

## *Photo Interrupter*

# 8ITR523D02SB0003

## DATASHEET

ITR523D is an ultra small outline photo-interrupter, integrating both infrared emitter and silicon phototransistor detector with plastic molding housing.



### Features

- Gap: 2 mm
- Slit: 0.4 mm
- Pb/Halogens free
- This product itself will remain within RoHS compliant version
- Compliance with EU REACH
- Compliance Halogen Free(Br < 900ppm, Cl < 900ppm,Br+Cl < 1500ppm)

### Applications

- Printer
  - Digital Camera
  - Optical switch
-

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## General Information

### Ordering Code Format

| <u>8</u>    | <u>ITR</u>            | <u>523</u> | <u>D</u>    | <u>02</u>     | <u>S</u>       | <u>B</u> | <u>XXXX</u>    |
|-------------|-----------------------|------------|-------------|---------------|----------------|----------|----------------|
| X1          | X2-X4                 | X5-X7      | X8          | X9-X10        | X11            | X12      | X13-X16        |
| X1          | X2-X4                 |            | X5-X7       |               | X8             |          |                |
| Type        | Component             |            | Size        |               | Type           |          |                |
| 8           | Category              | ITR        | Interrupter | 523           | 4.9*2.7*3.3 mm |          | S SMD<br>D DIP |
| X9-X10      | X11                   | X12        |             | X13-X16       |                |          |                |
| Gap spacing | Foot position pattern | Wavelength |             | Serial number |                |          |                |
| 02          | 2.0mm                 | 0          | -           | 0             | -              | -        |                |
|             |                       | S          | Straight    | A             | 850nm          |          |                |
|             |                       | F          | Fold        | B             | 940nm          |          |                |

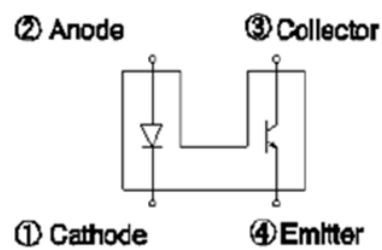
### Product Code Information

| Part No.         | Description                                     |
|------------------|---|
| 8ITR523D02SB0003 | ITR523 DIP type _940nm _positioning column type |

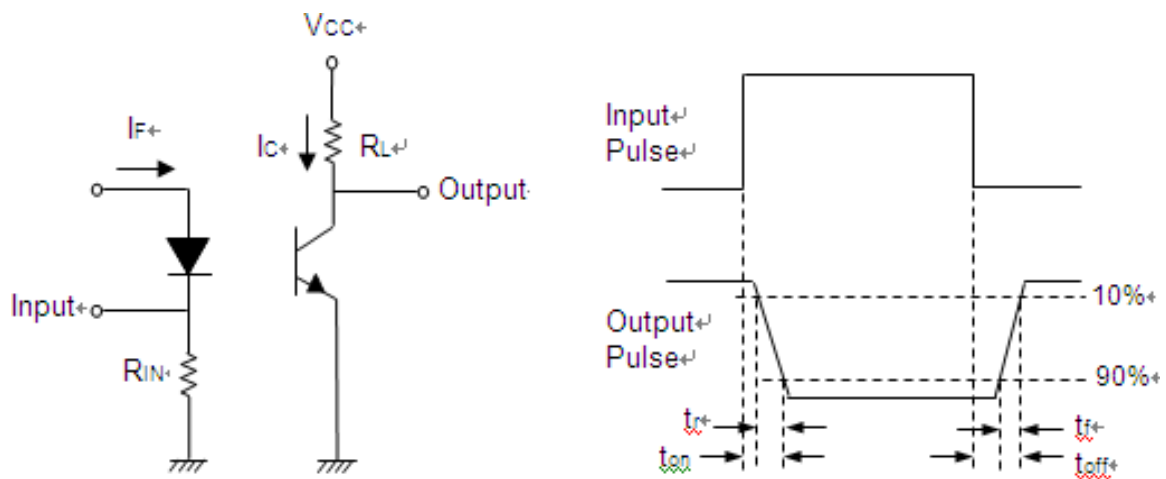
## Device Selection Guide

| Device No. | Chip Material |
|------------|---------------|
| IR         | AlGaAs        |

