OPTO INTERRUPTER

# LA317

## Features

Fast response time

High sensitivity

Cut-Off visible wavelength

Thin

Compact

Detection Distance Optimum 3-12mm

This product itself will remain within RoHS compliant version.

Compliance with EU REACH

Compliance Halogen Free(Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)

## Application

Camera

VCR

Floppy disk driver

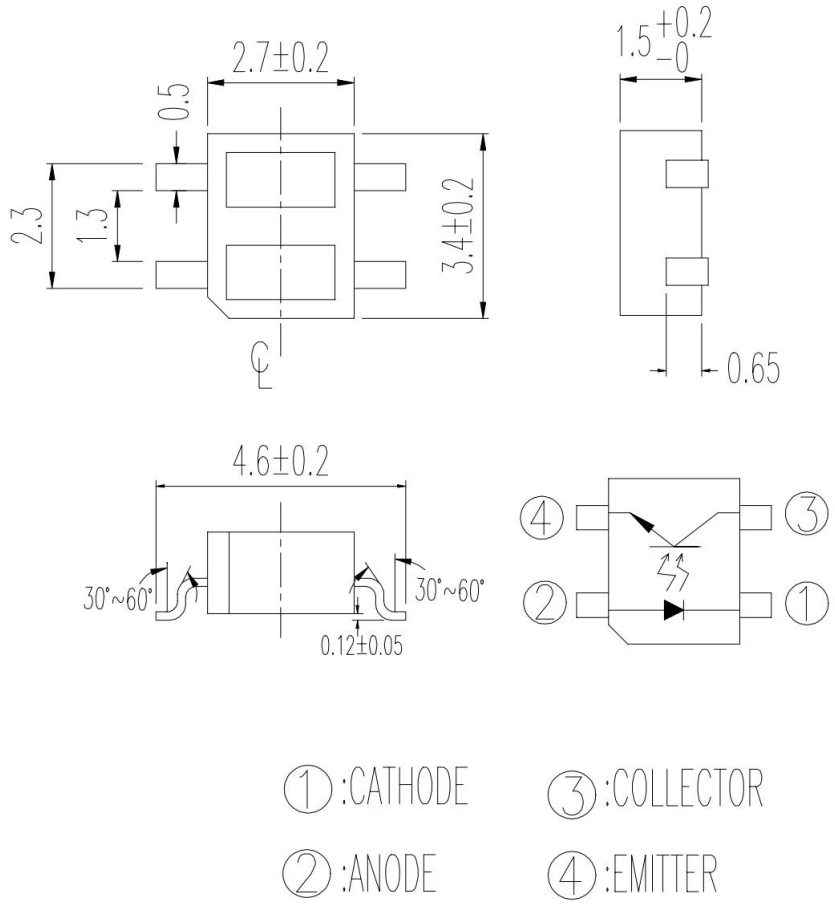
Cassette type recorder

Various microcomputer control equipment

## Description

LA317 is a light reflection switch which includes a GaAs IR-LED transmitter and a NPN photo-transistor with a high sensitive receiver for short distance, operating in the infrared range. Both components are mounted side- by- side in a plastic package.

## PACKAGE DIMENSIONS




NOTES:

1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm(.010") unless otherwise noted.
3. Lead spacing is measured where the leads emerge from the package.

## Absolute Maximum Ratings (Ta=25℃)

| Parameter | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Input | Power Dissipation at(or below) 25℃ Free Air Temperature | Pd | 75 | mW |
| | Reverse Voltage | $V_R$ | 5 | V |
| | Forward Current | $I_F$ | 50 | mA |
| | Peak Forward Current (*1) Pulse width ≦100 μs, Duty cycle=1% | $I_{FP}$ | 1 | A |
| Output | Collector Power Dissipation | $P_C$ | 75 | mW |
| | Collector Current | $I_C$ | 50 | mA |
| | Collector-Emitter Voltage | B $V_{CEO}$ | 30 | V |
| | Emitter-Collector Voltage | B $V_{ECO}$ | 5 | V |
| Operating Temperature | | Topr | -20~+70 | ℃ |
| Storage Temperature | | Tstg | -30~+80 | ℃ |
| Lead Soldering Temperature (*2) | | Tsol | 260 | ℃ |

