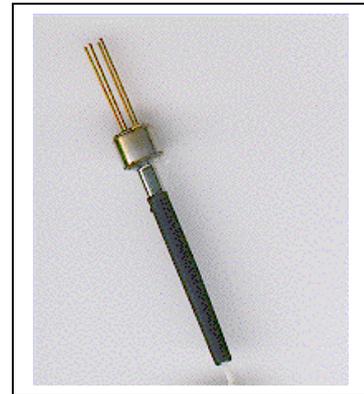


Optical Receiver Module (Photodiode with Preamplifier)

SRP00294x
SRP00295x

- InGaAs/InP-PIN-photodiode with Preamplifier-IC
- Designed for **SONET OC-48 / SDH STM-16** applications in fiber-optic communication systems
- Hermetically sealed 4-pin TO46 coaxial package
- MMF-pigtail with different connectors
- Sensitive in both opt. windows (1310 and 1550 nm)
- 3dB-Bandwidth 1600 MHz
- Module with high optical sensitivity -22 dBm
- High dynamic range (> 20 dB)
- 28,8 k Ω transimpedance (differential)
- Differential output with 60 Ω impedance
- Excellent noise immunity
- SRP00295x with flange for easy mounting

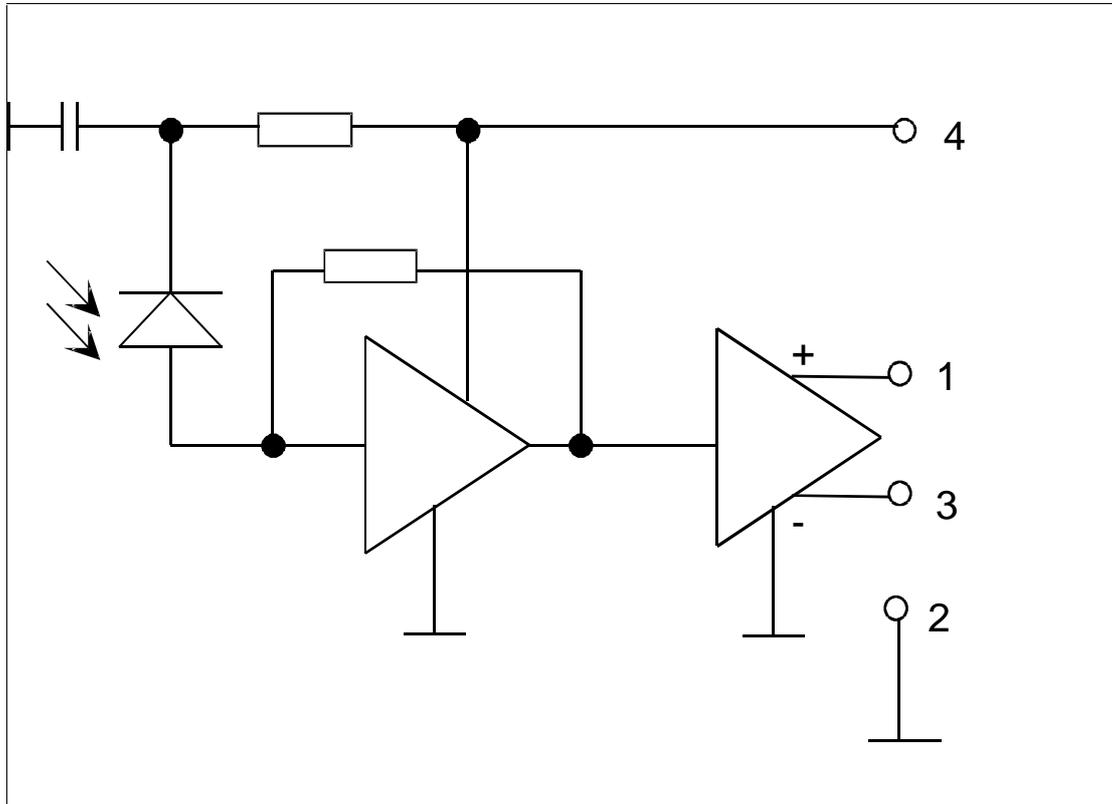


Maximum Ratings

Optical power ratings refer to the SM fiber input.

Parameter	Symbol	Values	Unit
Operating temperature range at case	T_c	- 40... +85	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	- 40... +85	$^{\circ}\text{C}$
Soldering temperature T_{max} for 10s, 2 mm distance from bottom edge of case	T_{max}	260	$^{\circ}\text{C}$
Maximum voltage	V_{cc}	6	V
Maximum optical power (average)	P_{max}	1000	μW

Principal function:



Characteristics

at $V_{cc}= 5,0V$ @ $T_A= 25^{\circ}C$, unless otherwise specified. Optical power data refer to SM fibre as optical port. Typical values, if not otherwise specified.

