DOMINANT™
Opto Technologies
Innovating Illumination

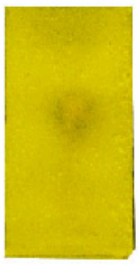
DATA SHEET:

SpiceLED™

InGaN White S-Spice : SSW-ULD

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 versality enables its application in automotive applicances, 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.

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.).

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Electrical Characteristics at Tj=25˚C

Part Ordering Number	Color	Viewing Angle˚	Luminous Intensity @ 20mA IV (mcd) Min.	Typ.	Max.
SSW-ULD-ST2-1	White	160	180.0	285.0	450.0

NOTE
1. All part number above comes in a quantity of 3000 units per reel.
2. Other luminious intensity groups are also available upon request
3. Luminous intensity is measured with an accuracy of ± 11%.
4. 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	Vf @ If = 20mA Min. (V)	Typ. (V)	Max. (V)	Vr @ Ir = 10uA Min. (V)
SSW-ULD	2.9	3.2	3.8	5

Forward voltage, Vf is measured with an accuracy of ± 0.1 V.

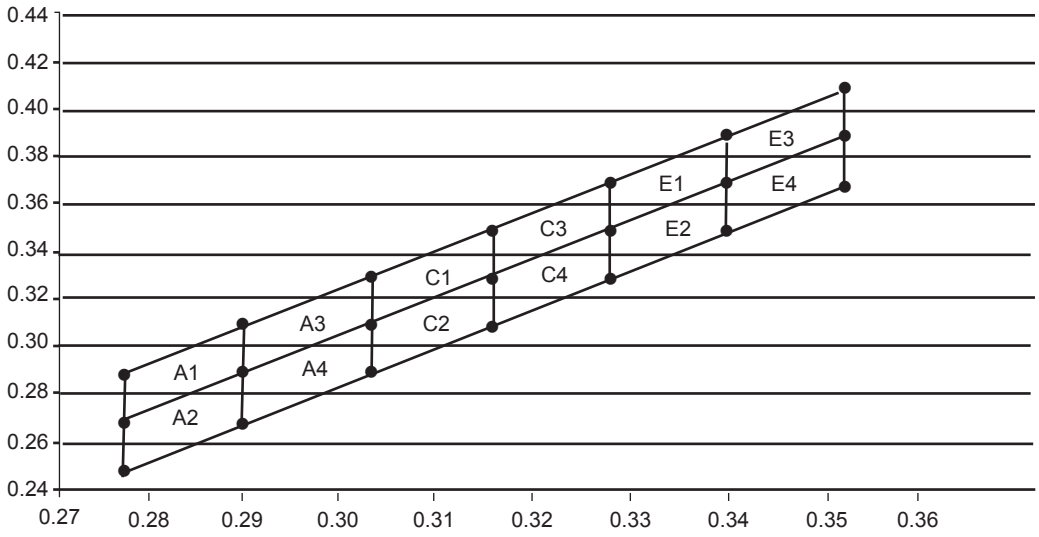
Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	20	mA
Peak pulse current; (tp ≤ 10μs, Duty cycle = 0.1)	250	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)	80	mW
Thermal resistance - Junction / ambient, $R_{th\ JA}$ - Junction / solder point, $R_{th\ JS}$ (Mounting on FR4 PCB, pad size >= 16 mm^2 per pad)	 480 280	 K/W K/W

Characteristics

	Symbol	Part Number	Value	Unit
Temperature coefficient of V_F (typ) I_F = 20mA; 0 ˚C <= T <= 100 ˚C	TC_V	SSW-ULD	-2.80	mV / K
Temperature coefficient of I_V (typ) I_F = 20mA; 0 ˚C <= T <= 100 ˚C	TC_{IV}	SSW-ULD	-0.32	% / K
Temperature coefficient of Cx (typ) I_F = 20mA; 0 ˚C <= T <= 100 ˚C	TC_{Cx}	SSW-ULD	-0.0002	
Temperature coefficient of Cy (typ) I_F = 20mA; 0 ˚C <= T <= 100 ˚C	TC_{Cy}	SSW-ULD	-0.0001	

Wavelength Grouping



Chromaticity coordinate groups are measured with an accuracy of ± 0.01.

