

Technical Data Sheet

1.9mm Round Subminiature Lead LEDs

91-21SYGC/S530-XX/XXX

Features

- Package in 12mm tape on 7" diameter reels.
- Compatible with automatic placement equipment.
- EIA Std. package.
- Mono-color type.
- Pb-free
- The product itself will remain within RoHS compliant version.

Descriptions

- The 91-21 SMD taping is much smaller than leaded components.
 Thus enable smaller board size.
 Higher packing density. Reduced storage space and finally smaller equipment to be obtained.
- Besides, light weight makes them ideal for miniature applications.
- Furthermore by automation assembly machines the accuracy is anticipated.

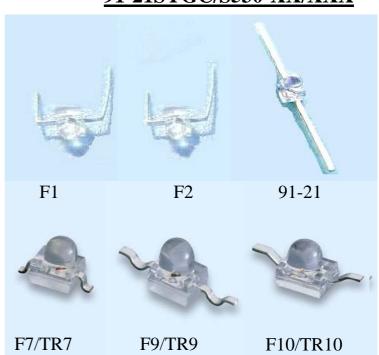
Applications

- Small indicator for indoor applications.
- Flat backlight for LCD, switches and symbols.
- Indicator and backlight in office equipment.
- Indicator and backlight for battery driven equipment.
- Indicator and backlight for audio and video equipment.
- Automotive : backlighting in dashboards and switches.
- Telecommunication: indicator and backlighting in telephone and fax.

Device Selection Guide

Chip		T. a. Cala	
Material Emitted Color		Lens Color	
AlGaInP	Brilliant Yellow Green	Water Clear	

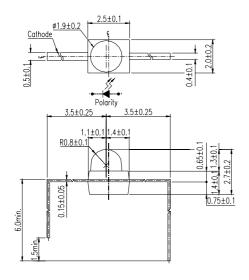
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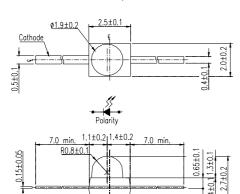


91-21SYGC/S530-XX/XXX

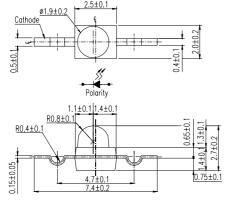
Package Outline Dimensions



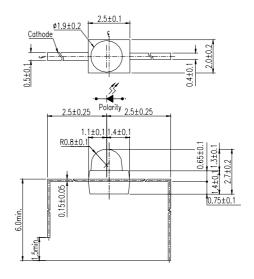




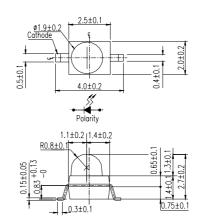
91-21



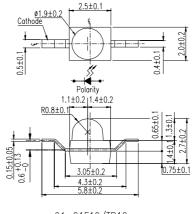
91-21F9/TR9



91-21/F2



91-21F7/TR7



91-21F10/TR10

Rev. 2.1

Page: 2 of 10

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91-21SYGC/S530-XX/XXX

Absolute Maximum Ratings (Ta=25°C)

		i	
Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
Forward Current	${ m I}_{ m F}$	25	mA
Operating Temperature	Topr	-40 ~ +85	$^{\circ}\! \mathbb{C}$
Storage Temperature	Tstg	-40 ~ +100	$^{\circ}\!\mathbb{C}$
Soldering Temperature	Tsol	260 for 5 Sec.	\mathbb{Q}
Electrostatic Discharge	ESD	2000	V
Power Dissipation	Pd	60	mW
Peak Forward Current(Duty 1/10 @ 1KHz)	Ifp	60	mA

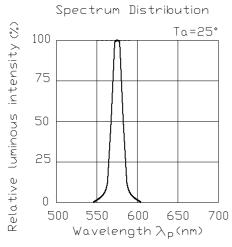
Electro-Optical Characteristics (Ta=25°C)

