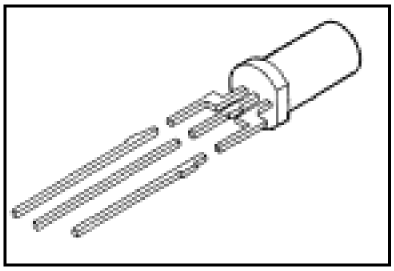
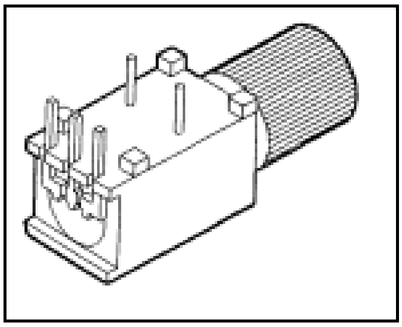
Transmitter and receiver for half duplex transmission





Preliminary Data

In this new device a transmitterchip (like SFH757) is placed on the top of a receiver chip (like Pin Photodiode SFH250). With reduced parameters (lower responsivity) the device can be used like a SFH757 or a SFH250 for working with one fiber.

Features

- Transmitter and receiver for half duplex transmission in one case
- Optimized coupling for low losses in transmitting and receiving mode
- Sensitive in visible and near IR range
- Low switching threshold
- Transfer rate ≤50 Mbitls
- 2,2 mm aperture holds standard 1000 micron plastic fiber
- No fiber stripping required
- Molded microlens for efficient coupling

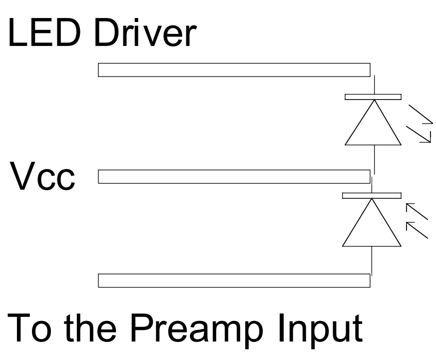
Plastic Connector Housing

- Mounting screw attached to the connector
- Interference-free transmission from light-tight housing
- Auto insertable and wave solderable
- Supplied in tubes

Applications

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

Block Diagram and Description



Maximum Ratings

Parameter	Symbol	Value	Unit
Operating Temperature Range	T_{OP}	-40 to +85	°C
Storage Temperature Range	T_{STG}	-55 to +100	°C
Junction Temperature	T_J	100	°C
Soldering Temperature (2mm from case bottom t_5s)	T_S	260	°C
Reverse Voltage Transmitter Reverse Voltage Receiver	V_{RT} V_{RR}	3 30	V V
Forward Current (Transmitter)	I_F	50	mA
Surge Current (Transmitter) t_10µs, D=0	I_{FSM}	1	A
Power Dissipation	P_{TOT}	120	mW
Thermal Resistance, Junction/Air	R_{thJA}	450	K/W

Characteristics Transmitter (T_A = 25°C)

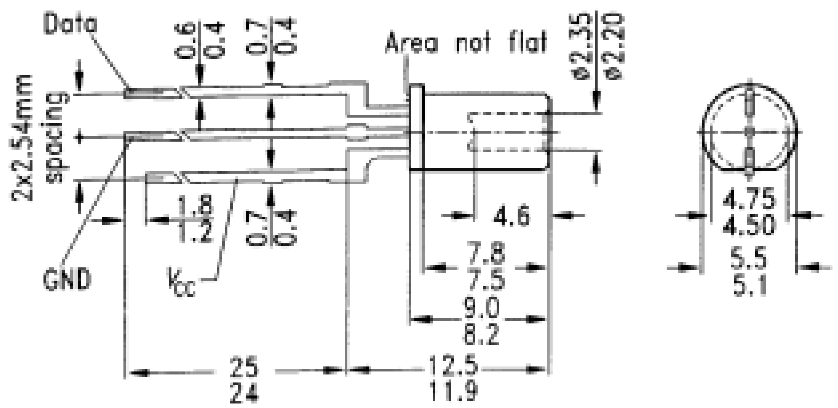
Parameter	Symbol	Value	Unit
Peak Wavelength	λ_{Peak}	650	nm
Spectral Bandwidth	$\Delta\lambda$	25	nm
Switching Times (R_L=50_ , I_F=50mA) 10% to 90% 90% to 10%	 t_R t_F	 15 15	 ns ns
Capacitance (f = 1 MHz, V_R = 0V)	C_O	30	pF
Forward Voltage (I_F= 50 mA)	V_F	2,1 (_2,8)	V
Output Power coupled into Plastic fiber (optimum position for transmitter)(I_F= 10 mA) see Note 1	Φ_{IN}	200 (_100)	µW
Temperature Coefficient $\_{IN}$	TC_	-0,4	%/K
Temperature Coefficient V_F	TC_V	-3	mV/K
Temperature Coefficient $\_{Peak}$	TC_	0,16	nm/K

Note 1: The output power coupled into plastic fiber is measured with a large area detector after a short fiber (about 30 cm). This value must not used for calculating the power budget for a fiber optic system with a long fiber because the numerical aperture of plastics fibers is decreasing on the first meters. Therefore the fiber seems to have compared with the specified value a higher attenuation on the first meters.