### <Internal connection diagram>



## Measuring Circuit For Response Time



## Absolute Maximum Ratings(Ta=25°C)

|        | Parameter   | Symbol            | Ratings  | Units |
|--------|---|-------------------|----------|-------|
|        | Power Dissipation at (or below) 25°C Free Air Temperature | Pd                | 65       | mW    |
| Input  | Reverse Voltage   | V <sub>R</sub>    | 5        | V     |
|        | Operating Current   | I <sub>F</sub>    | 50       | mA    |
|        | Peak Operating Current*1                                  | I <sub>FP</sub>   | 1        | A     |
|        | Collector Power Dissipation                               | PC                | 75       | mW    |
| Output | Collector Current   | I <sub>C</sub>    | 20       | mA    |
|        | Collector-Emitter Voltage                                 | BV <sub>CEO</sub> | 30       | V     |
|        | Emitter-Collector Voltage                                 | BV <sub>ECO</sub> | 5        | V     |
|        | Operating Temperature                                     | Topr              | -25~+85  | °C    |
|        | Storage Temperature                                       | Tstg              | -30~+100 | °C    |
|        | Lead Soldering Temperature *2                             | Tsol              | 260      | °C    |

NOTE:

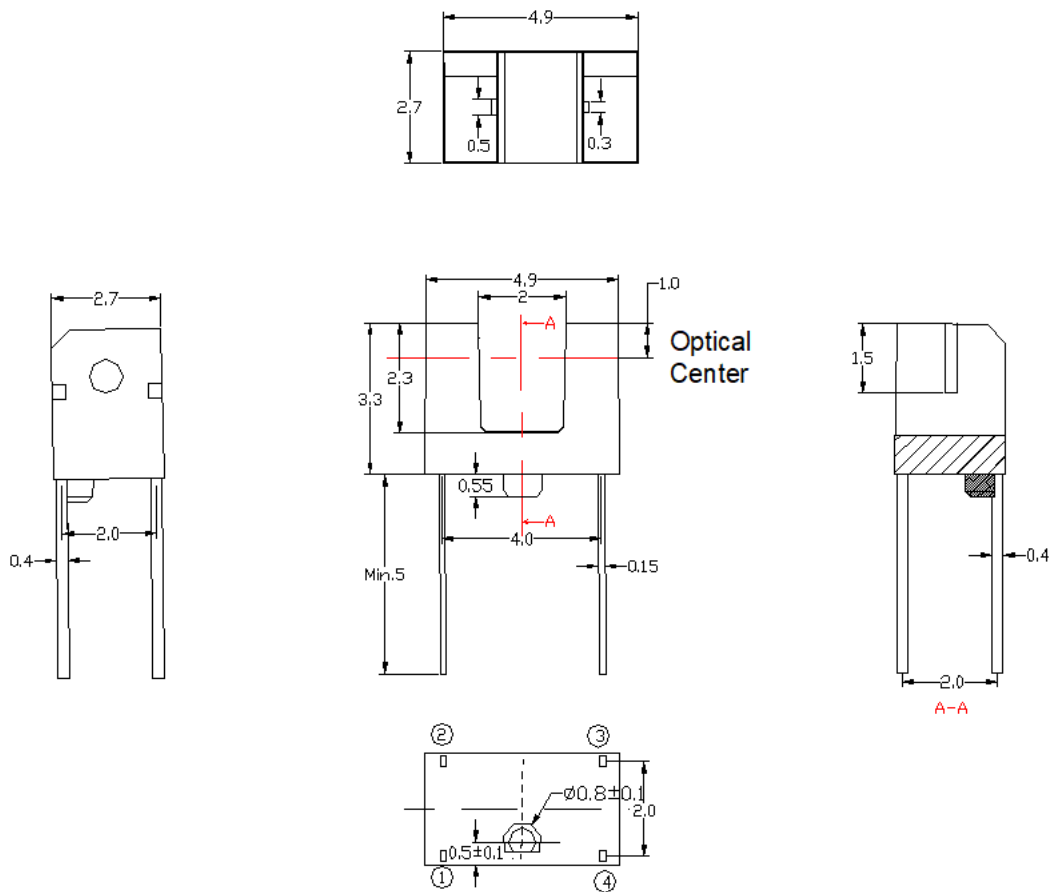
1. Pulse width  $t_w=100 \mu\text{sec}$  ,Period T=10 msec