Bin					
A1	Cx	0.2775	0.2900	0.2900	0.2775
	Cy	0.2732	0.2939	0.3114	0.2907
A2	Cx	0.2775	0.2900	0.2900	0.2775
	Cy	0.2557	0.2764	0.2939	0.2732
A3	Cx	0.2900	0.3025	0.3025	0.2900
	Cy	0.2939	0.3146	0.3321	0.3114
A4	Cx	0.2900	0.3025	0.3025	0.2900
	Cy	0.2764	0.2971	0.3146	0.2939
C1	Cx	0.3025	0.3150	0.3150	0.3025
	Cy	0.3146	0.3354	0.3529	0.3321
C2	Cx	0.3025	0.3150	0.3150	0.3025
	Cy	0.2971	0.3179	0.3354	0.3146
C3	Cx	0.3150	0.3275	0.3275	0.3150
	Cy	0.3354	0.3561	0.3736	0.3529
C4	Cx	0.3150	0.3275	0.3275	0.3150
	Cy	0.3179	0.3386	0.3561	0.3354

Bin					
E1	Cx	0.3275	0.3400	0.3400	0.3275
	Cy	0.3561	0.3768	0.3943	0.3736
E2	Cx	0.3275	0.3400	0.3400	0.3275
	Cy	0.3386	0.3593	0.3768	0.3561
E3	Cx	0.3400	0.3525	0.3525	0.3400
	Cy	0.3768	0.3975	0.4150	0.3943
E4	Cx	0.3400	0.3525	0.3525	0.3400
	Cy	0.3593	0.3800	0.3975	0.3768

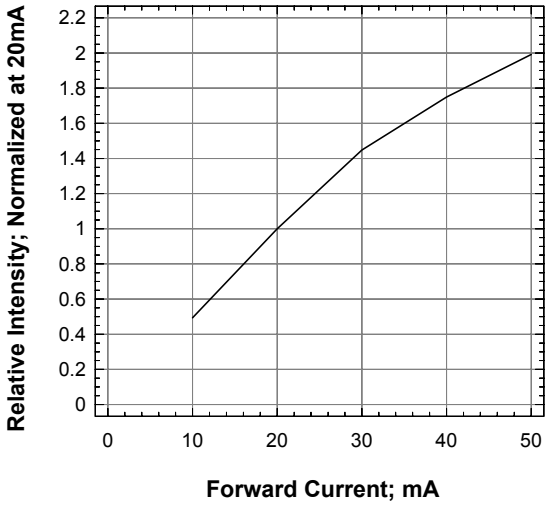
Dominant color coordinate is measured with an accuracy of ± 0.01.

Luminous Intensity Group at Tj=25˚C

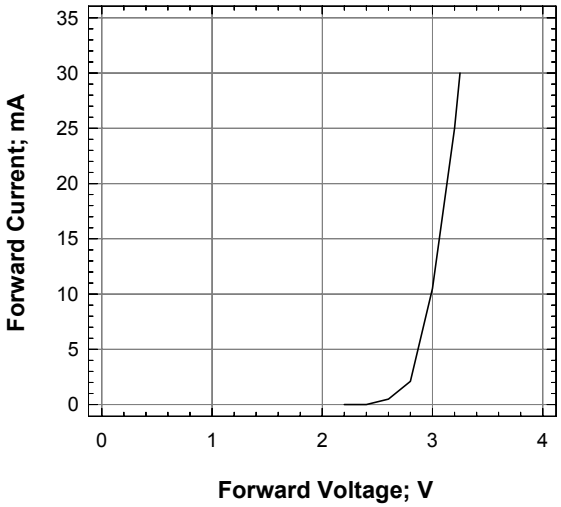
Brightness Group	Luminous Intensity IV (mcd)
S1	180.0...224.0
S2	224.0...285.0
T1	285.0...355.0
T2	355.0...450.0

Luminous intensity is measured with an accuracy of ± 11%.

