DOMINANT™
Opto Technologies
Innovating Illumination

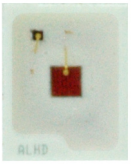
DATA SHEET:

SpicePlus2520

AlInGaP : SPx-VZHG

SpicePlus

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 SpicePlus packs a powerful performance and is a highly reliable design device.



Features:

- > Super high brightness surface mount LED automotive exterior applications.
- > 120° viewing angle.
- > Compact package outline (LxW) of 2.5 x 2.0mm.
- > Ultra low height profile - 0.7mm.
- > Low thermal resistance.
- > Superior corrosion robustness.
- > Compatible to IR reflow soldering.
- > Compliance to automotive standard; AEC-Q101.
- > Environmental friendly; RoHS compliance.

Applications:

- > Automotive: Exterior application: eg: Turn Signal Rear Combination Light (RCL), Center High Mounted Stop Light (CHMSL).

Electrical Characteristics at Tj=25˚C

Part Ordering Number	Color	Viewing Angle˚	Luminous Flux @ 200mA (lm) Appx. 1.2		
			Min.	Typ.	Max.
SPS-VZHG-MN3-3	Super Red, 635 nm	120	13.9	18.1	23.5
SPS-VZHG-NP3-2	Super Red, 630 nm	120	18.1	23.5	30.6
SPA-VZHG-PQ3-4	Amber, 624 nm	120	23.5	30.6	39.8
SPA-VZHG-QR3-2	Amber, 615 nm	120	30.6	39.8	51.7
SPY-VZHG-N3Q-1	Yellow, 589 nm	120	20.6	26.8	39.8

Electrical Characteristics at Tj=25˚C

Part Number	Vf @ If = 200mA Appx. 3.1		
	Min. (V)	Typ. (V)	Max. (V)
SPx-VZHG	1.9	2.3	2.6

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	250	mA
Peak pulse current; (tp ≤ 10µs, Duty cycle = 0.1)	600	mA
Reverse voltage; Ir_{max} = 10µA	Not designed for reverse bias	V
ESD threshold (HBM)	8	KV
LED junction temperature	150	˚C
Operating temperature	-40 … +125	˚C
Storage temperature	-40 … +125	˚C
Thermal resistance - Real Thermal Resistance Junction / solder point, $R_{th\ JS\ real}$ (typ = 28) - Electrical Thermal Resistance Junction / solder point, $R_{th\ JS\ el}$ (typ = 20) (Mounting on DOMINANT standard PCB)	 35 25	 K/W K/W

Wavelength Grouping at Tj= 25˚C

Color	Group	Wavelength distribution (nm) *Appx. 2.2*
SPx; Super Red	Full	627 - 637
	W	627 - 630
	X	630 - 634
	Y	634 - 637
SPx; Amber	Full	612 - 627
	W	612 - 616
	X	616 - 620
	Y	620 - 624
	Z	624 - 627
SPx; Yellow	Full	586 - 595
	X	586 - 589
	Y	589 - 592
	Z	592 - 595

Luminous Intensity Group at Tj=25˚C

Brightness Group	Luminous Flux *Appx. 1.2* (lm)
M2	13.9 ... 15.8
M3	15.8 ... 18.1
N2	18.1 ... 20.6
N3	20.6 ... 23.5
P2	23.5 ... 26.8
P3	26.8 ... 30.6
Q2	30.6 ... 34.8
Q3	34.8 ... 39.8
R2	39.8 ... 45.2
R3	45.2 ... 51.7

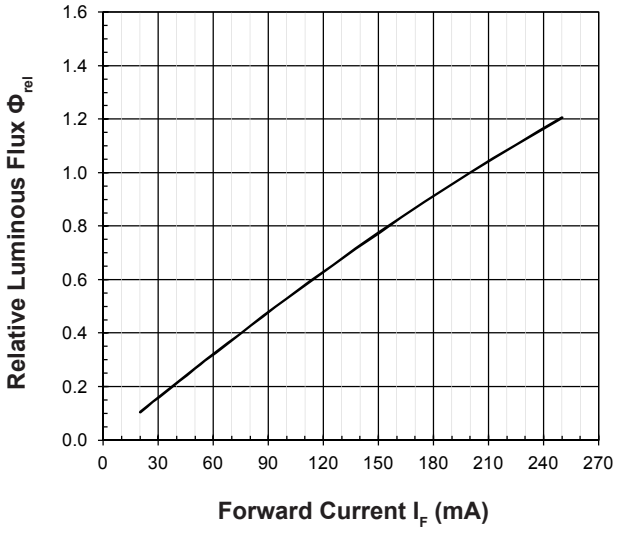
Vf Bining (Optional)

Vf Bin @ 200 mA	Forward Voltage (V) *Appx. 4.1*
V43	1.90 ... 2.05
V44	2.05 ... 2.20
V45	2.20 ... 2.35
V46	2.35 ... 2.50
V47	2.50 ... 2.65

Please consult sales and marketing for special part number to incorporate Vf bining.