2.  $2t \leq 5 \text{ Sec}$

## Electro-Optical Characteristics (Ta=25°C)

| Parameter                |                                      | Conditions                                | Symbol        | Min. | Typ. | Max. | Unit.         |
|--------------------------|--------------------------------------|---|---------------|------|------|------|---------------|
| Input                    | Forward Voltage                      | $I_F=20\text{mA}$                         | $V_F$         | -    | 1.2  | 1.4  | V             |
|                          | Reverse Current                      | $V_R=5\text{V}$                           | $I_R$         | -    | -    | 10   | $\mu\text{A}$ |
|                          | Peak Wavelength                      | $I_F=20\text{mA}$                         | $\lambda_p$   | -    | 940  | -    | nm            |
| Output                   | Dark Current                         | $V_{CE}=20\text{V}$                       | $I_{CEO}$     | -    | -    | 100  | nA            |
|                          | Collector-Emitter Saturation Voltage | $I_C=0.05\text{mA}$<br>$I_F=20\text{mA}$  | $V_{CE(sat)}$ | -    | -    | 0.4  | V             |
| Transfer Characteristics | Collector Current                    | $V_{CE}=5\text{V}$<br>$I_F=20\text{mA}$   | $I_{C(on)}$   | 0.2  | 1.0  | -    | mA            |
|                          | Rise time                            | $V_{CE}=5\text{V}$                        | $T_r$         | -    | 10   | -    | $\mu\text{s}$ |
|                          | Fall time                            | $I_C=1\text{mA}$<br>$R_L=1\text{K}\Omega$ | $T_f$         | -    | 10   | -    | $\mu\text{s}$ |

## Mechanical Dimensions



### NOTE:

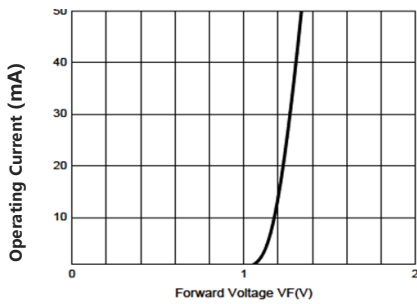
1. All dimension unit in mm

2. General Tolerances:  $\pm 0.2$  mm.

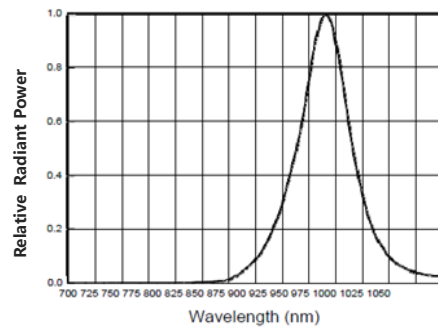
3. Lead spacing is measured where the lead emerge from the package.

