

Technical Data Sheet

1.8mm Round Subminiature Infrared LED

SIR42-21C/TR8

Features

- Small double-end package
- High reliability
- Low forward voltage
- Good spectral matching to Si photodetector



Descriptions

SIR42-21C/TR8 is an infrared emitting diode in miniature SMD package which is molded in a water clear plastic with spherical top view lens. The device is spectrally matched with silicon photodiode and phototransistor.

Applications

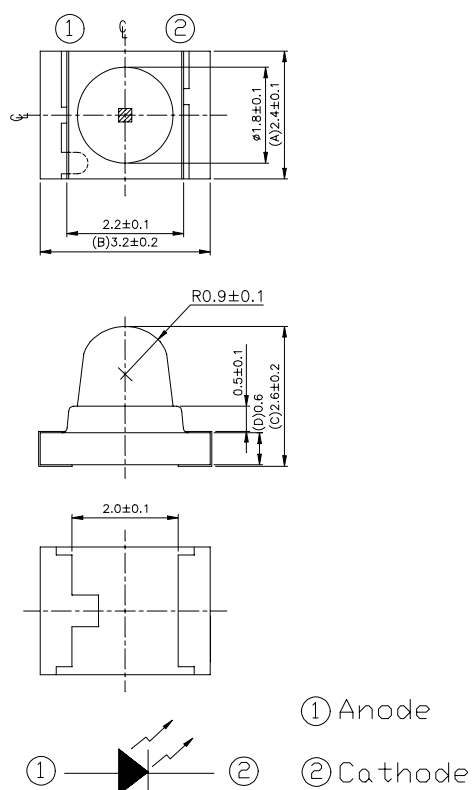
- PCB mounted infrared sensor
- Infrared emitting for miniature light barrier
- Floppy disk drive
- Optoelectronic switch
- Smoke detector

Device Selection Guide

LED Part No.	Chip	Lens Color
	Material	
SIR	GaAlAs	Water Clear

Device No:DTS-042-001

Package Dimensions



Notes: 1.All dimensions are in millimeters
2.Tolerances unless dimensions $\pm 0.1\text{mm}$

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Units
Continuous Forward Current	I_F	65	mA
Peak Forward Current	I_{FP}	1.0	A
Reverse Voltage	V_R	5	V
Operating Temperature	T_{opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +85	°C
Soldering Temperature	T_{sol}	260	°C
Power Dissipation at(or below) 25°C Free Air Temperature	P_d	130	mW

Notes: *1: I_{FP} Conditions--Pulse Width $\leq 100 \mu\text{s}$ and Duty $\leq 1\%$.

*2:Soldering time ≤ 5 seconds.

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Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
Radiant Intensity	Ee	I _F =20mA	1.5	4.0	--	mW/sr
		I _F =100mA Pulse Width ≤ 100 μs ,Duty ≤ 1%.	--	15	--	
Peak Wavelength	λ _p	I _F =20mA	--	875	--	nm
Spectral Bandwidth	Δ λ	I _F =20mA	--	80	--	nm
Forward Voltage	V _F	I _F =20mA	--	1.3	1.6	V
		I _F =100mA Pulse Width ≤ 100 μs ,Duty ≤ 1%.	--	1.4	1.8	
Reverse Current	I _R	V _R =5V	--	--	10	μ A
View Angle	2 θ 1/2	I _F =20mA	--	25	--	deg