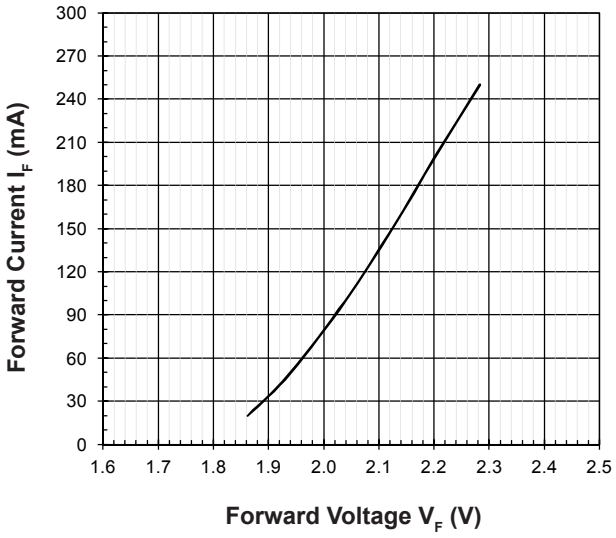
Relative Luminous Flux Vs Forward Current

$\Phi_V/\Phi_V(200mA) = f(I_F)$; $T_j = 25°C$



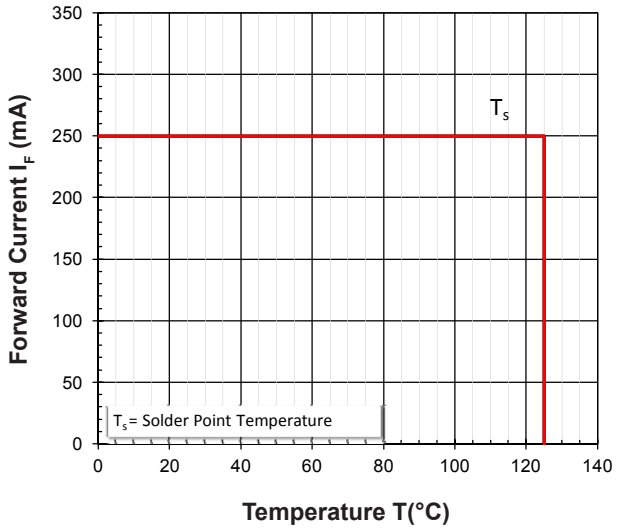
Forward Current Vs Forward Voltage

$I_F = f(V_F)$; $T_j = 25°C$



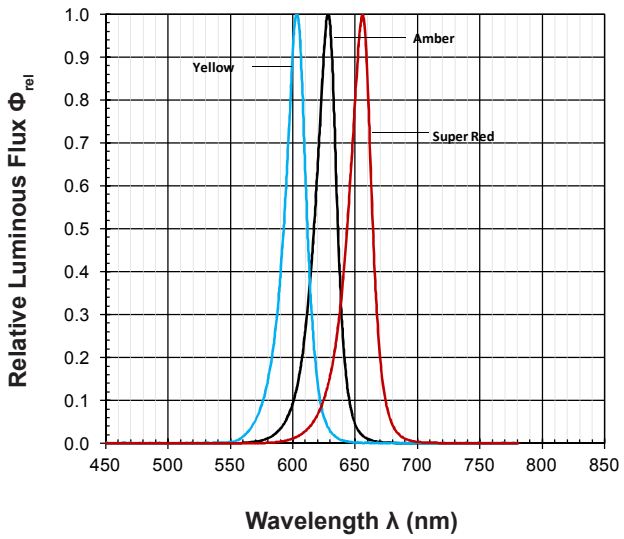
Maximum Current Vs Temperature

$I_F=f(T)$



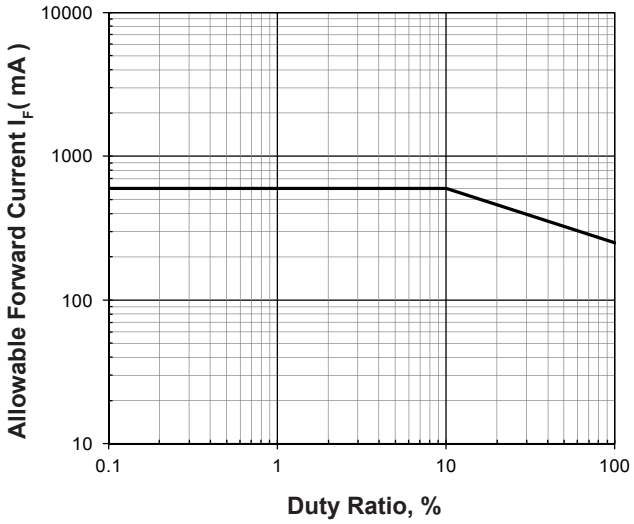
Relative Spectral Emission

$\Phi_{rel} = f(\lambda)$; $T_j = 25°C$; $I_F = 200mA$

