

HIGH SENSITIVITY OC-12/STM-4 APD RECEIVERS

SRX12-APD

Product Description

The SRX12-APD is a high sensitivity receiver module designed to exceed the SONET/SDH optical interface requirements at OC-12/STM-4 (622Mb/s) data rate. Highly reliable InGaAs/InP avalanche photodiode (APD) is used to cover the entire long wavelength range from 1100nm to 1600nm.

The receivers feature a low noise GaAs transimpedance IC with AGC capability to provide an extremely wide dynamic range and high sensitivity. The APD bias voltage is temperature compensated to ensure stable operation over the entire operating temperature range. A signal detect function which indicates loss of optical input is provided. A differential optical power monitor output is also available.

The SRX12-APD receivers require only a single +5V supply. The data interface signals are differential PECL. The signal detect outputs can have either PECL or TTL interface.

The SRX12-APD receivers can operate over an operating case temperature range of 0°C to +70°C ("H" option) or -40°C to +85°C ("I" option). The module is housed in a 24-pin dual-in-line metal package with a single mode fiber pigtail, which is terminated with ST, FC or SC connector.

Related OC-12/STM-4 transmitters & receivers

STX-12: 20-pin laser transmitter

SRX-12: 20-pin receiver without clock recovery (PECL SIGNAL DETECT)

SRX-12-L: 20-pin receiver without clock recovery (TTL SIGNAL DETECT)

SRC-12-S: 24-pin receiver with clock recovery



Features

- Exceeds SONET/SDH OC-12/STM-4 Long Reach Specifications
- Optical Power Monitor Outputs
- 40°C to +85°C Operating Temperature Option
- 24-pin DIP Metal Package
- ST, FC or SC-connectorized Fiber Pigtail
- Differential PECL Data Outputs
- Differential PECL or TTL Signal Detect Output Option
- Single +5V Power Supply

Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Storage Temperature	T_{ST}	- 40	+ 85	°C
Operating Case Temperature	"H" option	0	+ 70	°C
	"I" option	- 40	+ 85	
Operating & Storage Humidity	-	-	85	%
Supply Voltage	V_{CC}	0	+ 6.0	V
Maximum Input Optical Power	$P_{in,max}$	-	- 5.0	dBm
Lead Soldering Temperature & Time	-	-	260°C, 10 sec	

Receiver Performance Characteristics (Over Operating Case Temperature, $V_{CC} = 4.75$ to $5.25V$)

