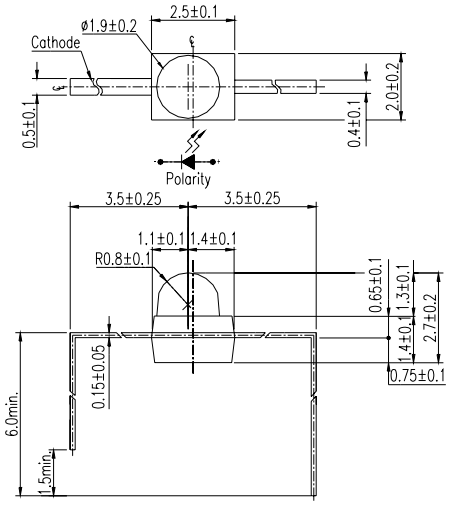
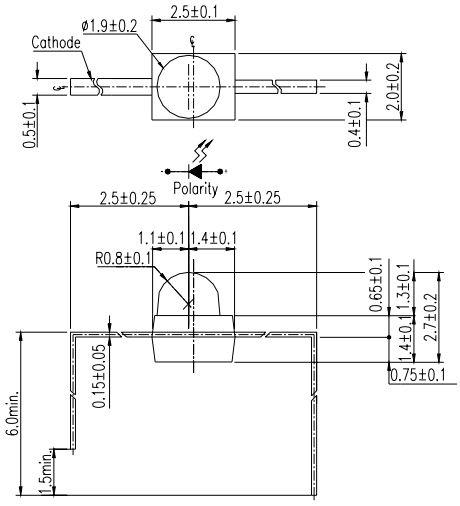
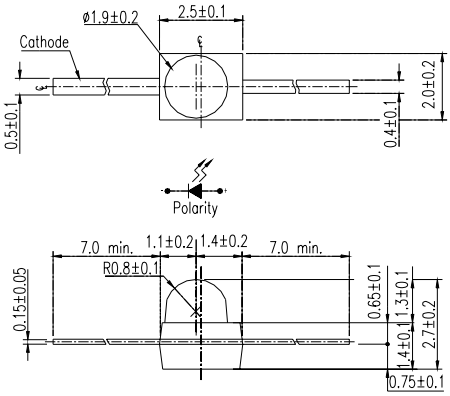
Package Outline Dimensions