## Typical Electrical/Optical/Characteristics Curves for IR

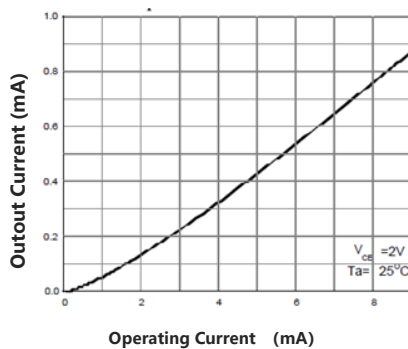
■ Operating Current vs. Forward Voltage



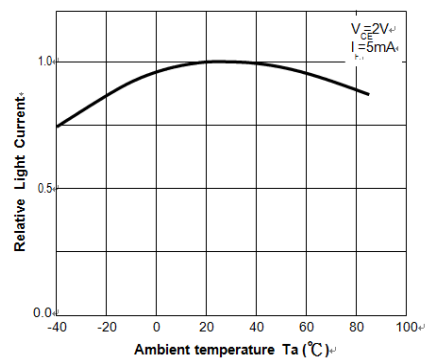
■ Spectral Response



■ Output Current vs. Operating Current

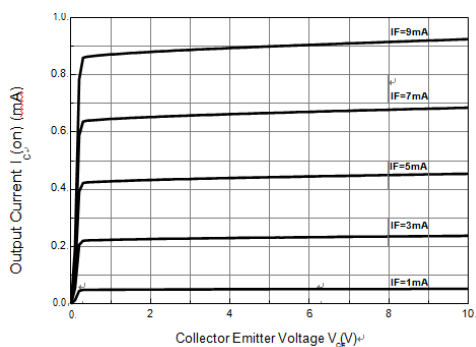


■ Output Current vs. Temperature

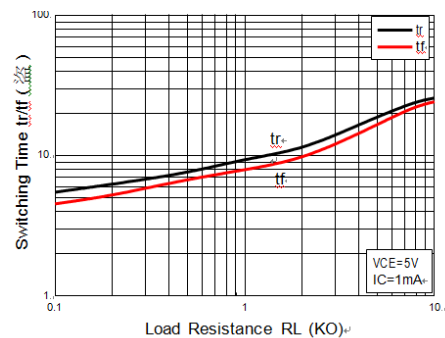


## Typical Electro-Optical Characteristics Curves

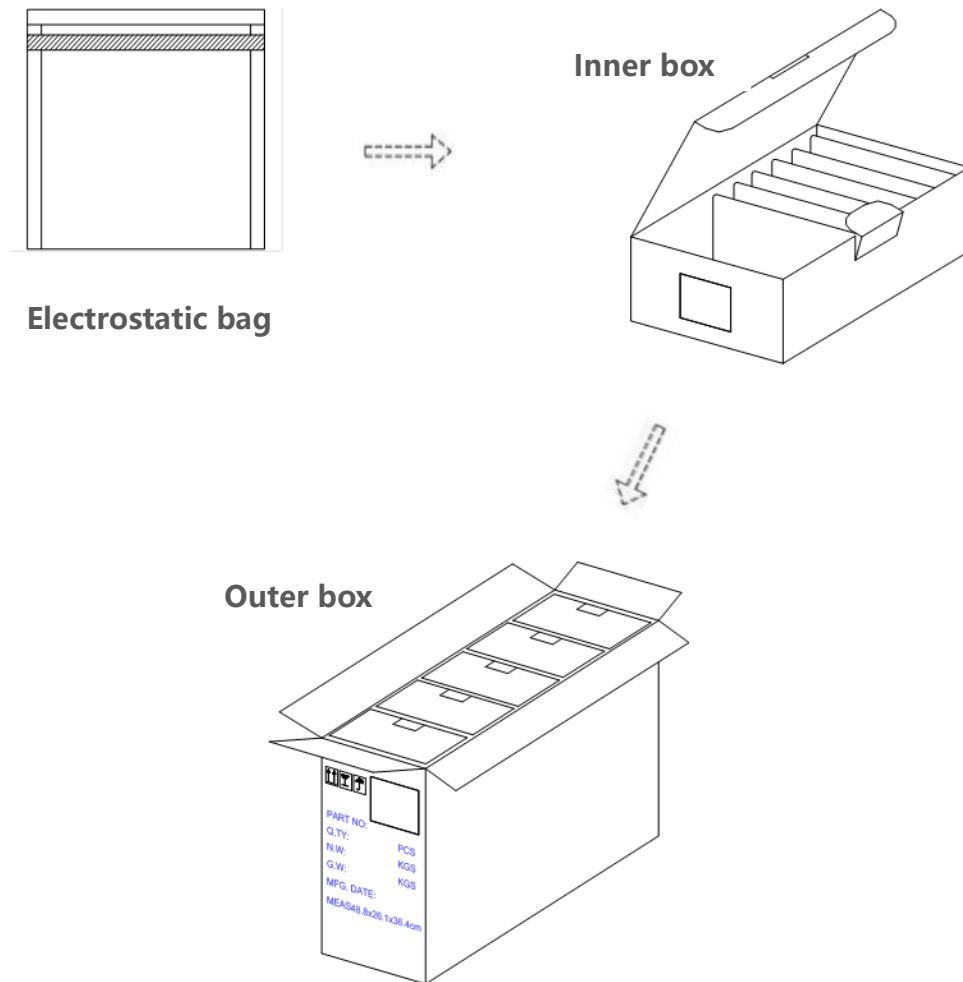
■ Output Characteristics (Ta=25°C)



■ Switching Time VS. Load Resistance.

