

TOPS-050TB2

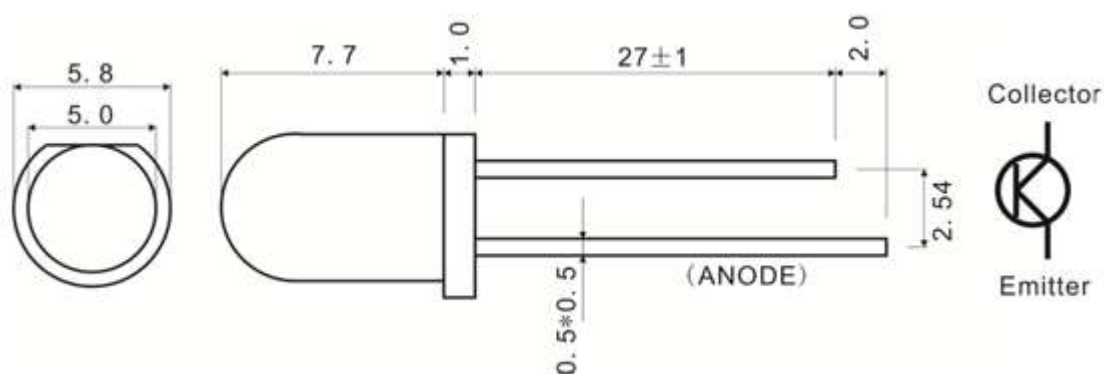
Photo Diode LED

Part Number	Chip		Lens Color
	Material	Source Color	
TOPS-050TB2	AlGaAs	Silicon Phototransistor	Black

Features

- I.C. compatible.
- Low power consumption.
- Compatible with wave soldering process.
- 5mm diameter package.
- Long life, stable and reliable.
- RoHS compliant.

Dimensions



Notes:

1. All dimensions are in millimeter.
2. Tolerance is $\pm 0.25\text{mm}$ unless otherwise noted.

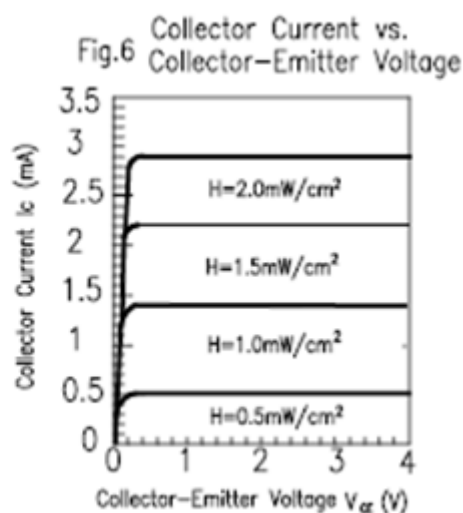
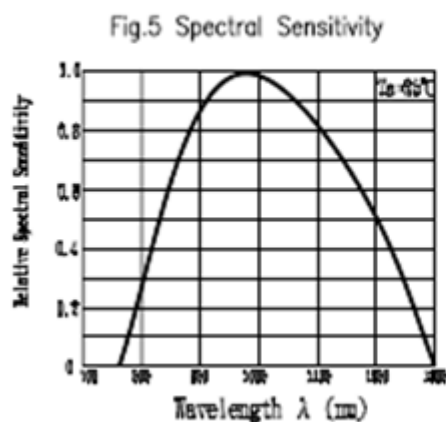
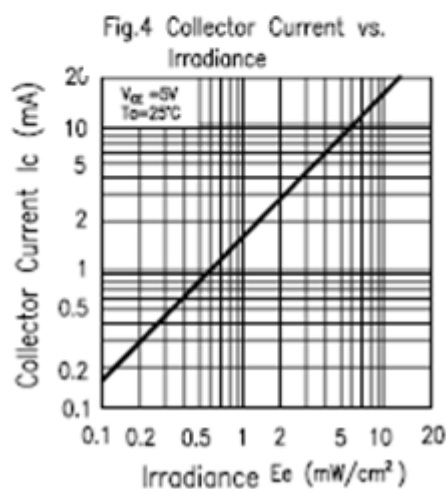
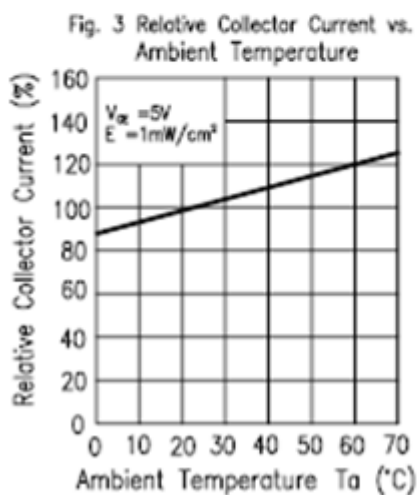
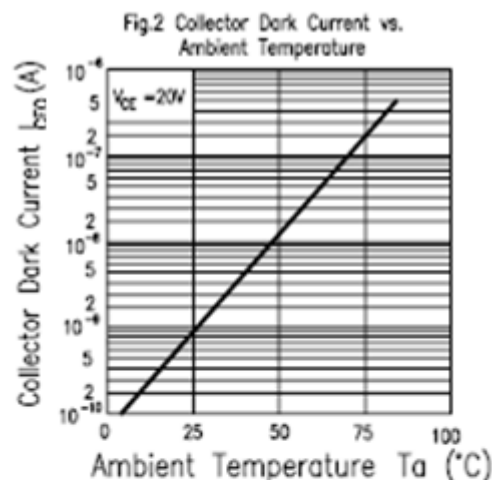
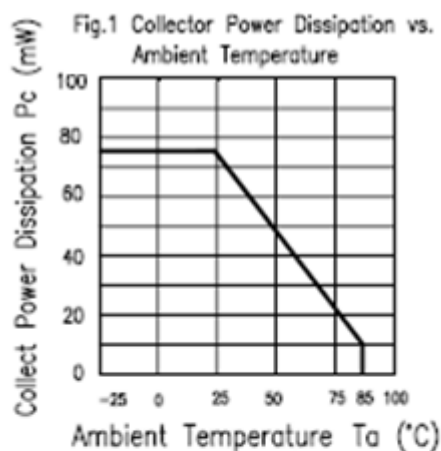
Absolute Maximum Rating @ Ta=25°C

Parameter	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector Voltage	V_{ECO}	5	V
Collector Current	I_C	20	mA
Operating Temperature Range	T_{opr}	-40 to +85	°C
Storage Temperature Range	T_{stg}	-40 to +100	°C
Lead Soldering Temperature (1/16 inch from body for 5 sec.)	T_{sol}	260 for 5 Sec	°C
Power Dissipation at (or below) 25°C Free Air Temperature	P_D	100	mW

Electrical / Optical Characteristic @ Ta=25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Collector-Emitter Breakdown Voltage	BV_{CEO}	30	-	110	V	$I_C=100\mu A$ $I_B=0$
Emitter - Collector Breakdown Voltage	BV_{ECO}	5	-	-	V	$I_E=100\mu A$ $I_B=0$
Rang of Spectral Wavelength	λ	750	-	1050	nm	-
Peak of collection Wavelength	λ_P	-	940	-	nm	-
Rise Time	t_R	-	20	-	μS	$V_{CE}=5V$ $I_C=1mA$ $R_L=1000\Omega$
Fall Time	t_F	-	20	-		
Collector Dark Current	I_{CEO}	-	-	100	nA	$V_{CE}=10V$ $H=0mW/cm^2$
Collector-emitter Saturation Voltage	$V_{CE(S)}$	-	-	0.2	V	$I_C=20mA$ $I_B=100\mu A$