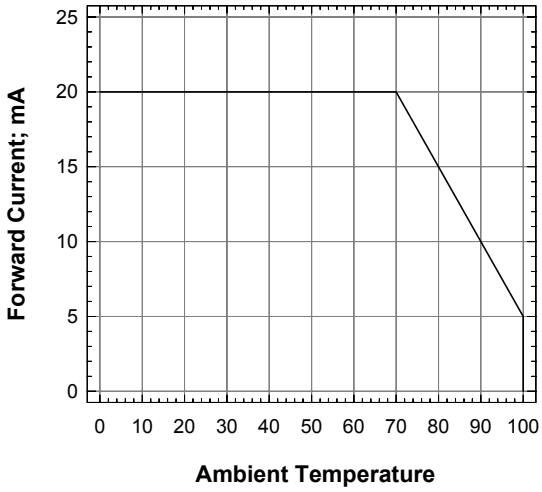
Relative Intensity Vs Forward Current



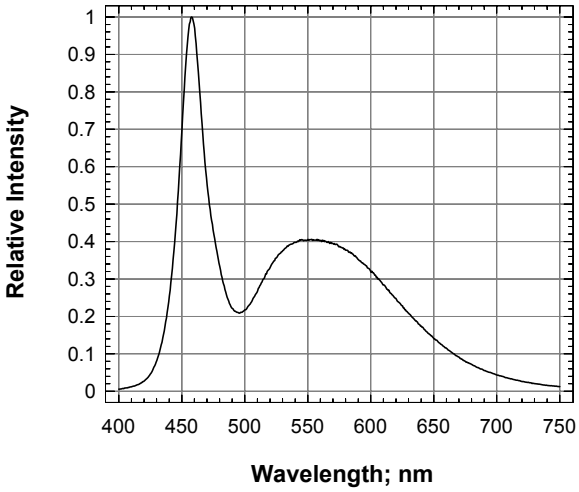
Forward Current Vs Forward Voltage



Maximum Current Vs Forward Current



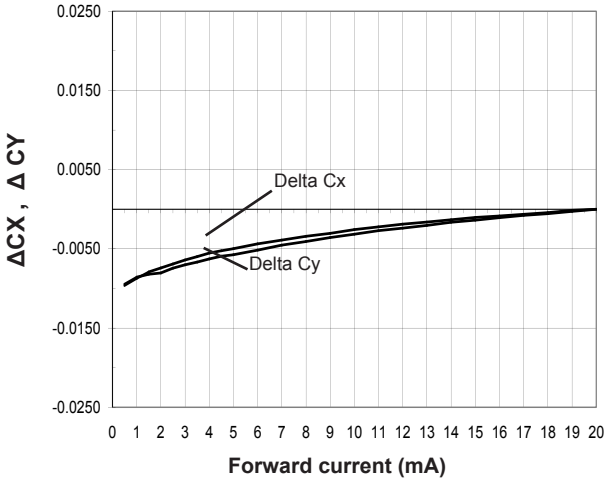
Relative Intensity Vs Wavelength



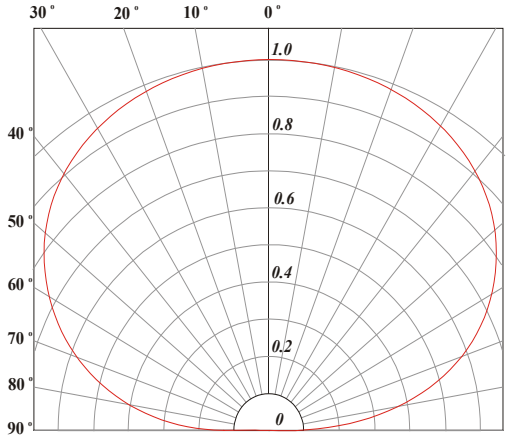
Allowable Forward Current Vs Duty Ratio
(Ta=25 Deg C, tp≤10uS)