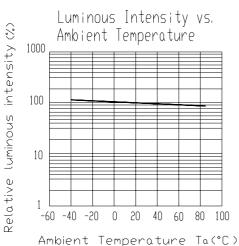
Parameter	Symbol	Chip Rank	MIN.	TYP.	MAX.	Unit	Condition
Luminous Intensity	Iv	E2		20		mcd	I _F =2mA
			264	330			I _F =20mA
		E3		28			I _F =2mA
			396	462			I _F =20mA
		E4		36			I _F =2mA
			528	594			I _F =20mA
Viewing Angle	2 \theta 1/2			25		deg	
Peak Wavelength	λр			575		nm	
Dominant Wavelength	λd			573		nm	I _F =20mA
Spectrum Radiation Bandwidth	Δλ			20		nm	
Forward Voltage	V_{F}			2.0	2.4	V	
Reverse Current	Ir				10	μ A	V _R =5V

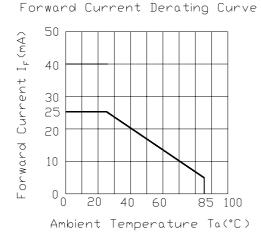
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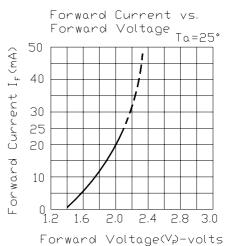
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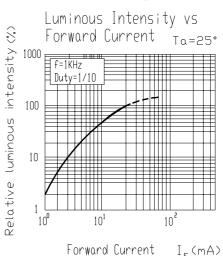
Typical Electro-Optical Characteristics Curves

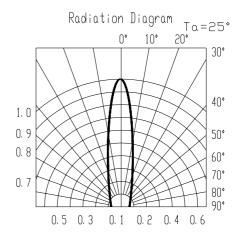












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91-21SYGC/S530-XX/XXX

Label explanation

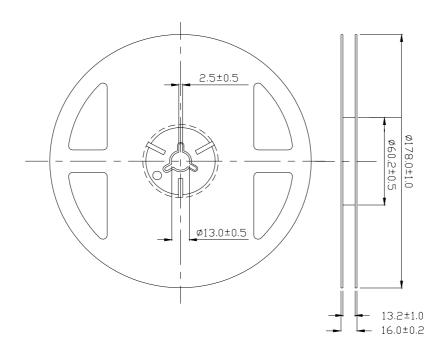
CAT: Luminous Intensity Rank

HUE: Dom. Wavelength Rank

REF: Forward Voltage Rank



Reel & Carrier Tape Dimensions



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Device No.: DLE-912-305

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Prepared date: 07-29-2005

Rev. 2.1

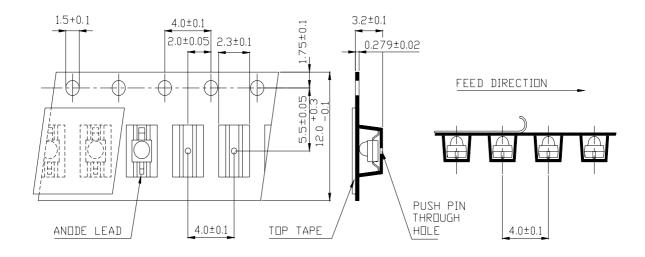
Page: 5 of 10

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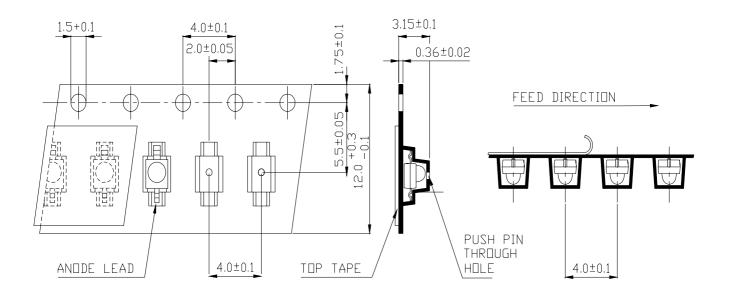