Typical Electro-Optical Characteristics Curve



Reliability Test Project

Test Items	Test Conditions	Failure Judgement Criteria	Samples(n)
			Defective(c)
Operation life	VCE=5V , Ta : 25°C 1000Hrs	$I_c(on) \leq L \times 0.8$ L : Lowe specification limit	n=22 , c=0
Temperature cycle	1 cycle-55°C to +25°C to +85°C (30min) (5min) (30min) 50 cycle test		n=22 , c=0
Thermal shock	-10°C to +100°C (5min)(5sec)(5min) 50 cycle test		n=22 , c=0
High temperature storage	Temp : +100°C 1000Hrs		n=22 , c=0
Low temperature storage	Temp : -40°C 1000Hrs		n=22 , c=0
High temperature storage High humidity	Ta : 85°C RH : 85% 1000Hrs		n=22 , c=0
Solder heat	Temp : 260±5°C 5sec 4mm From the bottom of the package.	More than 90% of Lead to be covered by soldering	n=22 , c=0
Solderability	Temp : 230°C±5°C 5sec 4mm From the bottom of the package.		n=22 , c=0

Judging criterion

Item	Symbol	Experiment condition	Criteria	
			Min.	Max.
Forward Voltage	VF	IF=20mA	-	Initial Datex1.1
Reverse Current	IR	VR=5V	-	30μA
Luminous Intensity	IV	IF=20mA	Initial Datex0.7	-

Package Description



FIG.1

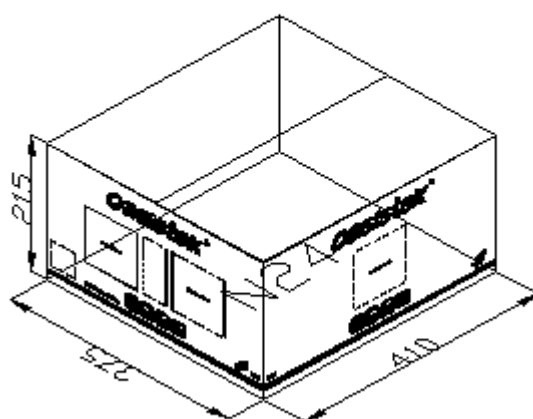
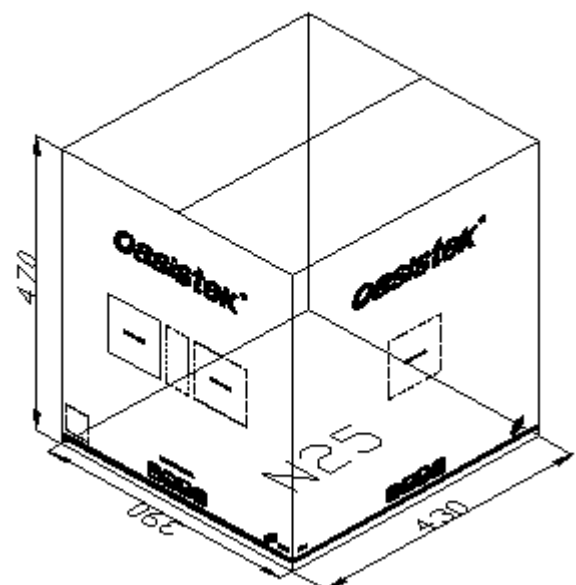