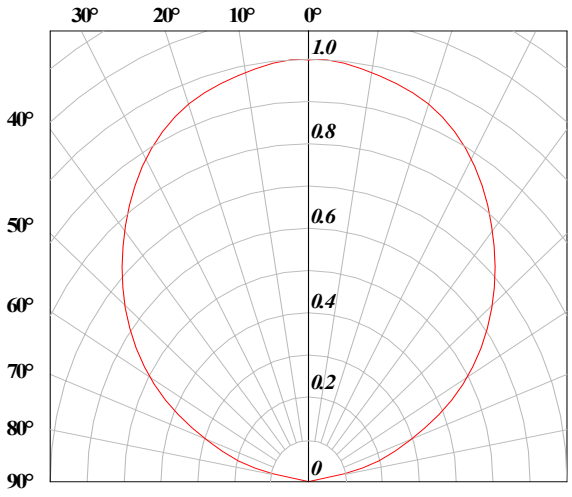


Allowable Forward Current Vs Duty Ratio

($T_j = 25°C$; $t_p \leq 10\mu s$)

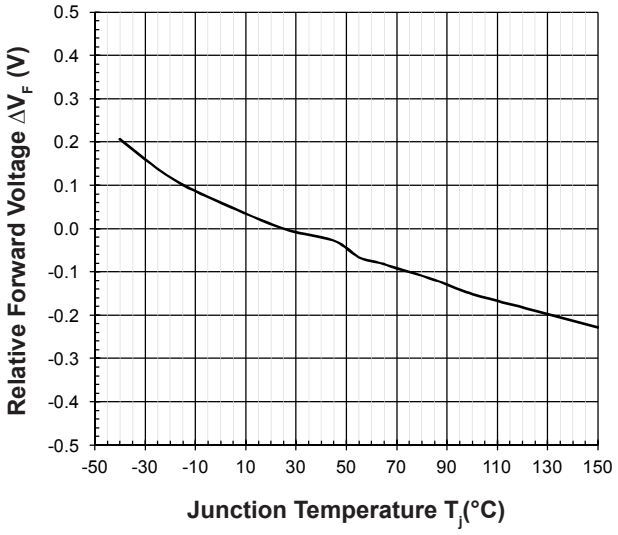


Radiation Pattern



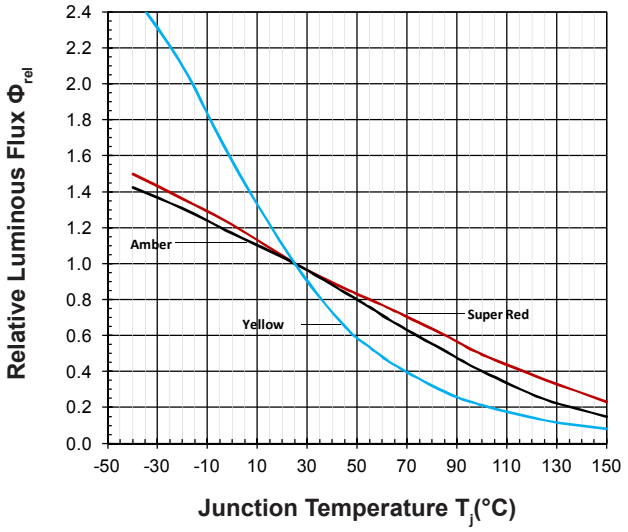
Relative Forward Voltage Vs Junction Temperature

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =200mA



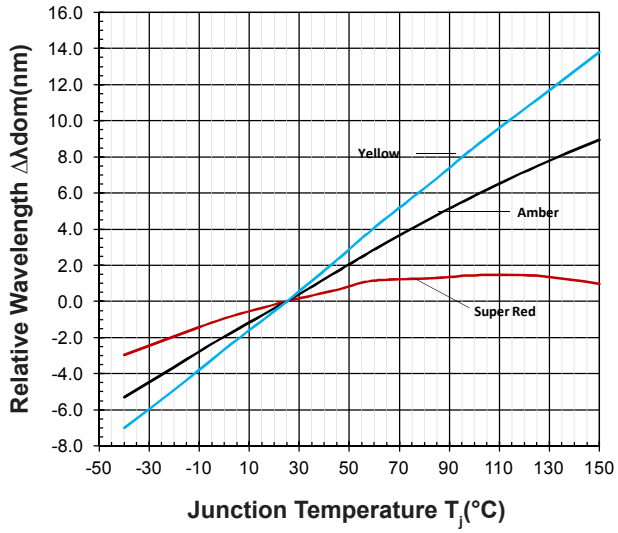
Relative Luminous Flux Vs Junction Temperature