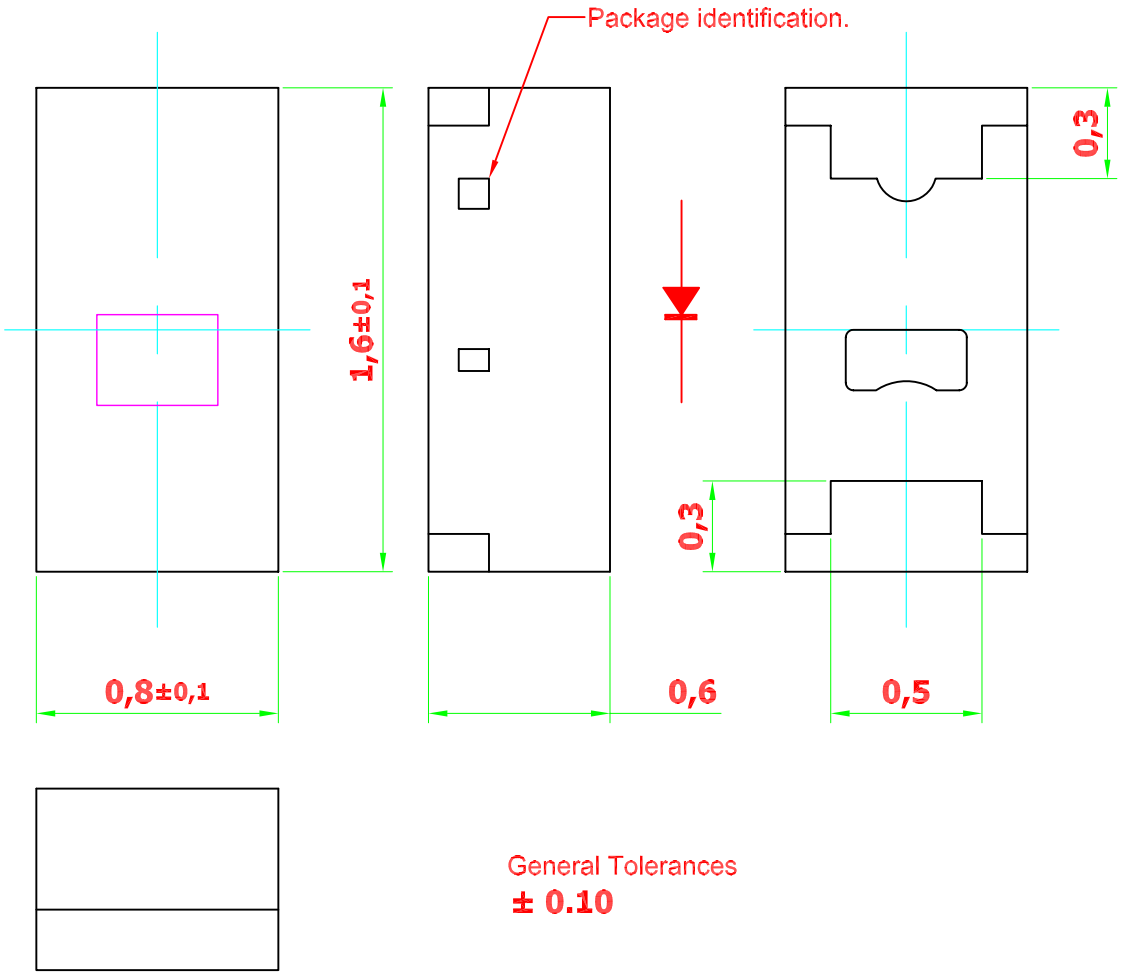
Chromaticity vs Forward Current



Radiation Pattern



SpiceLED™ • InGaN White S-Spice : SSW-ULD Package Outlines



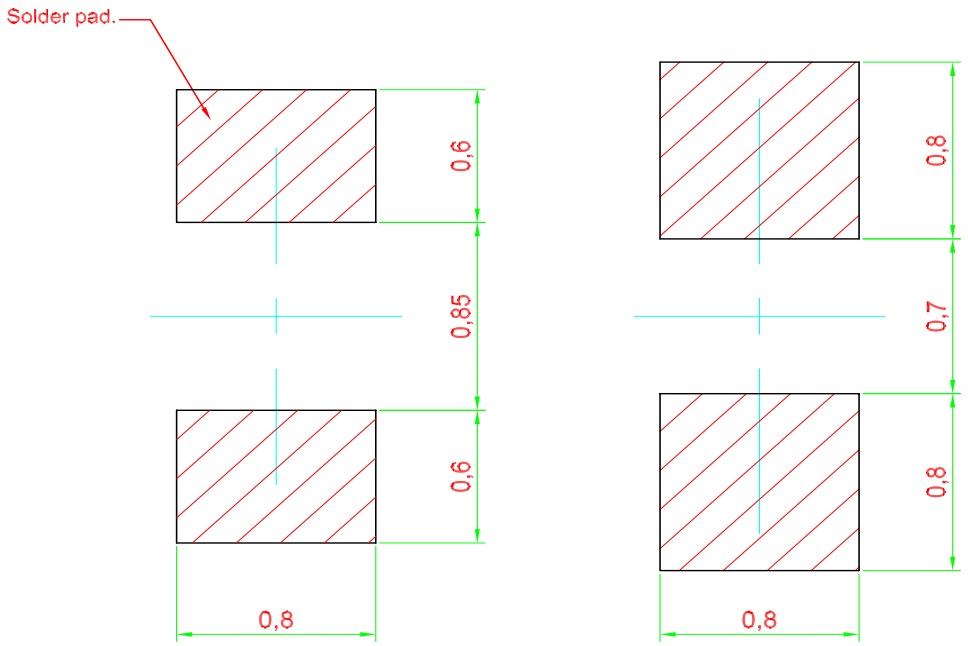
Note: The center pad is a common cathode. Please take care during soldering to avoid shorting.

