SEMILEDS

PRODUCT DATASHEET

SL-P-0815-3H

Description

SemiLEDs RGB in one Emitter provides high luminous flux and efficiency for color mixing capability and color changing applications. By utilizing 3-in-1 approach mounting the RGB LED dies into the same package, SemiLEDs RGB in one emitter enables light sources to achieve better color mixing than the separately packaged devices.

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RoHS Compliant

Features

- Three chips in one package
- Independent control
- Color mixing capability
- Long operating life
- RoHS complaint

Applications

- Beacon lighs
- Architectural lighting
- Stage lighting
- Contour lights

Characteristics

Absolute Maximum Ratings

Parameter	RGB in One
Peak Forward Current (1/10 Duty Cycle at 1KHz)	1000mA
Continuous Forward Current	700mA
LED Junction Temperature	120℃
Operation Temperature	-40℃~+105℃
Storage Temperature	-40℃~+120℃
ESD Sensitivity	>500V
Reverse Voltage (V)	Not designed for reverse operation

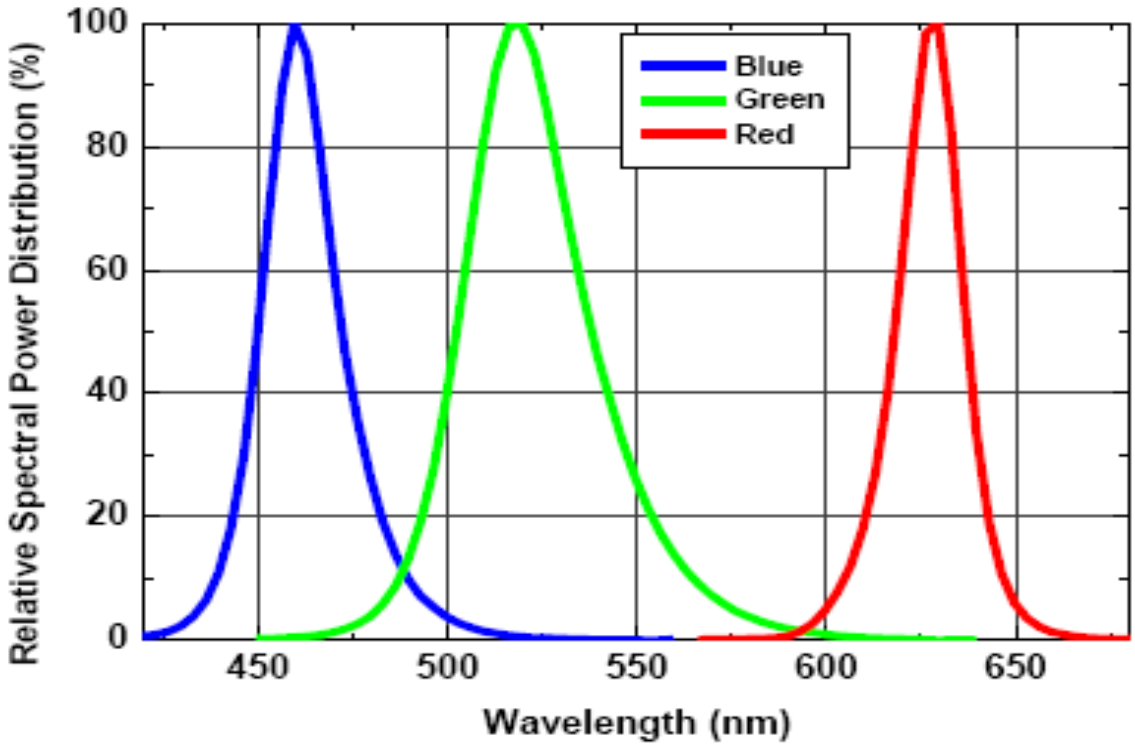
Electro-Optical Characteristics I_F=700mA ($T_{Soldering}$=25℃)

Parameter		Symbol	Value			Unit
			Min	Typical	Max	
Luminous flux(1)	Green	Φ_V(2)	120	150	--	lm
	Red		70	80	--	
	Blue		30	35	--	
Dominant Wavelength(3)	Green	Wd	510	--	530	Nm
	Red		620	--	630	
	Blue		457	--	470	
View angle	Green	$2\theta_{1/2}$(4)	--	140	--	Degree
	Red		--	140	--	
	Blue		--	140	--	
Forward Voltage(5)	Green	V_F	3.5	--	4.5	V
	Red		2.3	--	3.0	
	Blue		3.5	--	4.5	

