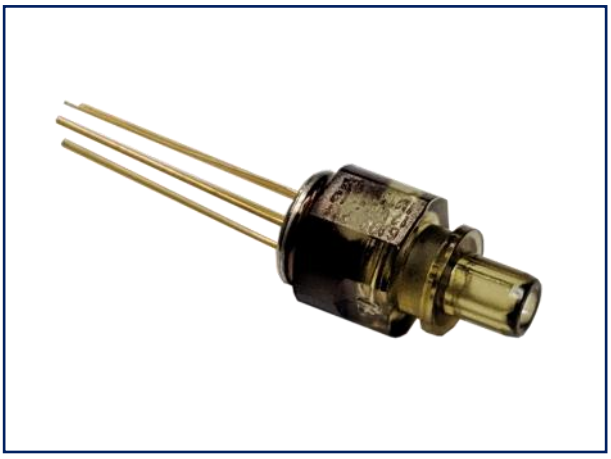
Features:

- 5 pin LC ROSA, with separate PD bias for RSSI
- High performance GaAs PIN photodiode with separate transimpedance amplifier
- Low electrical parasitic
- TO46 package
- Data rates from 155Mbps to 4.25Gbps
- A separate detector bias pin which can be used for receive power monitoring
- Low bias currents and voltages



COTSWORKS 4.25G SX ROSA is ideal for high speed fiber optic communications

General Description

The 105-00001 uses a high-performance GaAs PIN photo-detector packaged with a transimpedance amplifier designed to meet performance requirements for 4.25Gbps data communication over multimode optical fiber at 850nm. Applications include Ethernet, Fiber Channel, and ATM protocols. The optical assembly is designed to interface either 50µm or 62.5µm multimode fiber. The 105-00001 is designed to be paired with COTSWORKS P/N 104-00002 VCSEL TOSA product.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	T_{sto}	–40	85	°C	
Case Operating Temperature	T_{op}	–40	85	°C	
Lead Solder Temperature	T_{solder}		260	°C	(1)
Power Supply Voltage	V_{cc}	–0.5	4.0	V	
Incident Optical Power	P_{max}		+6	dBm	+3 dBm average
ESD Exposure (Human Body Model)	V_{ESD}		225	V	(2)

Notes

1) Hand solder for 10 seconds
2) Proper ESD conditions should be employed while attaching to host board.

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Opto-Electric Specifications (3.0V<Vcc<3.6V, AC coupled to 50Ω (100Ω differential), –40°C<T<85°C unless otherwise specified)

Parameters	Test Condition	Symbol	Min.	Typ.	Max.	Units	Notes
Data Rate		DR	0.15		4.25	Gbps	
Supply Voltage		V_{CC}	3.0	3.3	3.6	V	
Supply Current	P_R =0µW, R_L=50Ω AC coupled	I_{CC}		30	45	mA	(1)
Optical Return Loss	P_R =–12dBm	ORL	12			dB	(1)
Input Optical Wavelength	0°C to 70°C	λ_P	770	850	870	nm	
Maximum Average Input Power before Overload		P_{MAX}	0	+3		dBm	
Differential Output Voltage Swing	$P_{R,OMA}$ = –12Bm, AC Coupled to R_L=50Ω	$V_{o(pk-pk)}$	100	150	220	mV	(1)(2)
Differential Transimpedance	$P_{R,OMA}$ = –12dBm, AC Coupled to R_L=50Ω	T	1500	2500	3500	V/W	(1)(2)
–3dB Optical/Electrical Bandwidth	$P_{R,OMA}$ =–12dBm	BW	2		4	GHz	(1)(2)(3)
Low Frequency –3dB Cutoff	$P_{R,OMA}$ =–12dBm	BW_{LF}			10	KHz	(1)(2)(3)
Output Impedance		Z_{OUT}	42	50	58	Ω	
Output Return Loss	F<3GHz	S_{22}	8	12		dB	
RMS Input Referred Noise Equivalent Power	3.2GHz, 4-pole BT Filter, P_R=0uW (Dark), BER 10^{-12}	NEP			20	µW, OMA	(4)
Sensitivity, OMA	DR=1.0625, 1.25Gbps DR=2.125, 2.5Gbps DR=3.125Gbps DR=4.25Gbps	S		–20 –19 –18 –18	–17 –16 –16 –15.5	dBm	(5)
Stressed Sensitivity, OMA	DR=1.0625, 1.25Gbps DR=2.125, 2.5Gbps DR=3.125Gbps DR=4.25Gbps	$S_{STRESSED}$		–17 –16 –14 –14	–14 –13 –11 –10.5	dBm	(5)(6)
Rise/Fall Time	$P_{R,OMA}$ =–12dBm, (20%–80%)	T_R/T_F		80	120	ps	(2)(7)
Pulse Width Distortion		PWD			5	%	
Power Supply Rejection Ratio	P_R =0µW (Dark), 5MHz<F<2GHz	PSRR	20			dB	(1)(8)
Monitor Current Slope	P_R =–12dBm	I_{MON}	0.45	0.5	0.55	A/W	(9)
Monitor Current Offset	P_R =0mW	I_{OFFSET}			10	nA	
PD Bias Voltage		PD_{BIAS}	Vcc –1	Vcc	Vcc +0.5	V	(13)
Group Delay	$P_{R,OMA}$ = –12dBm,AC Coupled to R_L=50Ω 2MHz<F< 2GHz	Delay	–50		50	ps	(10)
Deterministic Jitter	$P_{R,OMA}$ = –12dBm, AC Coupled to R_L=50Ω	DJ_{TIA}		30	40	ps	(11)
Random Jitter	$P_{R,OMA}$ = –12dBm, AC Coupled to R_L=50Ω	RJ_{TIA}		3	5	ps	(12)