(＊1) tw=100 μsec. , T=10 msec. (＊2) t=5 Sec

## Electro-Optical Characteristics (Ta=25℃)

| Parameter | | Symbol | | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|---|---|
| Input | Forward Voltage | $V_F$ | | --- | 1.2 | 1.6 | V | $I_F$=20mA |
| | Reverse Current | $I_R$ | | --- | --- | 10 | μA | $V_R$=5V |
| | Peak Wavelength | $\lambda_P$ | | --- | 940 | --- | nm | --- |
| Output | Dark Current | $I_{CEO}$ | | --- | --- | 100 | nA | $V_{CE}$=10V |
| | C-E Saturation Voltage | $V_{CE}$(sat) | | --- | --- | 0.4 | V | $I_C$=2mA ,Ee=1mW/cm$^2$ |
| Transfer Characteristics | Light Current | $I_C$(ON) | B | 180 | --- | 300 | μA | $V_{CE}$=5V $I_F$=10mA |
| | | | C | 250 | --- | 440 | | |
| | Leakage Current | $I_{CEOD}$ | | --- | --- | 1 | μA | |
| | Rise time | $t_r$ | | --- | 20 | --- | μsec | $V_{CE}$=2V $I_C$=100 μA $R_L$=1KΩ |
| | Fall time | $t_f$ | | --- | 20 | --- | μsec | |