$\Phi V/\Phi V(25°C) = f(T_j)$; I_F = 200mA

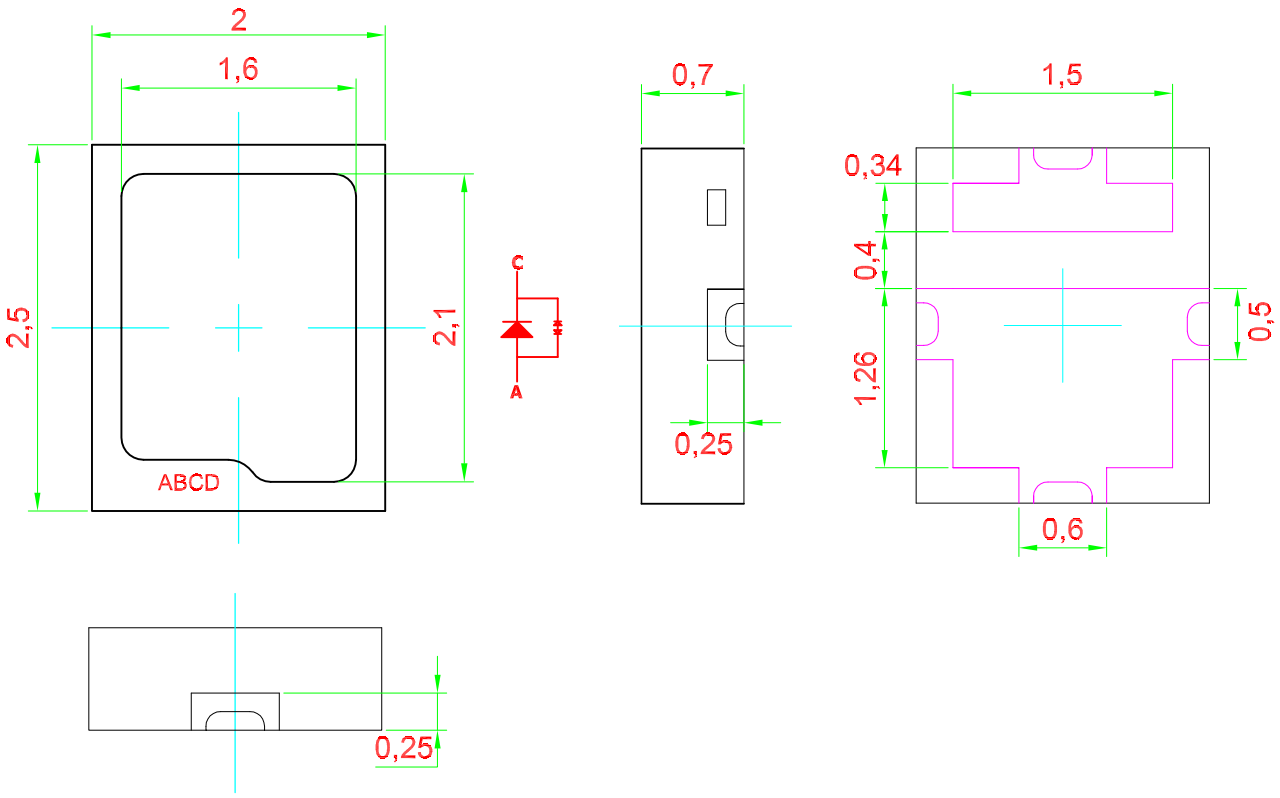


Relative Wavelength Vs Junction Temperature

$\Delta\lambda dom = \lambda dom - \lambda dom\ (25°C) = f(T_j)$; IF = 200mA



SpicePlus 2520 AlInGaP : SPx-VZHG Package Outlines



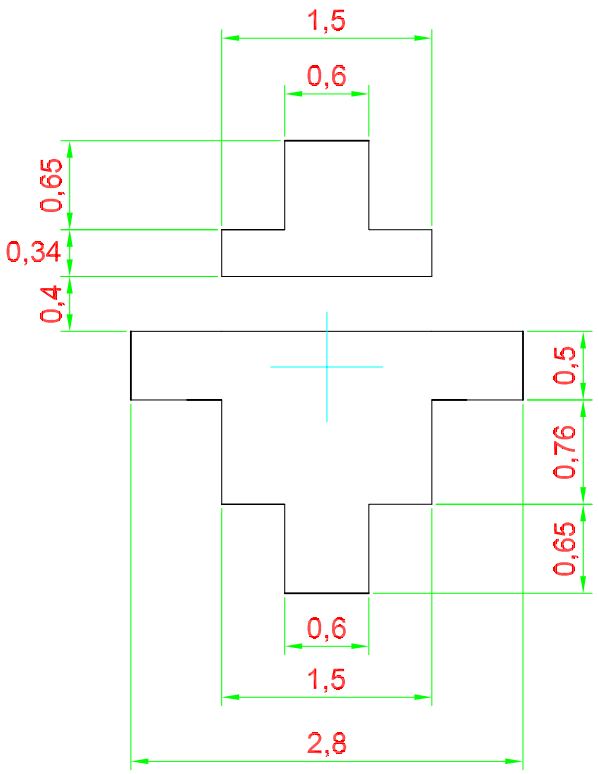