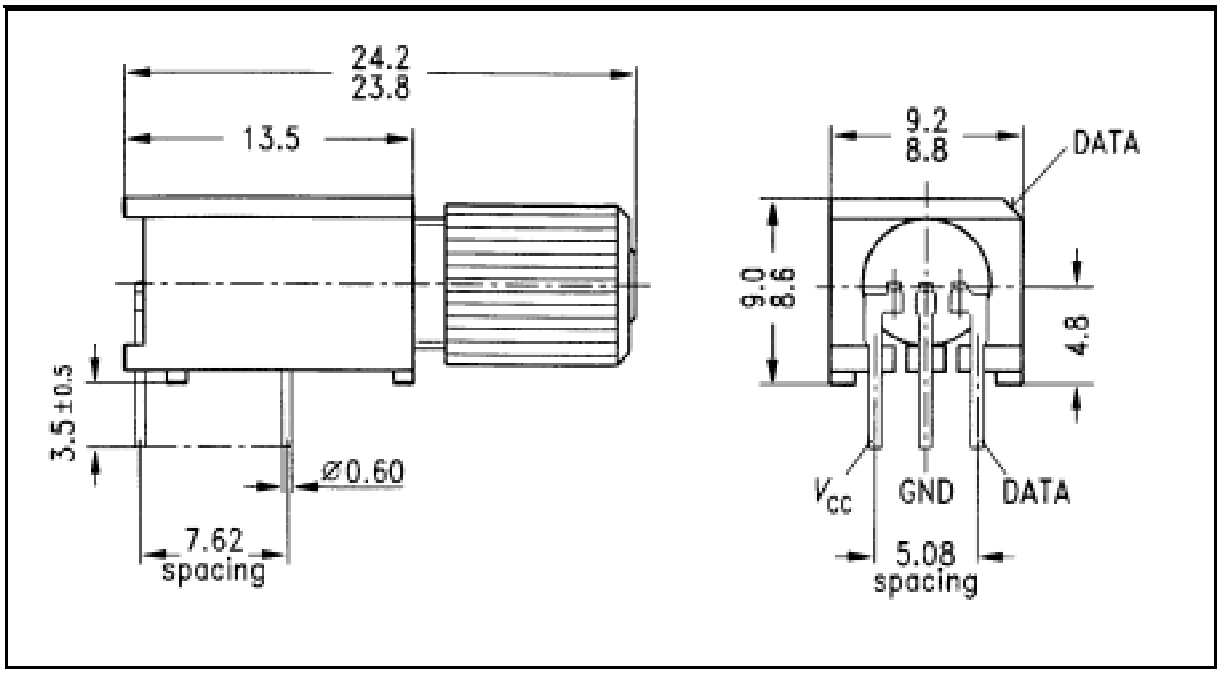
Characteristics Receiver (T_A = 25°C)

Parameter	Symbol	Value	Unit
Maximum photosensitivity wavelength	λ_{Peak}	850	nm
Photosensitivity spectral range	_	400 ... 1100	nm
Dark current (25°C, VR = 20 V)	Id	1 (<10)	nA
Maximum Dark current 85°C	Id	2500	nA
Capacitance (f= 1 MHz, VR = O V)	Co	11	pF
Rise and fall times of photocurrent (RL = 50 Ohm, VR = 30 V, _ = 880 nm) 10% to 90% 90% to 10% working with 660 nm rise and fall times become shorter	t_R t_F	0,01 0,01	µs µs
Photocurrent (_ IN = 10 µW coupled from the end of a plastic fiber, VR = 5 V) (optimum position for receiver) λ = 650 nm		0,2	A/W

Packages Outlines, **names of leads have to be changed** (dimensions in mm, unless otherwise specified)

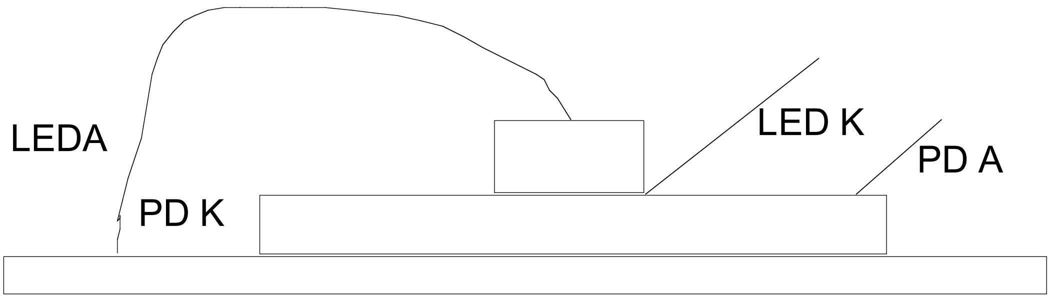


SFH 800



SFH 800V

Principal sketch of Chip on Chip



LED Anode and Photodiode Cathode have to be connected with the middle pin.
The other pins tbd.

LED Cathode short pin (indicated with Vcc) in picture

Photodiode Anode (indicated with Data) in picture