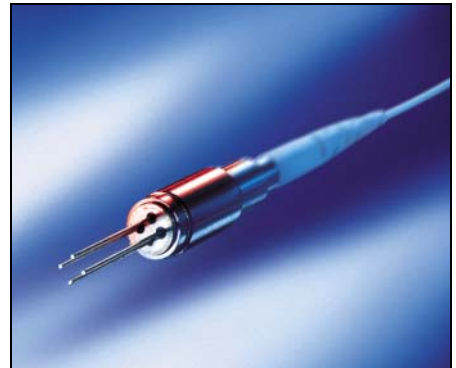


## Ternary PIN Photodiode with integrated Preamplicifier IC

SRP00244x  
SRP00245x

### Features

- InGaAs/InP PIN photodiode with preamplifier IC
- Designed for SONET OC-3 / SDH STM-1 applications in fiber-optics communication systems
- Sensitive receiver for 2nd and 3rd optical window (1300 nm and 1550 nm)
- Suitable for bit rates up to 155 Mbit/s
- Module with high optical sensitivity
- Fast switching times
- Low dark current
- Excellent noise immunity
- High reverse current stability from planar structure
- Hermetically sealed TO46 package



Pin Configuration

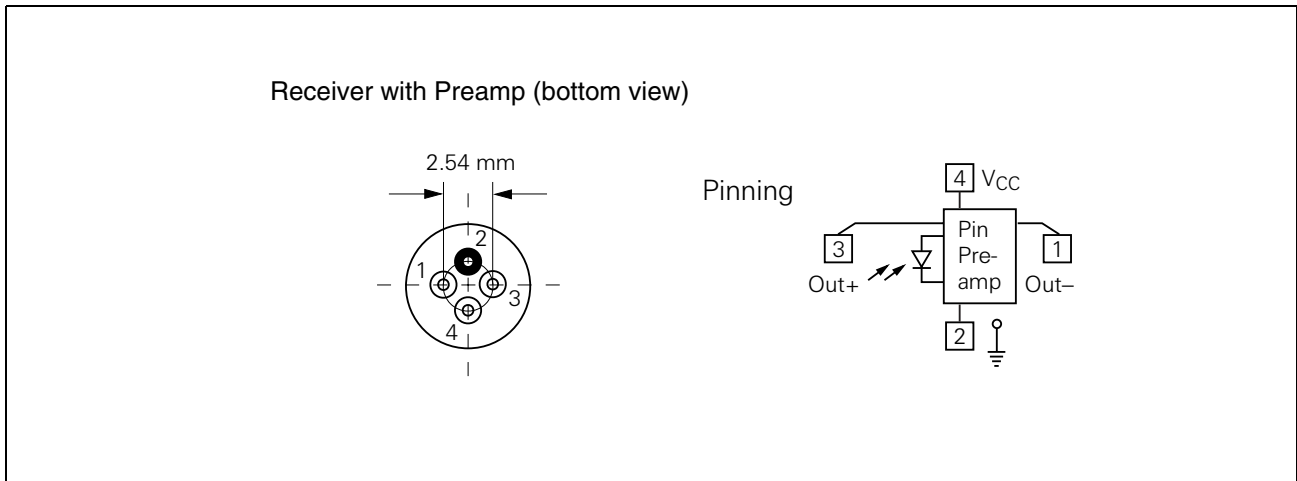


Figure 1 Receiver with Preamp

## Description

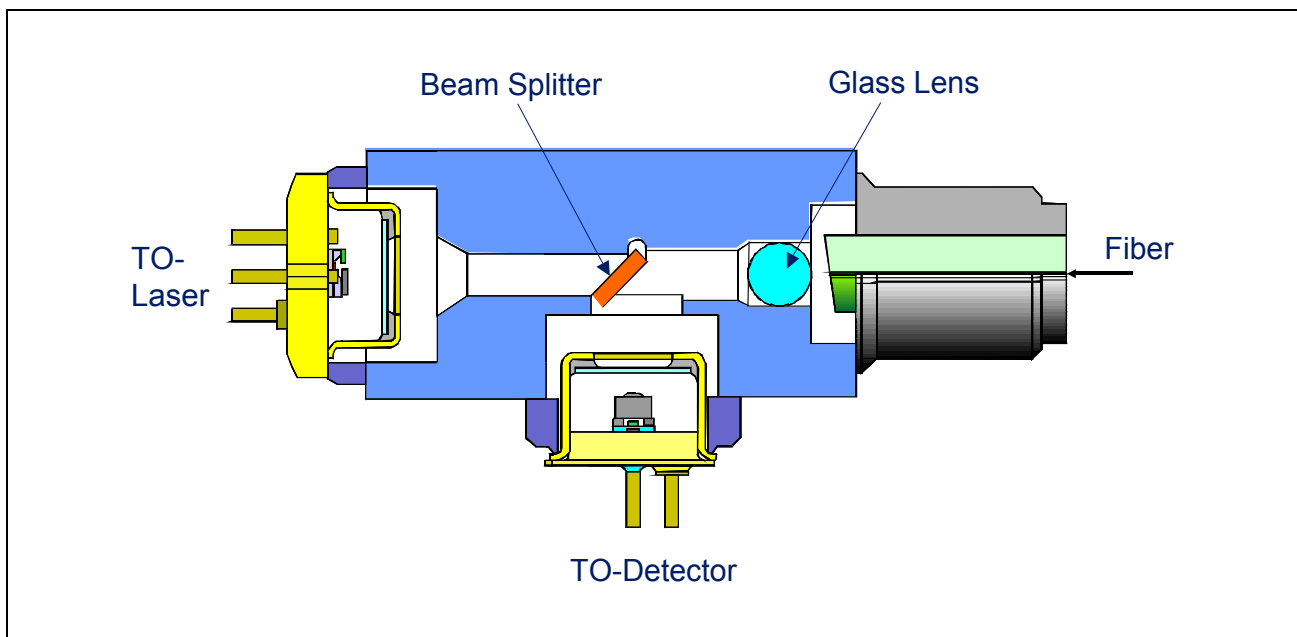
The Infineon optical receiver module has been designed for use in optical networks and is suitable for bit rates up to max. 2.5 Gbit/s if used without any TIA.

The optical receiver module uses a high-speed PIN photodiode optional coupled with a hybrid low noise transimpedance amplifier (PIN-TIA). The optical receiver photodiode can be used for 1310 nm or 1550 nm optical communications.

The PIN photodiode is made of InGaAs/InP and has an active diameter of 75  $\mu\text{m}$ . The function of the PIN and PIN-TIA optical receiver module is to detect input optical power, to transduce the incident radiation into current (PIN) and then to convert the current into a voltage (PIN-TIA).

The low input noise current density of the used transimpedance amplifiers in PIN-TIA's 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.

Last but not least the fast switching times, low dark currents and the packaging in a compact and hermetically sealed TO46 make the optical receivers usable in many other fiber optic receiver applications. One application is the use in a Compact realization of a transceiver in one module like the so called BIDI<sup>®</sup> (**Figure 2**).



**Figure 2 Compact Realization of the Transceiver in One Module**

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

Parameter	Symbol	Limit Values		Unit
		min.	max.	
<b>Module</b>				
Operating temperature range at case	$T_C$	-40	85	°C
Storage temperature range	$T_{stg}$	-40	85	
Soldering temperature ( $t_{max} = 10$ s, 2 mm distance from bottom edge of case)	$T_S$		260	

**Receiver Diode**

Reverse Voltage	$V_R$		20	V
Forward Current	$I_F$		10	mA
Optical power into the optical port	$P_{port}$		1	mW

The electro-optical characteristics described in the following table are only valid for use within the specified maximum ratings or under the recommended operating conditions.

Characteristics for Pin-Preamp Receivers at  $T_A = 25^\circ\text{C}$ , unless otherwise specified.

**Preamp Characteristics**

Parameter	Symbol	Limit Values			Unit
		min.	typ.	max.	