Note : Primary thermal path is through Anode lead of LED package
General Tolerances ± 0.10

Material

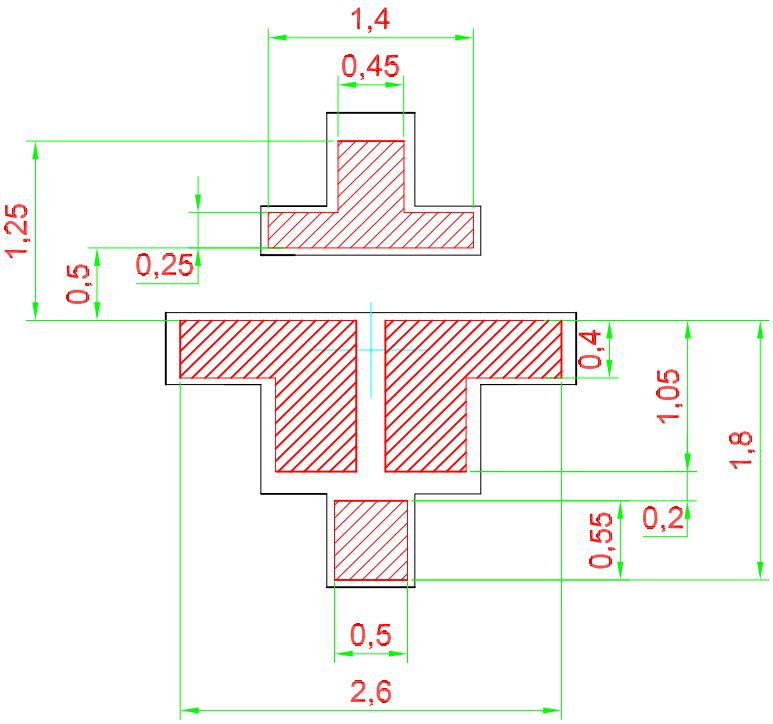
	Material
Lead-frame	Cu Alloy With Au Plating
Package	Heat Resistant Polymer
Encapsulant	Silicone Resin
Soldering Leads	Au Plating

