



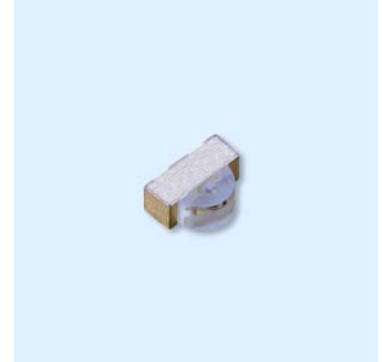
Technical Data Sheet

Chip LED with Right Angle Lens

12-21/Y2C-FR1S1L/2C

Features

- Package in 8mm tape on 7" diameter reel.
- Compatible with automatic placement equipment.
- Compatible with infrared and vapor phase reflow solder process.
- Mono-color type.
- Pb-free.
- The product itself will remain within RoHS compliant version.



Descriptions

- The 12-21 SMD taping is much smaller than lead frame type components, thus enable smaller board size, higher packing density, reduced storage space and finally smaller equipment to be obtained.
- Besides, lightweight makes them ideal for miniature applications etc.

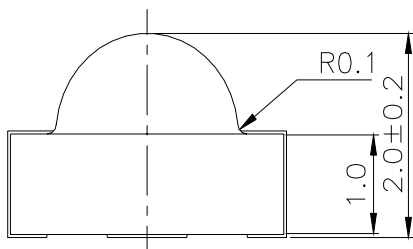
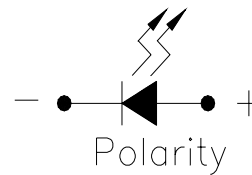
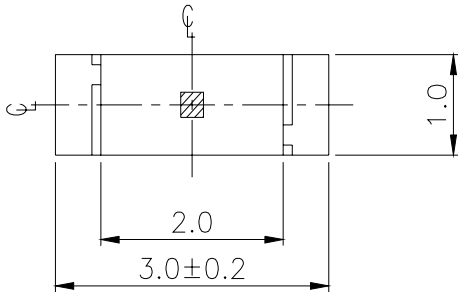
Applications

- Automotive: backlighting in dashboard and switch.
- Telecommunication: Indicator and backlighting in telephone and fax.
- Flat backlight for LCD, switch and symbol.
- General use.
- Indoor signboard use.

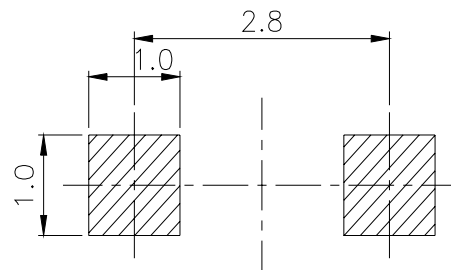
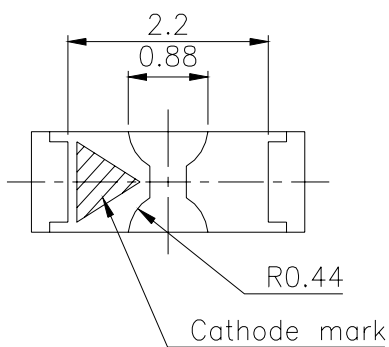
Device Selection Guide

Part No.	Chip		Lens Color
	Material	Emitted Color	
12-21/Y2C-FR1S1L/2C	AlGaInP	Brilliant Yellow	Water Clear

Package Outline Dimensions



For reflow soldering (propose)



Note: The tolerances unless mentioned is $\pm 0.1\text{mm}$, Unit = mm

12-21/Y2C-FR1S1L/2C
Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
Forward Current	I_F	50	mA
Operating Temperature	T_{opr}	-40 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +90	°C
Electrostatic Discharge	ESD	2000	V
Power Dissipation	P_d	120	mW
Peak Forward Current (Duty 1/10 @1KHz)	I_{FP}	100	mA
Soldering Temperature	T_{sol}	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I_V	112	-----	225	mcd	$I_F=20mA$
Peak Wavelength	λ_p	----	591	----	nm	
Dominant Wavelength	λ_d	586	-----	594	nm	
Spectrum Radiation Bandwidth	$\Delta \lambda$	----	15	----	nm	
Viewing Angle	$2\theta_{1/2}$	----	120	----	deg	
Forward Voltage	V_F	1.70	----	2.30	V	
Reverse Current	I_R	----	----	10	μA	$V_R=5V$

Notes:

- 1.Tolerance of Luminous Intensity $\pm 10\%$**
- 2.Tolerance of Dominant Wavelength $\pm 1nm$**
- 3.Tolerance of Forward Voltage $\pm 0.05V$**

12-21/Y2C-FR1S1L/2C
Bin Range Of Dom Wavelength

Group	Bin	Min	Max	Unit	Condition
F	DD1	586	588	nm	I _F =20mA
	DD2	588	590		
	DD3	590	592		
	DD4	592	594		

Bin Range Of Luminous Intensity

Bin	Min	Max	Unit	Condition
R1	112	140	mcd	I _F =20mA
R2	140	180		
S1	180	225		

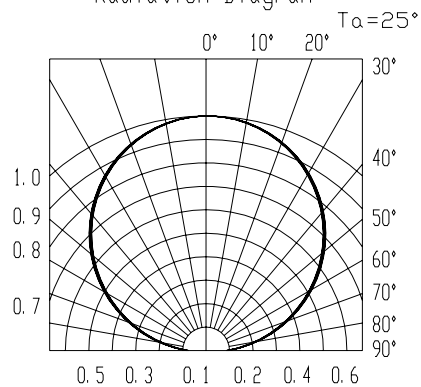
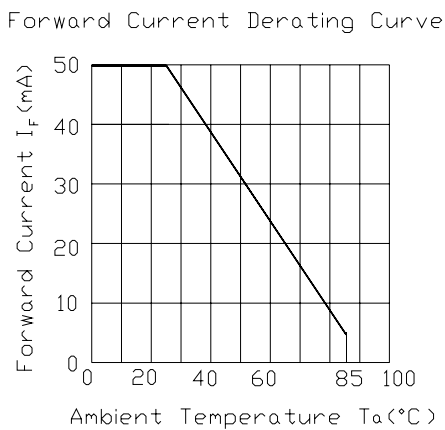
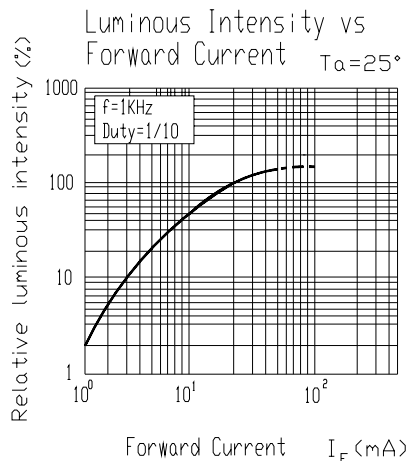
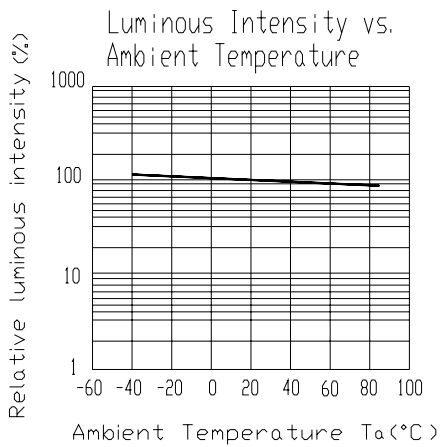
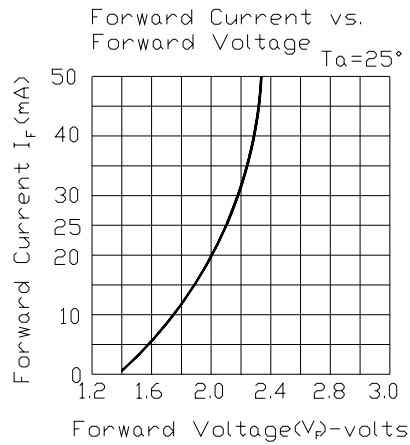
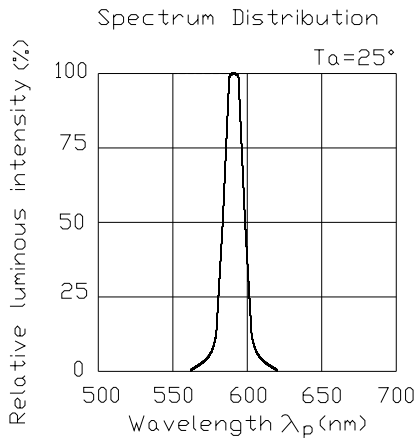
Bin Range Of Forward Voltage