**DC-Characteristics**

Supply Voltage	$V_{CC}$	4.5	5	5.5	V
Supply Current	$I_{CC}$		25	26	mA

**AC-Characteristics**

Optical Sensitivity (BER $\leq 10^{-9}$ , PN23)	$S$	-31	-35		dBm
Linear Bandwidth (-3 dB)	BW	180	240		MHz
Optical overload (avg.)	$P_{max}$	-4			dBm
Transimpedance (single ended)	$R_T$	8	10	12	k $\Omega$
Output resistance	$R_{out}$	40	50	60	$\Omega$
Noise current density			3		pa/ $\sqrt{\text{Hz}}$
Gain (differential)	G	10		24	V/mW
Return Loss, $\lambda = 1310$ nm	RL			-27	dB

Some Eye Diagrams

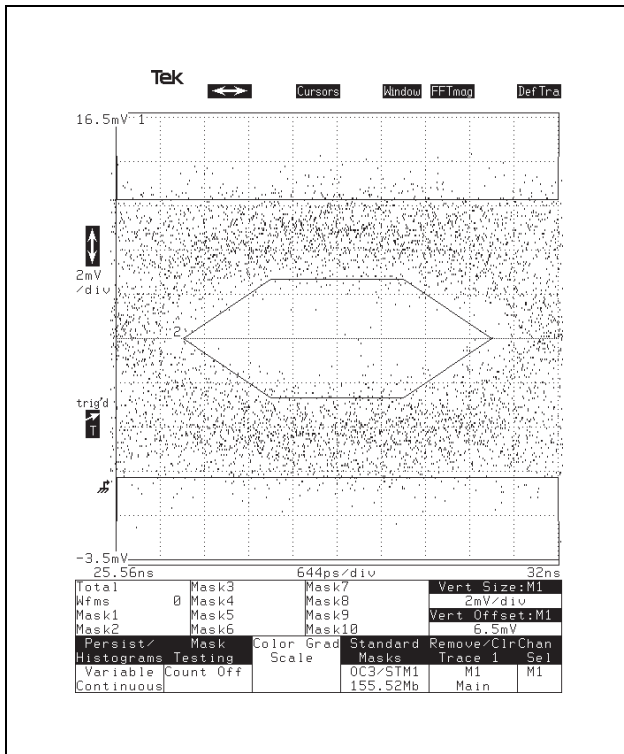


Figure 3  $P_{opt} = 0.25 \mu\text{W avg. (OC-3)}$

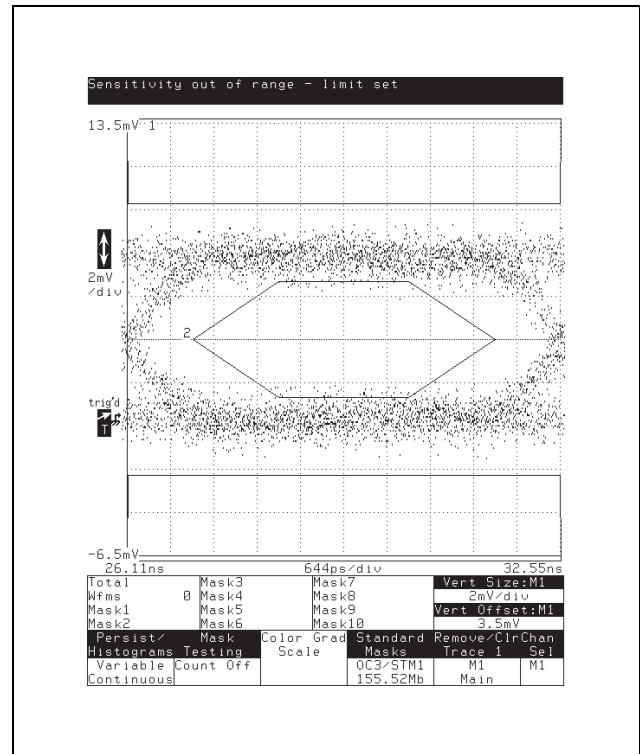


