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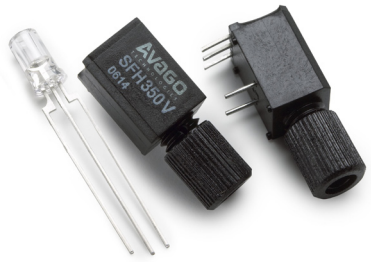
# SFH350 / SFH350V

Plastic Fiber Optic Phototransistor Detector
Plastic Connector Housing

## Data Sheet




### Description

The SFH350 is a low-cost 650nm receiver for simple optical data transmission with polymer optical fiber. The phototransistor yields a high output crurrent even at low optical input power and can be used for speeds up to 15kBd.

The transparent plastic package has an aperture where the the 2.2mm fiber-end can be inserted and fixed with glue. This easy coupling method is extremely cost-effective.

The V-housing allows easy coupling of unconnectorized 2.2mm plastic optical fiber by means of an axial locking screw.

### Ordering Information

| Type | Ordering Code |
|---|---|
| SFH350 | SP000063861 |
| SFH350V | SP000063853 |

### Features

- 2.2 mm Aperture holds Standard 1000 Micron Plastic Fiber
- No Fiber Stripping Required
- Good Linearity
- Sensitive in visible and near IR Range
- Molded Microlens for Efficient Coupling

### Plastic Connector Housing

- Mounting Screw Attached to the Connector
- Interference Free Transmission from light-Tight Housing
- Transmitter and Receiver can be flexibly positioned
- No Cross Talk
- Auto insertable and Wave solderable
- Supplied in Tubes

### Applications

- Household Electronics
- Power Electronics
- Optical Network

## Technical Data

### Absolute Maximum Ratings

| Parameter | Symbol | Limit Values min. | Limit Values max. | Unit |
|---|---|---|---|---|
| Operating Temperature Range | $T_{OP}$ | –40 | +85 | °C |
| Storage Temperature Range | $T_{STG}$ | –40 | +100 | °C |
| Soldering Temperature (2mm from case bottom, t ≤ 5 s) | $T_S$ | | 260 | °C |
| Collector-Emitter Voltage | $V_{CE}$ | | 50 | V |
| Collector Current | $I_C$ | | 50 | mA |
| Collector Peak Current (t ≤ 10 s) | $I_{CP}$ | | 100 | mA |
| Emitter-Bias Voltage | $V_{EB}$ | | 7 | V |
| Reverse Voltage | $V_R$ | | 30 | V |
| Power Dissipation $T_A = 25°C$ | $P_{TOT}$ | | 200 | mW |
| Thermal Resistance, Junction/Air | $R_{thJA}$ | | 375 | K/W |

### Characteristics (TA = 25°C)

| Parameter | Symbol | Values min. | Values typ. | Values max. | Unit |
|---|---|---|---|---|---|
| Maximum Photosensitivity Wavelength | $\lambda_{Smax}$ | | 850 | | nm |
| Photosensitivity Spectral Range (S = 10% $S_{max}$) | $\lambda$ | 400 | | 1100 | nm |
| Dark Current ($V_R = 20$ V) | $I_R$ | | 1 (≤ 10) | | nA |
| Capacitance (f = 1 MHz, without light) | | | | | pF |
| ($V_{CE} = 0$ V) | $C_{CE}$ | | 10.5 | | |
| ($V_{CB} = 0$ V) | $C_{CB}$ | | 21.5 | | |
| ($V_{EB} = 0$ V) | $C_{EB}$ | | 20.5 | | |
| Rise and Fall Times ofPhoto Current ($R_L = 1$ kΩ, $V_{CE} = 5$ V, $I_C = 1.0$ mA, $\lambda = 959$ nm) | | | | | ms |
| 10% to 90% | $t_R$ | | 20 | | |
| 90% to 10% | $t_F$ | | 20 | | |
| Current Gain | HFE | | 500 | | |
| Collector Dark Current($V_{CE} = 5$ V) | $I_{CE0}$ | | 2 (≤ 50) | | nA |
| Photo Current (VCE = 5 V,$\Phi_{IN}$ = 10 μW coupled from the end of a plastic fiber, $\lambda$ = 660nm) | $I_{CE}$ | | 0.8(≥ 0.16) | | mA |
| Temperature Coefficient HFE | $TC_{HFE}$ | | 0.55 | | %/K |
| Temperature Coefficient $I_{CE}$ $\lambda$ = 560 to 660 nm | $TC_I$ | | 0.34 | | %/K |
| Temperature Coefficient $I_{CE}$ $\lambda$ = 830 nm | | | 0.49 | | |
| Temperature Coefficient $I_{CE}$ $\lambda$ = 950 nm | | | 0.66 | | |