DC-Characteristics	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{cc}	4,5	5	5,5	V
Supply Current	I_{cc}		47		mA

AC-Characteristics	Symbol	Min.	Typ.	Max.	Unit
Optical Sensitivity ($BER \leq 10^{-9}$)	S		-22		dBm
Linear Bandwidth (-3dB)	BW		1600		MHz
Low frequency cutoff	f_{cutoff}	65			kHz
Optical overload	P_{max}		900		μW
Transresistance, differential	R_T		28,8		$k\Omega$
Output resistance, differential	R_{out}	50	60	70	Ω
Gain, differential	G		23		mV/ μW
Optical Return Loss	RL	-27			dB

Description

The SRP00294x / SRP00295x is an optical receiver module which uses a high-speed PIN-photodetector coupled with a hybrid low noise transimpedance amplifier (TIA) for 1310 nm or 1550 nm optical communications. The PIN-Photodiode is made of InGaAs/InP and has an active diameter of 75 μm .

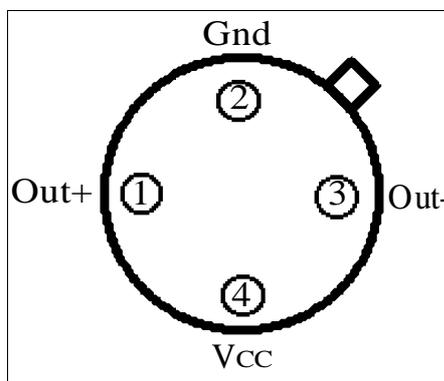
The function of the PIN-TIA module is to detect input optical power, to transduce the incident radiation into current and then to convert the current into a voltage and drive 50 Ω line.

The low input noise current density of the transimpedance amplifiers provides the optical receiver module, when used with appropriate filtering, with ample sensitivity for realizing minimum input power requirements.

Designers of optical receivers can use the module in any application that benefits from integration of the photodiode and TIA into a TO coaxial package. Typical for such applications are receivers for digital crossconnects, digital loop carriers, add/drop-multiplexers and optical network units.

The SRP00294x / SRP00295x is also beneficial because it operates from a single +5 volt supply and is packaged in a compact, hermetically sealed module. In addition, the SRP00294x / SRP00295x, which has three isolated leads, requires fewer electrical connections and no additional shielding compared with discrete implementations of the photodetection / TIA-function. These features make the SRP00294x / SRP00295x an excellent optical receiver module of benefit in other fiber optic receiver applications.

Application



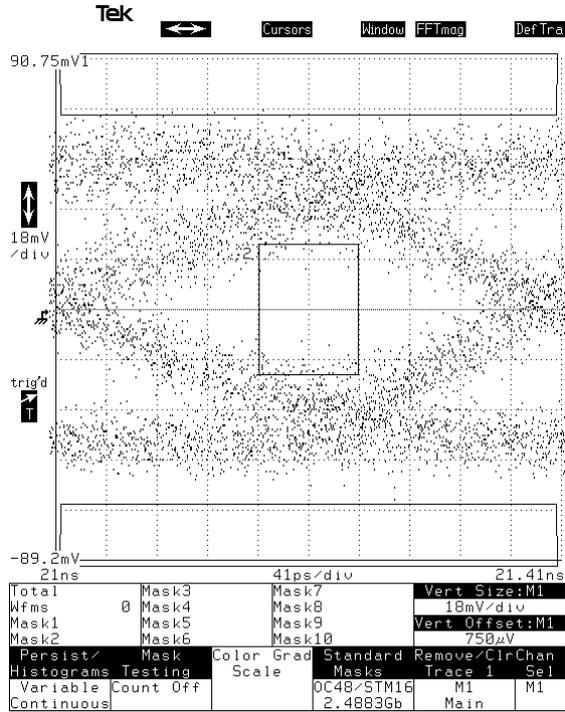
The outputs Out+ and Out - can be (AC-coupled!) loaded with 50 Ohm.

Both outputs have to be terminated with the same load.