Notes：

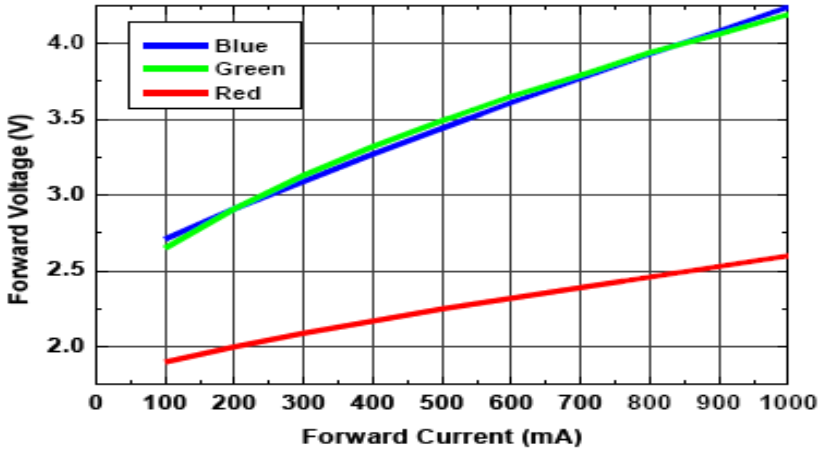
1. The typical luminous flux of SL-P-0815-3H may be upgraded in the future.
2. Φ_V, minimum luminous flux performance guaranteed within published operating conditions. SemiLEDs maintains a tolerance of ±10% luminous flux measurements.
3. Dominant wavelength is derived from the CIE1931 chromaticity diagram and represents the perceived color. The tester tolerance of dominant wavelength is ±1nm.
4. $\theta_{1/2}$ is the off axis angle from emitter centerline where the radiometric intensity is 1/2 of the peak value.
5. SemiLEDs maintains a tolerance of ±0.06V on forward voltage measurements.