Figure 5  $P_{opt} = 1 \mu\text{W avg. (OC-3)}$

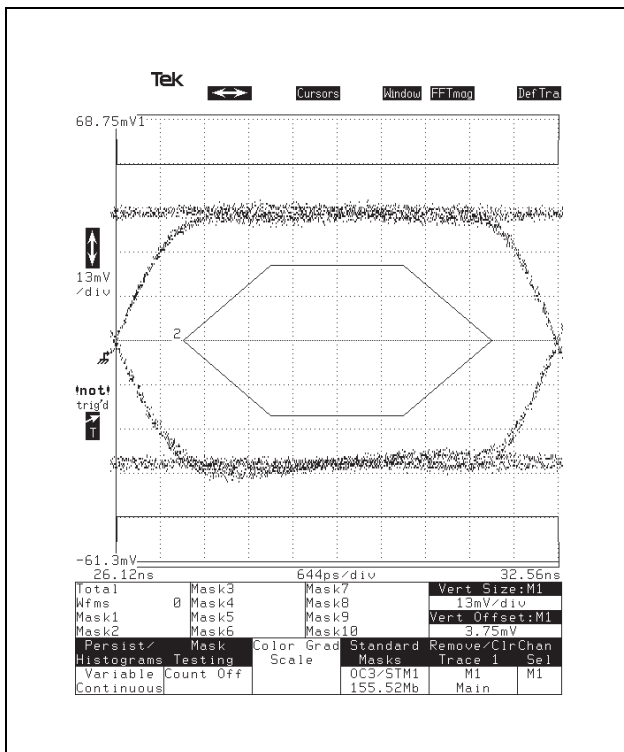


Figure 4  $P_{opt} = 10 \mu\text{W avg. (OC-3)}$

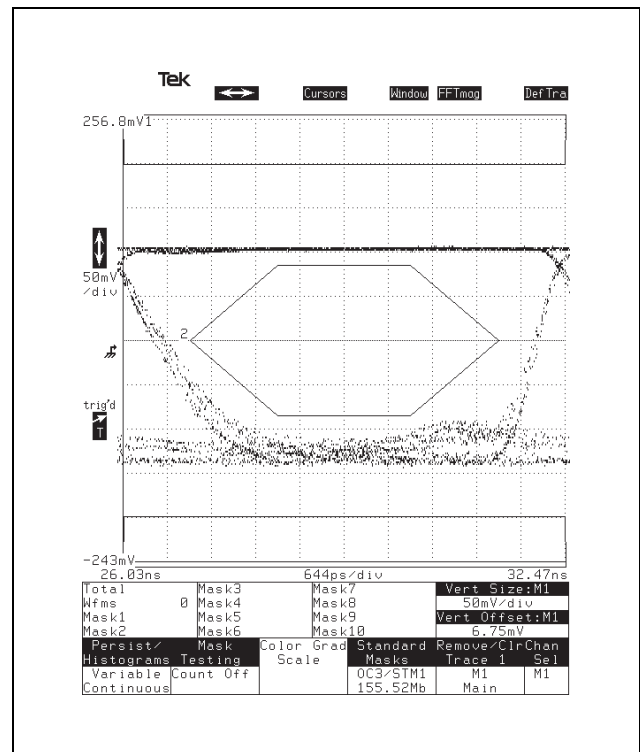


Figure 6  $P_{opt} = 100 \mu\text{W avg. (OC-3)}$

## Fiber Data

The mechanical fiber characteristics are described in the following table.

### Fiber Characteristics

Parameter	Limit Values			Unit
	min.	typ.	max.	
Mode Field Diameter		50		μm
Cladding Diameter	123	125	127	
Mode Field/Cladding Concentricity Error			1	
Cladding Non-circularity			2	%
Mode Field Non-circularity			6	
Cut off Wavelength	1270			nm
Jacket Diameter	0.8		1	mm
Bending Radius	30			
Tensile Strength Fiber Case	5			N
Length	0.8		1.2	m