91-21SYGC/S530-XX/XXX

Loaded quantity per reel 1000 PCS/reel



TR7



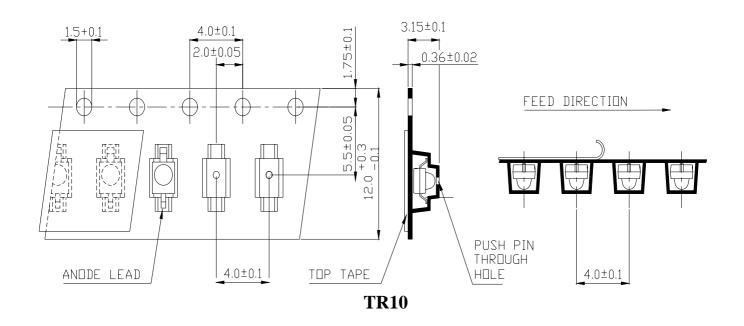
TR9

Everlight Electronics Co., Ltd. http://www.everlight.com Rev. 2.1 Page: 6 of 10 **Device No.: DLE-912-305** Prepared date: 07-29-2005 Prepared by: Forrest Chen



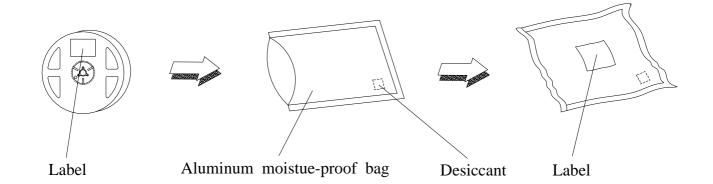
91-21SYGC/S530-XX/XXX

Loaded quantity per reel 1000 PCS/reel



Unit:mm

Moisture Resistant Packaging



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Page: 7 of 10

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91-21SYGC/S530-XX/XXX

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. 5 sec.	6 Min.	22 Pcs.	0/1
2	Temperature Cycle	H:+100°C 15 min. ∫ 5 min. L:-40°C 15 min.	300 Cycles	22 Pcs.	0/1
3	Thermal Shock	$H: +100^{\circ}\mathbb{C}$ 5 min. $\int 10 \text{ sec.}$ $L: -10^{\circ}\mathbb{C}$ 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	$I_F = 20 \text{ mA}$	1000 Hrs.	22 Pcs.	0/1
7	High Temperature / High Humidity	85°C / 85%RH	1000 Hrs.	22 Pcs.	0/1

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91-21SYGC/S530-XX/XXX

Precautions For Use

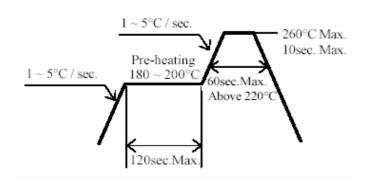
1. Over-current-proof

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 : $60\pm5^{\circ}$ 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 280°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.

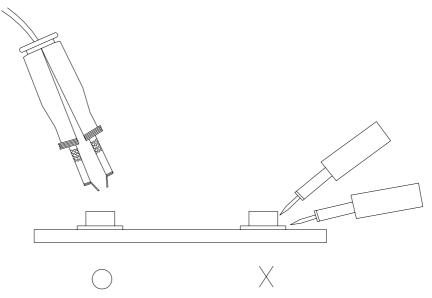
Everlight Electronics Co., Ltd. http://www.everlight.com Rev. 2.1 Page: 9 of 10 **Device No.: DLE-912-305** Prepared date: 07-29-2005 Prepared by: Forrest Chen



91-21SYGC/S530-XX/XXX

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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