Notes:

1. PR is the average optical power at the fiber face.
2. $P_{R,OMA}$ is the peak-to-peak optical power at the fiber face (optical Module Amplitude) $P_{R,OMA} \equiv \frac{2P_R(ER-1)}{ER+1}$ where ER is the extinction ratio (linear) of the optical source.
3. Bandwidth and Low Frequency Cutoff are measured with a small signal sinusoidal light source with –12dBm average power
4. RMS input referred optical noise equivalent power is obtained by measuring the RMS output noise into a 1875 MHz, 4-pole Bessel–Thompson filter then dividing by the responsivity. A scaling factor of 14 is used to predict a BER of 10^{-12}.
5. Sensitivity is measured with an optical source with an extinction ratio of 3dB.
6. Stressed receiver sensitivity is measured with 3.5dB vertical eye closure (intersymbol interference) and with 0.3UI of jitter added. The measurement technique is defined in IEEE 802.3ae.
7. Rise/Fall times are corrected for optical source Rise/Fall times. $T^2_{TIA} = T^2_{MEASURED} - T^2_{OPTICAL}$
8. Value shown is with no external power supply filtering.
9. The monitor current slope is measured as the current into the PD_{BIAS} connection.

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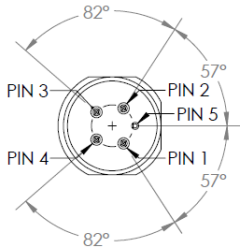
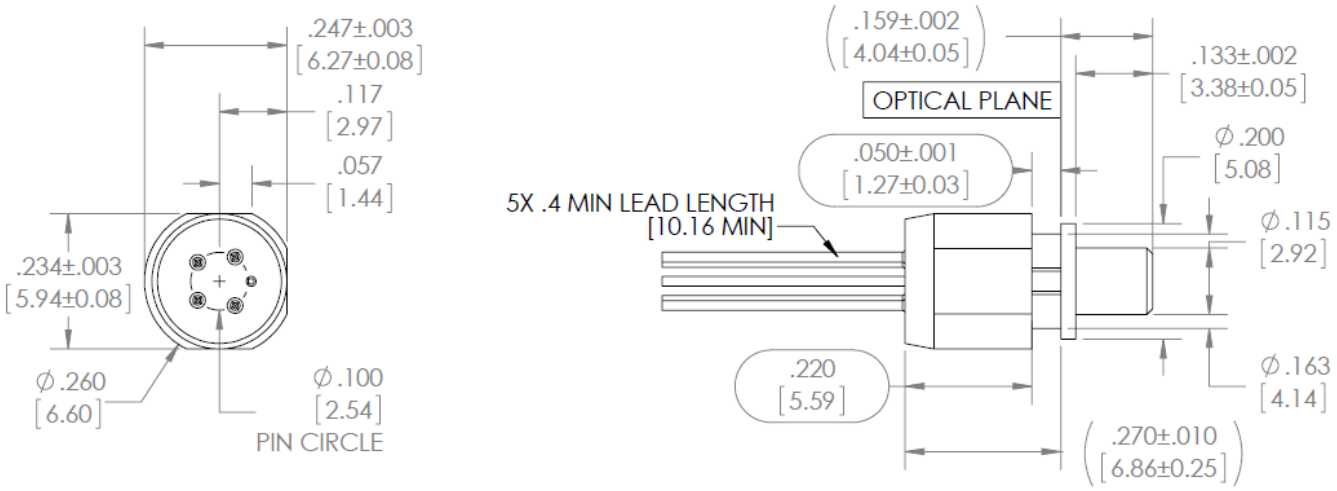
10. Group delay is a sensitive measurement to package interface, and includes the effects of PD, TIA, and package. Measurement is made with TO leads as short as possible.
11. DJ_{TIA} is specified as contributed DJ by the TIA, obtained from $DJ^2_{TIA} = DJ^2_{TOTAL} – DJ^2_{OPTICAL}$
12. RJ_{TIA} is specified as contributed DJ by the TIA, obtained from $RJ^2_{TIA} = RJ^2_{TOTAL} – RJ^2_{OPTICAL}$
13. If external bias voltage is applied to V_{PD} while V_{CC} is externally unbiased, internal biasing of the TIA will occur, resulting in erroneous RSSI current.

Electrical Pinout

PIN	Description
1	Vout+
2	Vout–
3	V_{PD}
4	V_{CC}
5	GND (Case)



Mechanical Dimensions



Dimensions in inches [mm]
Contact COTSWORKS for mechanical dimensional information.

Ordering Information – Contact COTSWORKS Sales for more information and pricing.

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