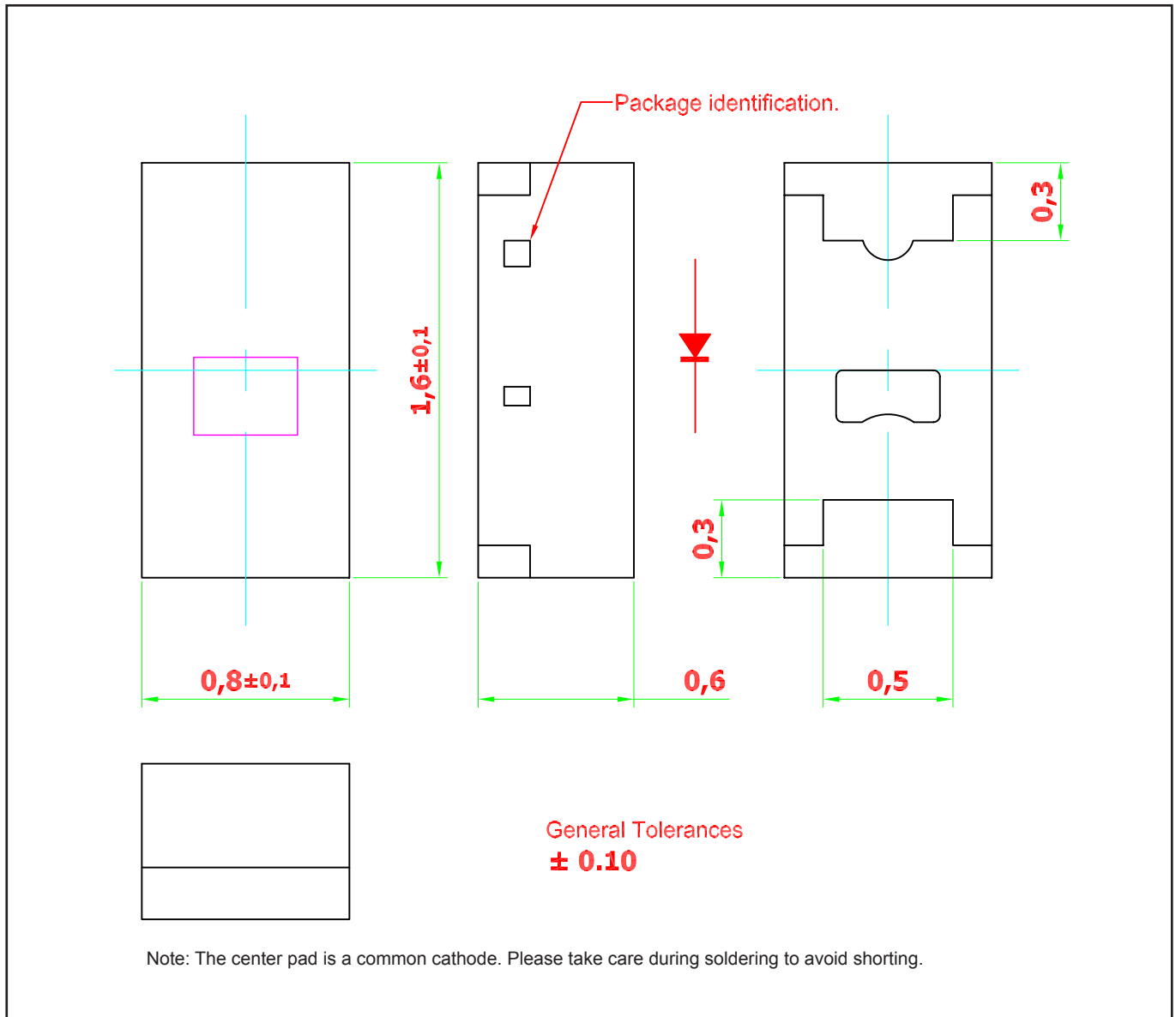
**Allowable Forward Current Vs Duty Ratio  
 ( Ta=25 Deg C, tp≤10uS )**