Material

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

Note: product is Pb free

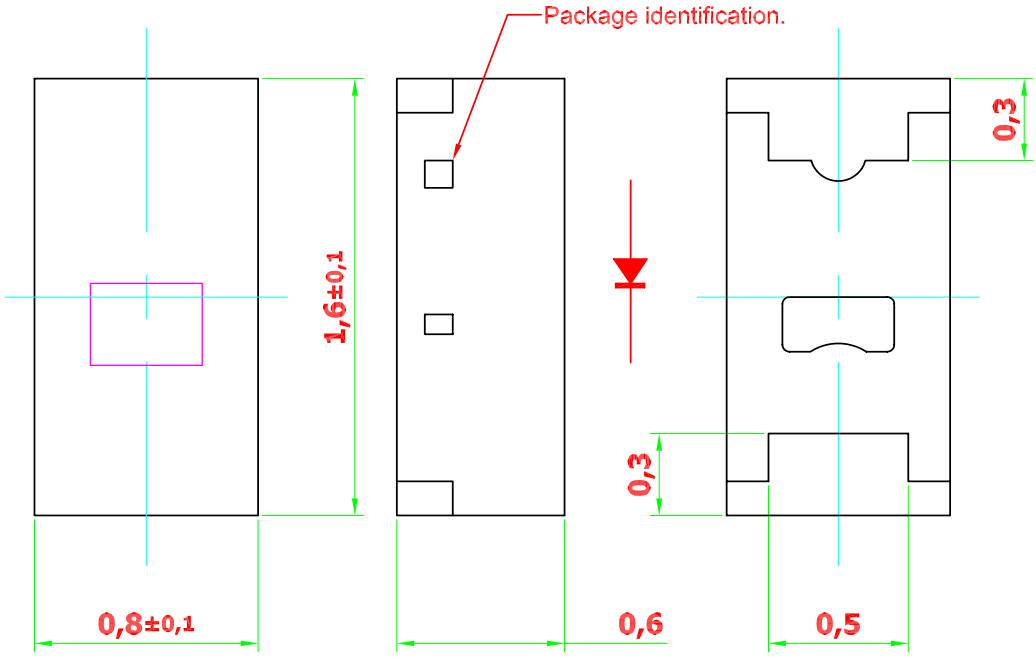
Recommended Solder Pad



Recommended Solder-pad

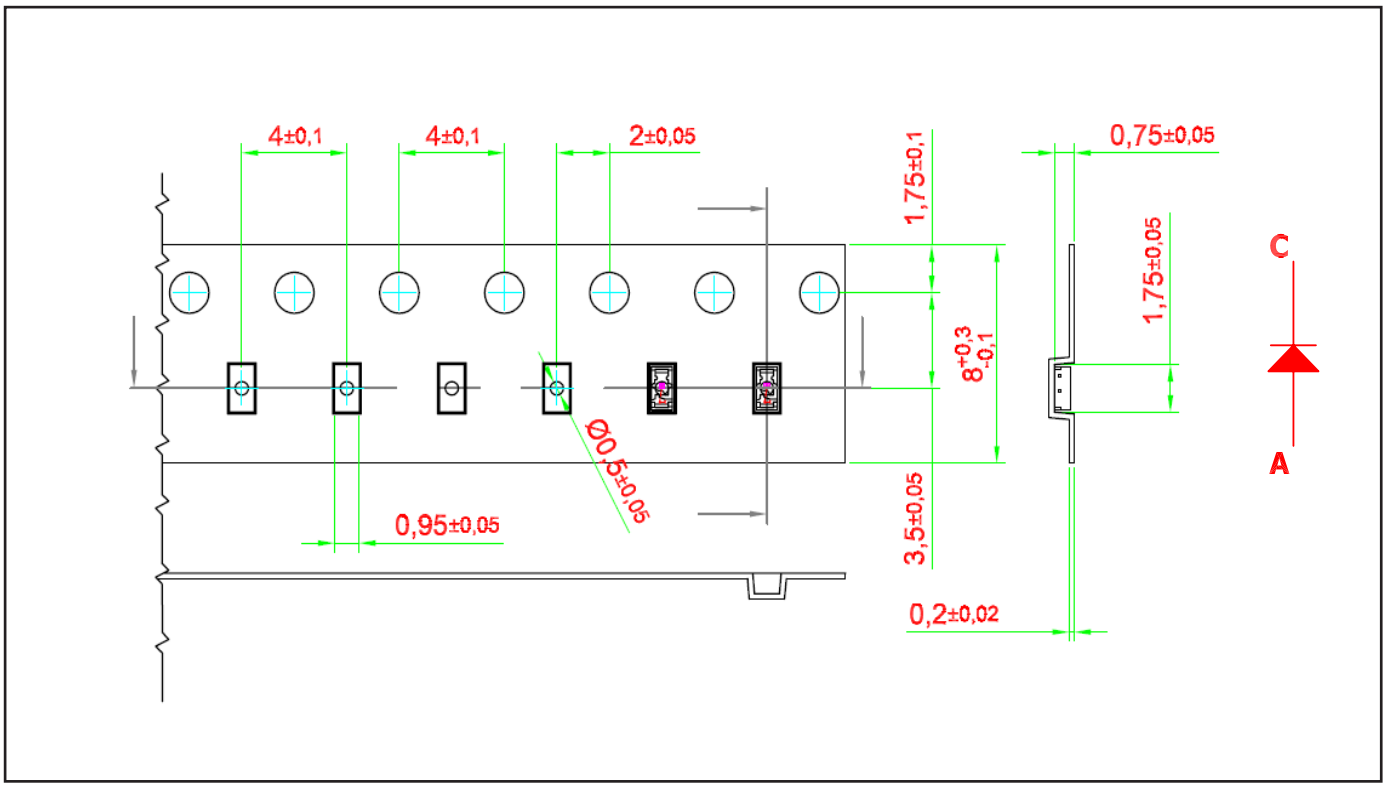
Alternative Solder-pad
Compatible to ChipLED 0603

