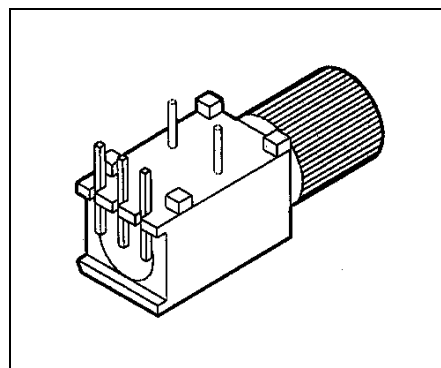
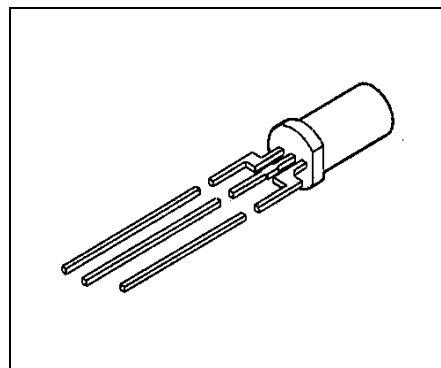


## Integrated Photo Detector Receiver for Plastic Fiber Plastic Connector Housing

**SFH551/1-1**  
**SFH551/1-1V**

### Features

- Bipolar IC with open-collector output
- Digital output, TTL compatible
- Sensitive in visible and near IR range
- Low switching threshold
- Transfer rate  $\leq 5$  Mbit/s
- 2.2 mm aperture holds standard 1000 micron plastic fiber
- No fiber stripping required
- Molded microlens for efficient coupling



### Plastic Connector Housing

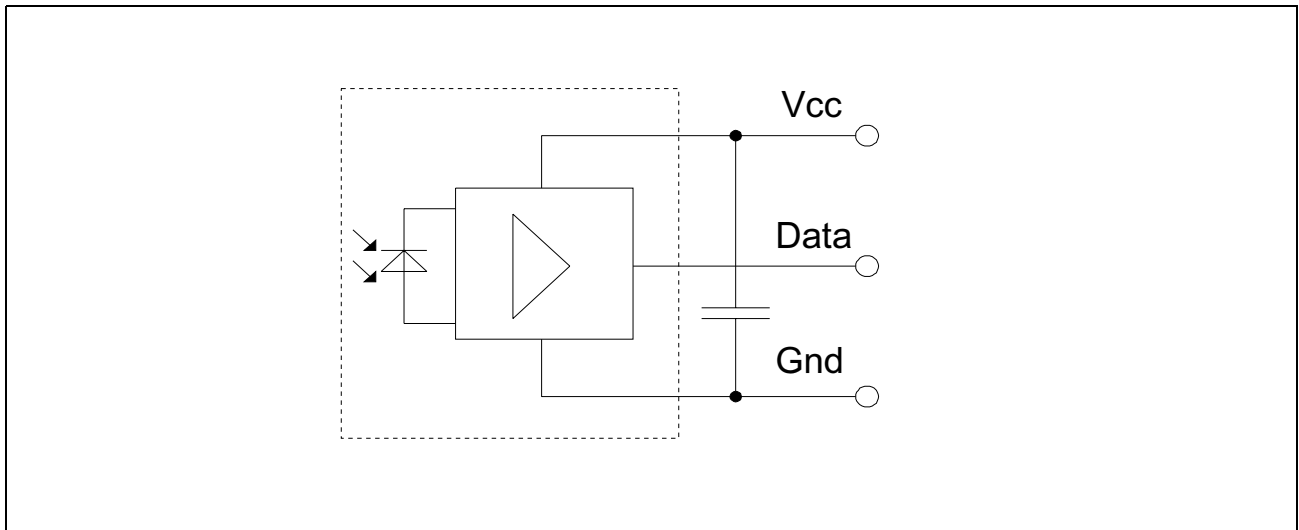
- Mounting screw attached to the connector
- Interference-free transmission from light-tight housing
- Transmitter and receiver can be flexibly positioned
- No cross talk
- Auto insertable and wave solderable
- Supplied in tubes

