

# BS500B Photodiode for Visible Light

T-41-51

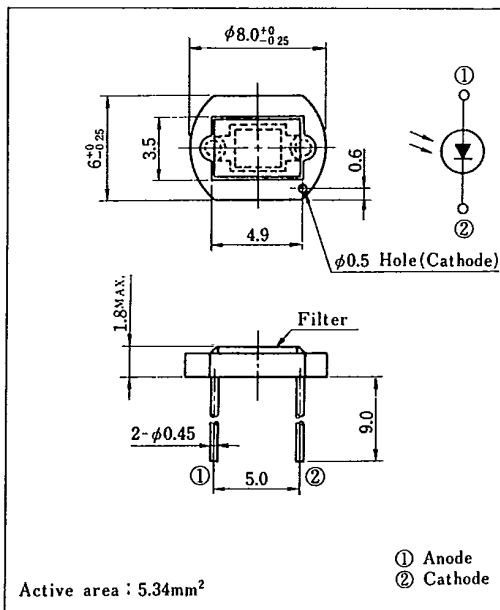
## Features

1. Wide dynamic range (Capable of measuring  $10^{-3}$  to  $10^4$  lx of  $E_v$ )
2. Low dark current ( $I_d$ : MAX.  $10^{-11}$ A at  $V_R=1V$ )
3. Most suitable for visible light measurement ( $\lambda_p=560nm$ )
4. Infrared light cut-off type

## Applications

1. AE (automatic exposure) system and ES (electronic shutter) system for cameras
2. Stroboscopes
3. Precise optical instruments

## Outline Dimensions (Unit : mm)



## Absolute Maximum Ratings

( $T_a=25^\circ C$ )

| Parameter                | Symbol    | Rating    | Unit       |
|--------------------------|-----------|-----------|------------|
| Reverse voltage          | $V_R$     | 10        | V          |
| Operating temperature    | $T_{opr}$ | -20 ~ +60 | $^\circ C$ |
| Storage temperature      | $T_{stg}$ | -20 ~ +80 | $^\circ C$ |
| *1 Soldering temperature | $T_{sol}$ | 260       | $^\circ C$ |

\*1 For 5 seconds

## Electro-optical Characteristics

( $T_a=25^\circ C$ )

| Parameter  | Symbol       | Conditions      | MIN. | TYP.                | MAX.       | Unit                |
|--|--------------|-----------------|------|---------------------|------------|---------------------|
| *2 Short circuit current                         | $I_{sc}$     | $E_v=100$ lx    | 0.40 | 0.55                | 0.65       | $\mu A$             |
| *2 Short circuit current temperature coefficient | $\beta_T$    | $E_v=100$ lx    | —    | 0.02                | 0.06       | %/ $^\circ C$       |
| Dark current                                     | $I_d$        | $V_R=1V$        | —    | $3 \times 10^{-12}$ | $10^{-11}$ | A                   |
| Dark current temperature coefficient             | $\alpha_T$   | $V_R=1V$        | —    | 4.0                 | 5.0        | times/ $10^\circ C$ |
| Terminal capacitance                             | $C_t$        | $V_R=0, f=1MHz$ | —    | 600                 | 1,000      | pF                  |
| Peak sensitivity wavelength                      | $\lambda_p$  |                 | 500  | 560                 | 600        | nm                  |
| *3 Spectral sensitivity infrared radiation ratio | $\Delta I_R$ |                 | —    | 5                   | —          | %                   |

\*2  $E_v$ : Illuminance by CIE standard light source A (tungsten lamp)

\*3  $\Delta I_R = \frac{I_{sc}(\lambda \geq 700nm)}{I_{sc}(\text{full wavelength})} \times 100\%$

SHARP

Fig. 1 Short Circuit Current vs. Illuminance

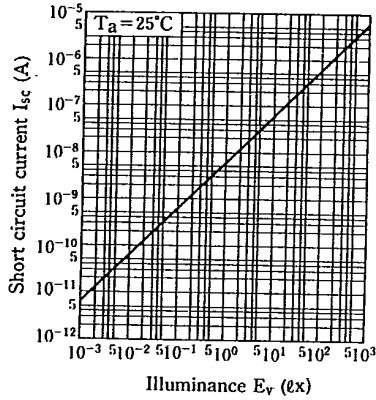


Fig. 2 Relative Short Circuit Current vs. Ambient Temperature T-41-51

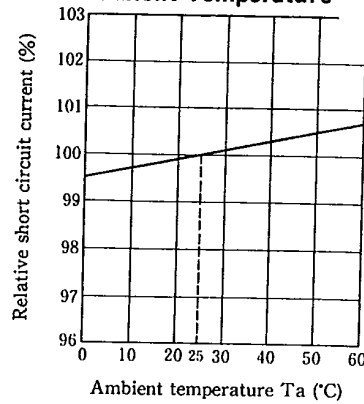


Fig. 3 Dark Current vs. Reverse Voltage

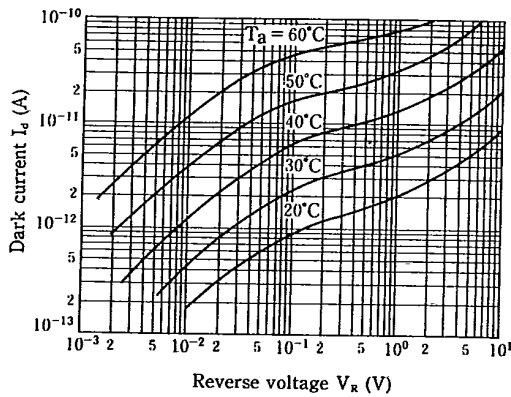
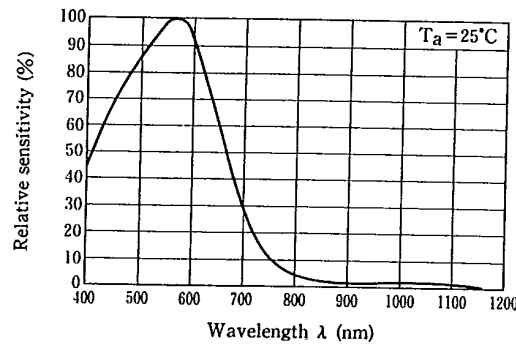
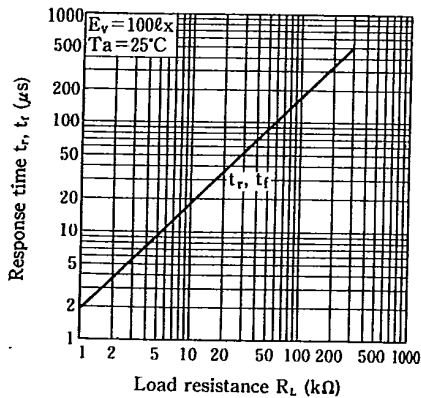


Fig. 4 Spectral Sensitivity

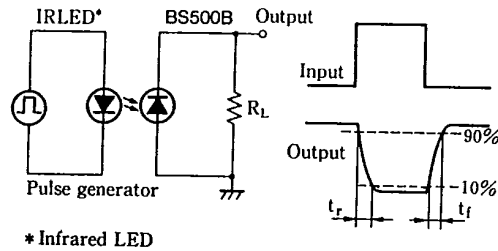


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Fig. 5 Response Time vs. Load Resistance



Test Circuit for Response Time



\* Infrared LED