

## Preliminary Data Sheet VSC7902

## SONET/SDH Transimpedance Amplifier

### Features

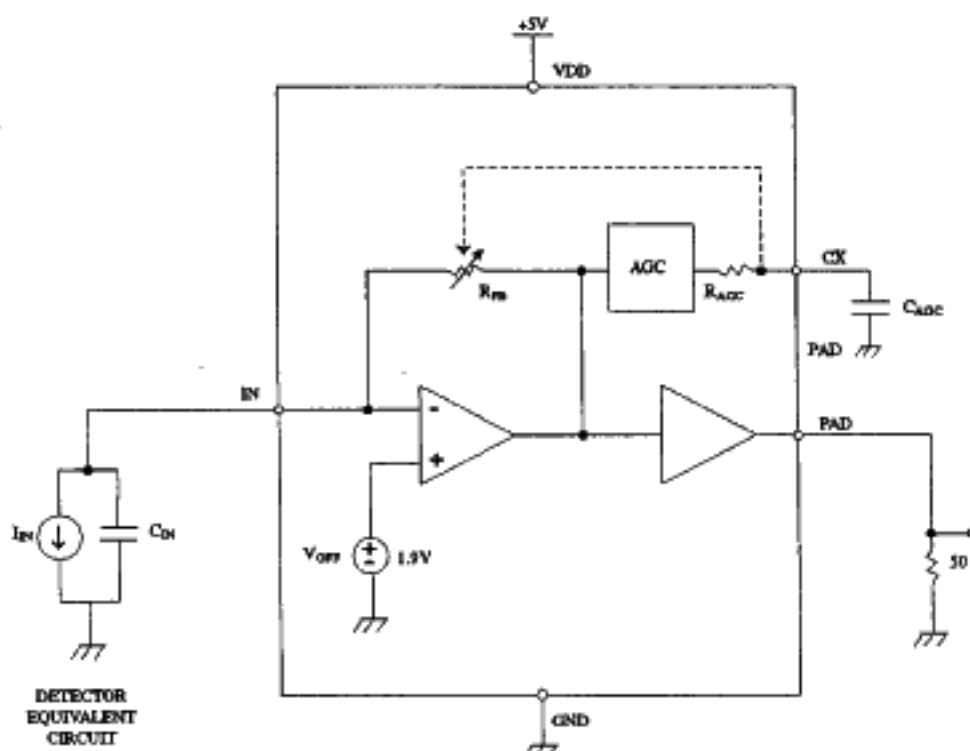
- SDH/SONET 155 Mb/s Compatible
- Single 5V Power Supply
- Single Ended Output
- Low Noise
- Integrated AGC
- Accepts a Wide Variety of Optical Detectors
- Industrial Temperature Range (-40 to +85 °C)

### General Description

The VSC7902 Transimpedance Amplifier provides a highly integrated solution for converting the current produced by a photodiode into a output voltage. The typical application of these devices is in a front-end receiver for a fiber-optic communication channel. The benefits of Vitesse Semiconductor's Gallium Arsenide H-GaAs process are fully utilized to provide very high bandwidth and low noise. Parts are available in die form.

The VSC7902 Transimpedance Amplifier is typically used with long-wavelength optical detectors. The amplifier includes an integrated AGC function to sense a wide range of input currents. AGC is accomplished by modifying the transimpedance of the amplifier. The AGC loop time constant can be changed using an off-chip capacitor.

