

Features

- Non-contact switching.
- For direct PC board or dual-in-line socket mounting.
- Fast switching speed.



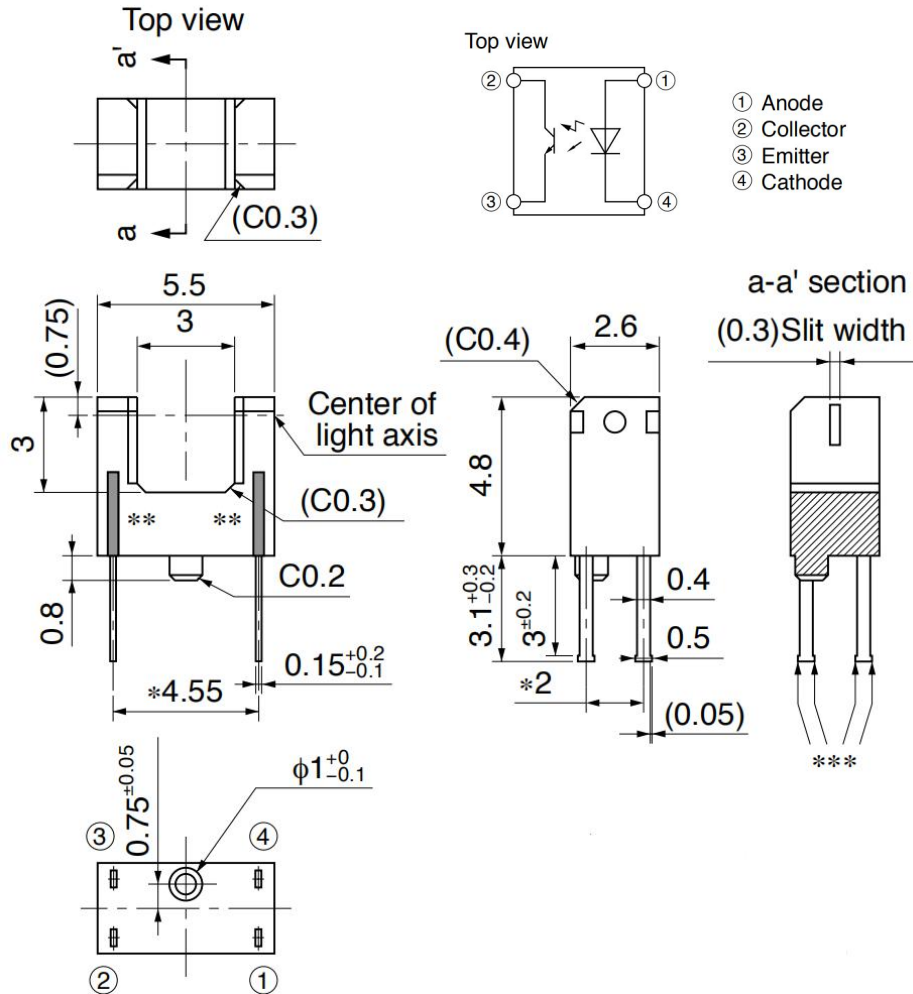
Application

- Scanner
- Edge,Position Detections
- FAX machine
- Counter

Description

The LA213S series consist of Gallium Arsenide infrared emitting diode and a NPN silicon phototransistor mounted in a black plastic housing. Phototransistor switching takes place whenever an opaque object passes through the slot. These series are designed for direct soldering into PC board or mounting in standard dual-in-line socket.

PACKAGE DIMENSIONS

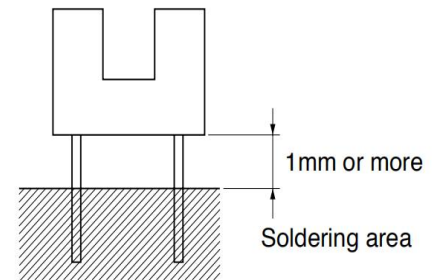


NOTES:

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

ABSOLUTE MAXIMUM RATINGS AT TA =25°C

| Parameter | | Symbol | Rating | Unit |
|--------------------------|-----------------------------|-----------|-------------|------|
| Input | Forward current | I_F | 50 | mA |
| | Reverse voltage | V_R | 6 | V |
| | Power dissipation | P | 75 | mW |
| Output | Collector-emitter voltage | V_{CEO} | 35 | V |
| | Emitter-collector voltage | V_{ECO} | 6 | V |
| | Collector current | I_C | 20 | mA |
| | Collector power dissipation | P_C | 75 | mW |
| Total power dissipation | | P_{tot} | 100 | mW |
| Operating temperature | | T_{opr} | -25 to +85 | °C |
| Storage temperature | | T_{stg} | -40 to +100 | °C |
| *1 Soldering temperature | | T_{sol} | 260 | °C |