Relative Spectral Power Distribution

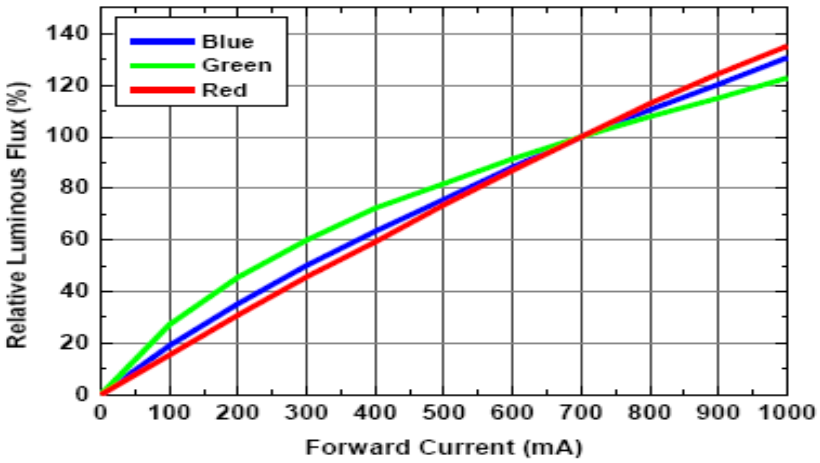


Typical Electro-Optical Characteristics Curves

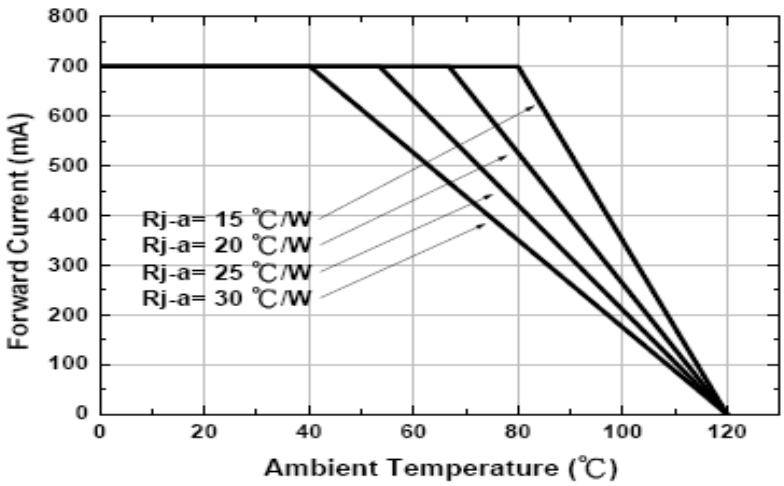
Forward Voltage vs. Forward Current



Typical Light Output Characteristics over Forward Current

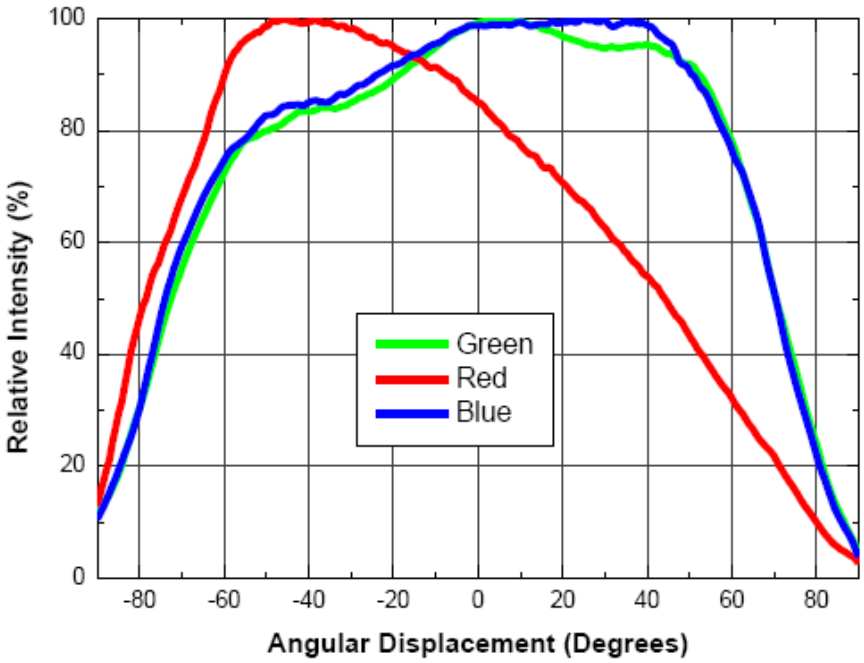


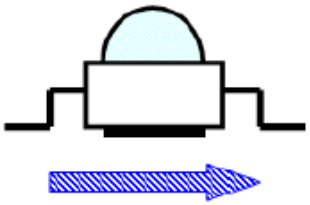
Operating Current & Ambient Temperature