Typical Electro-Optical Characteristics Curves

Fig.1 Forward Current vs. Ambient Temperature

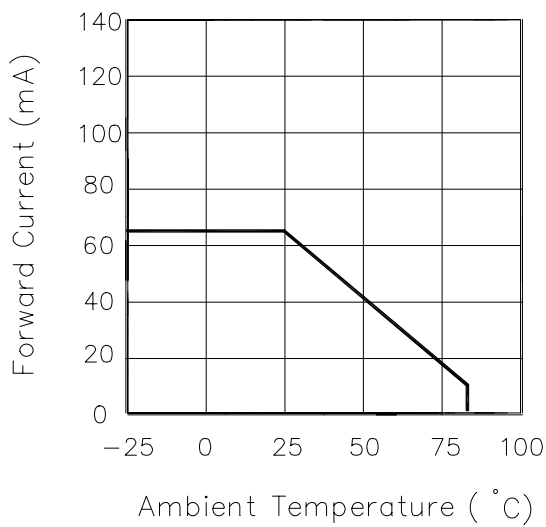


Fig.2 Spectral Distribution

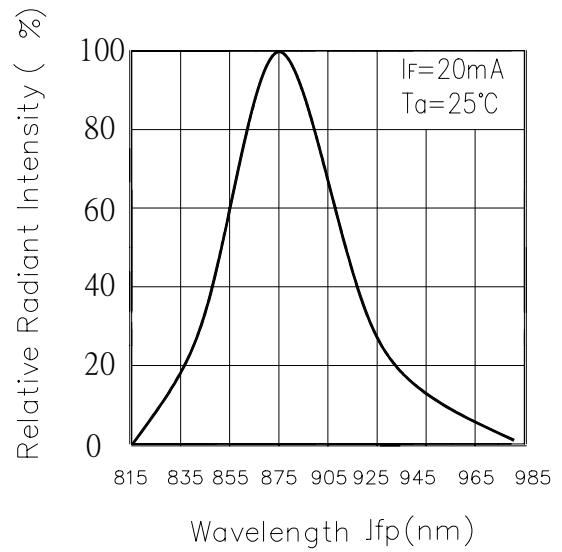


Fig.3 Peak Emission Wavelength λ_p vs. Ambient Temperature

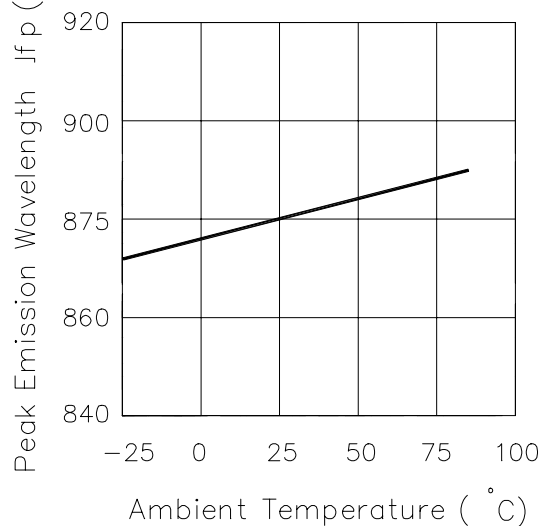
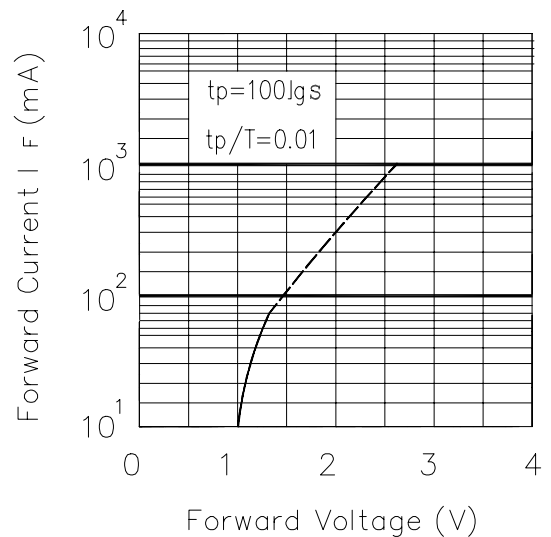


Fig.4 Forward Current vs. Forward Voltage



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Typical Electro-Optical Characteristics Curves