Note: product is Pb free

Recommended Solder Pad

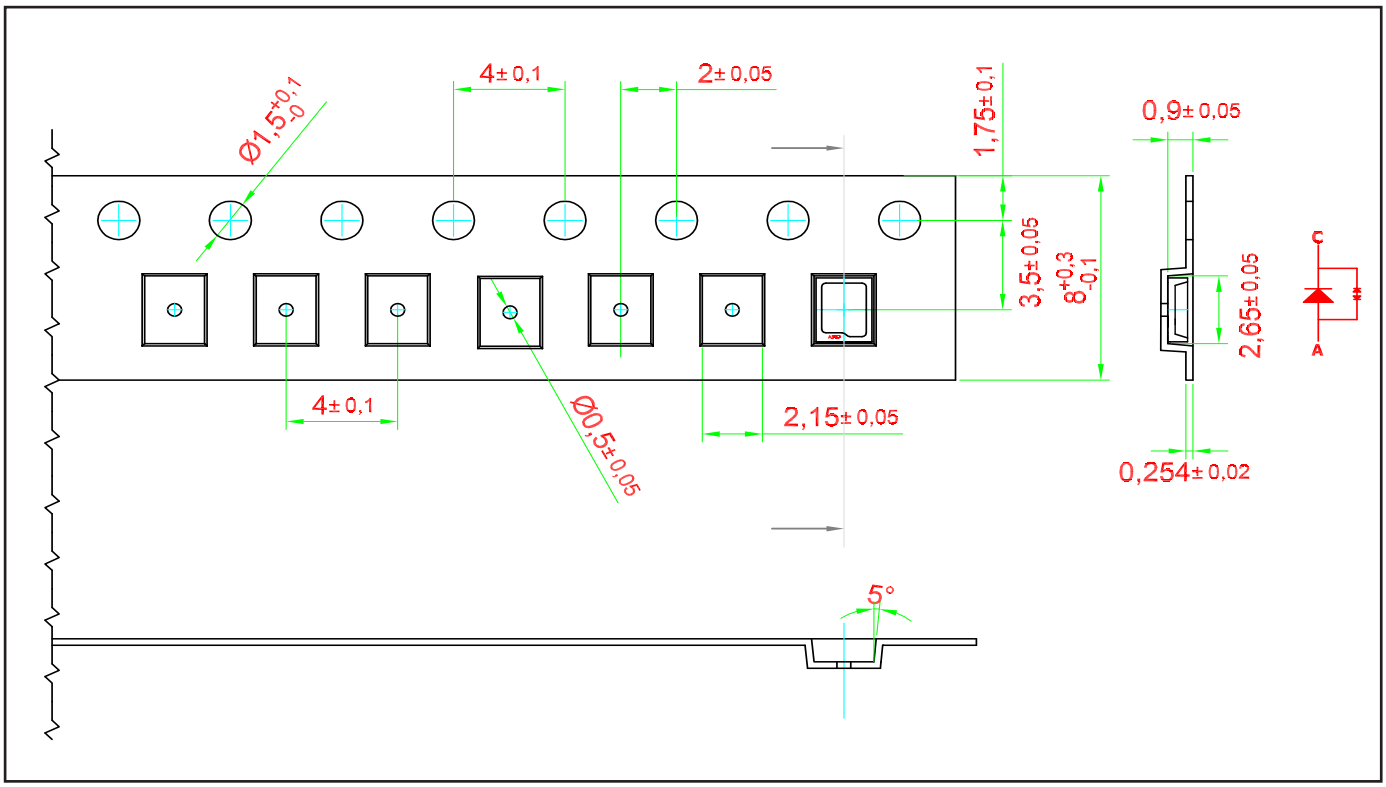


Recommended Solder Stencil Design

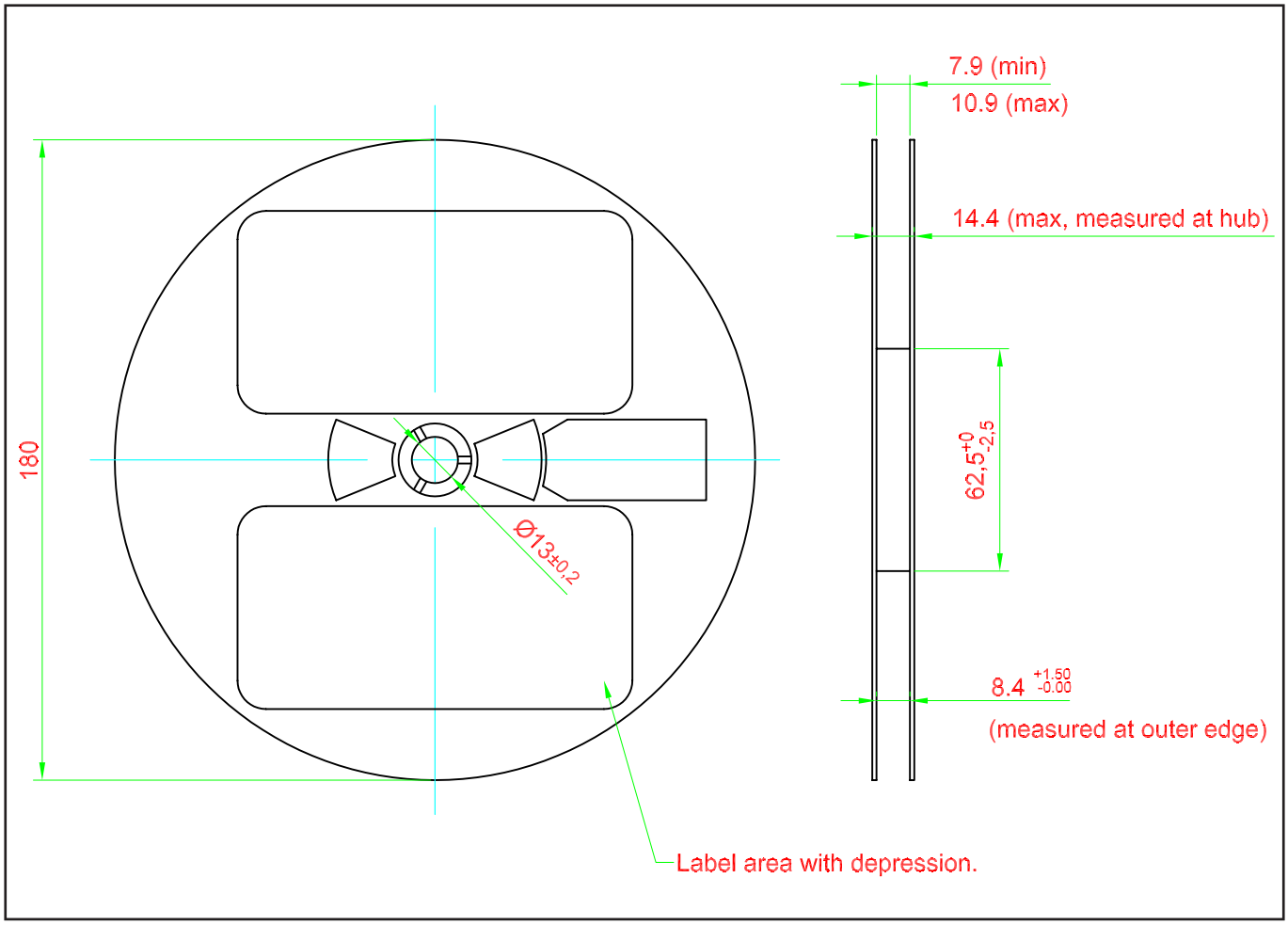