**Radiation Pattern**



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



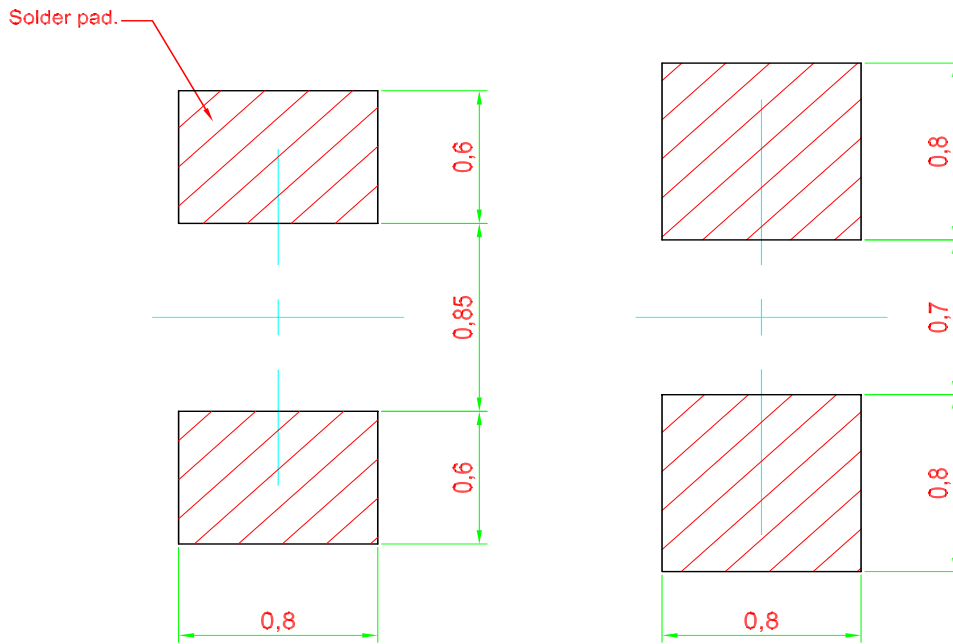
**Material**

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

Note: product is Pb free



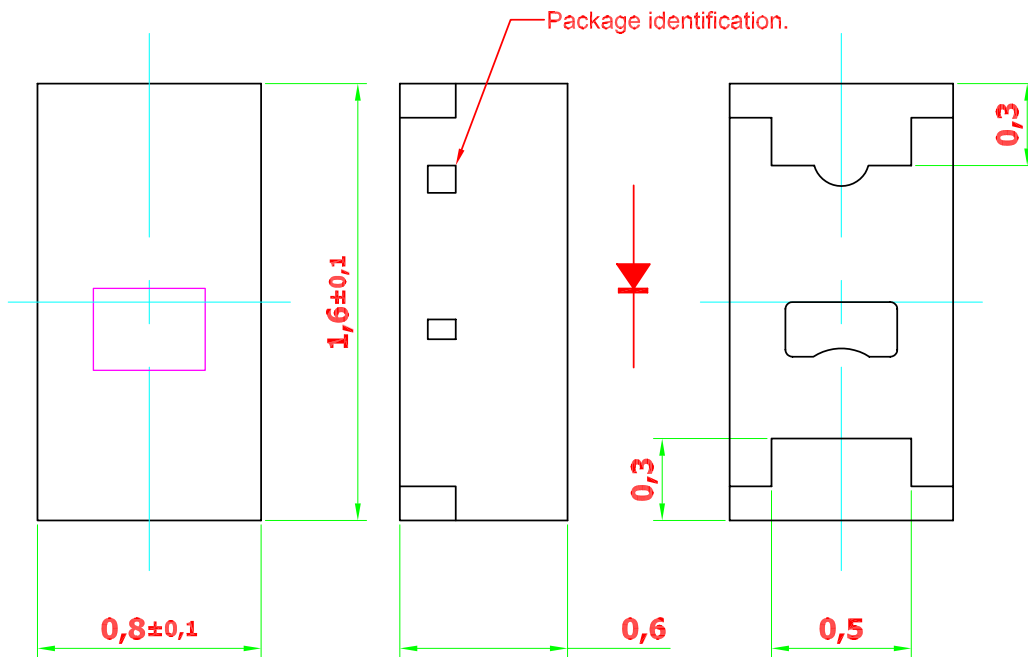
**Recommended Solder Pad**



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.

