Chip LEDs with low power dissipation

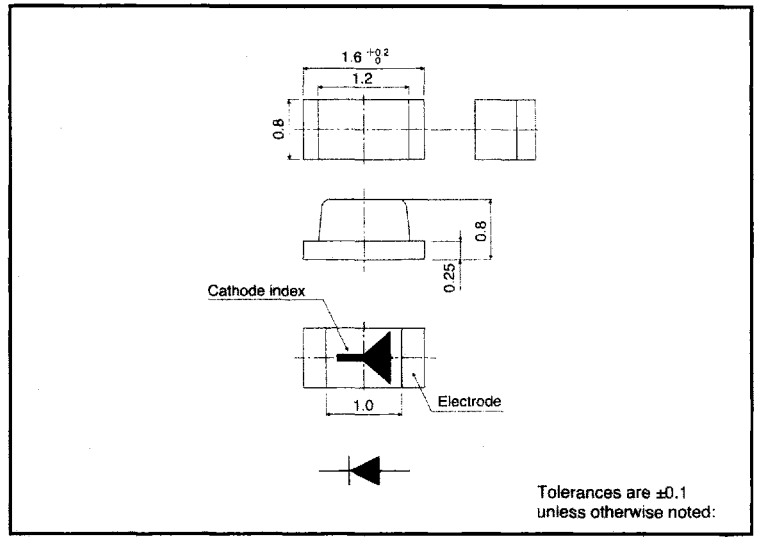
SML-311 Series

The SML-311 series are low power dissipation, chip LEDs equipped with an AlGaInP chip. These LEDs are compact and leadless to allow a higher mounting density, and low power consumption makes them an ideal light source for battery driven products.

●Features

1) Three colors : red, orange and yellow.
2) Low power dissipation chip LEDs equipped with an AlGaInP chip.
3) Six times the brightness of previous GaAsP chips at I_F = 2 mA.
4) Compact 1.6mm × 0.8mm surface mount package.
5) Thin 0.8mm package.
6) Ideal light source for battery driven products.

●External dimensions (Unit: mm)



●Selection guide

Emitting color / Lens	Red	Orange	Yellow	Green
Transparent clear	SML-311UT	SML-311DT	SML-311YT	—

●Absolute maximum ratings (Ta = 25℃)

Parameter	Symbol	Red	Orange	Yellow	Unit
		SML-311UT	SML-311DT	SML-311YT	
Power dissipation	P_D	22	22	22	mW
Forward current	I_F	10	10	10	mA
Peak forward current	I_{FP}	60	60	60	mA*
Reverse voltage	V_R	4	4	4	V
Operating temperature	Topr	−30~85			℃
Storage temperature	Tstg	−40~85			℃

* Pulse width 1ms Duty 1/5

●Electrical and optical characteristics (Ta = 25℃)

Type \ Parameter		Color	Forward voltage			Reverse current		Luminous intensity			Peak wavelength		Spectral line half width	
			V_F(V)		Cond.	I_R(μA)	Cond.	I_V(mcd)		Cond.	λ_P(nm)	Cond.	$\Delta\lambda$(nm)	Cond.
			Typ.	Max.	I_F(mA)	Max.	V_R(V)	Min.	Typ.	I_F(mA)	Typ.	I_F(mA)	Typ.	I_F(mA)
SML-311	UT	Red	1.8	2.2	2	100	4	0.9	2.5	2	630	2	18	2
	DT	Orange	1.8	2.2	2	100	4	0.9	2.5	2	611	2	16	2
	YT	Yellow	1.8	2.2	2	100	4	0.56	1.6	2	590	2	15	2

