

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

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

**Features**

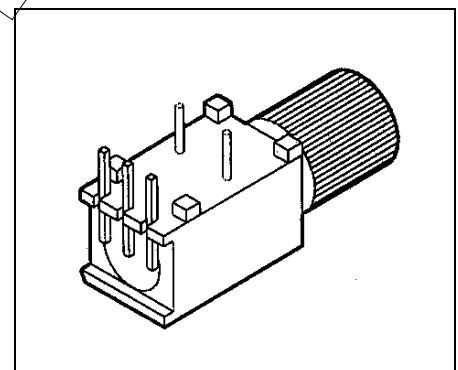
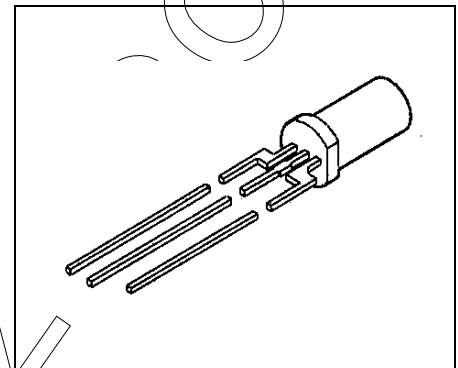
- Bipolar IC with open-collector output
- Digital output, TTL compatible
- Sensitive in visible and near IR range
- Low switching threshold
- Transfer rate  $\leq 5$  Mbit/s
- 2.2 mm aperture holds standard 1000 micron plastic fiber
- No fiber stripping required
- Molded microlens for efficient coupling