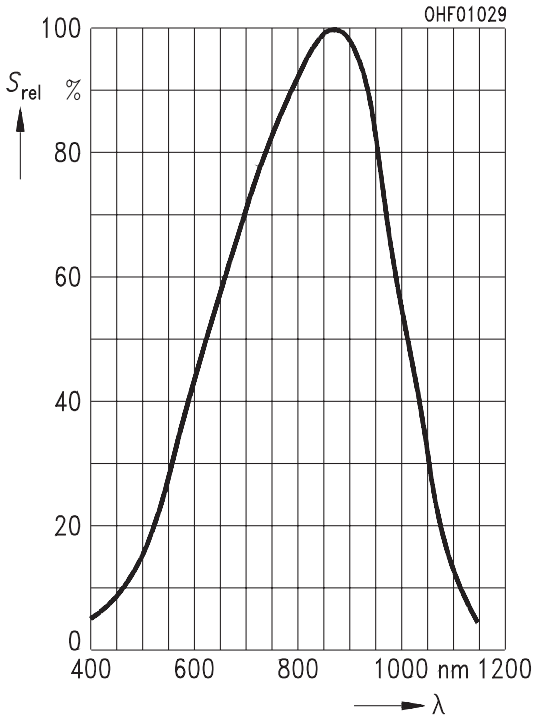



**Figure 1. Relative Spectral Sensitivity $S_{rel} = f(\lambda)$**

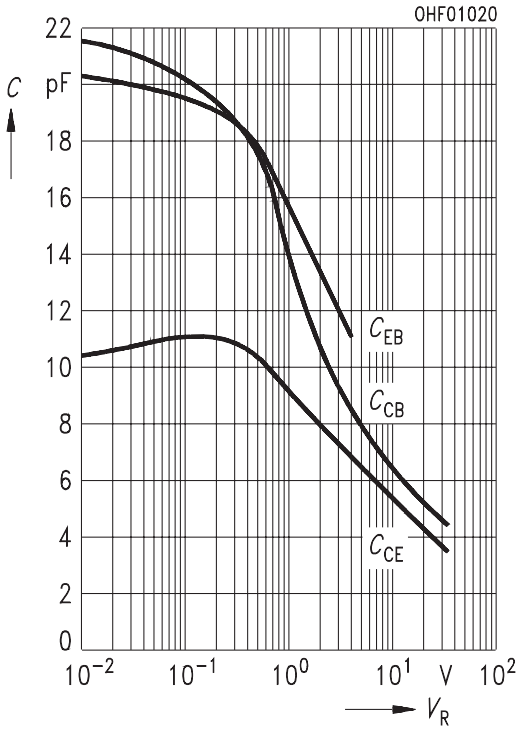



**Figure 2. Capacitance $C = f(V_R)$, $f = 1$ MHz, $E_V = 0$**

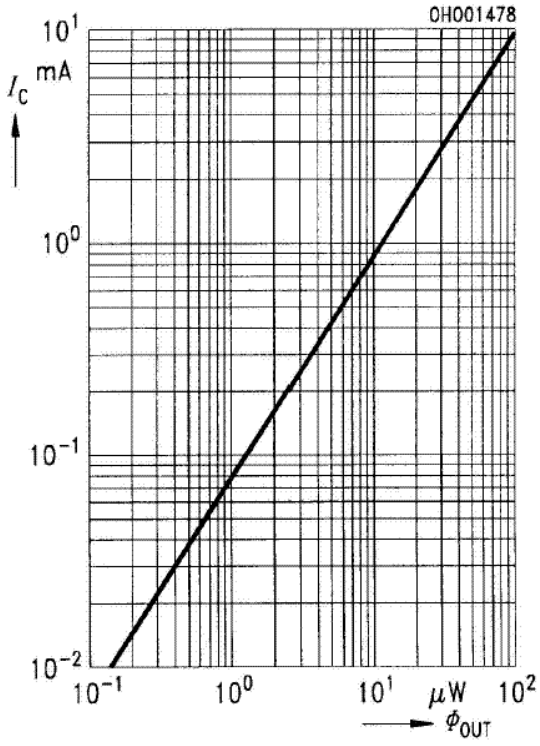



**Figure 3. Photocurrent $I_C = f(\Phi_{OUT})$, $V_{CE} = 5$ V, $\lambda = 