Fig.5 Relative Intensity vs. Forward Current

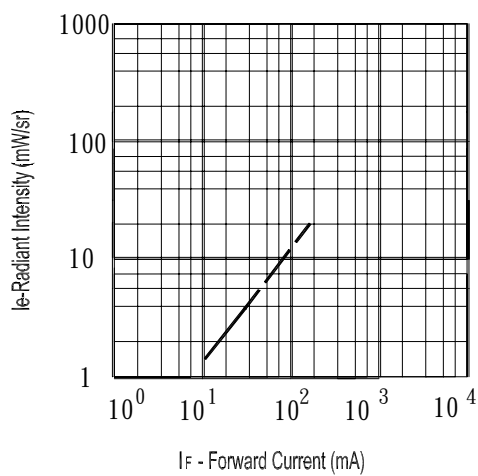


Fig.6 Relative Radiant Intensity vs. Angular Displacement

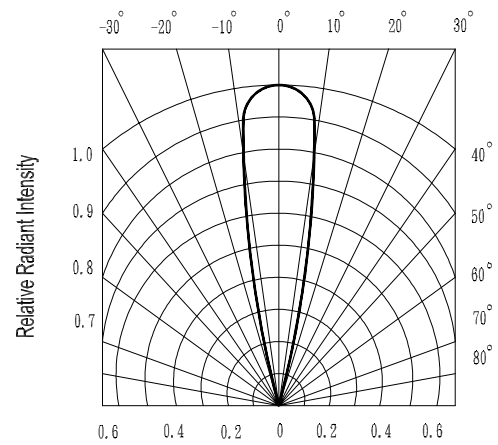


Fig.7 Relative Intensity vs. Ambient Temperature ($^\circ$ C)

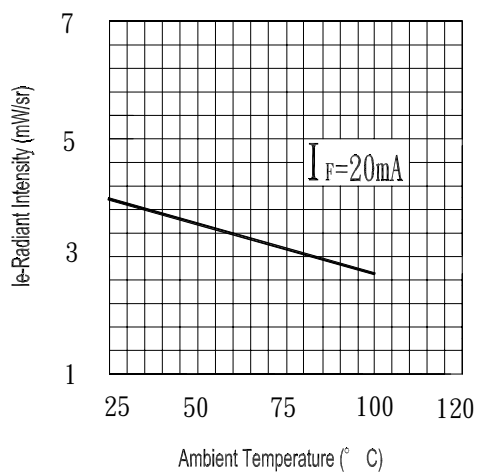
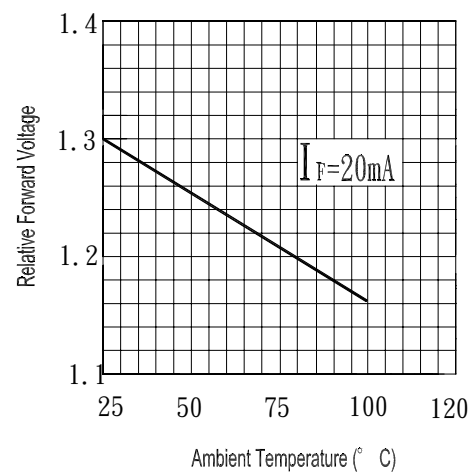
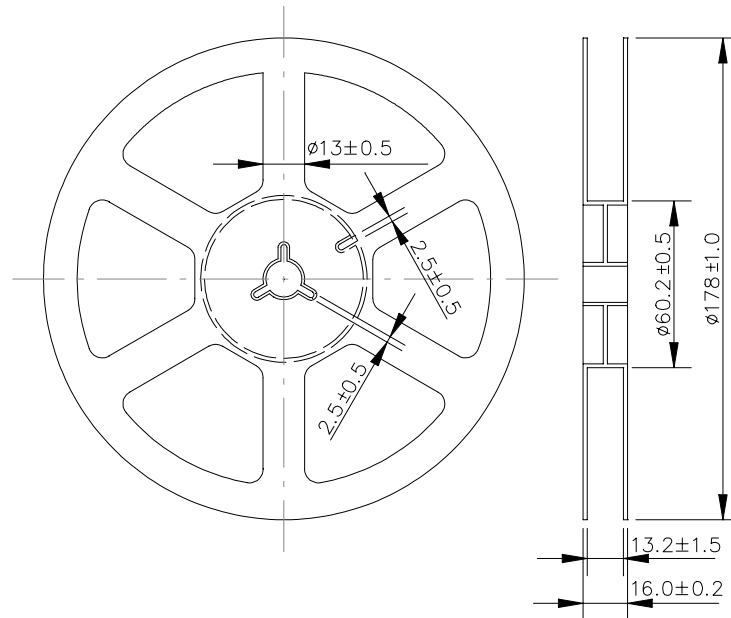