●Directional pattern

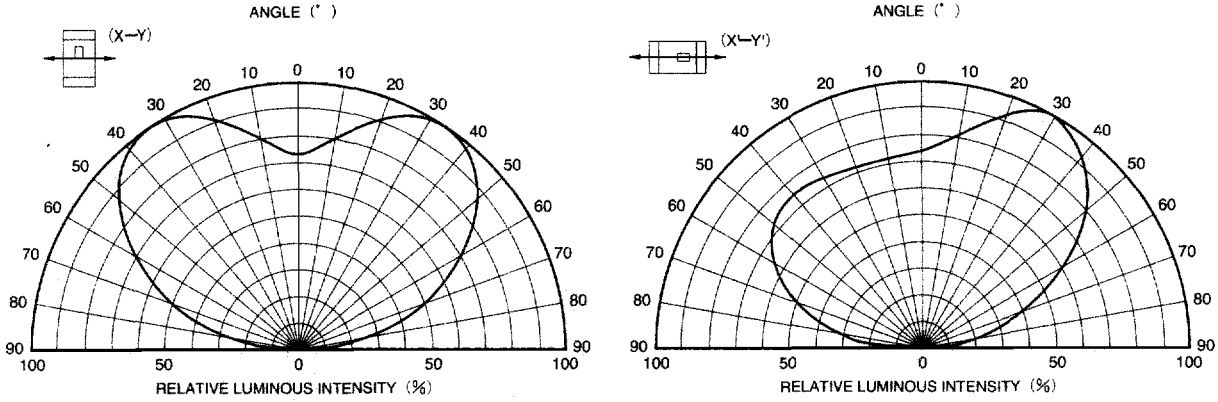


Fig. 1 Directional pattern

●Electrical characteristics 1 (SML-311UT)

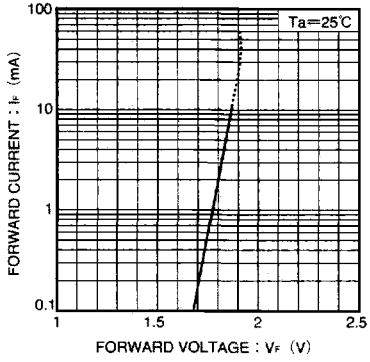


Fig. 2 Forward current vs. forward voltage

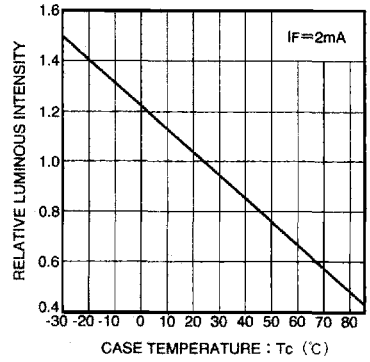


Fig. 3 Luminous intensity vs. case temperature

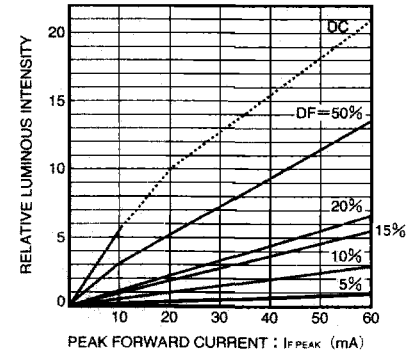


Fig. 4 Luminous intensity vs. peak forward current

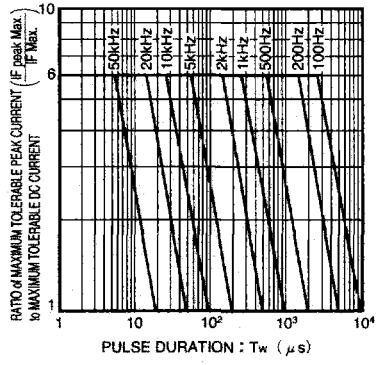


Fig. 5 Maximum tolerable peak current vs. pulse duration

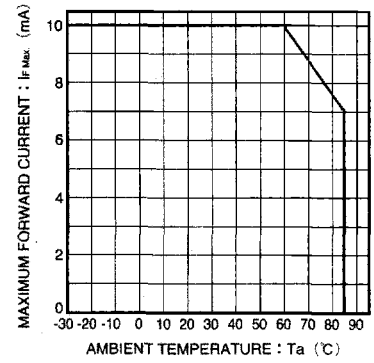


Fig. 6 Maximum forward current vs. ambient temperature

●Electrical characteristics 2 (SML-311DT) (orange)