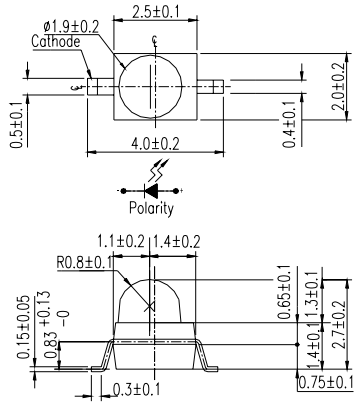
91-21/F1



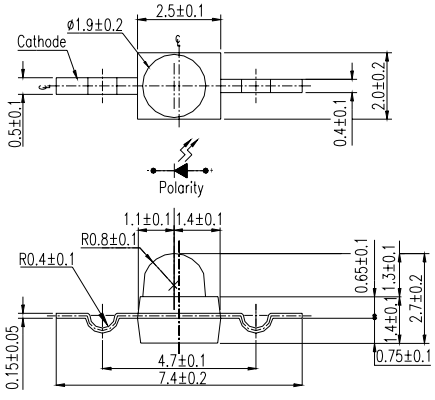
91-21/F2



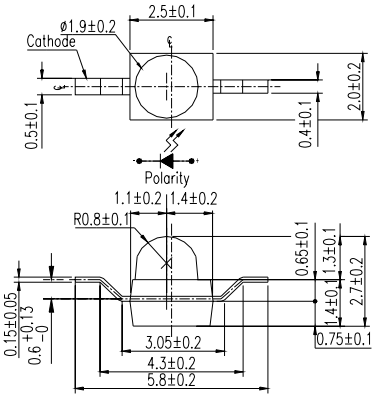
91-21



91-21F7/TR7



91-21F9/TR9



91-21F10/TR10

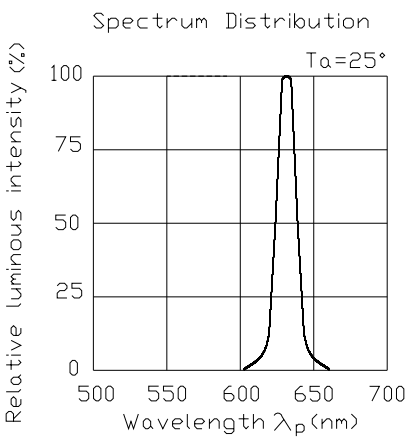
Absolute Maximum Ratings (Ta=25℃)

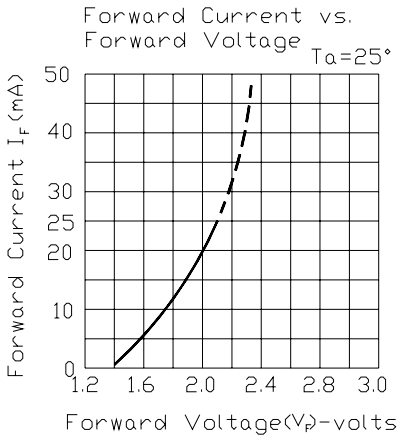
Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
Forward Current	I_F	25	mA
Operating Temperature	Topr	-40 ~ +85	℃
Storage Temperature	Tstg	-40 ~ +100	℃
Soldering Temperature	Tsol	260 for 5 Sec.	℃
Electrostatic Discharge	ESD	2000	V
Power Dissipation	Pd	60	mW
Peak Forward Current(Duty 1/10 @ 1KHz)	I_{FP}	60	mA

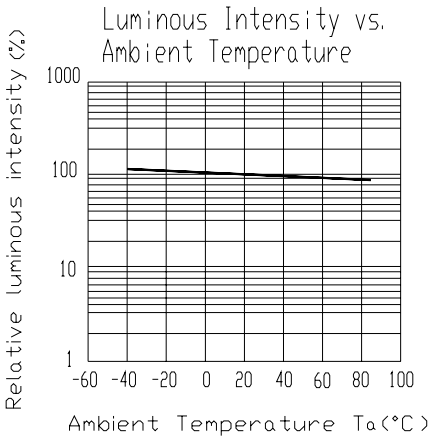
Electro-Optical Characteristics (Ta=25℃)

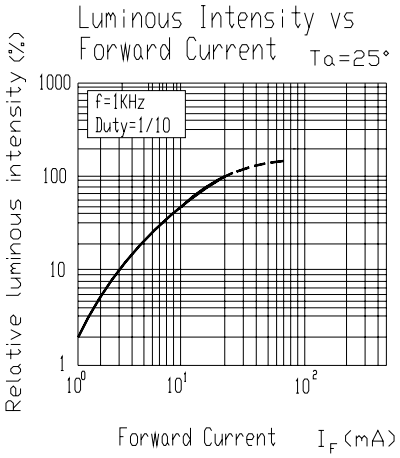
Parameter	Symbol	Chip Rank	MIN.	TYP.	MAX.	Unit	Condition
Luminous Intensity	I_V	A2	----	29	----	mcd	I_F=2mA
			198	482	----		I_F=20mA
		A3	----	36	----		I_F=2mA
			400	600	----		I_F=20mA
		A4	----	49	----		I_F=2mA
			550	820	----		I_F=20mA
		A5	----	61	----		I_F=2mA
			665	1020	----		I_F=20mA
		A6	----	74	----		I_F=2mA
			802	1232	----		I_F=20mA
Viewing Angle	2θ 1/2	----	----	25	----	deg	I_F=20mA
Peak Wavelength	λ p	----	----	632	----	nm	
Dominant Wavelength	λ d	----	----	624	----	nm	
Spectrum Radiation Bandwidth	$\triangle\lambda$	----	----	20	----	nm	
Forward Voltage	V_F	----	----	2.0	2.4	V	
Reverse Current	I_R	----	----	----	10	μA	V_R=5V

