

**LED 650nm 50MBit/s**

**1 General**

This active component is especially suited for applications with standard 1mm plastic optical fiber. Pre-mounted with a fast 650nm LED capable of high optical output power, the component is a good solution in optical data transmission systems with plastic optical fibers.

**2 Applications**

Due to the high data rate of 50MBit/s, the good optical and mechanical features this transmitter may be used in many applications:

- Optical networks
- Industrial electronic
- Power electronic

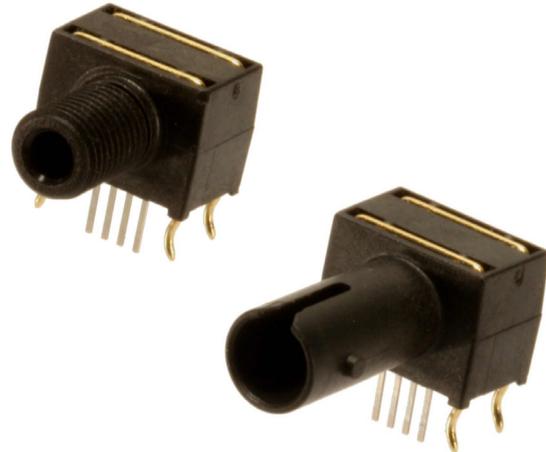
**3 Ordering Information**

**Style**

F-SMA  
 F-ST

**Part Number**

905SE650SM402  
 905SE650ST402

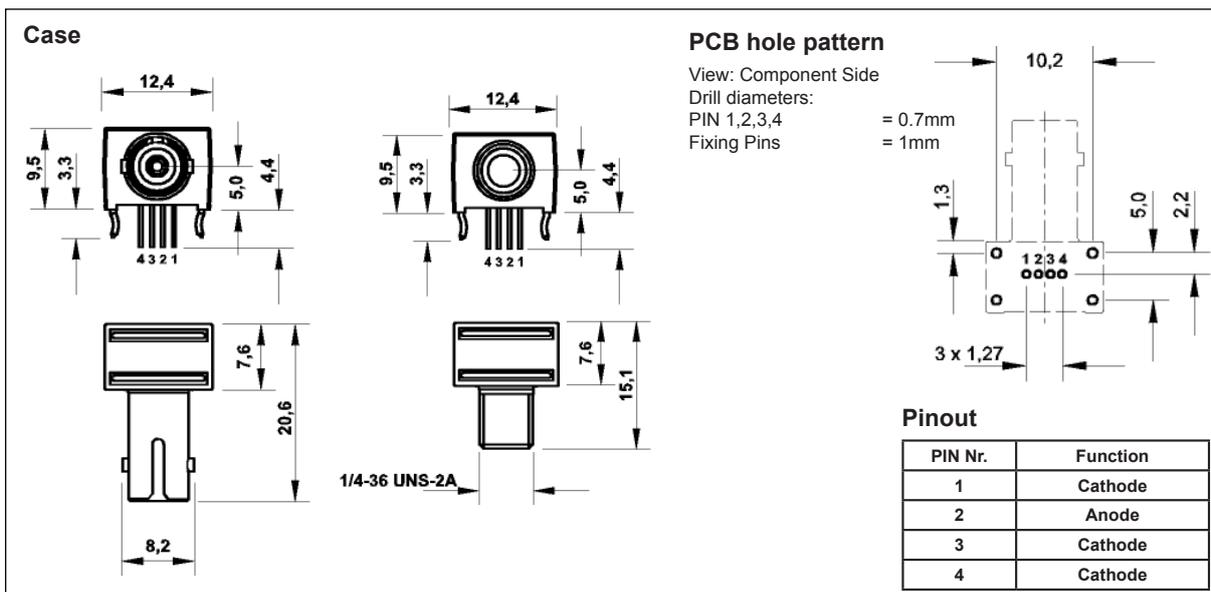


Pic. 1 650nm RCLED

**5 Features**

- 650nm LED
- -3.5dBm output power at 20mA
- 50MBit/s data rate
- conductive plastic receptacle
- F-SMA port
- F-ST port
- Qualified for plastic and HCS® fiber
- wave soldering compatible