Group	Bin	Min	Max	Unit	Condition
L	19	1.70	1.80	V	I _F =20mA
	20	1.80	1.90		
	21	1.90	2.00		
	22	2.00	2.10		
	23	2.10	2.20		
	24	2.20	2.30		

Notes:

- 1.Tolerance of Luminous Intensity $\pm 10\%$**
- 2.Tolerance of Dominant Wavelength $\pm 1\text{nm}$**
- 3.Tolerance of Forward Voltage $\pm 0.05\text{V}$**

Typical Electro-Optical Characteristics Curves



Label explanation

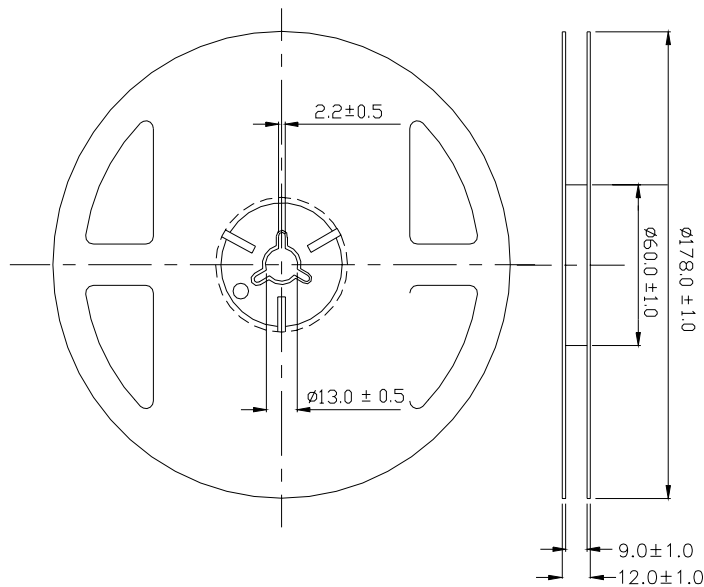
CAT: Luminous Intensity Rank

HUE: Dom. Wavelength Rank

REF: Forward Voltage Rank

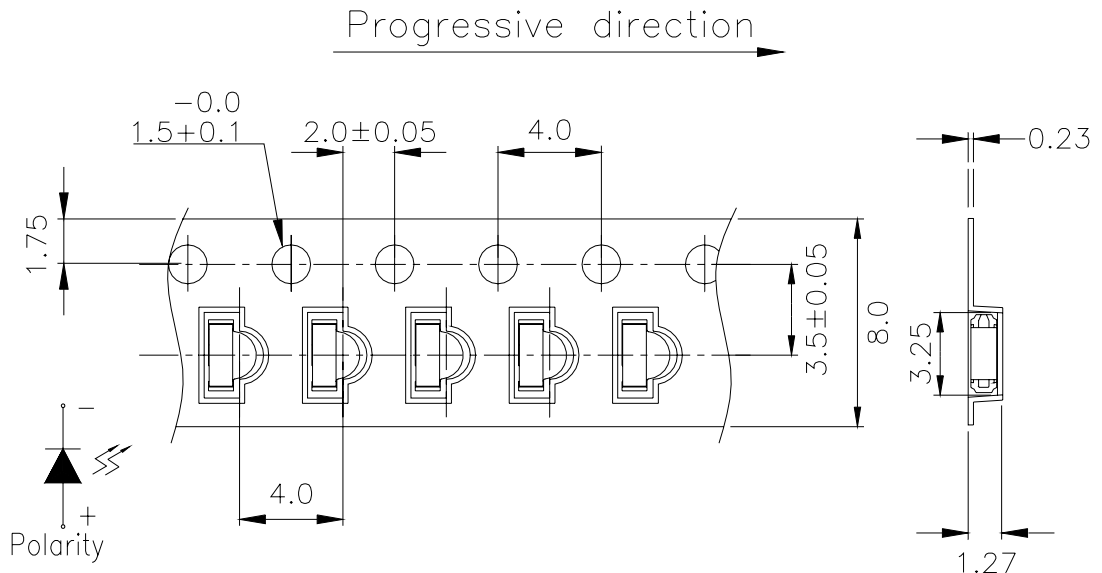


Reel Dimensions



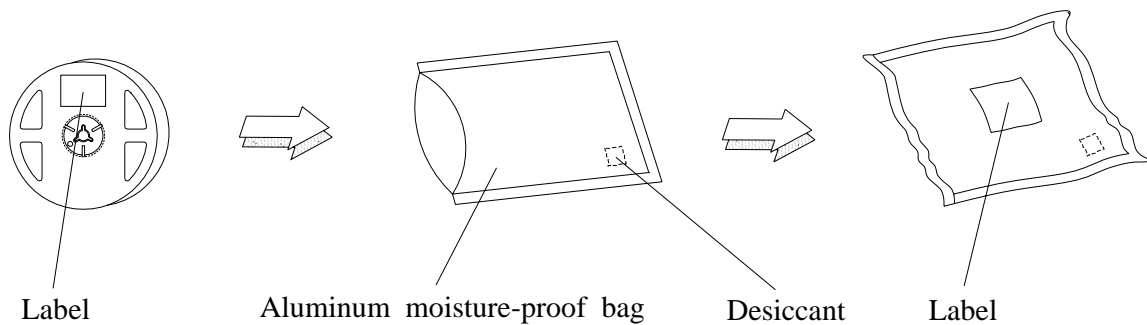
Note: The tolerances unless mentioned is $\pm 0.1\text{mm}$, Unit = mm

Carrier Tape Dimensions: Loaded quantity 2000 PCS per reel



Note: The tolerances unless mentioned is $\pm 0.1\text{mm}$,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°C ±5°C Min. 5sec.	6 Min.	22 PCS.	0/1