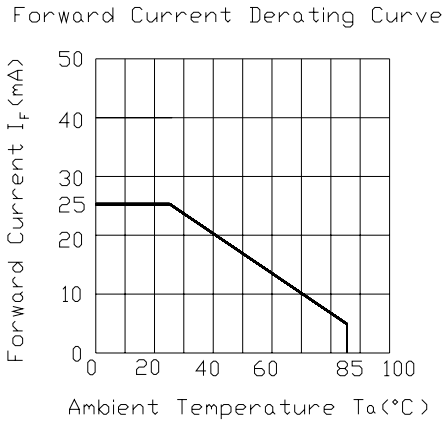
Typical Electro-Optical Characteristics Curves

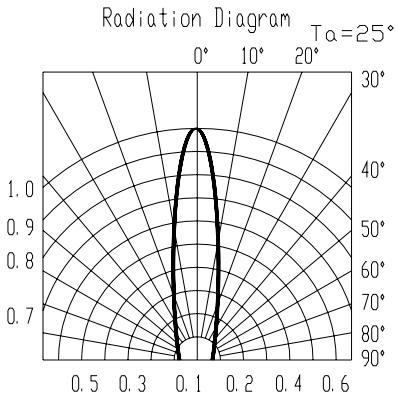












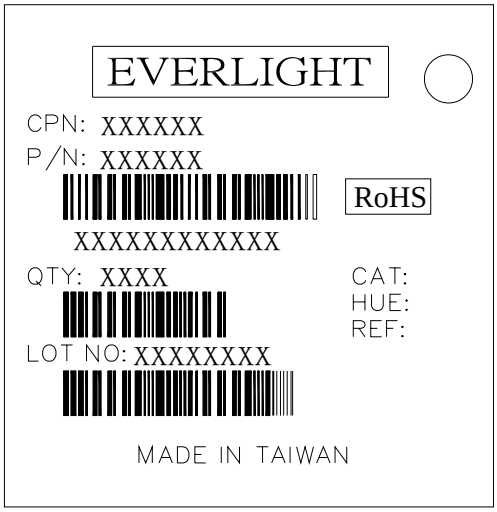
91-21SURC/S530-XX/XXX

Label explanation

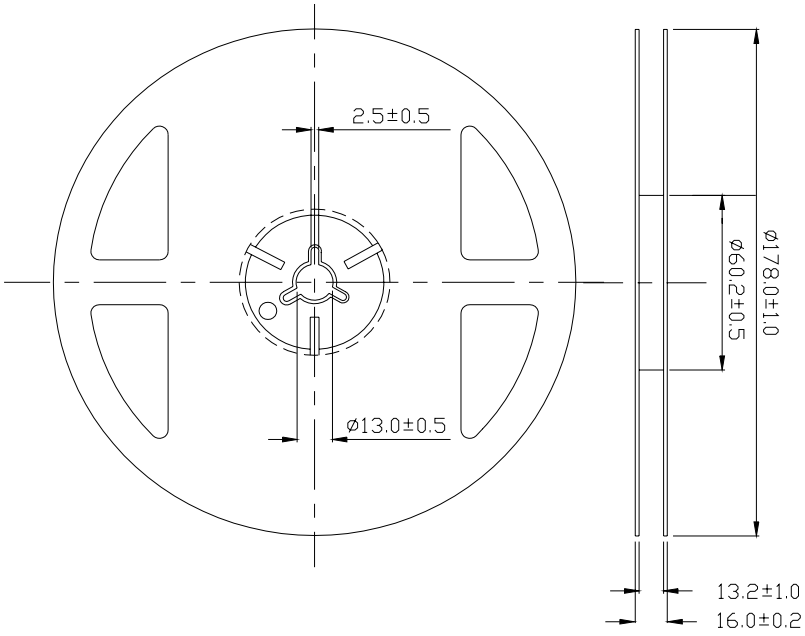