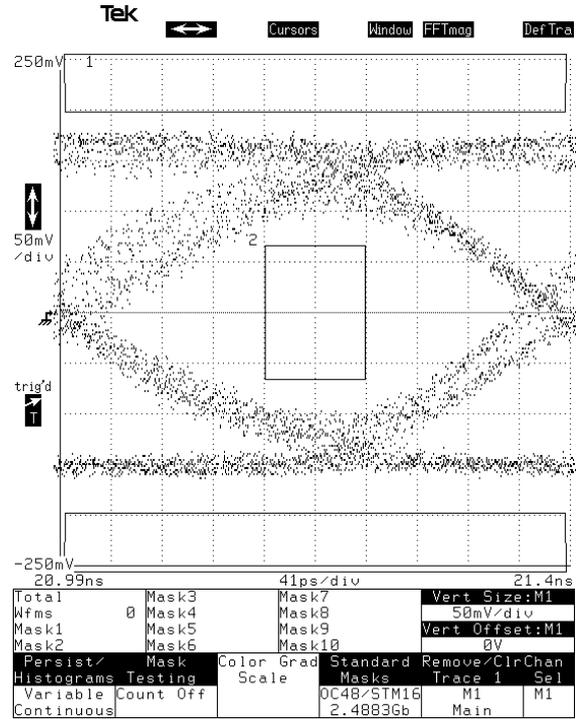
At small optical input power (< 10 μW) the photocurrent produced in the photodiode can be directly measured between Vcc and Gnd without applying any voltage at Vcc. (At higher optical input power the photocurrent is not proportional to the optical input power.)

Pinout (bottom view)

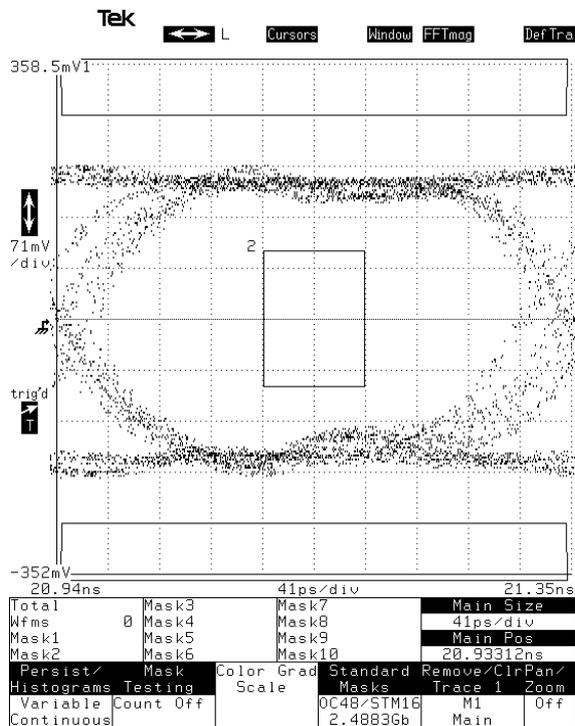
Some eye diagrams



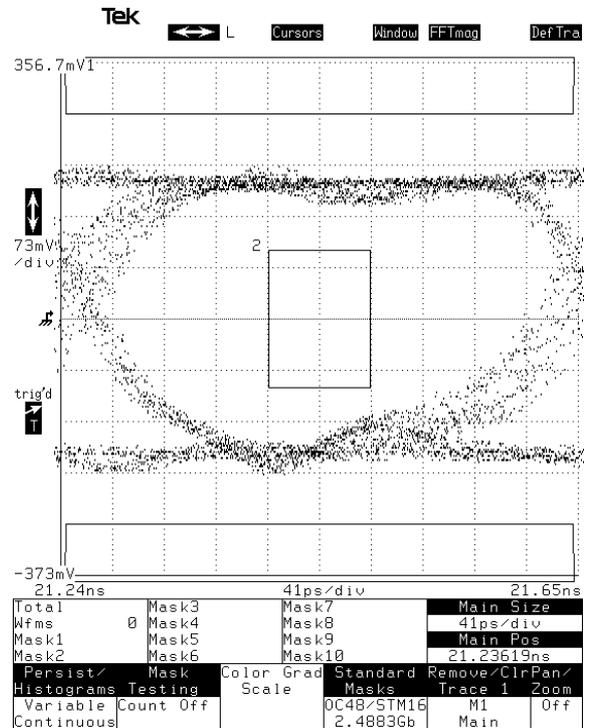
$P_{opt} = 5 \mu\text{W}$ avg. (OC-48/STM-16)



$P_{opt} = 10 \mu\text{W}$ avg. (OC-48/STM-16)



$P_{opt} = 100 \mu\text{W}$ avg. (OC-48/STM-16)



$P_{opt} = 500 \mu\text{W}$ avg. (OC-48/STM-16)