### Applications

- Household electronics
- Power electronics
- Optical networks
- Medical instruments
- Automotive electronics

| Type        | Ordering Code |
|-------------|---------------|
| SFH551/1-1  | Q62702-P3180  |
| SFH551/1-1V | Q62702-P3181  |

## Block Diagram



**Figure 1**

A bypass capacitor (100 nF) near the device (distance  $\leq 3$  cm) is necessary between ground and  $V_{CC}$ . In critical applications the distance may be shorter.

## Description

The SFH551/1V is a transimpedance amplifier with digital TTL open collector output stage and integrated photodiode. The active area of the detector in connection with the molded microlens gives an efficient coupling from the end of a plastic fiber.

The receiver is fully DC coupled and therefore no line code is needed.

The SFH551/1V includes a Schmitt trigger function to provide stable output states over the whole dynamic range. With noise free  $V_{CC}$  and GND no undefined output signal is possible. SFH551/1 must not be used without shielding the ambient light, because ambient light causes malfunction when reaching the threshold level, noise or complete switching the output. Interference free transmission is possible by using the SFH551/1V with the black plastic connector housing.

**Technical Data**
**Absolute Maximum Ratings**

| Parameter  | Symbol       | Limit Values |      | Unit     |
|--|--------------|--------------|------|----------|
|  |              | min.         | max. |          |
| Operating Temperature Range                                    | $T_{OP}$     | -40          | +85  | °C       |
| Storage Temperature Range                                      | $T_{STG}$    | -55          | +100 |          |
| Soldering Temperature<br>(2 mm from case bottom, $t \leq 5$ s) | $T_S$        |              | 260  |          |
| Supply Voltage Range without Damage                            | $V_{CC}$     | -0.5         | 15   | V        |
| Minimum Supply Voltage for Function                            | $V_{CCmin}$  |              | 4    |          |
| Minimum Pullup Resistance<br>( $V_{CC} = 5$ V)                 | $R_{outmin}$ |              | 330  | $\Omega$ |
| Output Voltage   | $V_O$        | -0.5         | 15   | V        |
| Output Current   | $I_O$        |              | 50   | mA       |
| Power Dissipation (output)                                     | $P_O$        |              | 100  | mW       |

**Characteristics** ( $T_A = 25^\circ\text{C}$ ,  $V_{CC} = 4.75$  to  $5.25$  V)

| Parameter   | Symbol                               | Limit Values |                          |      | Unit                 |
|---|--------------------------------------|--------------|--------------------------|------|----------------------|
|   |                                      | min.         | typ.                     | max. |                      |
| Maximum Photosensitivity Wavelength   | $\lambda_{S\max}$                    |              | 700                      |      | nm                   |
| Photosensitivity Spectral Range ( $S = 80\% S_{\max}$ )   | $\lambda$                            | 600          |                          | 780  |                      |
| SFH551/1-1 Optical Threshold Power ( $\lambda = 660$ nm)  | $\Phi_{\text{INth}}$                 |              | $\leq 6$<br>$\leq -22$   |      | $\mu\text{W}$<br>dBm |
| Maximum Optical Power ( $\lambda = 660$ nm)<br>Maximum Value of $t_{\text{PLH}}$ at Maximum Power | $\Phi_{\text{INL}}$                  |              | 1000<br>0                |      | $\mu\text{W}$<br>dBm |
| Optical Power for Output High without Errors ( $\lambda = 660$ nm)                                | $\Phi_{\text{INH}}$                  |              | $\leq 0.1$<br>$\leq -40$ |      | $\mu\text{W}$<br>dBm |
| Propagation Delay (optical input to electrical output, with fast optical pulse)                   | $t_{\text{PHL}}$<br>$t_{\text{PLH}}$ |              | $< 100$<br>$< 250$       |      | ns                   |
| Current Consumption (without output current)  | $I_{\text{CC}}$                      |              | 4                        |      | mA                   |