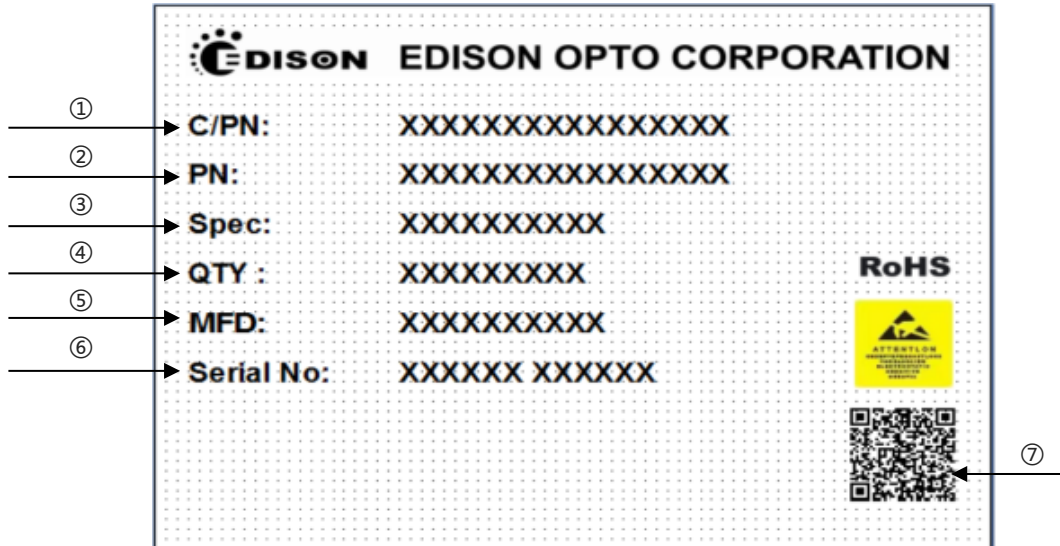


## Product Packaging Information



| Item      | Quantity       | Total     | Size(mm)    |
|-----------|----------------|-----------|-------------|
| bag       | 500pcs         | 500pcs    | 150*150     |
| inner box | 10bags         | 5,000pcs  | 240*170*90  |
| Outer box | 10 inner boxes | 50,000pcs | 488*261*364 |