ELECTRICAL OPTICAL CHARACTERISTICS AT TA=25°C

| Parameter | | Symbol | Condition | MIN. | TYP. | MAX. | Unit | |
|--------------------------|--------------------------------------|-----------|------------------------------------|---|------|------|---------------|---------------|
| Input | Forward voltage | V_F | $I_F=20\text{mA}$ | - | 1.2 | 1.4 | V | |
| | Reverse current | I_R | $V_R=3\text{V}$ | - | - | 10 | μA | |
| Output | Collector dark current | I_{CEO} | $V_{CE}=20\text{V}$ | - | - | 100 | nA | |
| Transfer characteristics | Collector current | I_C | $V_{CE}=5\text{V}, I_F=5\text{mA}$ | 40 | - | 400 | μA | |
| | Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_F=10\text{mA}, I_C=40\mu\text{A}$ | | 0.4 | V | |
| | Response time | Rise time | t_r | $V_{CE}=5\text{V}, I_C=100\mu\text{A}, R_L=1\text{k}\Omega$ | - | 50 | 150 | μs |
| | | Fall time | t_f | | - | 50 | 150 | μs |

Fig.1 Forward Current vs. Ambient Temperature

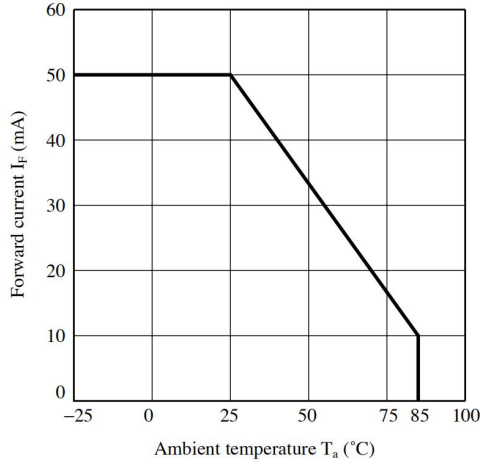


Fig.2 Power Dissipation vs. Ambient Temperature

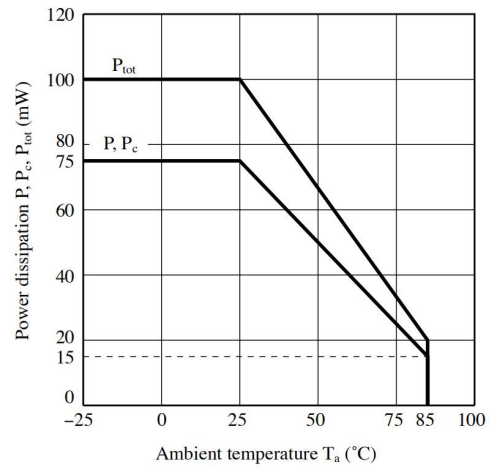


Fig.3 Forward Current vs. Forward Voltage

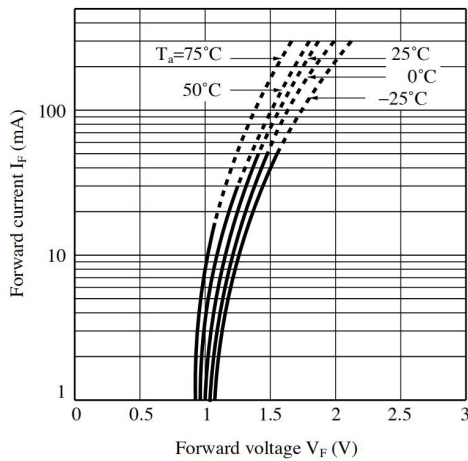


Fig.4 Collector Current vs. Forward Current

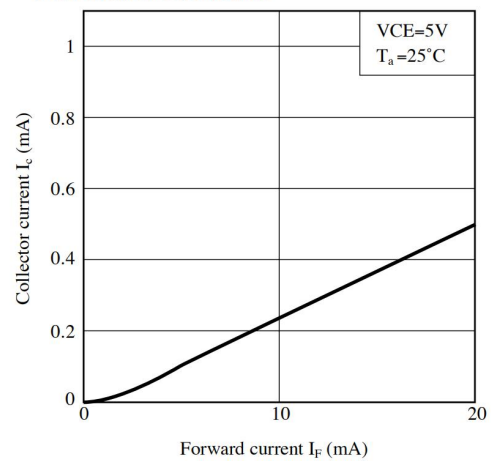


Fig.5 Collector Current vs. Collector-emitter Voltage

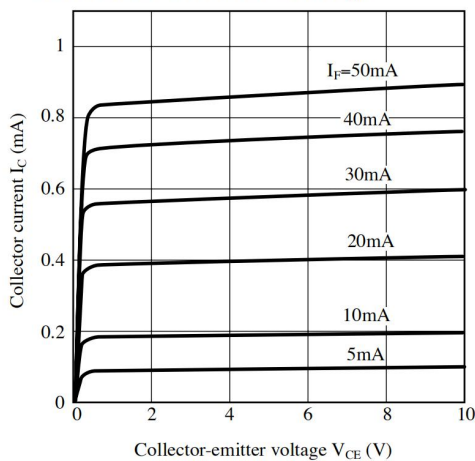


Fig.6 Relative Collector Current vs. Ambient Temperature

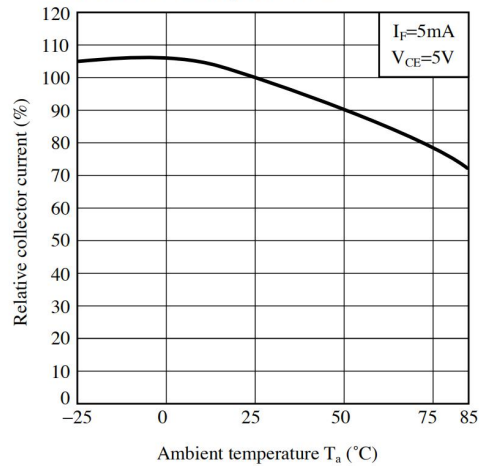


Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

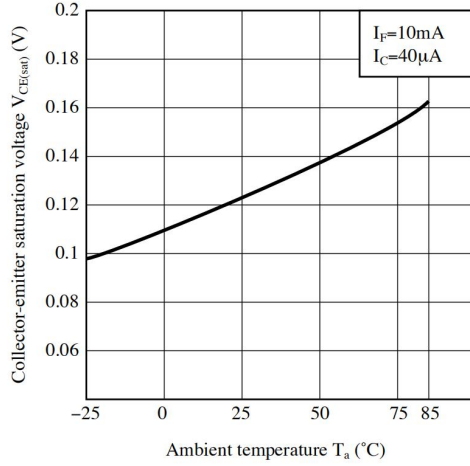


Fig.8 Collector Dark Current vs. Ambient Temperature

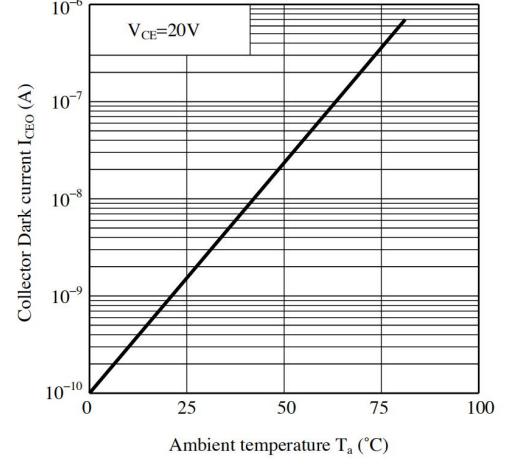


Fig.9 Response Time vs. Load Resistance

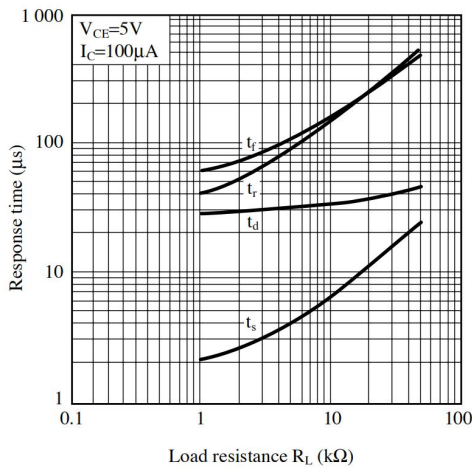


Fig.10 Test Circuit for Response Time

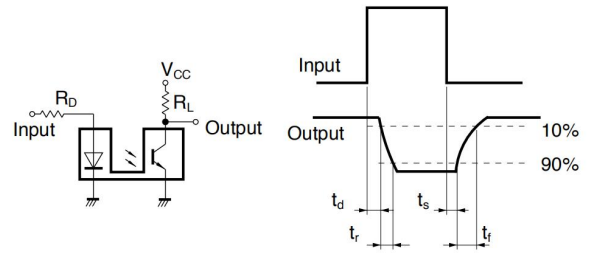


Fig.11 Detecting Position Characteristics (1)