Taping and orientation

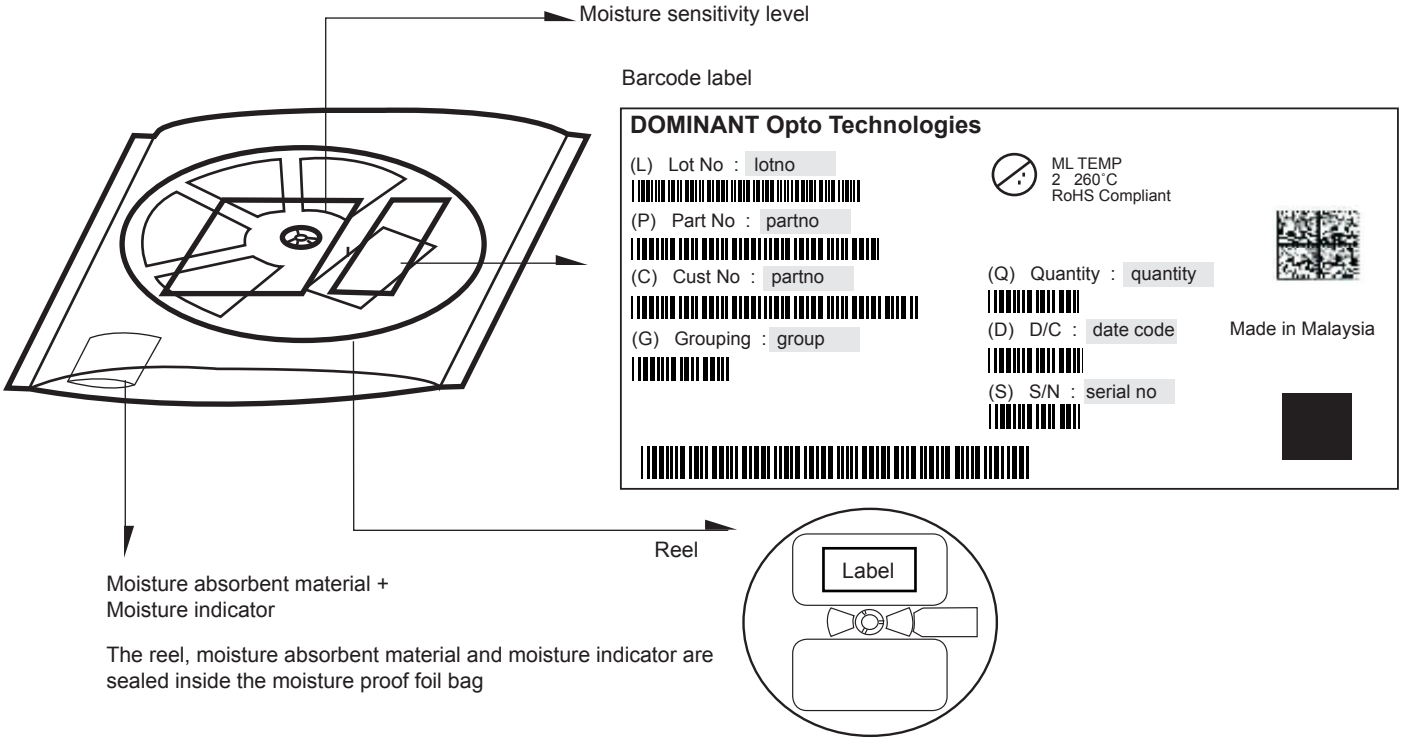
- Reels come in quantity of 2000 units.
- Reel diameter is 180 mm.