**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



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

Block Diagram

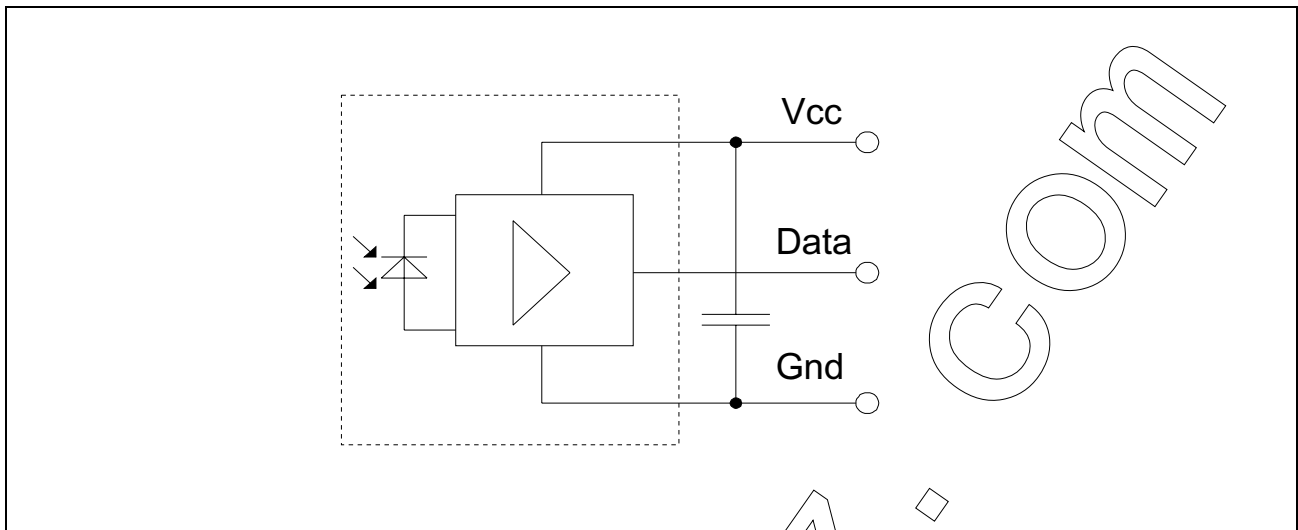


Figure 1

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. For optical input power levels above  $6 \mu\text{W}$  typically the electrical output will be logical "low" and vice versa. 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	$T_{STG}$	-40	+100	°C
Soldering Temperature (2 mm from case bottom, $t \leq 5$ s)	$T_S$		260	°C
Supply Voltage Range without Damage	$V_{CC}$	-0.5	15	V
Recommended and Guaranteed Maximum Voltage			5.5	V
Minimum Supply Voltage for Function	$V_{CCmin}$	4		V
Minimum Pull-up Resistance ( $V_{CC} = 5$ 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	Values			Unit
		min.	typ.	max.	
Maximum Photosensitivity Wavelength	$\lambda_{Smax}$		700		nm
Photosensitivity Spectral Range ( $S = 80\% S_{max}$ )	$\lambda$	600		780	nm
SFH551/1-1 Optical Threshold Power ( $\lambda = 660$ nm) for Output Low	$\Phi_{INth}$		$\geq 6$ $\geq -22$		$\mu\text{W}$ dBm
Maximum Optical Power ( $\lambda = 660$ nm) Maximum Value of $t_{PLH}$ at Maximum Power	$\Phi_{INL}$		1000 0		$\mu\text{W}$ dBm
Optical Power for Output High without Errors ( $\lambda = 660$ nm)	$\Phi_{INH}$		$\leq 0.1$ $\leq -40$		$\mu\text{W}$ dBm
Propagation Delay (optical input to electrical output, with fast optical pulse)	$t_{PHL}$ $t_{PLH}$		< 100 < 250		ns
Current Consumption (without output current)	$I_{CC}$		4		mA