560...950$ nm**

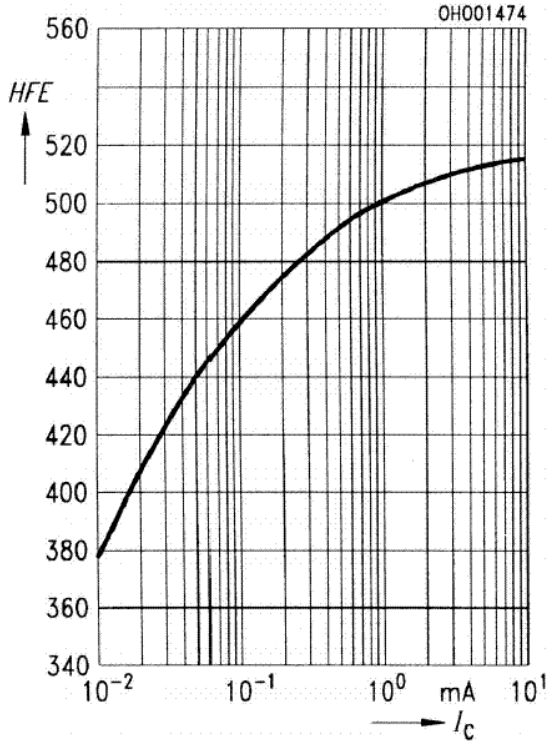



**Figure 4. Current Gain $HFE = f(I_C)$, $V_{CE} = 5$ V, $T_A = 25°C$**

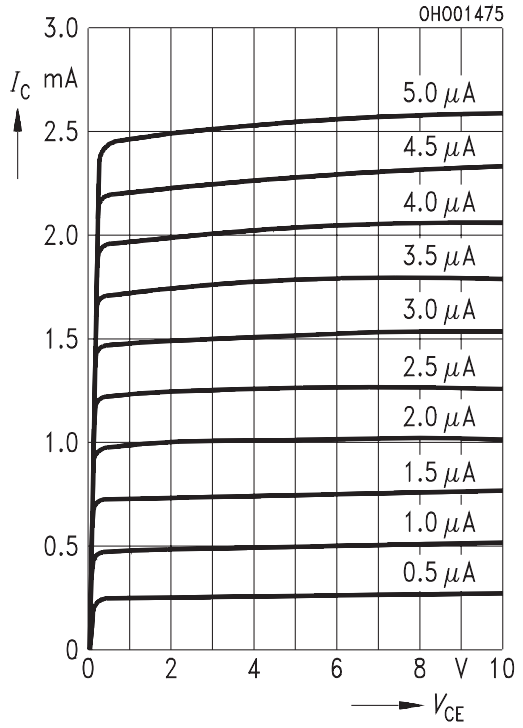



**Figure 5. Output Characteristics $I_C = f(V_{CE})$, $I_B$ = parameter**

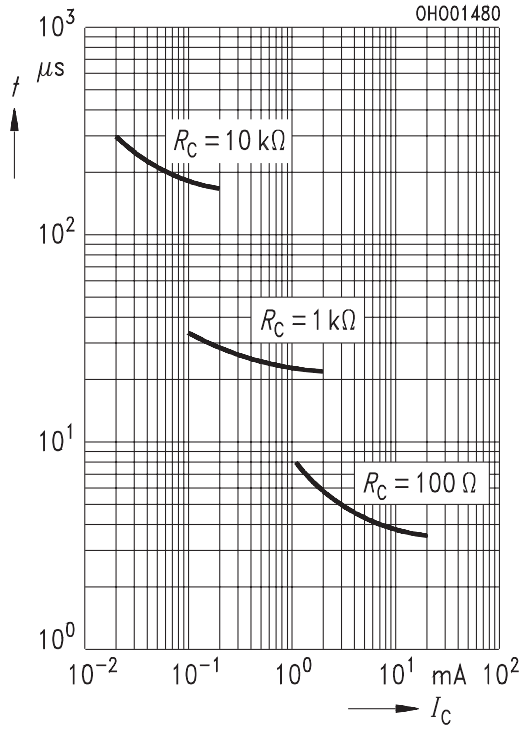