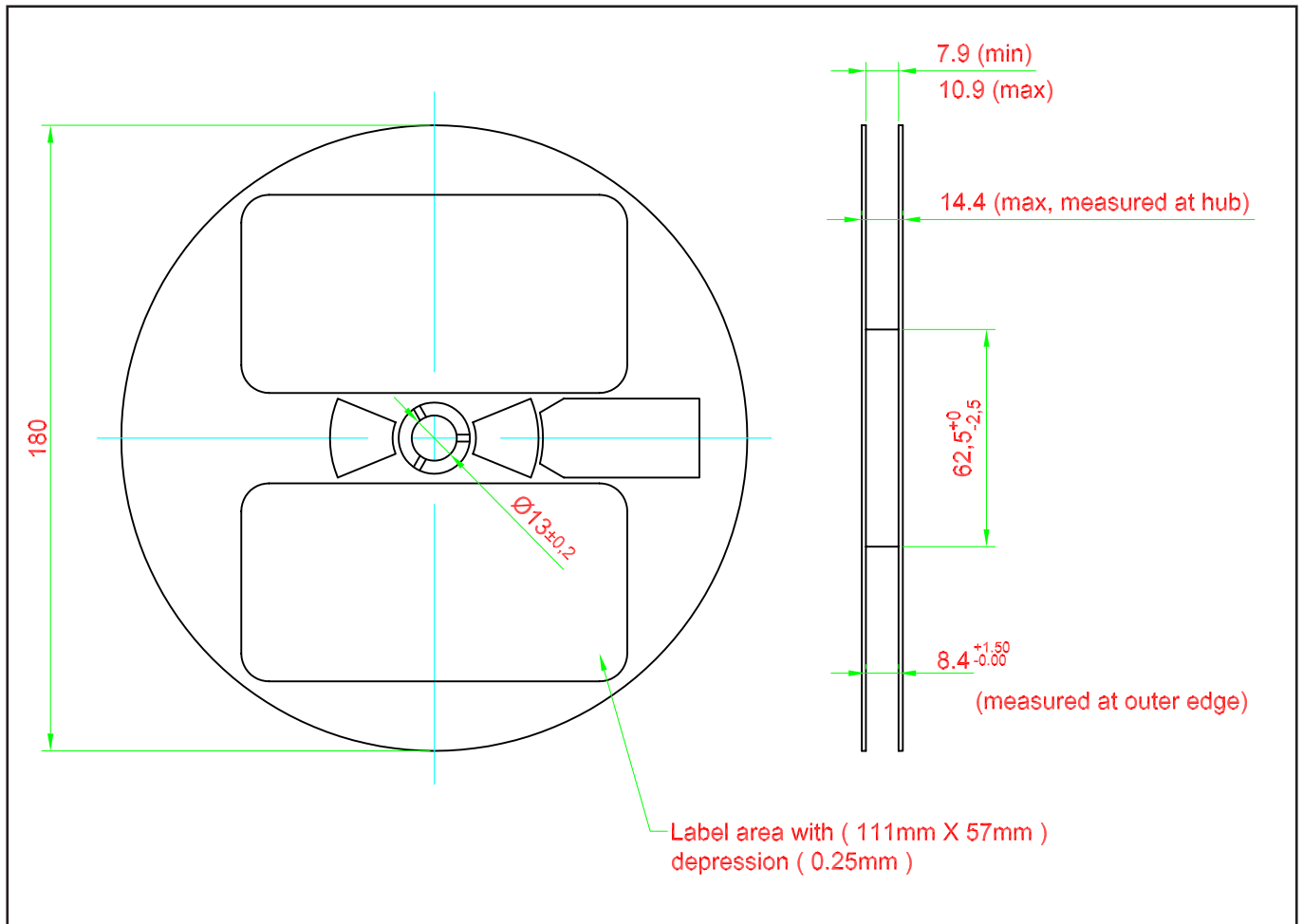


Surface are not intended for soldering

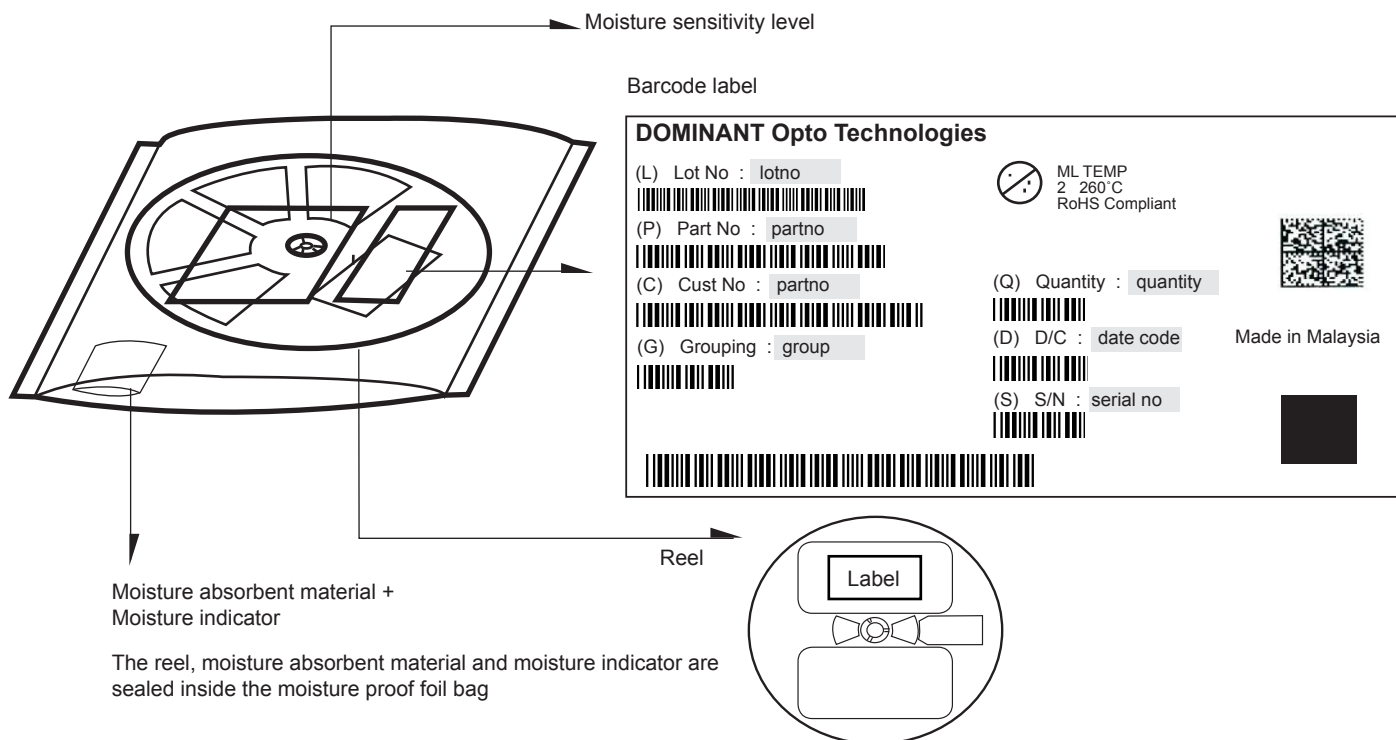
General Tolerances  
**± 0.10**



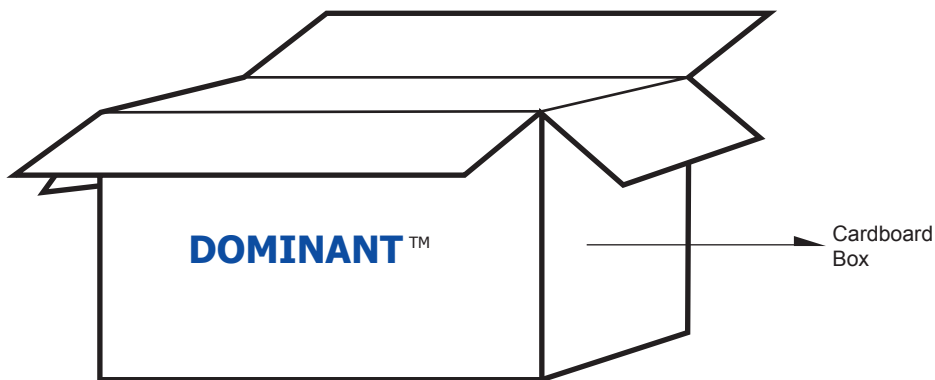
**Packaging Specification**



**Packaging Specification**



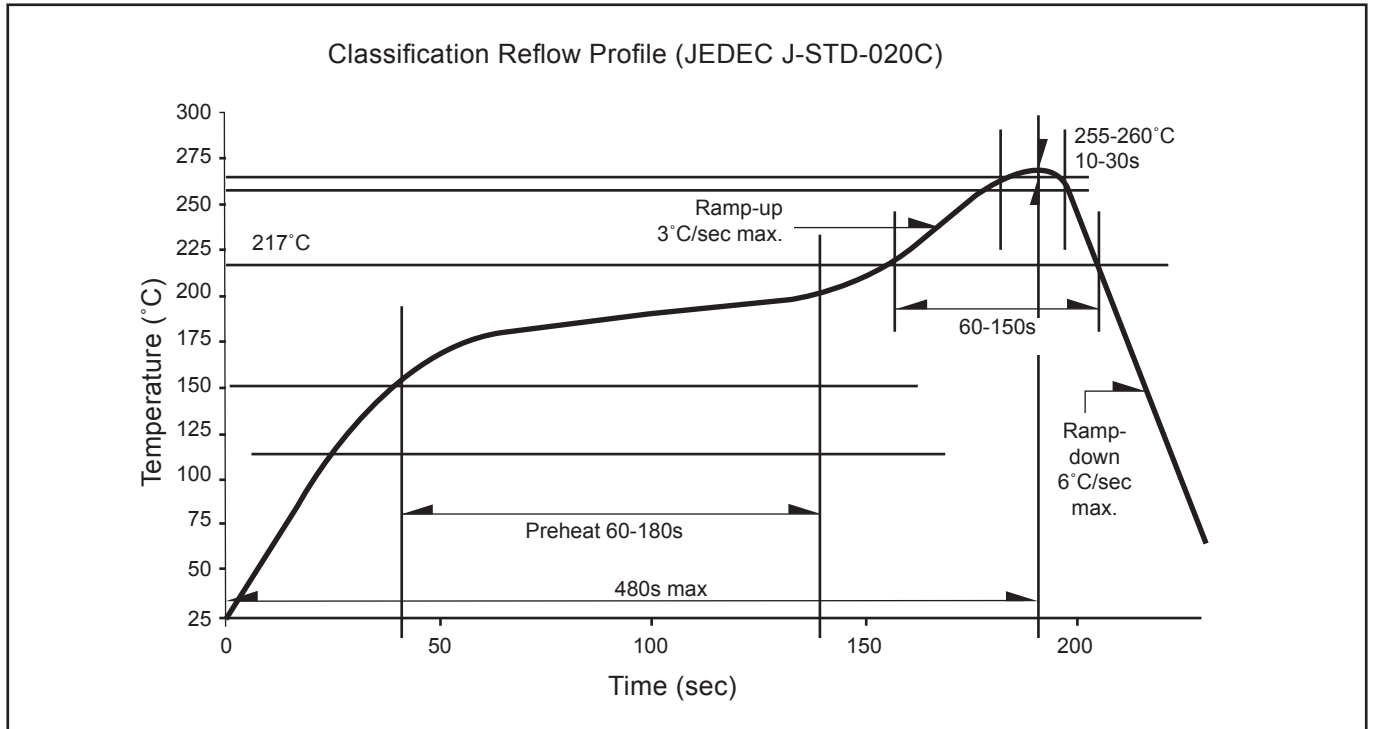
	Average 1pc SpiceLED	1 completed bag (3000pcs)
Weight (gram)	0.001	140 ± 10



**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  $\pm 0.005$  and an expanded uncertainty of  $\pm 0.01$  (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**

<b>Page</b>	<b>Subjects</b>	<b>Date of Modification</b>
-	New Format	09 Jun 2009
-	Update Company Name	11 Mar 2010
2	Add new partno: SSA-CLD-P2Q-1	05 May 2010
2	Add new partno: SSS-CLD-P2Q-1	21 Oct 2010
2	Add new partno: SSY-CLD-Q2R-1	25 Jan 2011
4	Add Characteristics	10 Dec 2013
7, 10	Update graph: Relative Intensity Vs Forward Current Update Carrier Tape	14 Feb 2014
7	Add Graph: Allowable Forward Current Vs Duty Ratio	02 Apr 2015
1, 12	Add Features Update Package Specification	26 Oct 2015
1, 10, 14	Add Features 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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