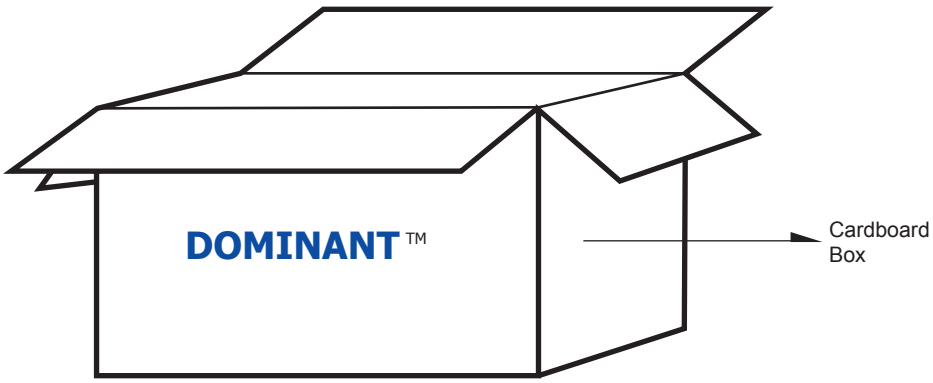
Packaging Specification



Packaging Specification



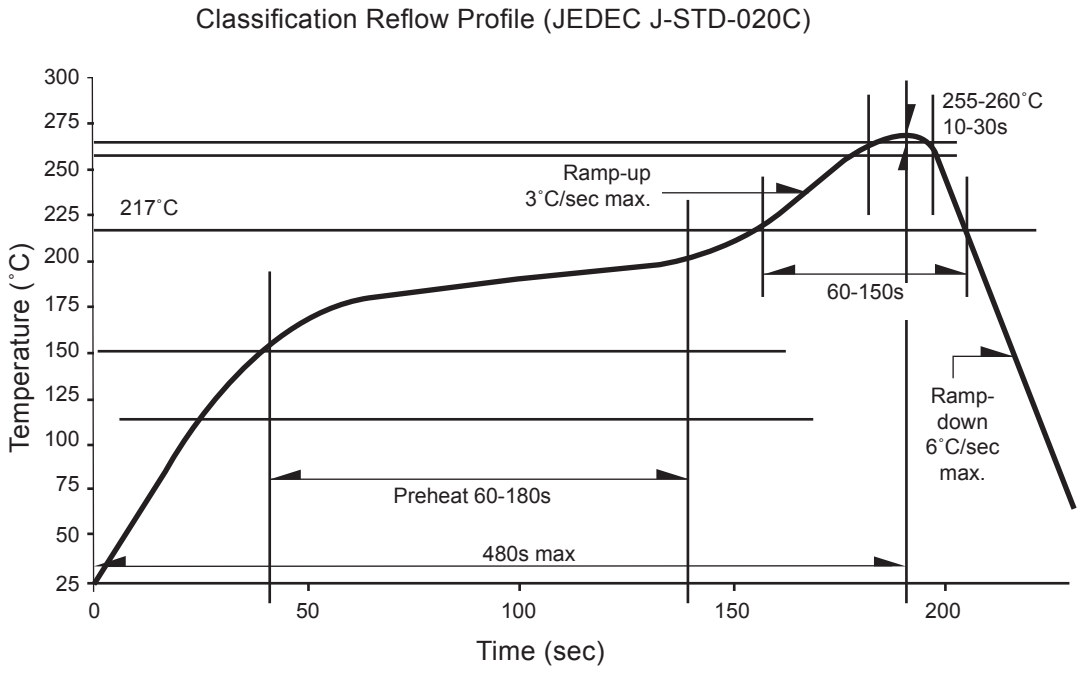
	Average 1pc SpicePlus 2520	1 completed bag (2000pcs)
Weight (gram)	**0.011**	**200 ± 10**



For SpicePlus 2520

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 ± 8 % and an expanded uncertainty of ± 11 % (according to GUM with a coverage factor of k=3).

1.2 Luminous flux is measured with an internal reproducibility of ± 8 % and an expanded uncertainty of ± 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 ± 0.5nm and an expanded uncertainty of ± 1nm (accordingly to GUM with a coverage factor of k=3).

3) Voltage:

3.1 Forward Voltage, Vf is measured with an internal reproducibility of ± 0.05V and an expanded uncertainty of ± 0.1V (accordingly to GUM with a coverage factor of k=3).

Revision History

Page	Subjects	Date of Modification
-	Initial Release	10 Aug 2017
2, 5	Typo Error on DC Forward Current Error on Graph	07 Sep 2017
6	Update Graph: Relative Luminous Flux Vs Junction Temperature	17 Jan 2018

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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