## Typical Electrical/Optical/Characteristics Curves for IR

Fig. 1 Forward Current vs. Ambient Temperature

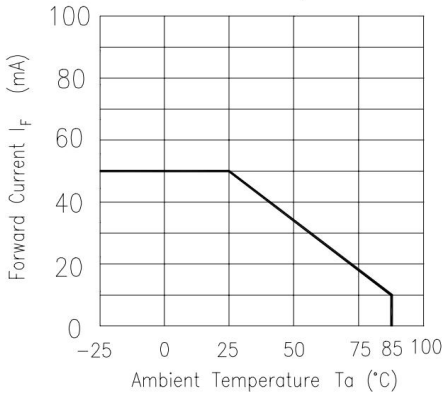



Fig. 2 Spectral Distribution

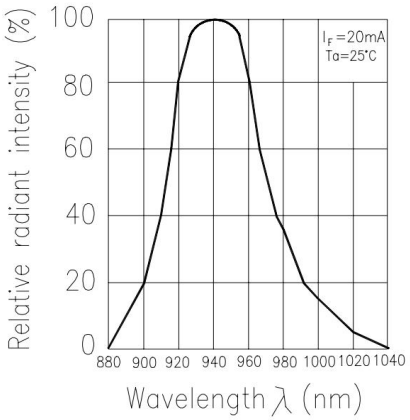



Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

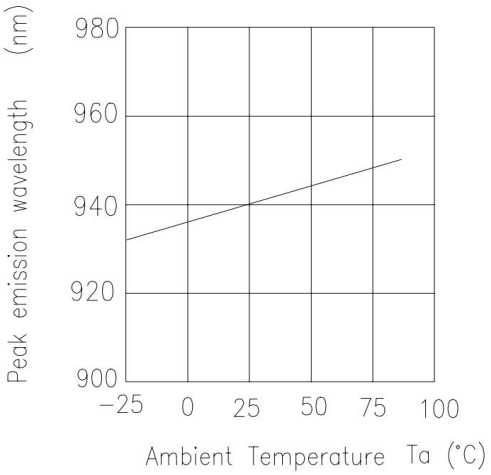



Fig. 4 Forward Current vs. Forward Voltage

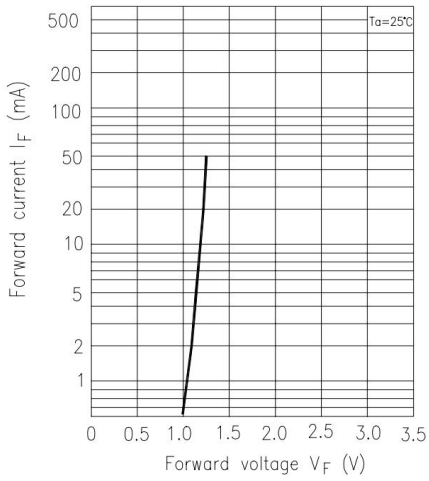



Fig. 5 Forward Voltage vs. Ambient Temperature

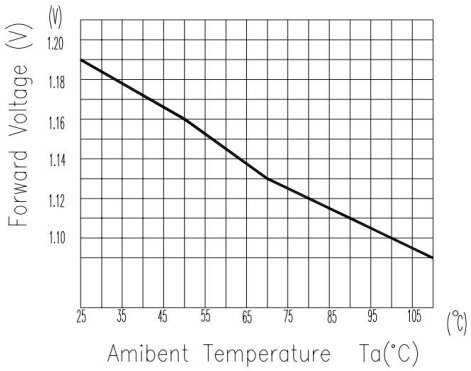
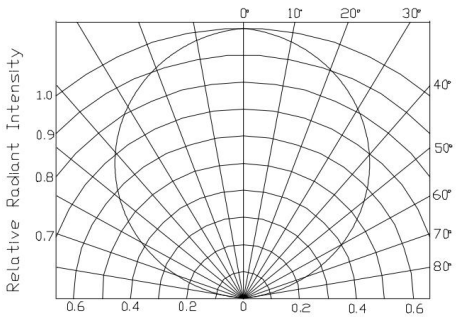