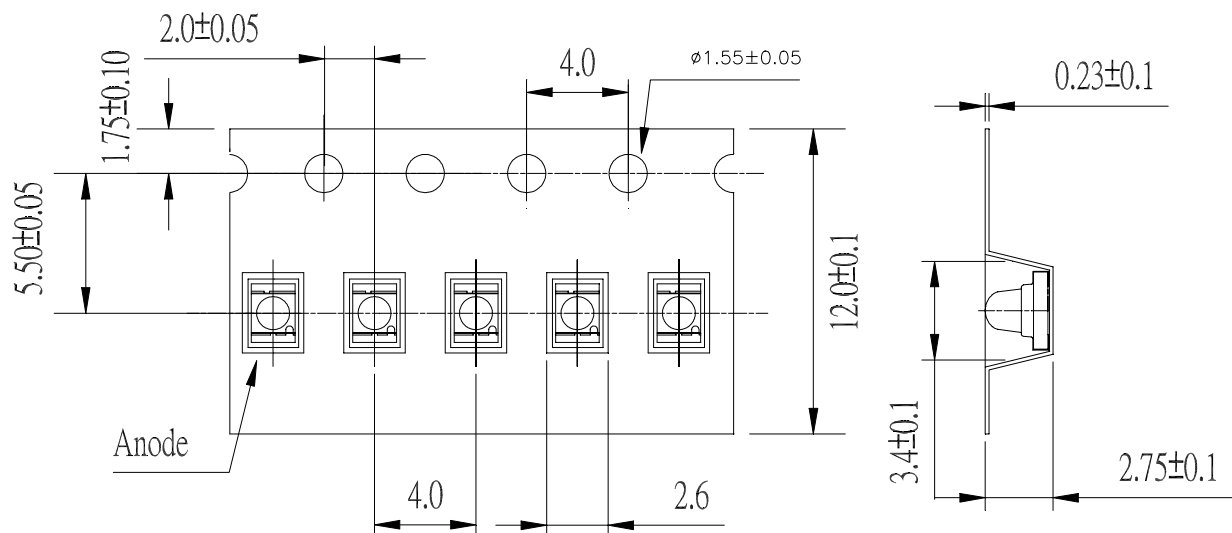
Fig.8 Forward Current vs. Ambient Temperature ($^\circ$ C)



Package Dimensions



Loaded Quantity Per Reel 1000PCS/Reel



TOLERANCES UNLESS DIMENSION±0.1

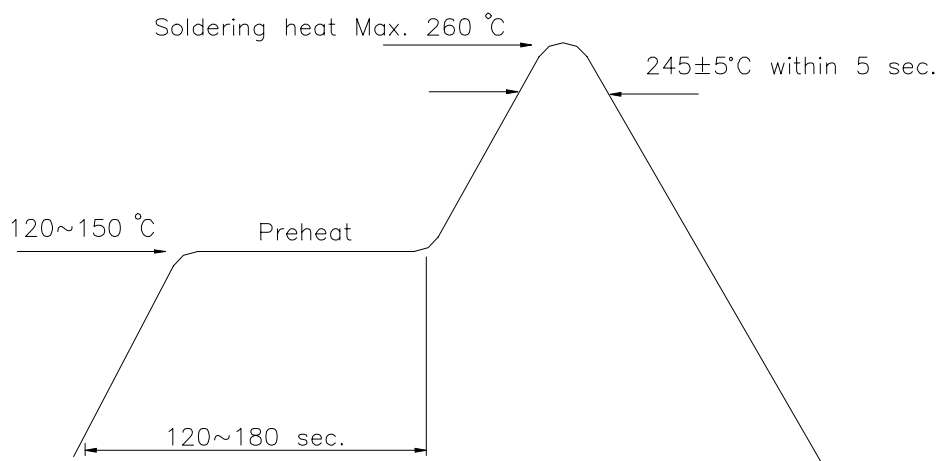
ANGLE±0.5

Unit : mm

Device No:DTS-042-001

Soldering heat reliability(DIP)