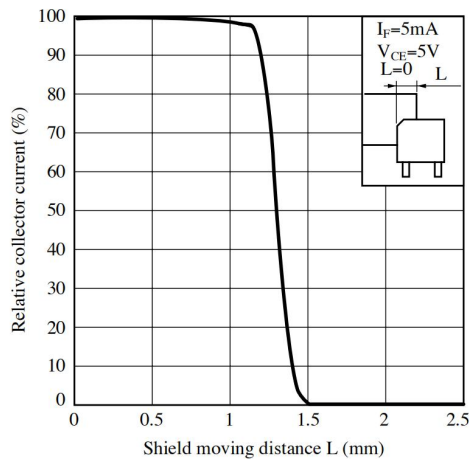
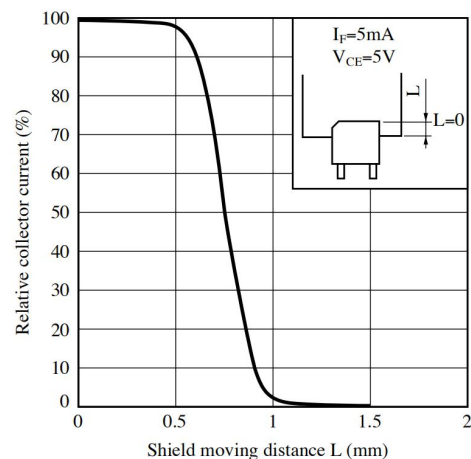


Fig.12 Detecting Position Characteristics (2)



Remarks : Please be aware that all data in the graph are just for reference and not for guarantee.

Packing Quantity Specification

1. 100Pcs/1tube,50 tube/1Box

Label Form Specification

| | |
|--|--|
| 製品名 PRODUCT | |
| コードNo. CODE No. | |
| 数量 Q'TY | |
| ロットNo. LOT No. | |
| 備考 REMARKS | |
|  | |

- 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.

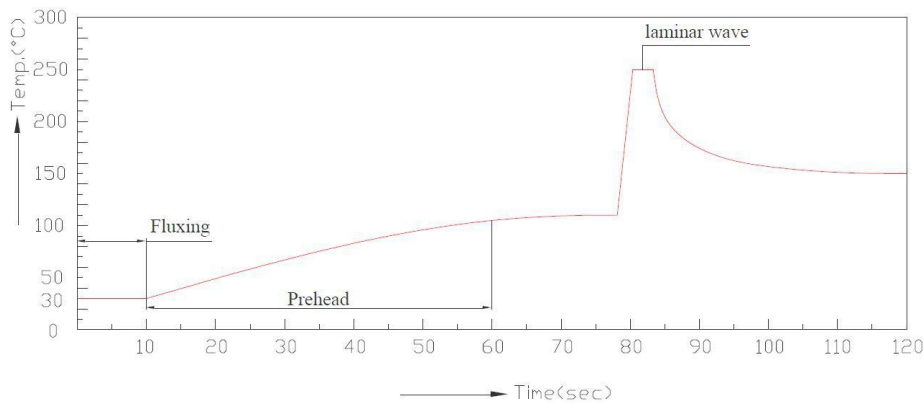
5. When mounting the Photo Interrupter onto a PCB, the PCB holes must be aligned exactly with the lead position of the Photo Interrupter. If the Photo Interrupter are mounted with stress at The leads, it causes deterioration of the epoxy resin and this will degrade the Photo Interrupter.

Soldering

- 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.
- 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



- Avoiding applying any stress to the lead frame while the Photo Interrupter are at high temperature particularly when soldering.
- Dip and hand soldering should not be done more than one time
- After soldering the Photo Interrupter, the epoxy bulb should be protected from mechanical shock or vibration until the Photo Interrupter return to room temperature.
- A rapid-rate process is not recommended for cooling the Photo Interrupter down from the peak temperature.
- 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.
- Wave soldering parameter must be set and maintain according to recommended temperature and dwell time in the solder wave.

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