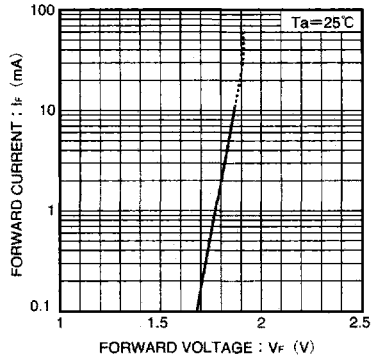


Fig. 7 Forward current vs. forward voltage

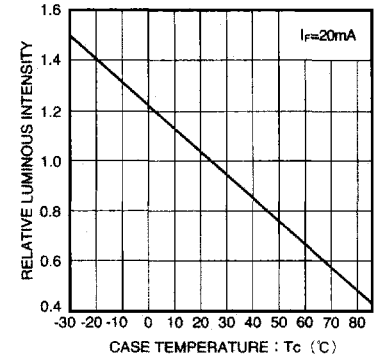


Fig. 8 Luminous intensity vs. case temperature

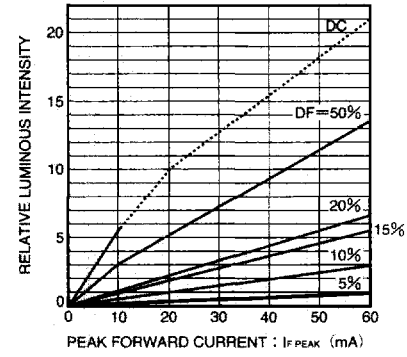


Fig. 9 Luminous intensity vs. peak forward current

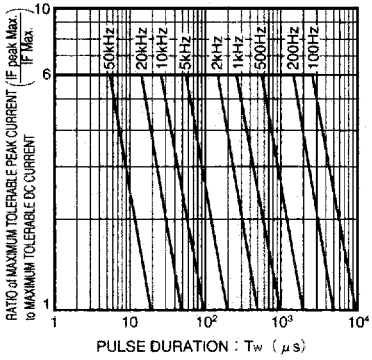


Fig. 10 Maximum tolerable peak current vs. pulse duration

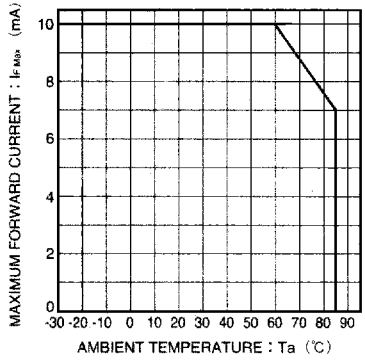


Fig. 11 Maximum forward current vs. ambient temperature

●Electrical characteristics 3 (SML-311YT) (yellow)