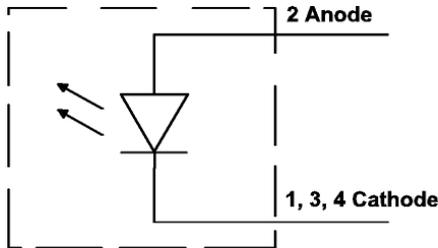
**4 Technical Drawing**



Pic 2 Case drawing

**LED 650nm 50MBit/s**

**6 Schematic** \_\_\_\_\_

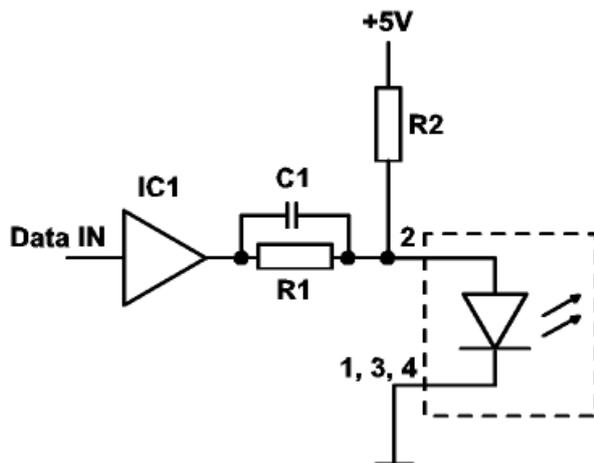


Pic. 3 Schematic

**8 PCB Layout** \_\_\_\_\_

The receptacle is made of **conductive** plastic. During PCB placement and routing avoid unwanted signal **shorts** by the housing. The fixing pins are electrical connected to the housing. Small Stand-Offs at receptacle bottom side allows routing of signal traces on PCB component side. The stand-off area ( see Pic. 5 red marking) should keep clean from signal traces.

**7 Driver circuit** \_\_\_\_\_



Pic. 4 Recommended driver circuit

R1 = 300Ω, R2 = 750Ω, C1 = 77pF  
 IC1 = 74ACT08 or equivalent

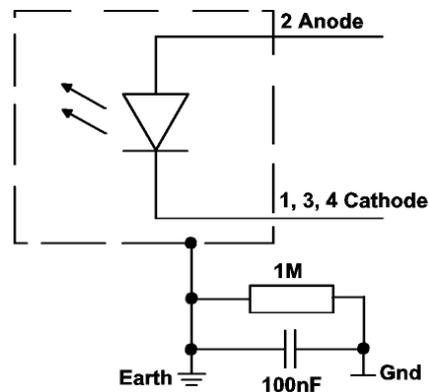
Note:  
 Avoid unwanted signals on the voltage supply.  
 Place an 100nF decoupling capacitor as close as possible to R2 and IC1.  
 Keep PCB traces as short as possible.  
 Defend the transmitter from dirt.



Pic. 5 Bottom side stand-off area

**9 EMI-coupling** \_\_\_\_\_

Electromagnetic shielding without direct coupling the housing to system ground can be achieved by using the circuitry in picture 5. Component values may vary for specific applications.



Pic. 6 EMI-coupling



## LED 650nm 50MBit/s

### 10 Maximum ratings \_\_\_\_\_

Stresses beyond those listed under ‘Maximum Ratings’ may cause permanent damage to the device. Listed values are stress limits only and functional operation of the device at these conditions is not recommended. Exposure to maximum rating conditions for extended periods may affect the device reliability.

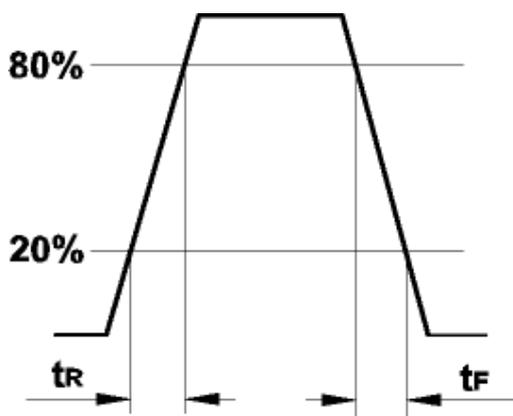
Parameter	Symbol	Value	Unit
forward current	$I_F$	40	mA
reverse voltage	$V_R$	5	V
power dissipation*1	$P_{MAX}$	250	mW
operating temperature	$T_{opr}$	-10 to +70	°C
storage temperature	$T_{stg}$	-40 to +85	°C
solder temperature	$T_{Solder}$	230°C for 5sec.	°C

\*1: Derate power dissipation at a rate of 1.75mW / °C above  $T_a = 25^\circ\text{C}$

### 11 Technical data \_\_\_\_\_

Parameter	Symbol	Condition	Min	Typ	Max	Unit
forward voltage	$V_F$	$I_F = 20\text{mA}$	-	1.9	2.3	V
data rate	$f_D$		DC	-	50	MBit/s
optical power	$P_{OUT}$	1mm POF @ $I_F = 20\text{mA}$	-7	-3.5	-	dBm
emission wavelength	$\lambda$	$I_F = 20\text{mA}$	-	650	-	nm
spectral half width	$\Delta\lambda$	$I_F = 20\text{mA}$	-	20	-	nm
switching times	$t_r$		-	-	8	ns
	$t_f$		-	-	8	ns

### 12 Timing definition \_\_\_\_\_



Pic. 7 timing

The information released by Ratioplast-Optoelectronics GmbH in this data sheet is believed to be accurate and reliable. However, no responsibility is assumed by Ratioplast-Optoelectronics GmbH for its use. Ratioplast-Optoelectronics GmbH reserves the right to change circuitry and specifications at any time without notification to the customer.