Fig. 6 Relative Radiant Intensity vs. Angular Displacement



## Typical Electro/Optical/Characteristics Curves for PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

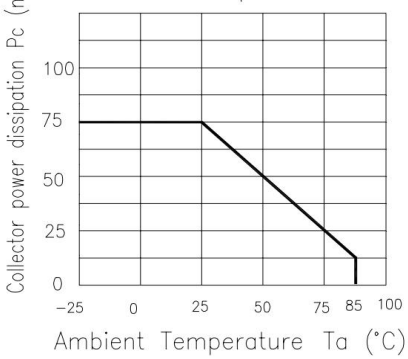



Fig.2 Collector Dark Current vs. Ambient Temperature

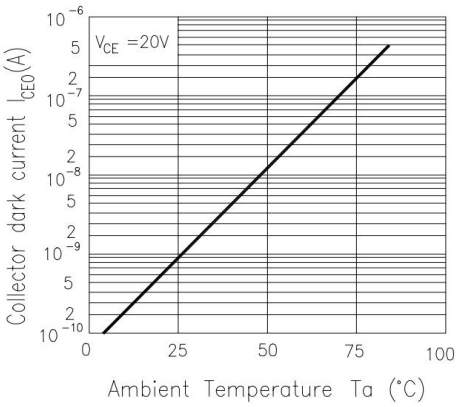



Fig. 3 Relative Collector Current vs. Ambient Temperature

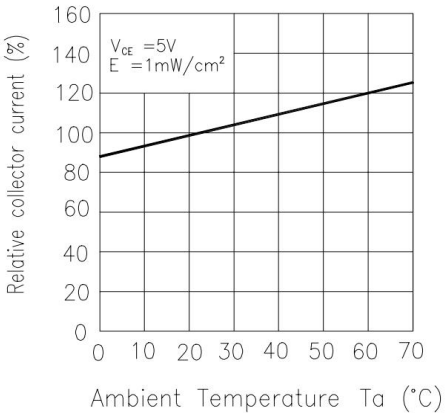



Fig.4 Collector Current vs. Irradiance

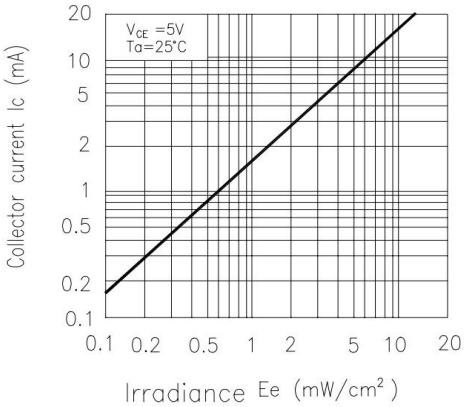



Fig.5 Spectral Sensitivity

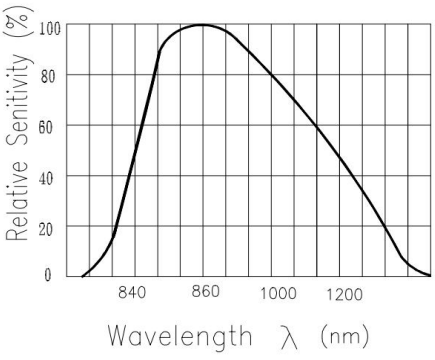
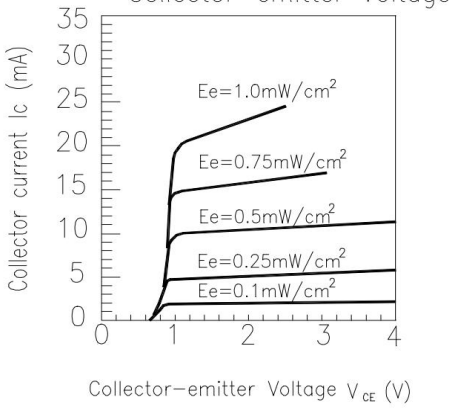
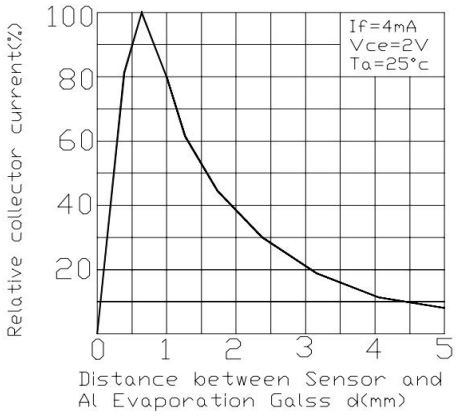



Fig.6 Collector Current vs. Collector−emitter Voltage



## Typical Electrical/Optical/Characteristics Curves For ITR

Fig.1 Relative Collector Current vs. Distance between Sensor and Al Evaporation Galss



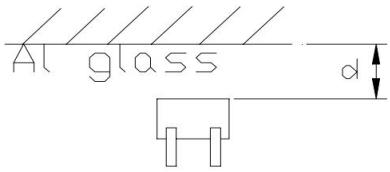
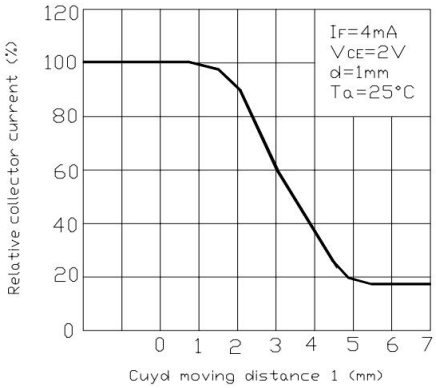




Fig.2 Relative Collector Current vs. Card Moving Distance (1)



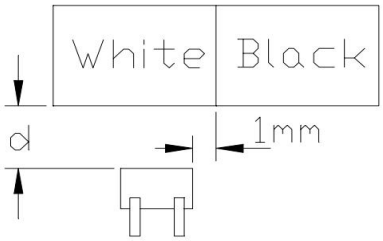
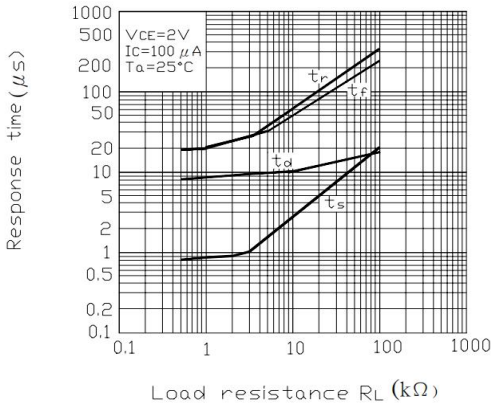
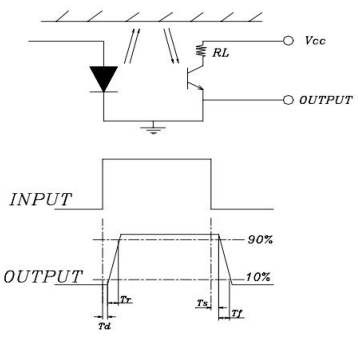