## Package Outlines

### SFH551/1-1

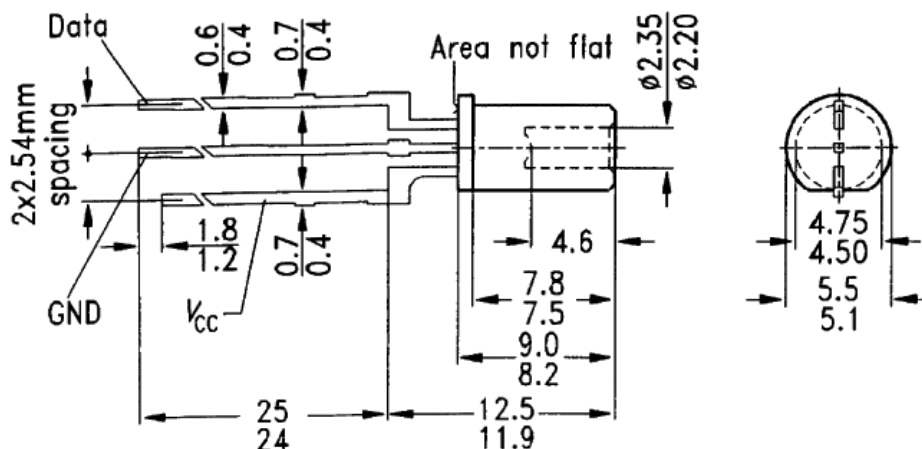


Figure 2

### SFH551/1-1V

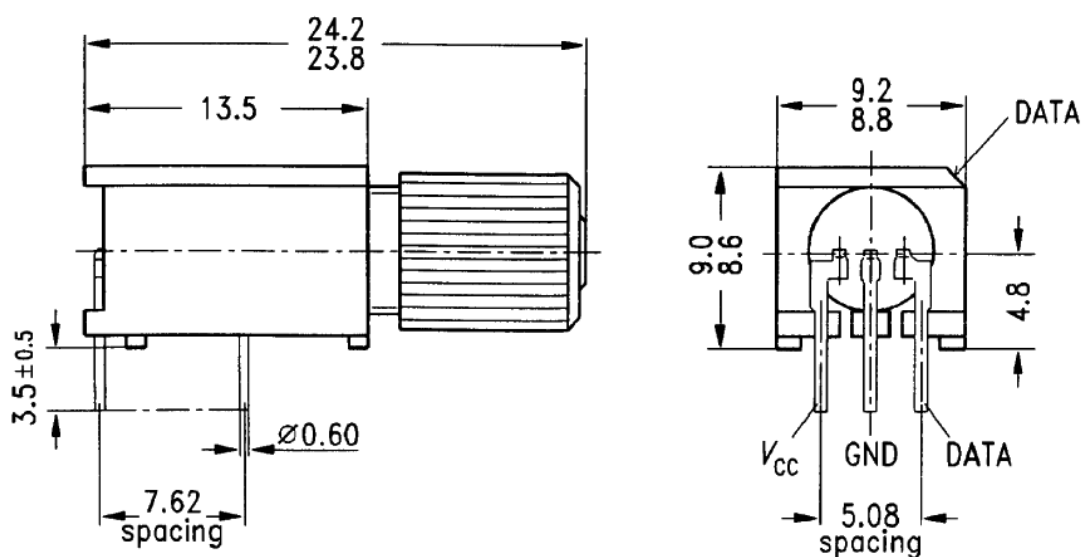


Figure 3

(dimensions in mm, unless otherwise specified)

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**SFH551/1-1**

**SFH551/1-1V**

**Revision History: 2002-03-14**

**DS0**

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Previous Version:

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| <b>Page</b> | <b>Subjects (major changes since last revision)</b> |
|-------------|---|
|             | Document's layout has been changed: 2002-Aug.       |

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