CAT: Luminous Intensity Rank

HUE: Dom. Wavelength Rank

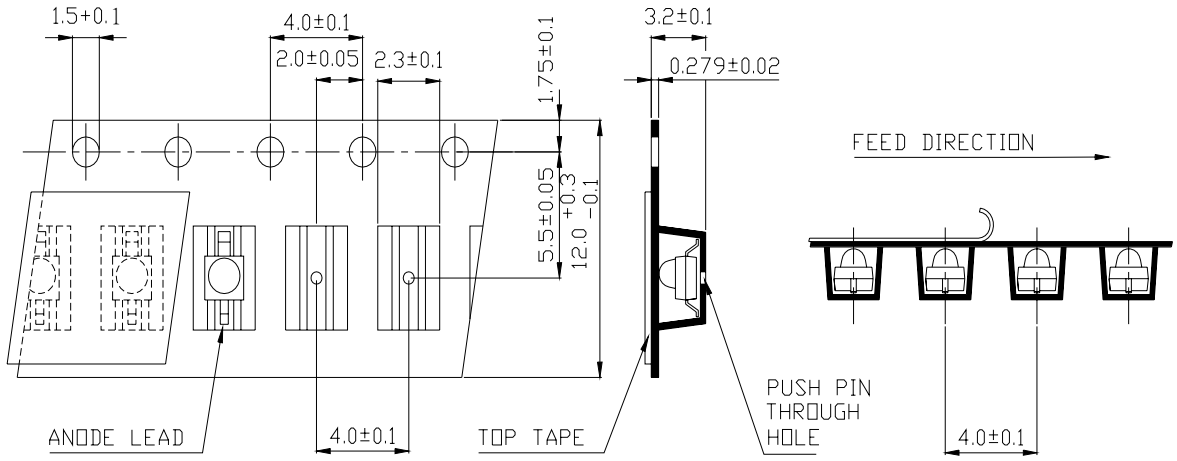
REF: Forward Voltage Rank



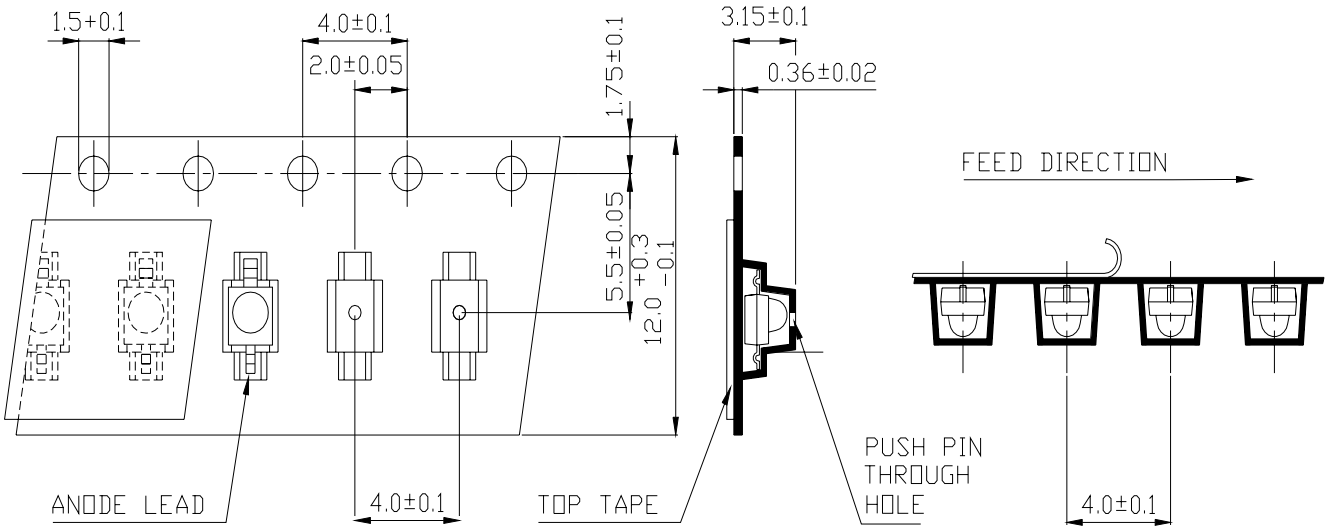
Reel & Carrier Tape Dimensions



Loaded quantity per reel 1000 PCS/reel

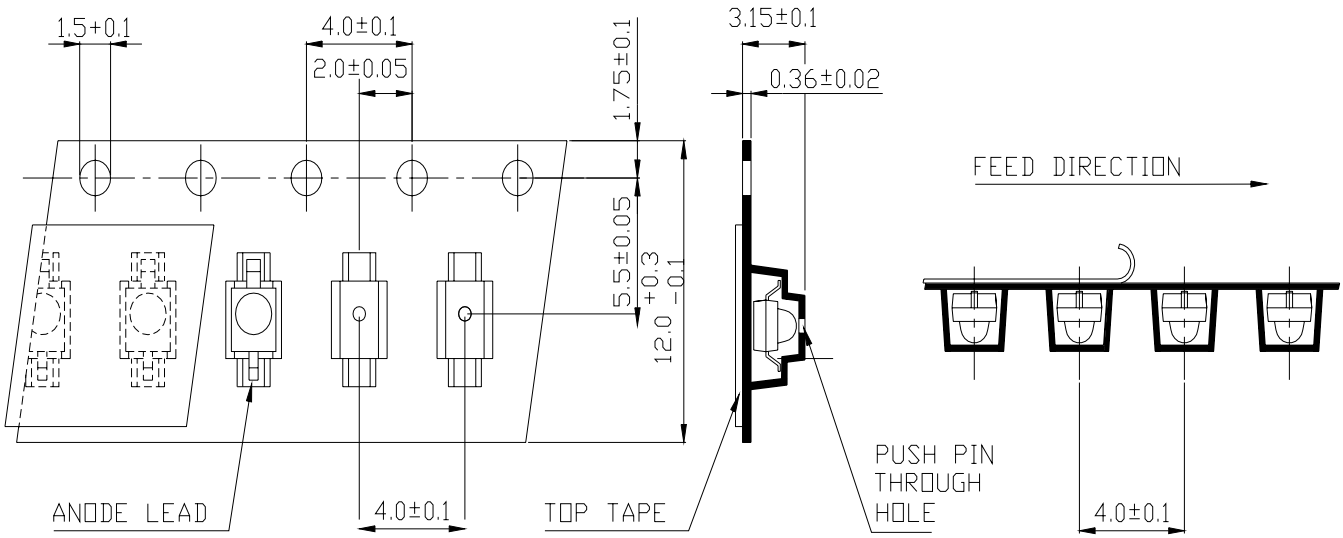