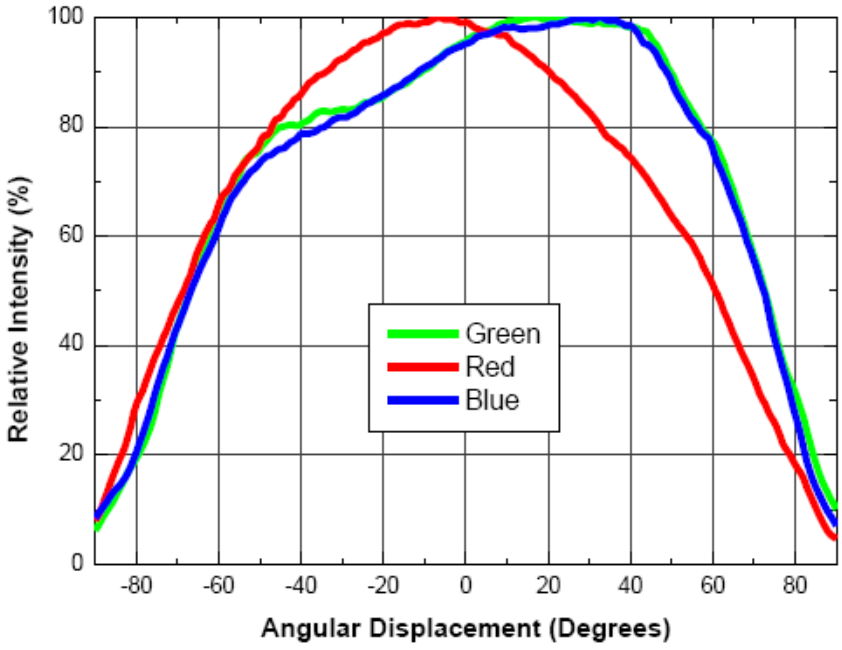
Typical Radiation Patterns

Typical Representative Spatial Radiation Pattern in X-axis



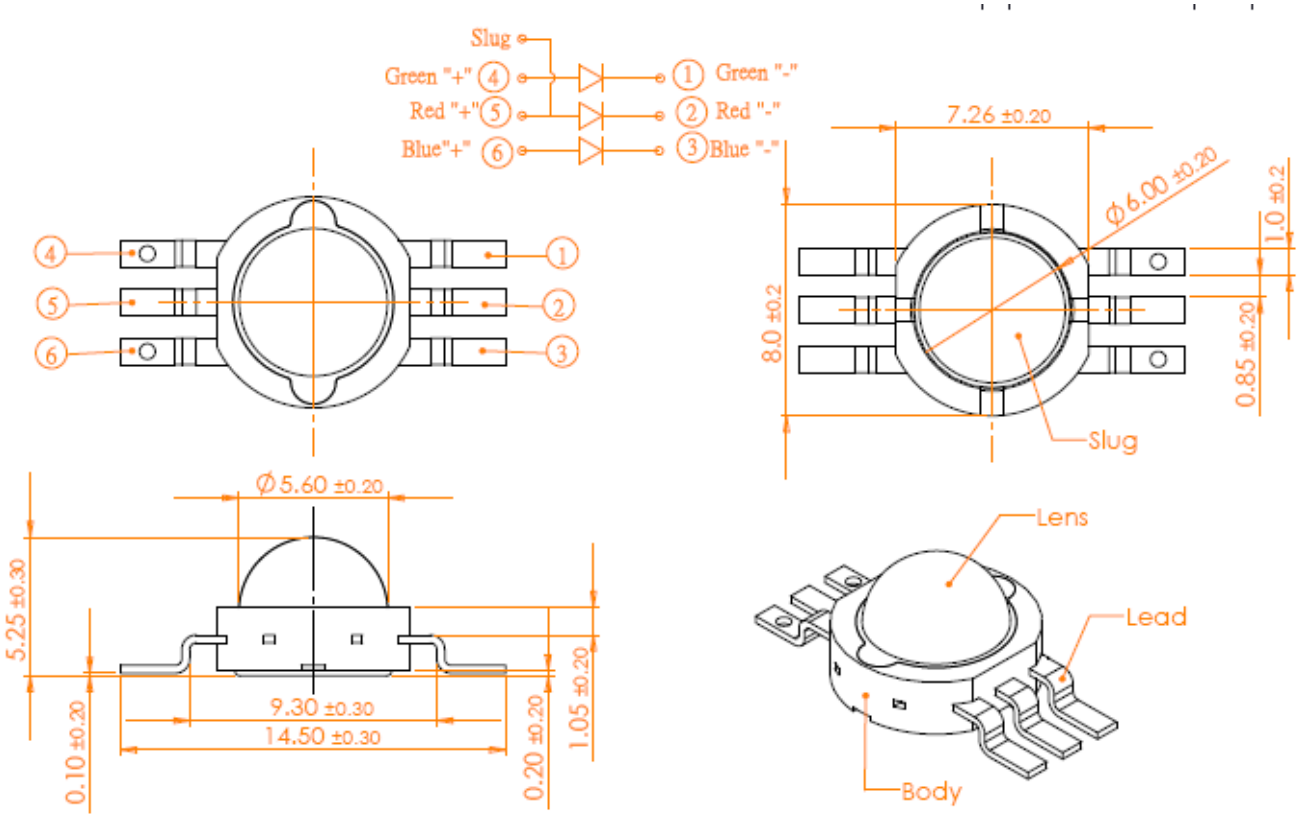


Typical Representative Spatial Radiation Pattern in Y-axis



Package Dimensions

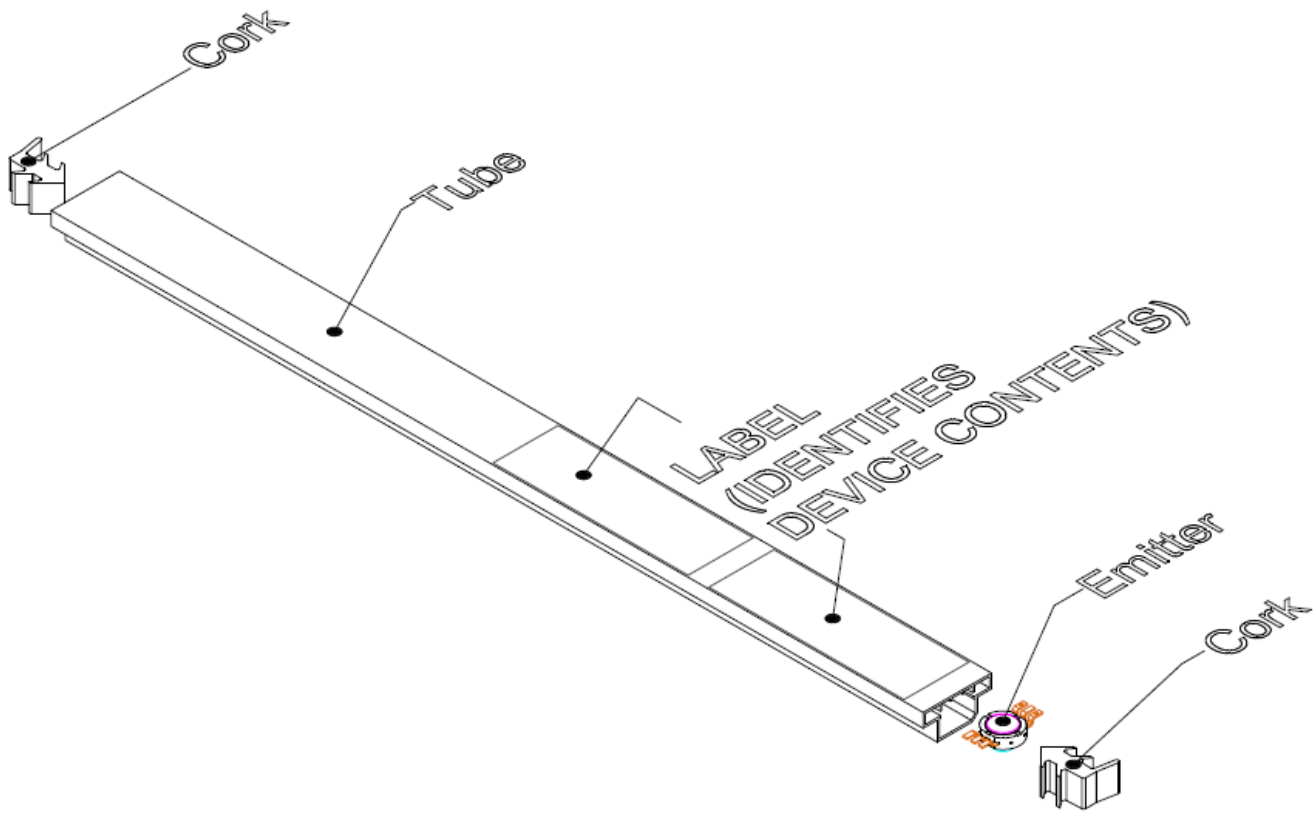
SMT Lead Form



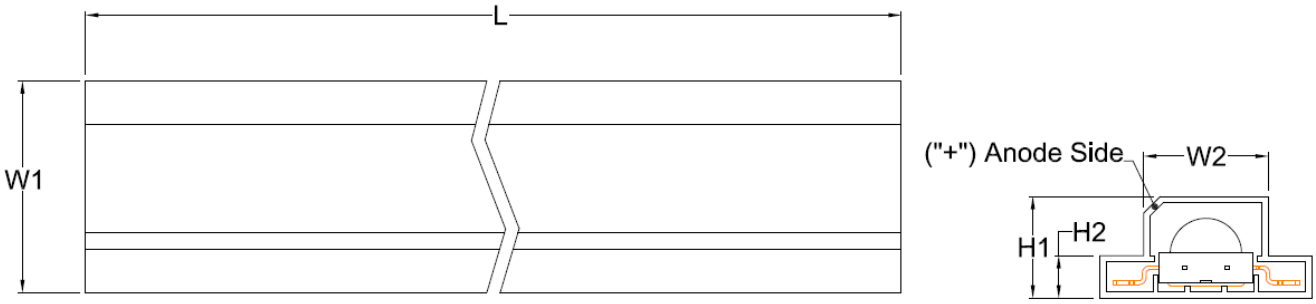
Note:

1. The anode side of the device is denoted by a hole in the lead frame.
2. Electrical insulation between the case and the board is required. The slug of the device is not electrically neutral.
3. Drawings are not to scale.
4. All dimensions are all millimeter.
5. All dimensions without tolerance are for reference only.
6. Specifications are subject to change without notice.