2	Temperature Cycle	H : +100°C 15min ∩ 5 min L : -40°C 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100°C 5min ∩ 10 sec L : -10°C 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100°C	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40°C	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°C / 85%RH	1000 Hrs.	22 PCS.	0/1

Precautions For Use

1. Over-current-proof

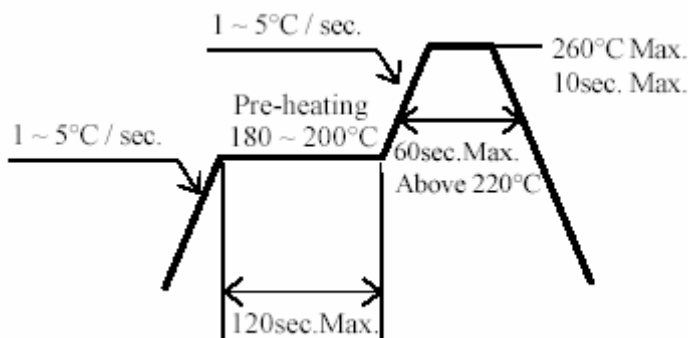
Customer must apply resistors for protection , otherwise slight voltage shift will cause big current change (Burn out will happen).

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°C 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°C 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°C for 24 hours.

3. Soldering Condition

3.1 Pb-free solder temperature profile



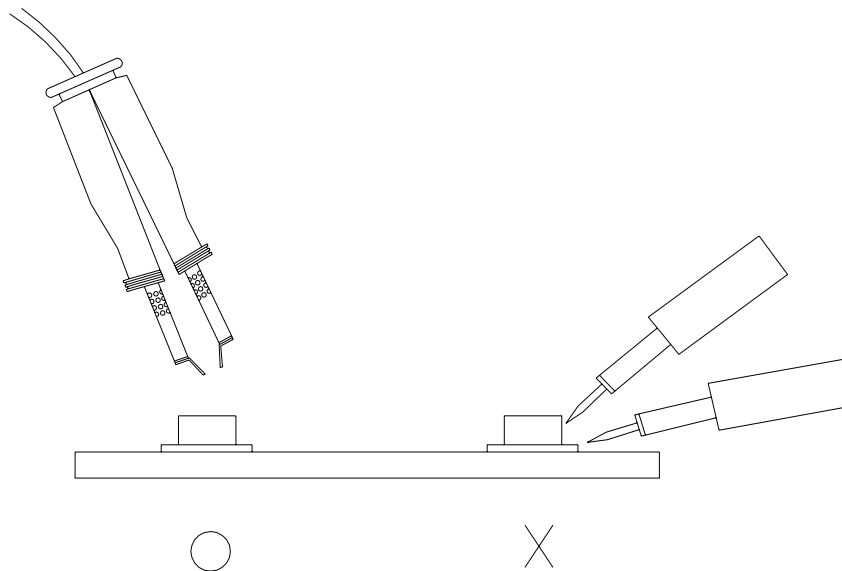
- 3.2 Reflow soldering should not be done more than two times.
- 3.3 When soldering, do not put stress on the LEDs during heating.
- 3.4 After soldering, do not warp the circuit board.

4.Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C 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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