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.

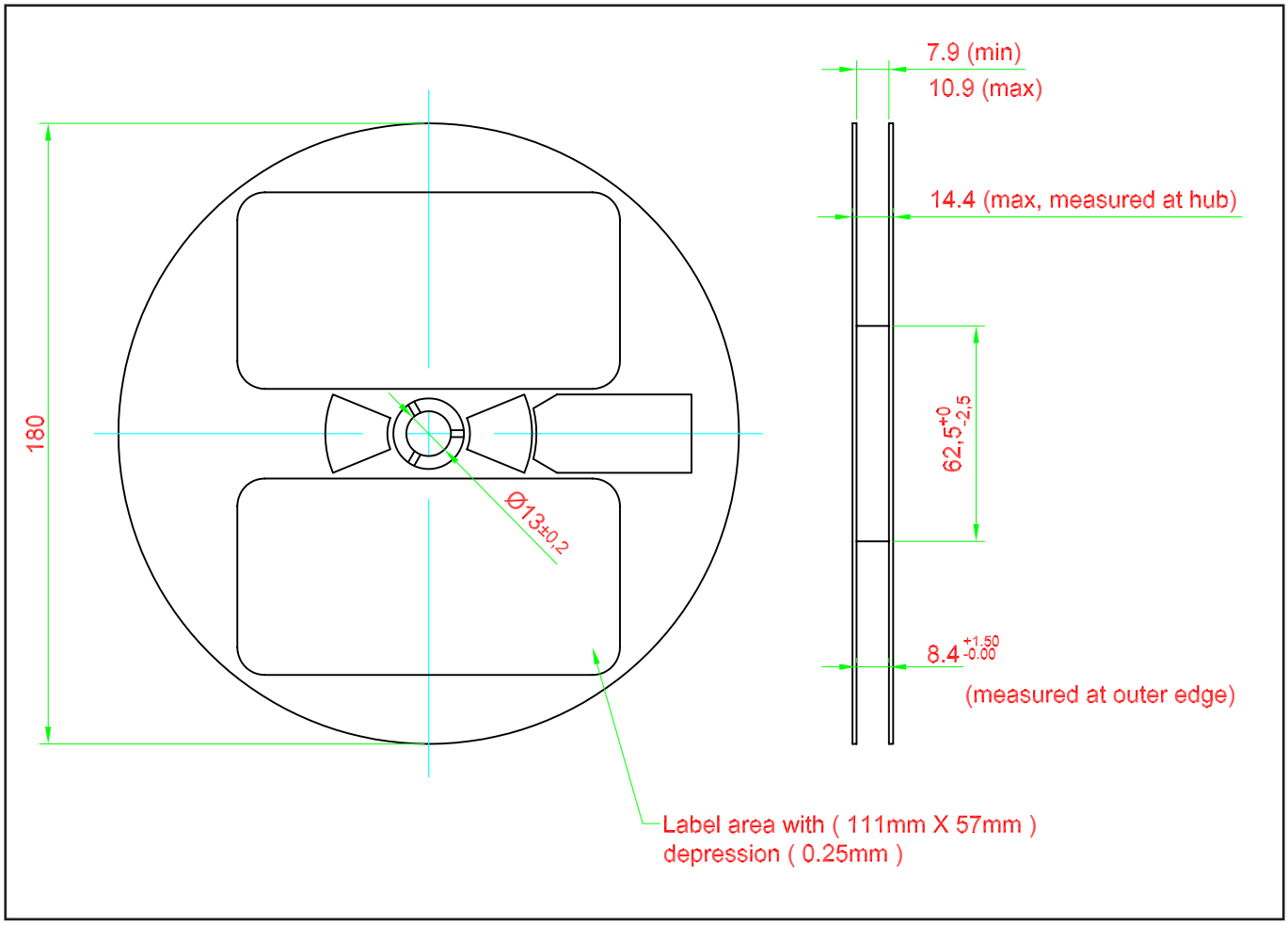


Taping and orientation