Package Outlines

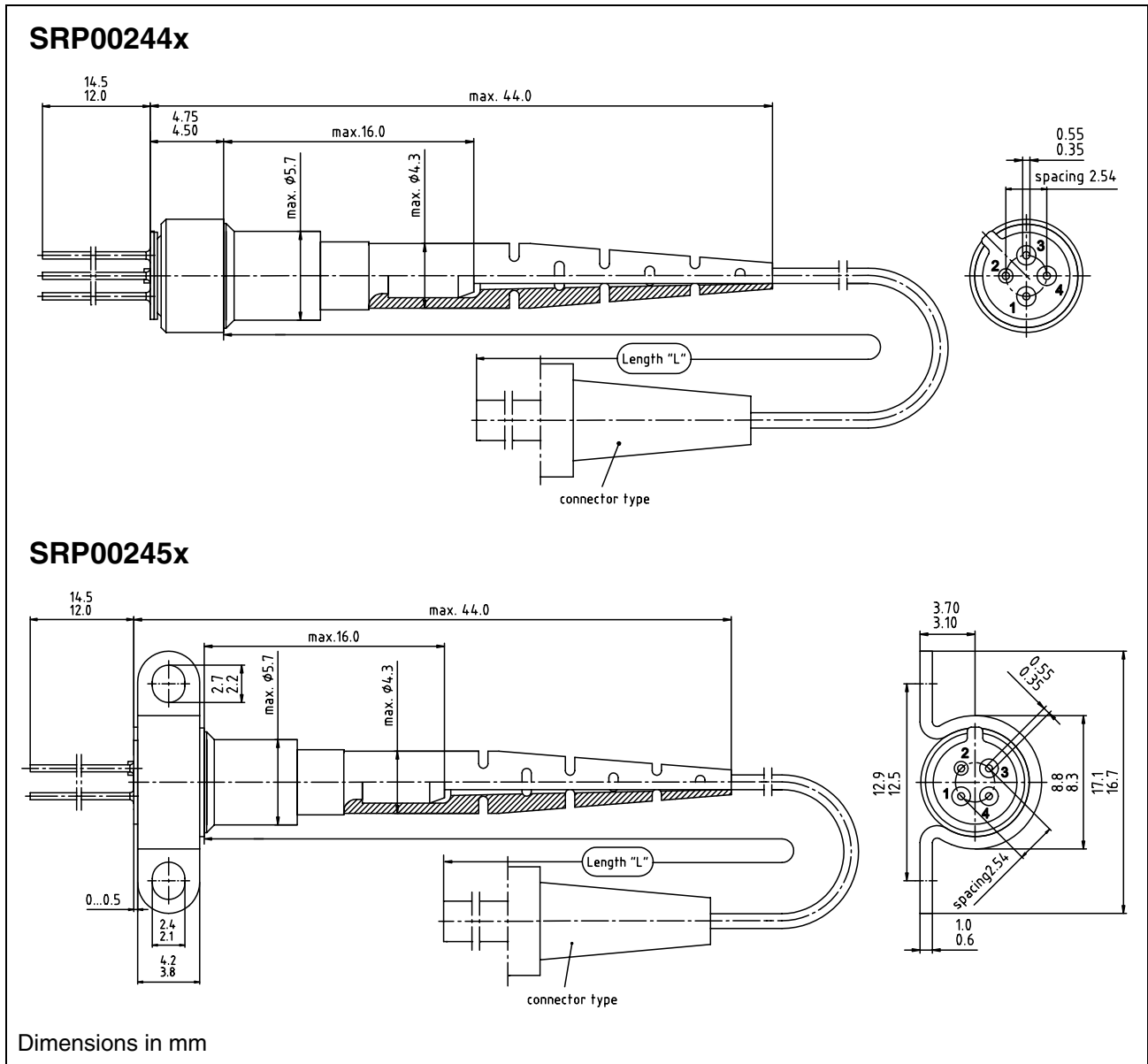


Figure 7

**Flange Options**

Type	Flange
SRP00244x	without
SRP00245x	with

**Connector Options**

Model	Type
SRP00244H SRP00245H	MM FC/PC
SRP00244G SRP00245G	SM FC/PC
SRP00244O SRP00245O	MM SC/PC 0°
SRP00244N SRP00245N	SM SC/PC 0°
SRP00244Q SRP00245Q	MM SC 8° APC
SRP00244P SRP00245P	SM SC 8° APC
SRP00244W SRP00245W	MM without connector
SRP00244Z SRP00245Z	SM without connector

Other connectors on request



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**SRP00244x**

**SRP00245x**

**Revision History: 2001-12-01**

**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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