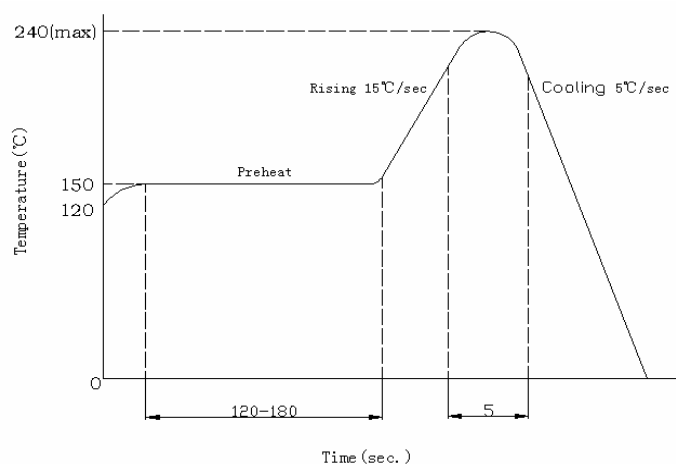
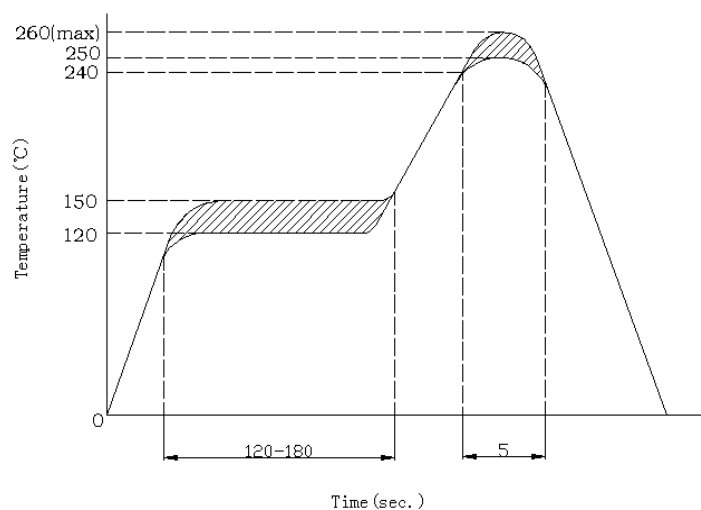
FIG.2



Cautions

- LED bracket forming method :
 1. The pin of led can be bent where is at least 3mm out of led colloid.
 2. Must use fixture to deform the led bracket.
 3. Finishing the forming of led bracket must be before soldering.
 4. Guarantee the gap between two pin of led tallys with LED pads in PCB when forming.
- Manual soldering :

The tip temperature of soldering iron don't exceed 260°C ; soldering time don't exceed 3s and soldering position must be 3mm out of led colloid.
- Soldering temperature curve chart (figure A、figure B) :



- ESD countermeasure

Static electricity and high volt can damage led. The production whose Die material is InGaN must strictly required to prevent ESD, must put on static glove and static fillet. Soldering tool and the cover of device must connect the ground, soldering condition follows the related stating of production specification manual.

- Protecting countermeasure when over current

Need add the protecting resistor in circuit in order to avoid damaging led due to big current and voltage fluctuation.

- LED installation method

1. Pay attention to the led polarity and avoid installation wrong. LED can't be close to eutermic component, work condition should tally with it's specification.
2. Don't install the LED under the condition of the led pin deformation.
3. The led bracket don't load any pressure when installing the led into PCB or fitting hole.
4. Must avoid any strike and force on led before the soldering temperature return to room temperature.

- Storage time

1. LED can be stored for a year under the condition:

the temperature of $5^{\circ}\text{C} \sim 35^{\circ}\text{C}$ and humidity of RH60%, These production must be re-inspected and tested before use if their storage time exceed a year.

2. If LED is exposed in air for a week under the condition:

the temperature of $5^{\circ}\text{C} \sim 35^{\circ}\text{C}$, humidity of RH60%, must place the led in the ambience of $65^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 24 hours and use it in 15 days for best.

- Cleaning

Be careful of some chemical results in the led colloid fades and damage when using chemical clean the LED such as chloroethylene, acetone etc. can use ethanol to wash or soak LED but the time don't exceed 3 minutes.

- Kinked

The kinked tooling scrape easily the pin of LED, where the led bracket is rusting easily, especial expose it in moist air. To decrease the led bracket rust, suggest using plated tin led bracket.