All parameters guaranteed only at typical data rate

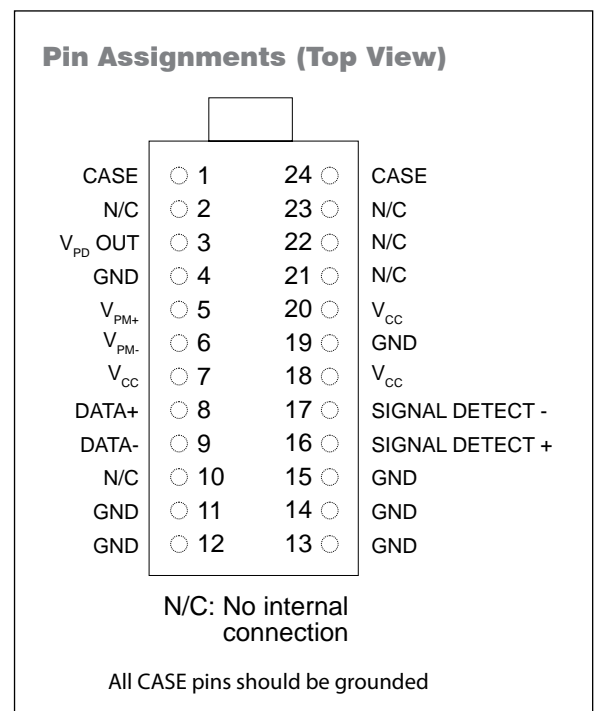
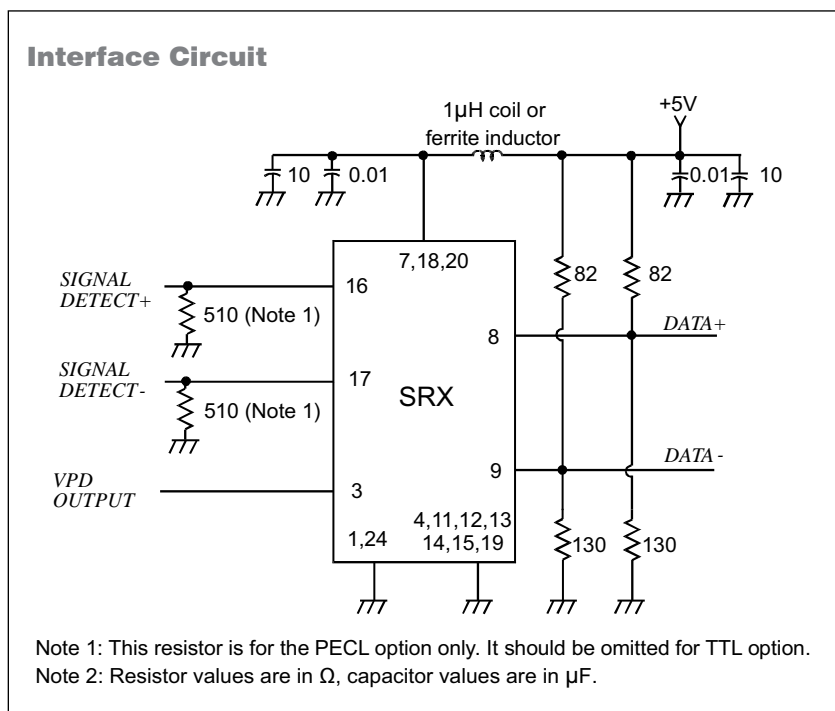
Parameter	Symbol	Minimum	Typical	Maximum	Units
Operating Data Rate ¹	B	-	622	-	Mb/s
Receiver Sensitivity (10 ⁻¹⁰ BER) ²	Temperature Option "I"	- 37.0	- 40.5	-	dBm
	Temperature Option "H"	- 38.0	- 40.5	-	
Maximum Input Optical Power (10 ⁻¹⁰ BER) ²	P_{max}	- 8.0	- 3.0	-	dBm
Signal Detect Thresholds	Increasing Light Input	P_{sd+}	-	- 38.0	dBm
	Decreasing Light Input	P_{sd-}	- 55.0	-	
Signal Detect Hysteresis	-	-	0.5	-	dB
Wavelength of Operation	λ	1100	-	1600	nm
Optical Power Monitor Differential Voltage (at 25°C)	V_{PM}	-	10	-	mV/ μ W

¹ Data rate ranges from 50Mb/s to 700Mb/s. However, some degradation may be incurred in overall performance.
² Specified in average optical input power and measured at 1310nm wavelength with 2²³-1 PRBS at 622Mb/s.

Receiver Electrical Interface (Over Operating Case Temperature, $V_{CC} = 4.75$ to $5.25V$)

Parameter	Symbol	Minimum	Typical	Maximum	Units
Supply Voltage	V_{CC}	4.75	5.0	5.25	V
Supply Current	I_{CC}	-	120	180	mA
DATA Output HIGH Voltage ¹	V_{OH}	$V_{CC} - 1.150$	-	$V_{CC} - 0.880$	V
DATA Output LOW Voltage ¹	V_{OL}	$V_{CC} - 1.830$	-	$V_{CC} - 1.555$	V
SIGNAL DETECT HIGH Voltage (PECL option) ¹	V_{OH}	$V_{CC} - 1.150$	-	$V_{CC} - 0.880$	V
SIGNAL DETECT LOW Voltage (PECL option) ¹	V_{OL}	$V_{CC} - 1.830$	-	$V_{CC} - 1.555$	V
SIGNAL DETECT HIGH Voltage (TTL option)	V_{OH}	2.7	-	V_{CC}	V
SIGNAL DETECT LOW Voltage (TTL option)	V_{OL}	0	-	0.5	V
V_{PD} Output Voltage (maximum current 3mA)	V_{PD}	- 90	- 60	- 20	V

¹ With termination of 50 Ω to $V_{CC} - 2V$.