Tube Package Specifications



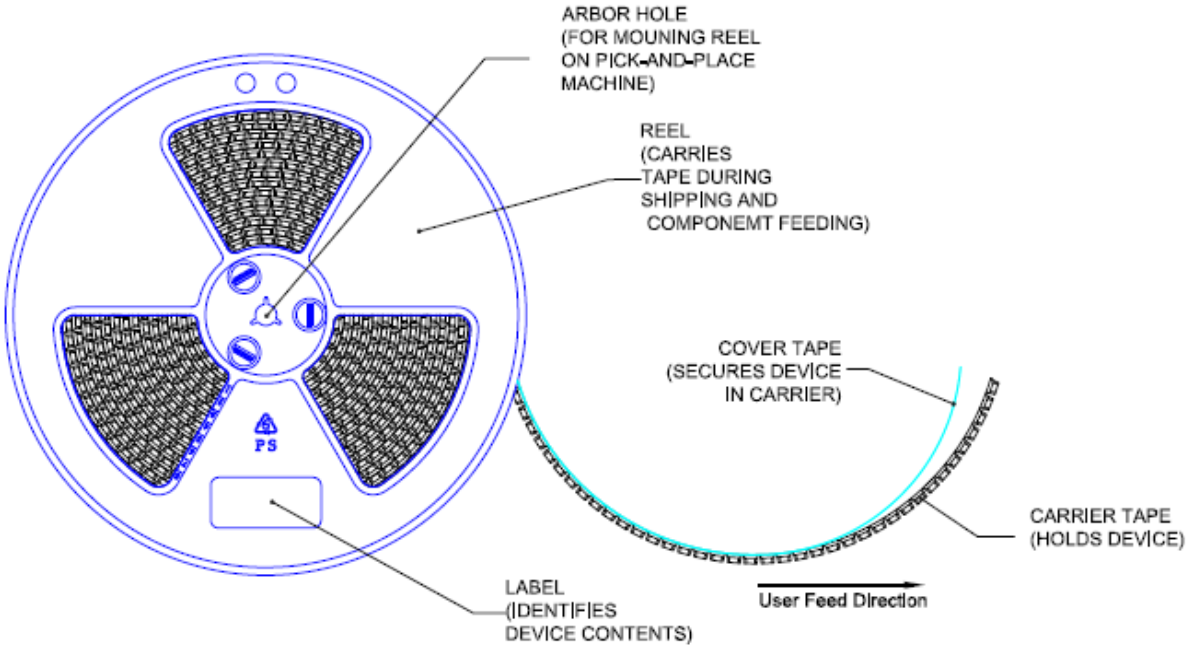
Tube Dimensions



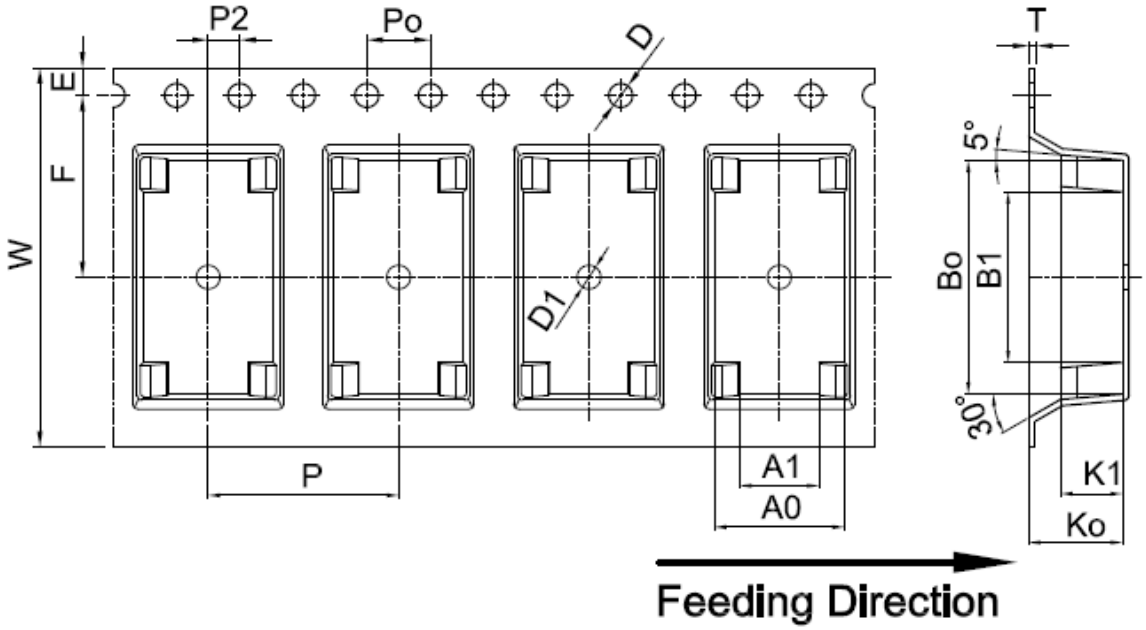
UNIT : mm

W1	W2	H1	H2	L
16.5±0.2	9.7±0.2	7.9±0.2	3.3±0.2	420.0±1.0

Reel Package Specifications



CARRIER TAPE DIMENSIONS (2 PINS)

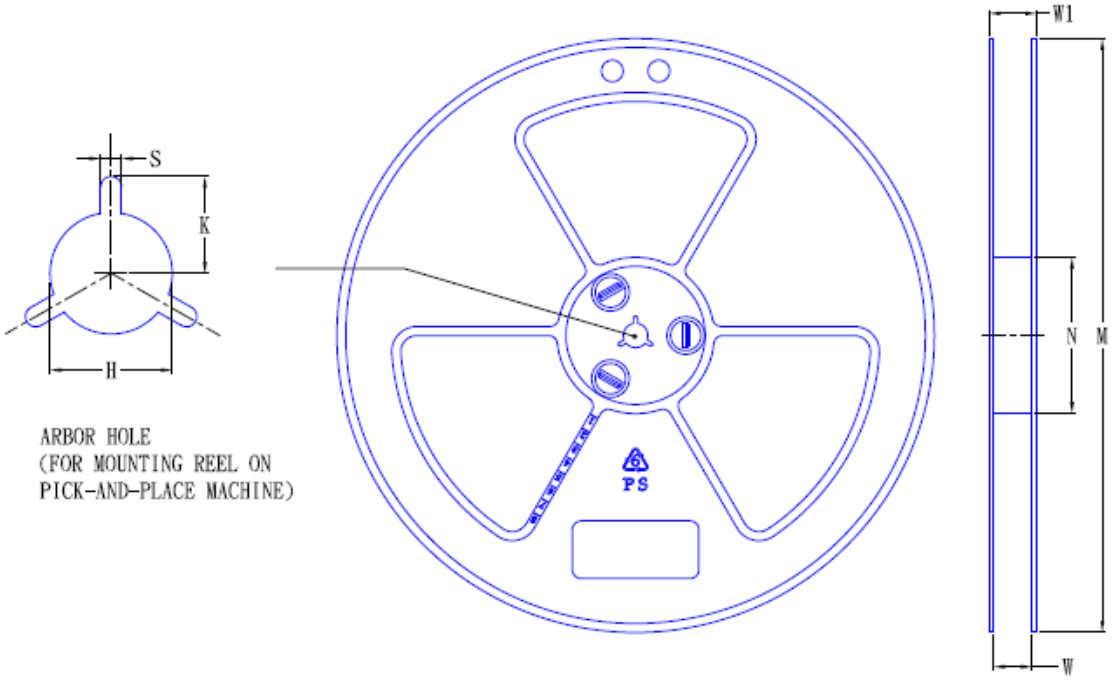


UNIT : mm

W	P	E	F	P2	D	D1	P0	A0	B0	K0	T
24.0 ±0.3	12.0 ±0.1	1.75 ±0.1	11.5 ±0.1	2.0 ±0.1	1.5 +0.1 -0.0	1.5 ±0.1	4.0 ±0.1	8.2 ±0.1	14.8 ±0.1	5.85 ±0.1	0.5 ±0.05