Package Outlines

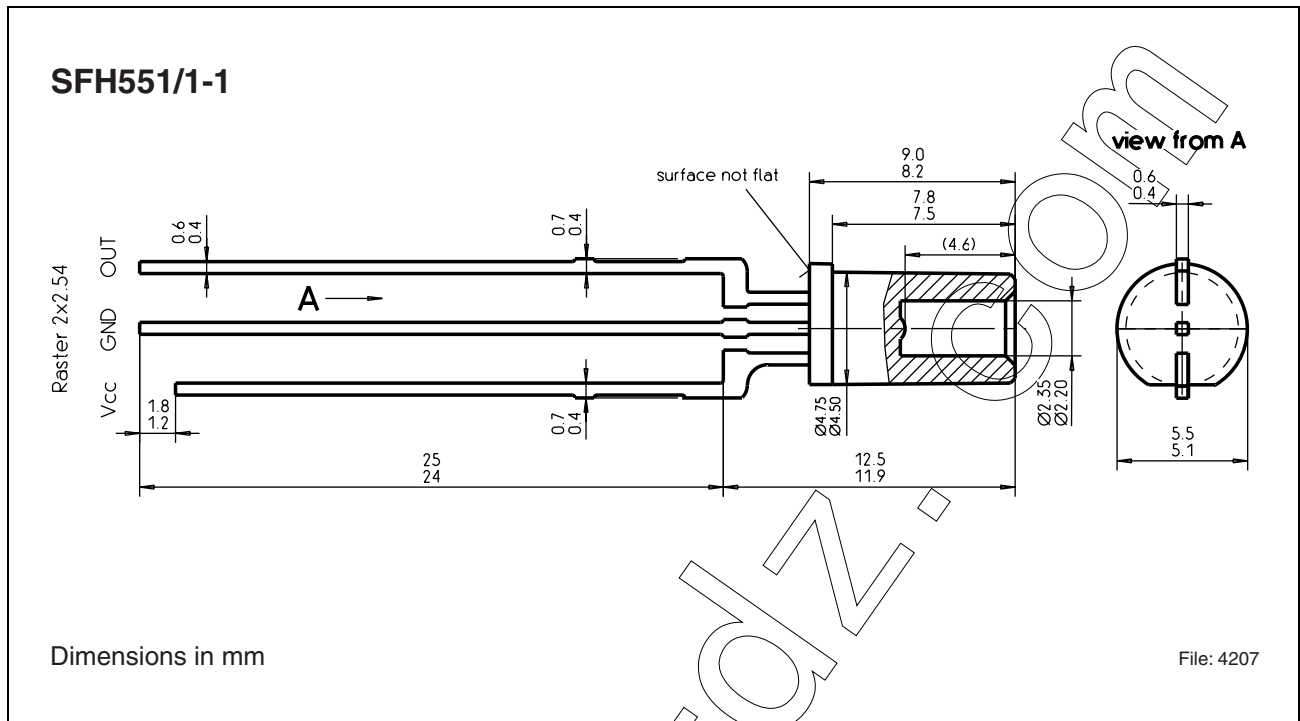


Figure 2

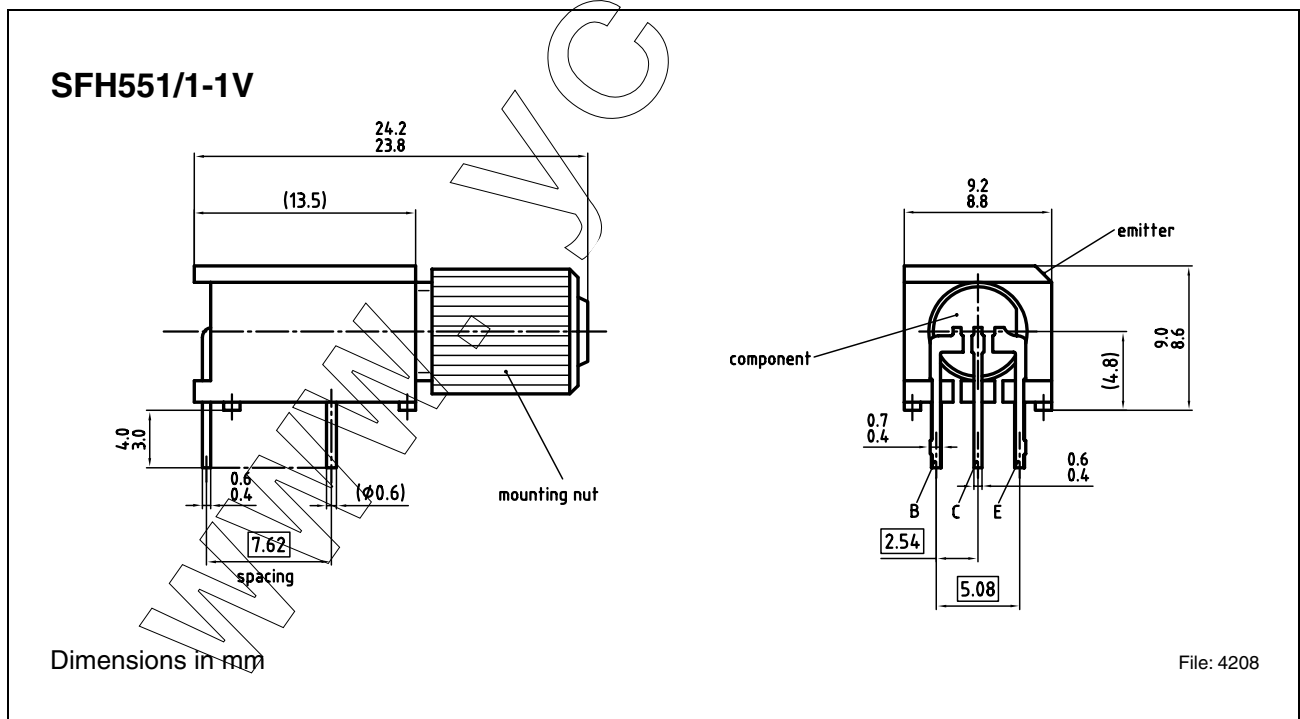


Figure 3

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

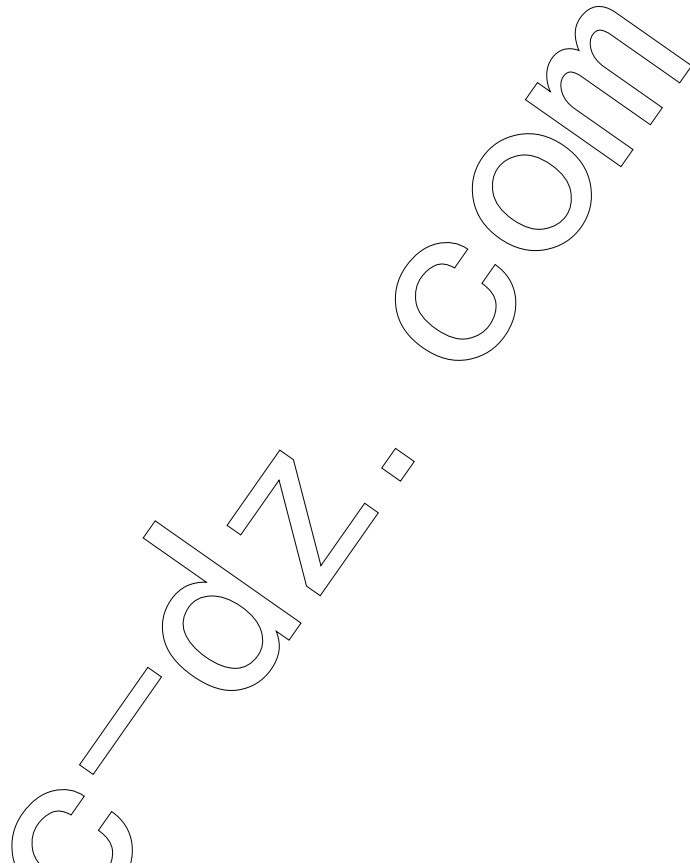
**Revision History:**           **2004-03-19**

**DS1**

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Previous Version:           2002-03-14

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**Edition 2004-03-19**

**Published by Infineon Technologies AG,  
St.-Martin-Strasse 53,  
81669 München, Germany**

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