TR7



TR9

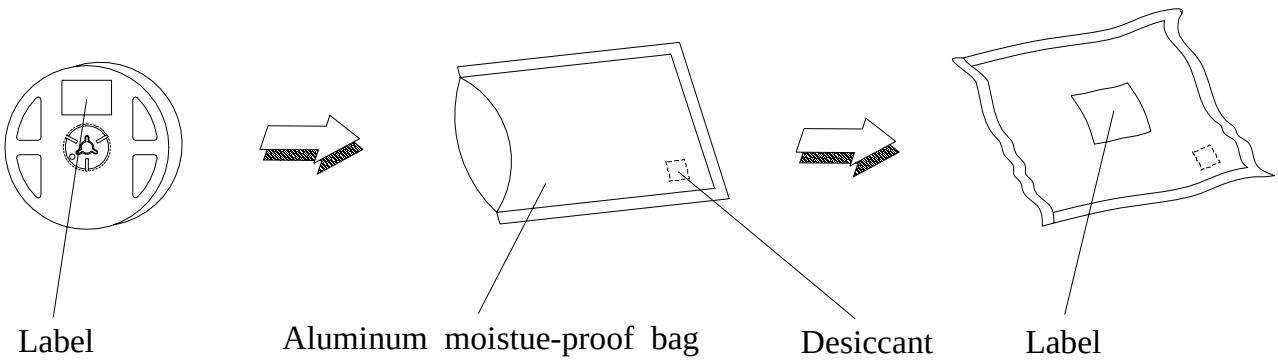
Loaded quantity per reel 1000 PCS/reel



TR10

Unit :mm

Moisture Resistant Packaging



Reliability Test Items And Conditions

The reliability of products shall be satisfied with items listed below.