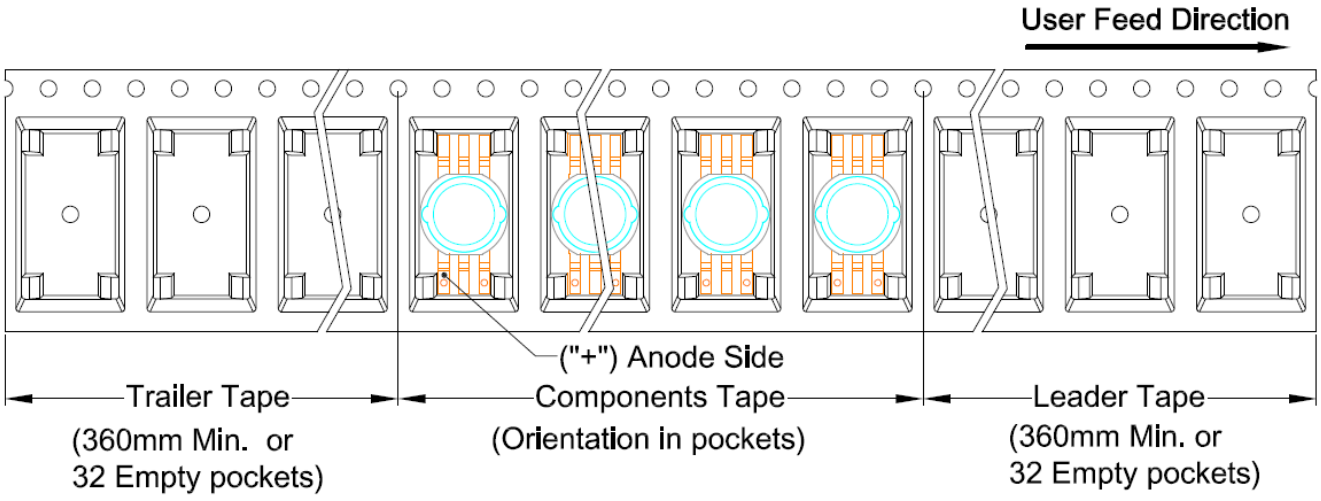
Reel Dimensions

UNIT : mm



M	N	W	W1	H	K	S
Ψ380.0 ±1.0	Ψ100.0 ±1.0	24.6 ±0.5	30.6 ±0.5	Ψ13.5 ±0.5	10.45 ±0.5	2.5 ±0.5

Leader/Trailer and Orientation(2 PINS)



Reliability Test Item and Conditions

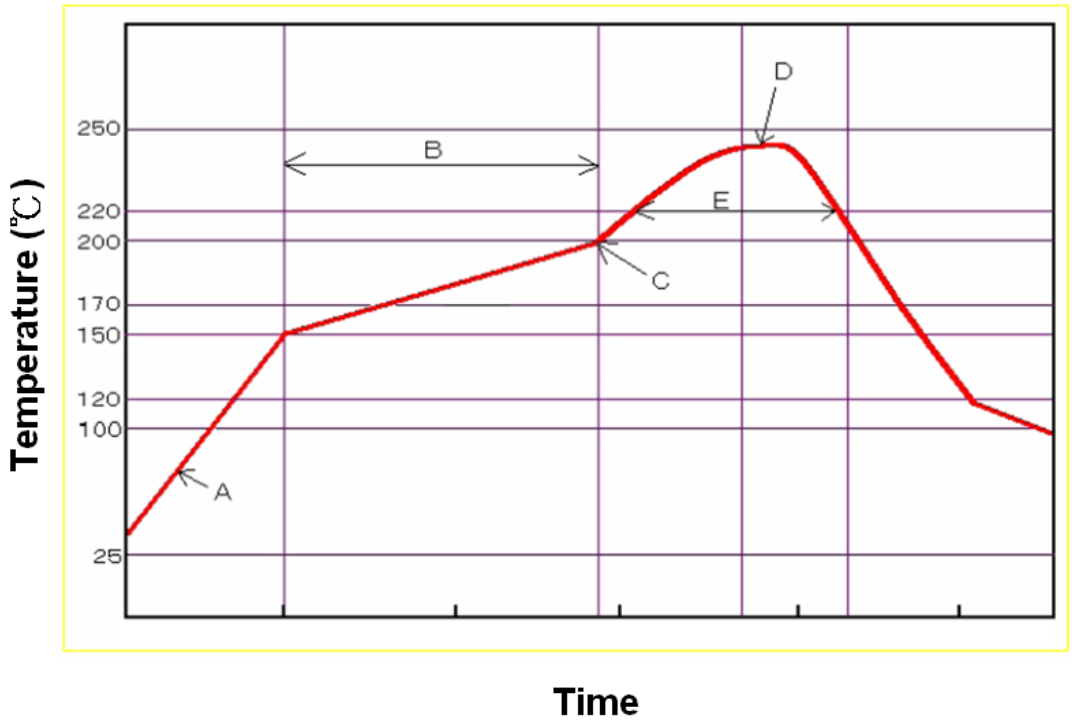
Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
Resistance to Soldering heat (reflow soldering)	JEITA ED-4701 300 301	Ta=260℃, 10sec. (Pre treatment 25 ℃,70%,168hrs.)	2 times	0/10
Solderability (reflow soldering)	JEITA ED-4701 300 303	Tsld=215±5℃, 3sec. (Lead Solder)	1 time over 95%	0/10
Steady state Operating life		Ta=25℃, I_F=700mA Tested with Semileds Standard circuit board	1000 hrs.	0/10
Steady state Operating life of High humidity heat		60℃, RH=90%, I_F=700mA Tested with Semileds Standard circuit board	1000 hrs.	0/10
Temperature cycle	JEITA ED-4701 100 105	-40℃～25℃～100℃～25℃ 30min. 5min. 30min. 5min.	100 cycles	0/10
Thermal Shock	JEITA ED-4701 300 307	0℃～100℃ 15sec. 15sec.	20 cycles	0/10
High temperature Storage	JEITA ED-4701 200 201	Ta=100℃	1000 hrs.	0/10
Low temperature Storage	JEITA ED-4701 200 202	Ta=-40℃	1000 hrs.	0/10
Vibration		2000Hz, 2directions	60min.	0/10