Application Notes

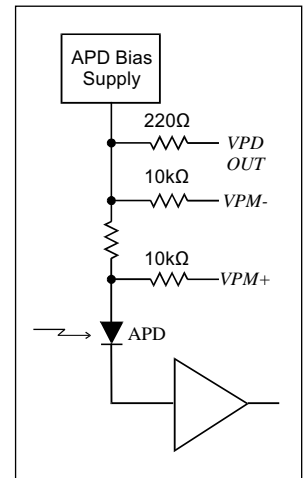
The receiver converts the incident optical power to a photocurrent via a high performance avalanche photodiode (APD). The photocurrent can be monitored via the differential voltage across the two VPM+ and VPM- output pins. It is important to note that the common mode voltage (i.e. DC voltages at PM+ and VPM-) is high (~60V typical). The APD bias voltage is temperature compensated to ensure stable operation over the entire operating temperature range. The APD bias voltage is also available as an output via the VPD output. The maximum current that this output can source is 1mA.

The signal detect circuit monitors the level of the incoming optical signal and generates a logic LOW signal when an insufficient photocurrent is produced.

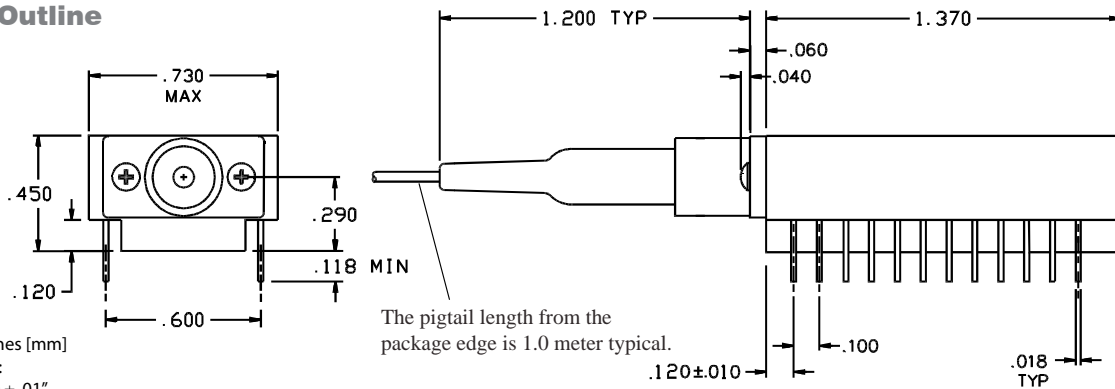
Both differential DATA+ and DATA outputs (also SIGNAL DETECT+ and SIGNAL DETECT- if the PECL option is chosen) are open emitter PECL levels requiring termination (50Ω to $V_{CC} - 2V$ or 510Ω to GRD is recommended). Both differential outputs should be terminated in the same manner, even if only one is used.

If the TTL option is chosen for the SIGNAL DETECT outputs, no termination resistor should be used.

The power supply line should be wellfiltered. The power supply should be bypassed by 0.01 or 0.1 μF ceramic chip placed as close to the receiver module as possible.



Package Outline



Dimensions in inches [mm]
 Default tolerances:
 .xxx = ± .005", .xx = ± .01"

The pigtail length from the package edge is 1.0 meter typical.

Related Transmitter & Receiver Modules

- STX-12 : OC-12/STM-4 Transmitter (multi-sourced 20-pin DIP)
- SRX-12 : OC-12/STM-4 Receiver without Clock Recovery, ECL SIGNAL DETECT (multi-sourced 20-pin DIP)
- SRX-12-L : OC-12/STM-4 Receiver without Clock Recovery, TTL SIGNAL DETECT (multi-sourced 20-pin DIP)
- SRC-12 : OC-12/STM-4 Receiver with Clock Recovery (multi-sourced 20-pin DIP)
- SRX-12-S : OC-12/STM-4 Receiver with Clock Recovery (24-pin DIP, compatible with Sumitomo SDT8712-RD)

Ordering Information