**Figure 6. Response Time $t = f(I_C)$, $V_{CC}$ = 5 V, λ = 950 nm**

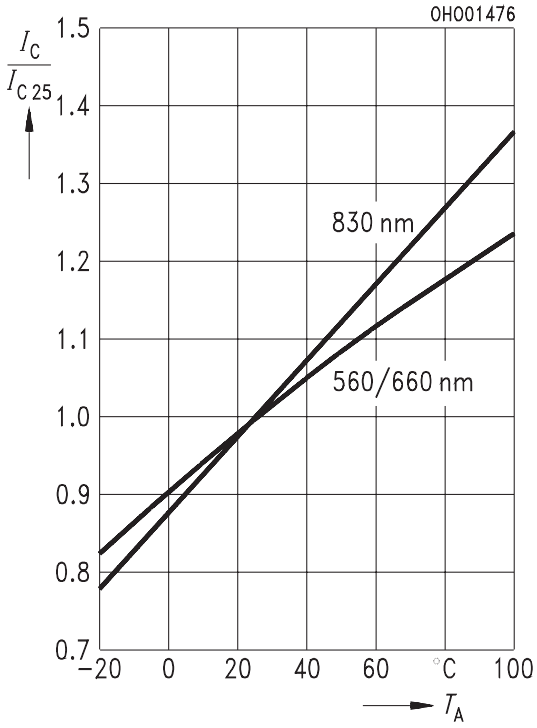



**Figure 7. Photocurrent $I_C/I_{C25} = f(T_A)$, $V_{CE}$ = 5 V, λ = parameter**

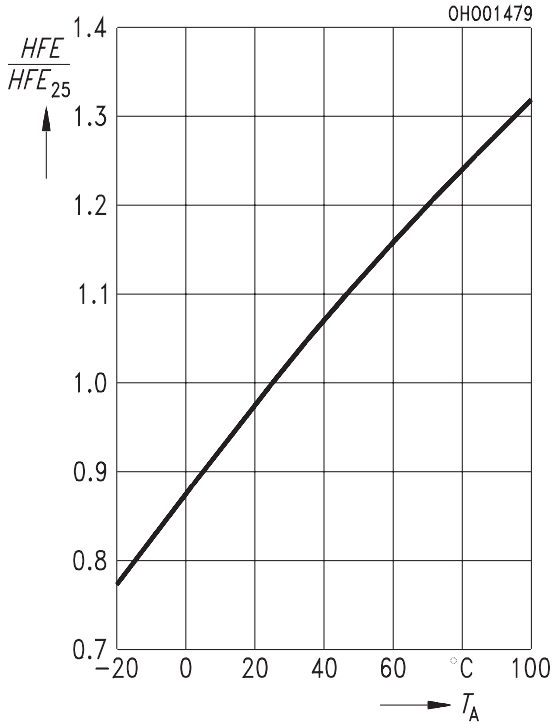
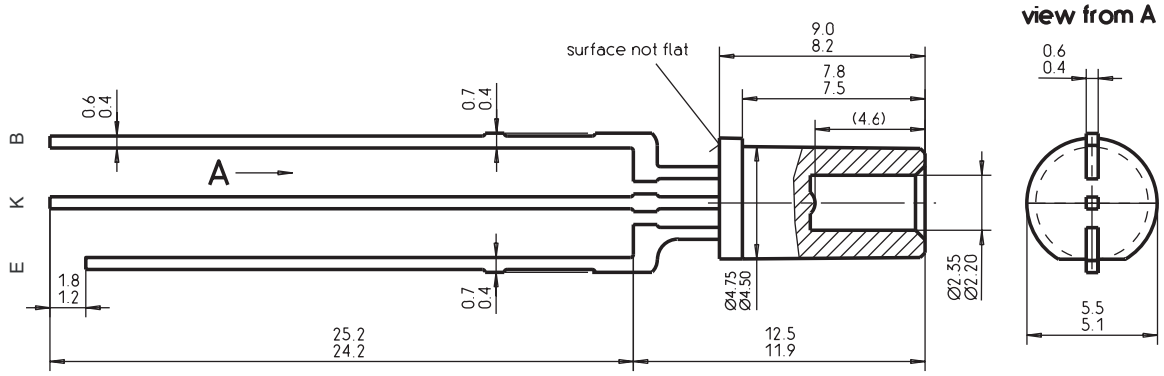


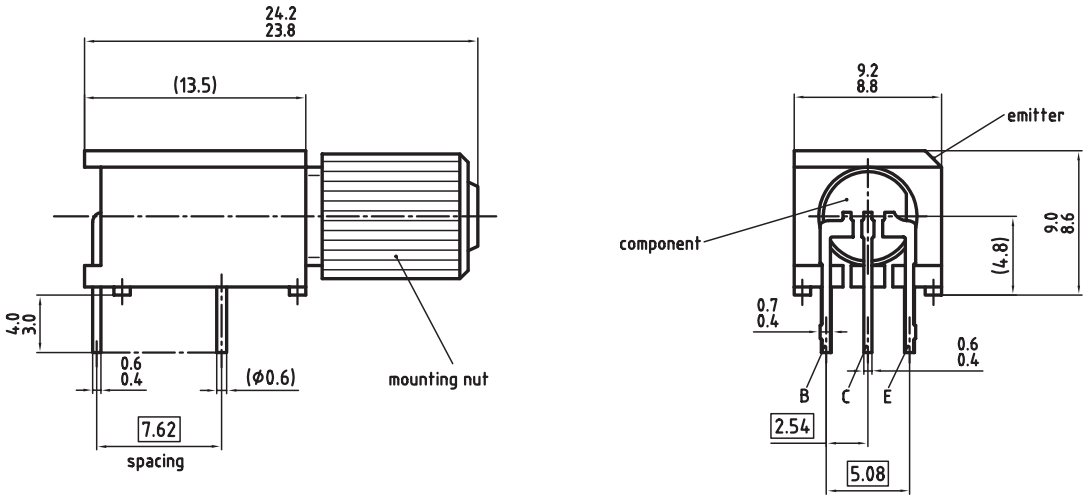

**Figure 8. Current Gain $HFE/HFE_{25} = f(T_A)$, $V_{CE}$ = 5 V, $I_C$ = 1 mA**

## Package Outlines




Dimensions in mm

**Figure 9. SFH350**




Dimensions in mm

**Figure 10. SFH350V**

## Disclaimer

The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics.

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AV01-0712EN - July 18, 2007

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