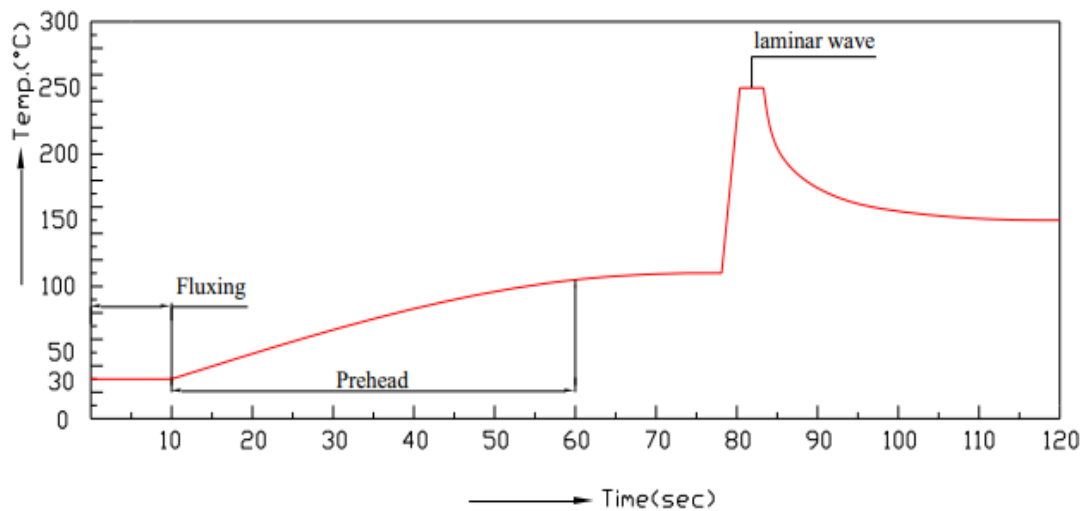
## Label Information



| Number | Item      | Remark                                 |
|--------|-----------|--|
| ①      | C/PN      | Customer product name                  |
| ②      | PN        | The name or description of a commodity |
| ③      | Spec      | Product standard                       |
| ④      | QTY       | Quantity                               |
| ⑤      | MFD       | Date of manufacture                    |
| ⑥      | Serial No | Manufacturing order                    |
| ⑦      | QR Code   | ①~②/④~⑥                                |

## Precaution for Use

- The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



| 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) |

Note: Do not use hot plate to mount the package at the peak temperature (Tp) of 260°C over 5 seconds.

2. Specifications and technical data may be modified without notice. Performance graphs are illustrative; actual results require validation.
3. EDISON disclaims liability for all damages (direct, indirect, incidental, consequential) arising from product use, including personal injury, profit loss, or business disruption.
4. Not authorized for safety-critical systems (e.g., military, medical, aviation) without EDISON' s explicit validation. Users bear full responsibility for suitability assessments.
5. Reproduction, adaptation, or distribution prohibited without written consent.
6. Cleaning
  - (1) Do not clean the Photo Interrupter by the ultrasonic.
7. Heat Management
  - (1) Heat management of Photo Interrupter must be taken into consideration during the design stage of Photo Interrupter application. The current should be de-rated appropriately by referring to the de-rating curve found in each product specification.
  - (2) The temperature surrounding the Photo Interrupter in the application should be controlled.
8. Storage
  - (1) The Photo Interrupter should be stored at 10~30°C and 70%RH or less after being shipped from Edison and the storage life limits are 3 months. If the Photo Interrupter are stored for 3 months or more, they can be stored at 10°C~25°C and 20%RH~60%RH for a year in a sealed container with a nitrogen atmosphere. After opening the package, the devices must be stored at 10°C~25°C and 20%RH~60%RH, and suggested to be used within 24 hours or as soon as possible. Besides, suggest keeping devices sealed in the package bag.
  - (2) Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.
9. ESD
  - (1) The products are sensitive to static electricity or surge voltage. ESD can damage a die and its reliability.
  - (2) When handling the products, the following measures against electrostatic discharge are strongly recommended
  - (3) Eliminating the charge.
    - a. Grounded wrist strap, ESD footwear, clothes and floors Grounded workstation equipment and tools ESD table/shelf mat made of conductive materials.
  - (4) Proper grounding is required for all devices, equipment, and machinery used in product assembly. Surge protection should be considered when designing of commercial products.
  - (5) If tools or equipment contain insulating materials such as glass or plastic, the following measures against electrostatic discharge are strongly recommended
  - (6) Dissipating static charge with conductive materials and preventing charge generation with moisture. Neutralizing the charge with ionizers.

## Environmental Compliance

The entire product line complies with the substance restrictions outlined in the RoHS and REACH regulations, and all contained metals adhere to conflict-free compliance standards.

## Datasheet History

| Versions | Description            | Release Date |
|----------|------------------------|--------------|
| 1        | Establish a Datasheet. | 2023/07/30   |

## About EDISON OPTO

Edison Opto provides comprehensive LED and solid-state lighting products from LED Component, Light Module, UV / IR LED, LED sensing, Horticulture and Automotive Lighting. With a view to improve R&D process, Edison Opto develops the vertical platform on TEMOTM (Thermal. Electrical. Mechanical. Optical) to ensure the quality of products and services; Furthermore, Edison Opto creates LDMSTM (LED Design Manufacturing Service) from light source to luminaire manufacturing, to serve our customers a quality experience of customized solutions.

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