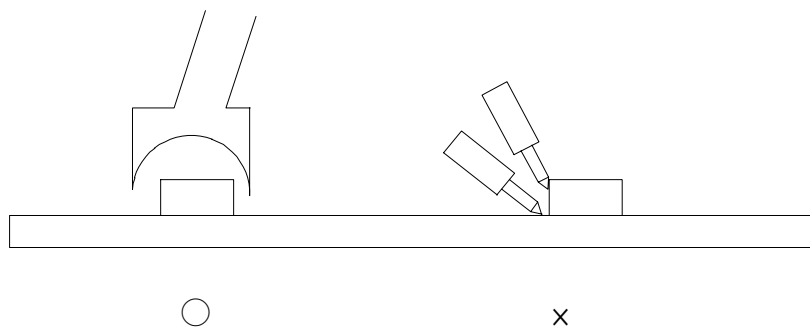
Please refer to the following figure

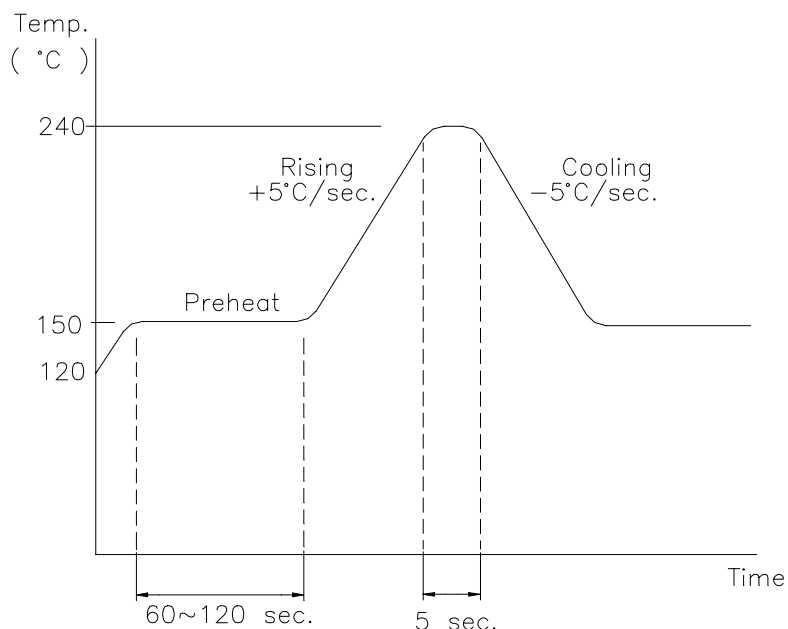

Soldering Iron

Basic spec is ≤ 5 sec when 260°C. If temperature is higher, time should be shorter (+10°C \rightarrow -1sec). Power dissipation of Iron should be smaller than 15W, and temperature should be controllable. Surface temperature of the device should be under 230°C.

Rework

- 1.Customer must finish rework within 5 sec under 260°C.
- 2.The head of iron can not touch copper foil.
- 3.Twin-head type is preferred.



Reflow Temp./Time**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 The operation of temperature and R.H are : 5°C~35°C , R.H.60%.

2.2 Once the package is opened, the products should be used within a week.

Otherwise, they should be kept in a damp proof box with desiccating agent.

Considering the tape life, we suggest our customers to use our products within a year (from production date).

2.3 If opened more than one week in an atmosphere 5°C~35°C , R.H.60%, they should be treated at 60°C ± 5°C for 15hrs.

2.4 When you discover that the desiccant in the package has a pink color (normal=blue), you should treat them in the same conditions as 2.3

Reliability Test Item And Condition

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

Confidence level : 90%

LTPD : 10%

NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgement Criteria	Ac/Re
1	REFLOW	TEMP. : $240^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 5secs	6mins	22pcs	More than 90% of lead to be covered by soldering	0/1
2	Temperature Cycle	H : $+85^{\circ}\text{C}$ 30mins ↕ 5mins L : -55°C 30mins	50Cycles	22pcs	$I_R \geq U \times 2$ $E_e \leq L \times 0.8$	0/1
3	Thermal Shock	H : $+100^{\circ}\text{C}$ 5mins ↕ 10secs L : -10°C 5mins	50Cycles	22pcs	$V_F \geq U \times 1.2$ U : Upper	0/1
4	High Temperature Storage	TEMP. : $+100^{\circ}\text{C}$	1000hrs	22pcs	Specification Limit	0/1
5	Low Temperature Storage	TEMP. : -55°C	1000hrs	22pcs	L : Lower Specification	0/1
6	DC Operating Life	$I_F = 20\text{mA}$	1000hrs	22pcs	Limit	0/1
7	High Temperature/ High Humidity	85°C / 85% R.H	1000hrs	22pcs		0/1

EVERLIGHT ELECTRONICS CO., LTD.

Office: No 25, Lane 76, Sec 3, Chung Yang Rd,
Tucheng, Taipei 236, Taiwan, R.O.C

Tel: 886-2-2267-2000, 2267-9936

Fax: 886-2267-6244, 2267-6189, 2267-6306

<http://www.everlight.com>

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