### VSC7902 Block Diagram



**Table 1: Electrical Specifications**

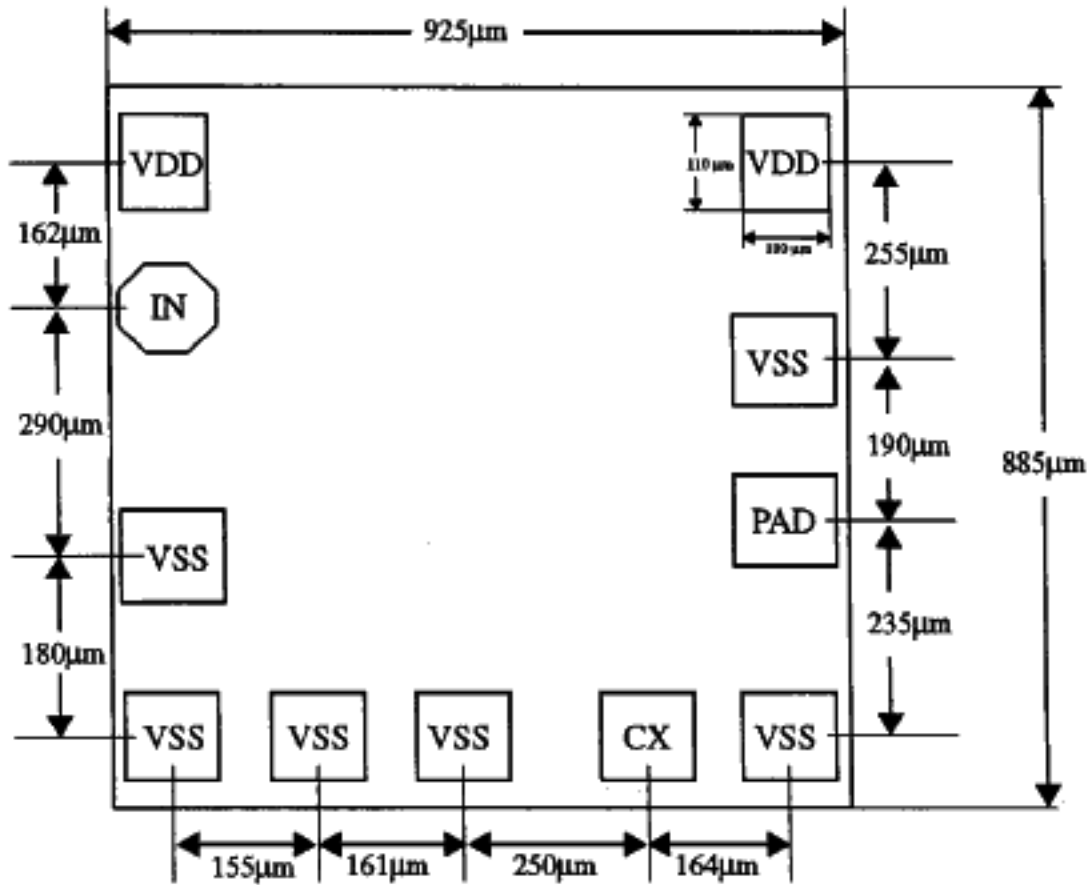
Symbol	Description	Min	Typ	Max	Units	Conditions
$Z_{dc}$	DC Transimpedance	10			K $\Omega$	$R_L = \infty$
$Z_{ac}$	AC Transimpedance	5			K $\Omega$	$R_L = 50\Omega$ , $f = 150\text{MHz}$ , $I_{in} = 4\mu\text{A}$
$f_{3db}$	Modulation Bandwidth	130			MHz	$R_L = 50\Omega$ , $C_{in} = 0.8\text{pF}$ , $I_{in} = 4\mu\text{A}$
$I_{NOISE}$	Input Noise Current Density		2		$\frac{\text{pA}}{\sqrt{\text{Hz}}}$	
$I_{max}$	Max. Input Current			2	mA	
$I_{agc}$	AGC Threshold Current		20		$\mu\text{A}$	
$T_{agc}$	AGC Time Constant		33		$\mu\text{sec}$	$C_{agc} = 470\text{pF}$
$V_{OFF}$	Input Offset Voltage		1.9		V	$T_J = 25^\circ\text{C}$
$\frac{dV_{OFF}}{dTemp}$	Input Voltage Drift			-3	$\frac{\text{mV}}{^\circ\text{C}}$	$I_{IN} = 4\mu\text{A}$
$V_{out}$	Output Voltage		1.5		V	
$R_{out}$	Output Resistance	35	50	65	$\Omega$	
$I_{cc}$	Supply Current		35	45	mA	

Note: All specifications guaranteed with  $V_{DD} = +5.0\text{V} \pm 10\%$ ,  $C_{IN} = 0.8\text{pf}$ ,  $T_{JUNCTION} = -45^\circ\text{C}$  to  $100^\circ\text{C}$  unless otherwise noted.

**Table 2: Absolute Maximum Rating**

Symbol	Parameter	Maximum
$V_{DD}$	Power Supply	7 Volts
$T_{STG}$	Storage Temperature	$-50^\circ\text{C}$ to $125^\circ\text{C}$
$I_{IN}$	Input Current	10mA

Figure 1: VSC7902 Bonding Pad Diagram



## **Part Numbering Scheme**

VSC7902B

Package Style

X = Die Form

## **Notice**

This document contains information on products that are in the preproduction phase of development. The information contained in this document is based on test results and initial product characterization. Characteristic data and other specifications are subject to change without notice. Therefore, the reader is cautioned to confirm that this datasheet is current prior to placing orders.

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