Confidence level : 90 %

LTPD : 10 %

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260℃±5℃ Min. 5 sec.	6 Min.	22 Pcs.	0/1
2	Temperature Cycle	H : +100℃ 15 min. ∫ 5 min. L : -40℃ 15 min.	300 Cycles	22 Pcs.	0/1
3	Thermal Shock	H : +100℃ 5 min. ∫ 10 sec. L : -10℃ 5 min.	300 Cycles	22 Pcs.	0/1
4	High Temperature Storage	Temp. : 100℃	1000 Hrs.	22 Pcs.	0/1
5	Low Temperature Storage	Temp. : -40℃	1000 Hrs.	22 Pcs.	0/1
6	DC Operating Life	I_F = 20 mA	1000 Hrs.	22 Pcs.	0/1
7	High Temperature / High Humidity	85℃/ 85% RH	1000 Hrs.	22 Pcs.	0/1

Precautions For Use

1. Over-current-proof

   Customer must apply resistors for protection , otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

   2.1 Do not open moisture proof bag before the products are ready to use.

   2.2 Before opening the package, the LEDs should be kept at 30℃ or less and 90%RH or less.

   2.3 The LEDs should be used within a year.

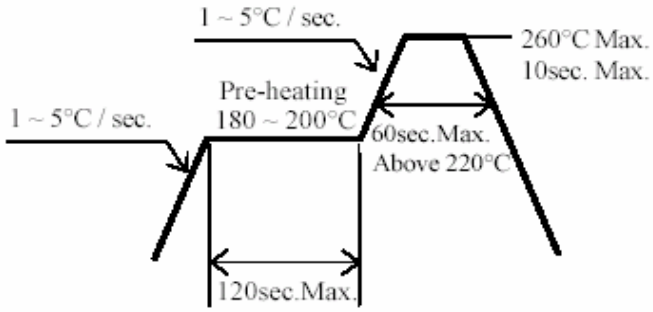
   2.4 After opening the package, the LEDs should be kept at 30℃ or less and 70%RH or less.

   2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

   2.6 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.
   Baking treatment : 60±5℃ for 24 hours.

3. Soldering Condition

3.1 Pb-free solder temperature profile



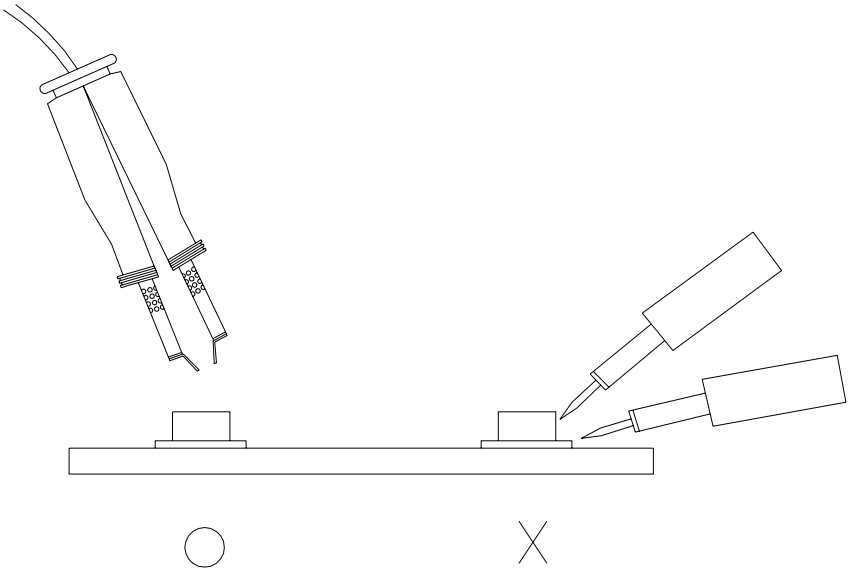
3.2 Reflow soldering should not be done more than two times.
3.3 When soldering, do not put stress on the LEDs during heating.
3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 280℃ for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5.Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



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