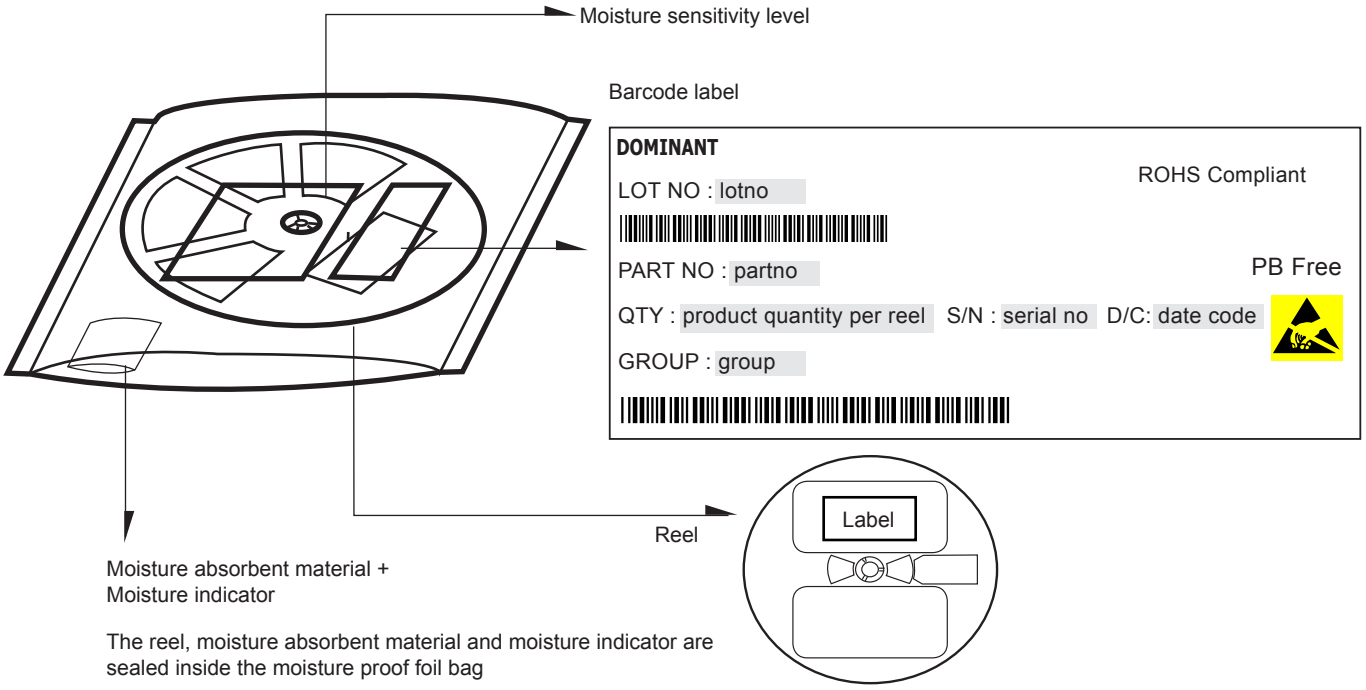
- Reels come in quantity of 3000 units.
- Reel diameter is 180 mm.