Failure Criteria:

1. Forward Voltage shift : >200mV
2. Luminous Flux degradation : >30%
3. Forward or Reverse Leakage : >10uA

Solder Reflow Process Parameters

Reflow soldering of SL-P-0815-3H emitters requires effective control of heating and cooling. Both the rate of heating and cooling and the absolute temperatures reached are critical in assuring the formation of a reliable solder joint while avoiding damage to the emitter during the reflow process. The recommended temperature profile of solder reflow process is shown below in the figure.



Preheat

1) Set the temperature rising speed A at a rate of 2～4℃/s. Careful about rapid temperature rise in preheat zone as it may cause excessive slumping of the solder paste.
2) Appropriate preheat time B will be from 60 to 180 seconds. If the preheat is insufficient, rather large solder balls tend to be generated. Conversely, if performed excessively, fine balls and large balls will generate in clusters at times.
3) Appropriate preheat ending temperature C will be from 180 to 200℃. If the temperature is too low, non-melting tends to be caused in the area with large heat capacity after reflow.

Heating

1) Careful about sudden rise in temperature as it may worsen the slump of solder paste.
2) Set the peak temperature D in the range from 230 to 240℃
3) Adjust the melting time that the time over 220℃, E, will be from 30 to 90 seconds.

Cooling

1) Careful about slow cooling as it may cause the positional shift of parts and decline in joining strength at times.

Caution

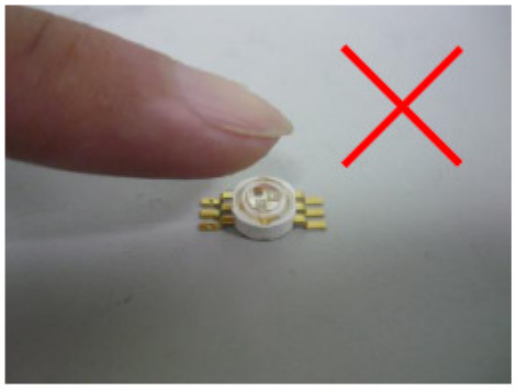
Storage

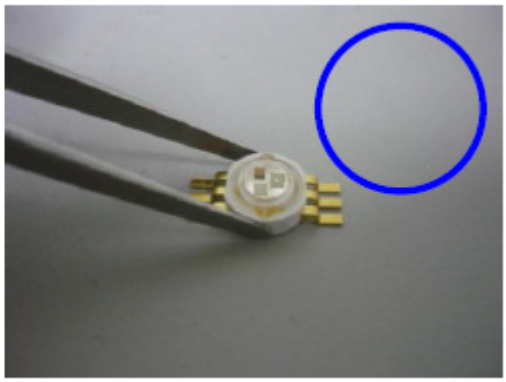
- Do not open the moisture proof bag before the devices are ready to use.
- Before the package is opened, LEDs should be stored at temperatures less than 30℃ and humidity less than 50%.
- After the package is opened, LEDs should be stored at temperatures less than 30℃ and humidity less than 30% .
- LEDs should be used within 168 hours (7 days) after the package is opened.
- Before using LEDs, baking treatment should be implemented based on the following Conditions: pre-curing at 60±5℃ for 6 hours.

Handling Precaution

The softness and dust affinity of silicone molding lens constrain the handling of LED. Thus, some handling indications of SL-P-0815-3H RGB in One are presented for possible damage prevention and excellent reliability.

- Avoid leaving fingerprints or scratches (by sharp tools) on the silicone resin parts.
- Do not force over 2000gf impact or pressure on the silicoe molding lens.
- The LEDs should only be picked up by making contact with the sides of the LED body.
- When populating in SMT production, the pick-and-place nozzle must not place excessive pressure on the silicone molding lens.





About Us

SemiLEDs Corporation is a US based manufacturer of ultra-high brightness LED chips with state of the art fabrication facilities in Hsinchu Science Park, Taiwan. SemiLEDs specializes in the development and manufacturing of vertical LED chips in blue (white), green, and UV using a patented copper alloy base. This unique design allows for higher performance and longer lumen maintenance. The World Economic Forum recognized SemiLEDs innovations with the 2009 Technology Pioneer Award. SemiLEDs is fully ISO 9001:2008 Certified

SemiLEDs is a publicly traded company on NASDAQ Global Select Market (stock symbol "LEDS"). For investor information, please contact us at **investors@semileds.com.**

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