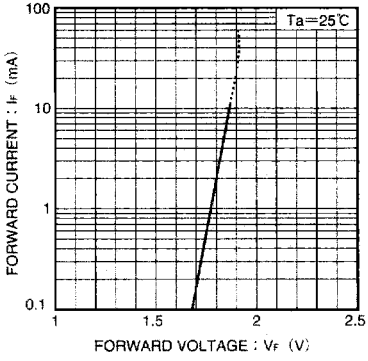


Fig. 12 Forward current vs. forward voltage

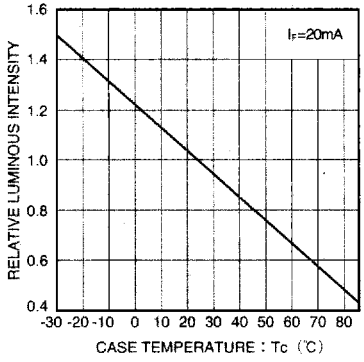


Fig. 13 Luminous intensity vs. case temperature

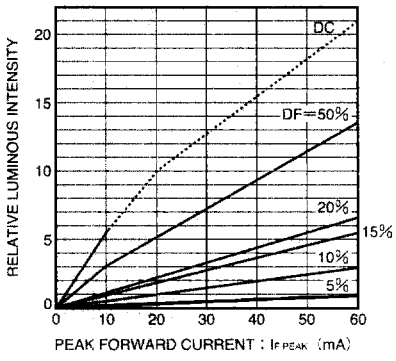


Fig. 14 Luminous intensity vs. peak forward current

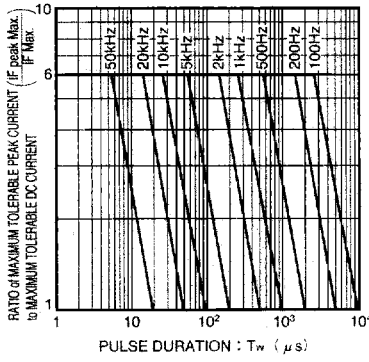


Fig. 15 Maximum tolerable peak current vs. pulse duration

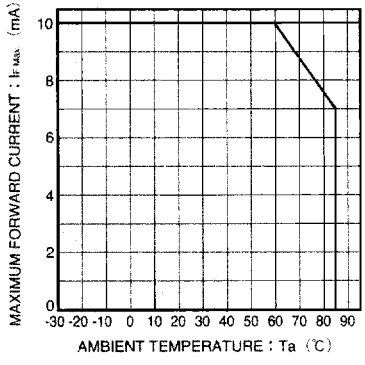


Fig. 16 Maximum forward current vs. ambient temperature

●Attention points in handling

This product was developed as a surface mount LED especially suitable for reflow soldering.
Please take care of following point when using this device.

(1) Designing of PCB

As for a recommendable solder pattern, please refer to Fig.17. The size and direction of the pad pattern depend on the condition of the PCB, so please investigate about the adjacent thoroughly designing.

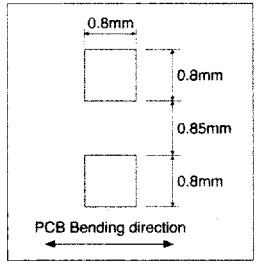
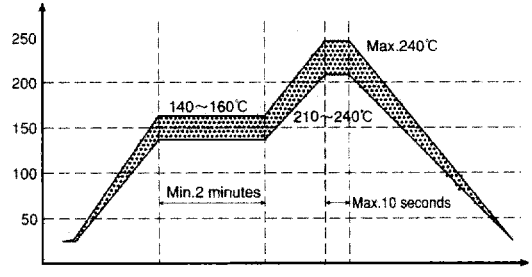


Fig. 17

(2) Soldering

LED products do not contain reinforcement materials such as glass fillers. Therefore, thermal stress by soldering greatly influences its reliability.
The temperature conditions for reflow soldering should therefore be set up according to the characteristic of this product. (see Fig.18)



(3) Washing

Please note the following points when washing is required after soldering.

① Washing solvent : Isopropyl alcohol or other alcoholic solvent is recommendable.
② Temperature : Below 30℃, immersion time : within 3 minutes.
③ Ultra sonic washing : Below 15w/1 liter of solvent tub.
④ Curing : Below 100℃ within 3 minutes.

(4) Storage

At reflow soldering, the reliability of this product is often influenced by moisture absorption. So we apply the packaging with moistureproof. For better condition is use, please also note that :

① Storage before use : Not to be opened before using.
② Storage after opening package : To be kept in our moistureproof packaging with some desiccant (silica gel) after opening it. To be baked in case the silica gel indicator loses its blue colour.
③ Baking to remove moisture : Bake the LEDs at 60℃ for 12 to 24 hours.