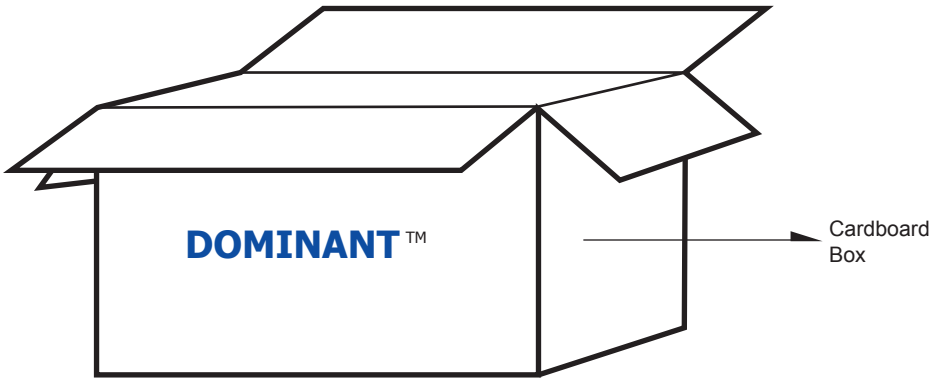
Packaging Specification



Packaging Specification



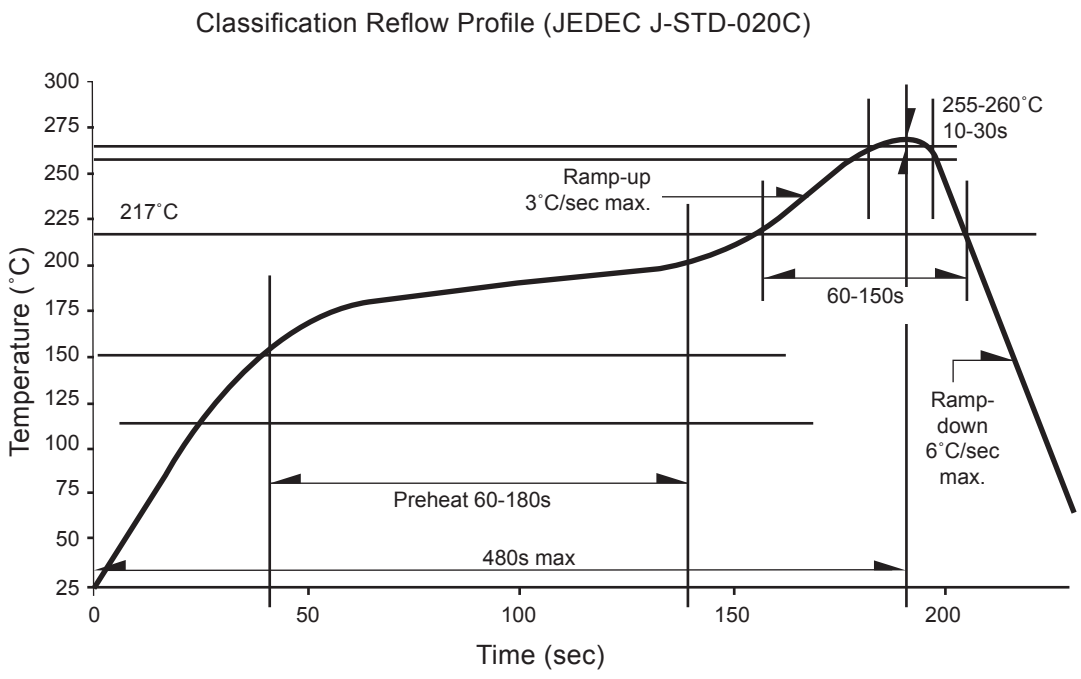
	Average 1pc SpiceLED	1 completed bag (3000pcs)
Weight (gram)	**0.001**	**140 ± 10**



For SpiceLED™

Cardboard Box Size	Dimensions (mm)	Empty Box Weight (kg)	Reel / Box	Quantity / Box (pcs)
Small	300 x 250 x 250	0.58	15 reels MAX	45,000 MAX
Large	416 x 516 x 476	1.74	96 reels MAX	288,000 MAX

Recommended Pb-free Soldering Profile



Revision History

Page	Subjects	Date of Modification
-	New Format	23 Feb 2006
-	Update company name	29 Mar 2010
2	Update Thermal Resistance	05 Nov 2012
3, 6	Add Characteristic Add graph: Chromaticity vs Forward Current	19 Nov 2012
9	Update Carrier Tape	13 Feb 2014
6	Add Graph: Allowable Forward Current Vs Duty Ratio	02 Apr 2015

NOTE

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