Fig.3 Response Time vs. Load Resistance



## Packing Quantity Specification

1. 1000Pcs/1Reel,38 Reel/1Box

## Label Form Specification


- PRODUCT: Part Number
- CODE NO.: Product Serial Number
- QTY: Packing Quantity
- LOT No: Lot Number
- REMARKS:Remarks

## Notes

### Lead Forming

1. During lead frame bending, the lead frame should be bent at a distance more than 3mm from bottom of the epoxy.

Note: Must fix lead frame and do not touch epoxy before bending to avoid Photo Interrupter broken.

2. Lead forming should be done before soldering.

3. Avoid stressing the Photo Interrupter package during leads forming. The stress to the base may damage the characteristics of Photo Interrupter, or it may break the Photo Interrupter.

4. Cut the Photo Interrupter lead frame at room temperature. Cutting the lead frame at high temperatures may cause failure of the Photo Interrupter.

5. When mounting the Photo Interrupter onto a PCB, the PCB holes must be aligned exactly with the lead position of the Photo Interrupter. If the Photo Interrupter are mounted with stress at The leads, it causes deterioration of the epoxy resin and this will degrade the Photo Interrupter.

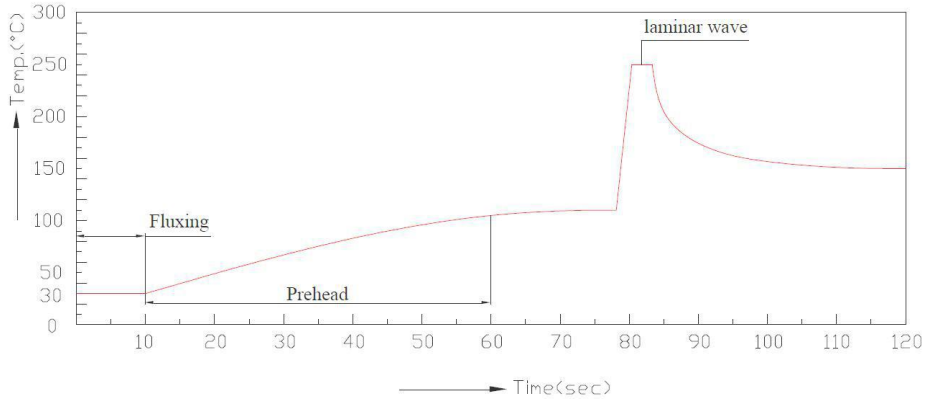
## Soldering

1. Careful attention should be paid during soldering. When soldering, leave more than 3mm from solder joint to epoxy bulb, and soldering beyond the base of the tie bar is recommended.

2. Recommended soldering conditions:

| Hand Soldering | | DIP Soldering | |
|---|---|---|---|
| Temp. at tip of iron | 300°C Max. (30W Max.) | Preheat temp. | 100°C Max. (60 sec Max.) |
| Soldering time | 3 sec Max. | Bath temp. & time | 260 Max., 5 sec Max |
| Distance | 3mm Min.(From solder joint to epoxy bulb) | Distance | 3mm Min. (From solder joint to epoxy bulb) |

3. Recommended soldering profile




4. Avoiding applying any stress to the lead frame while the Photo Interrupter are at high temperature particularly when soldering.

5. Dip and hand soldering should not be done more than one time

6. After soldering the Photo Interrupter, the epoxy bulb should be protected from mechanical shock or vibration until the Photo Interrupter return to room temperature.

7. A rapid-rate process is not recommended for cooling the Photo Interrupter down from the peak temperature.

8. Although the recommended soldering conditions are specified in the above table, dip or hand soldering at the lowest possible temperature is desirable for the Photo Interrupter.

9. Wave soldering parameter must be set and maintain according to recommended temperature and dwell time in the solder wave.

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