

FCI-020A and FCI-040A with active area sizes of 0.5mm and 1.0mm, are parts of OSI Optoelectronics's large active area IR sensitive Silicon detectors exhibiting excellent responsivity at 970nm. These large active area devices are ideal for use in low speed infrared instrumentation and monitoring applications. The photodiode chip is isolated in a TO-18 package.

APPLICATIONS

- Optical Communications
- Power Measurement
- IR Sensing
- Medical Devices
- Optical Taps

FEATURES

- High Responsivity @ 970nm
- Large Active Area Diameter
- Spectral Range 400nm to 1100nm
- Wide Dynamic Range



Absolute Maximum Ratings

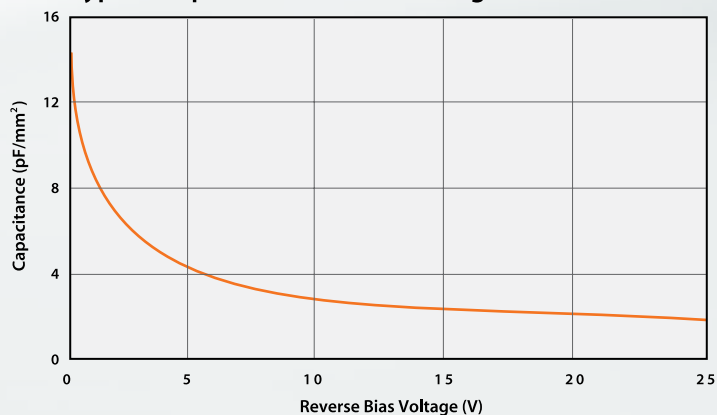
PARAMETERS	SYMBOL	MIN	MAX	UNITS
Storage Temperature	T_{stg}	-55	+125	°C
Operating Temperature	T_{op}	-40	+75	°C
Soldering Temperature	T_{sld}	---	+260	°C

Electro-Optical Characteristics

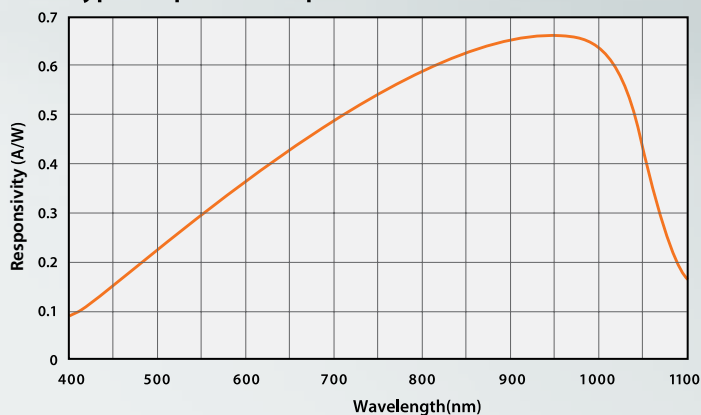
$T_A = 23^\circ\text{C}$

PARAMETERS	SYMBOL	CONDITIONS	FCI-020A			FCI-040A			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
Active Area Diameter	AA_ϕ	---	---	0.51	---	---	1.02	---	mm
Responsivity	R_λ	$\lambda = 400\text{nm}$	0.07	0.12	---	0.07	0.12	---	A/W
		$\lambda = 632\text{nm}$	0.33	0.40	---	0.33	0.40	---	
		$\lambda = 970\text{nm}$	0.60	0.65	---	0.60	0.65	---	
Capacitance	C_j	$V_R = 0\text{V}$	---	4	---	---	8	---	pF
		$V_R = 10\text{V}$	---	1	---	---	2	---	
Dark Current	I_d	$V_R = 10\text{V}$	---	0.01	0.15	---	0.05	0.50	nA
Reverse Voltage	---	---	---	---	30	---	---	30	V
Rise Time	t_r	$V_R = 10\text{V}$, $\lambda = 632\text{nm}$ 10% to 90%, $R_L = 50\Omega$	---	26	---	---	24	---	ns
NEP	---	---	---	2.80E-15	---	---	6.20E-15	---	W/√Hz

Typical Capacitance vs. Bias Voltage

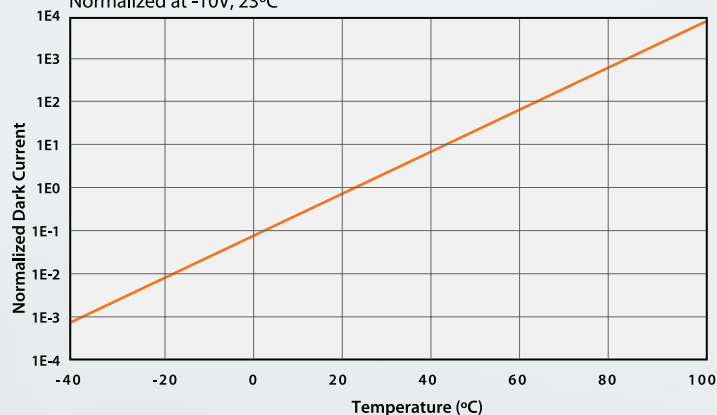


Typical Spectral Response



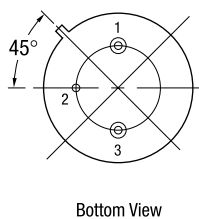
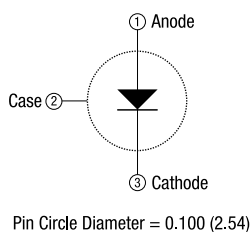
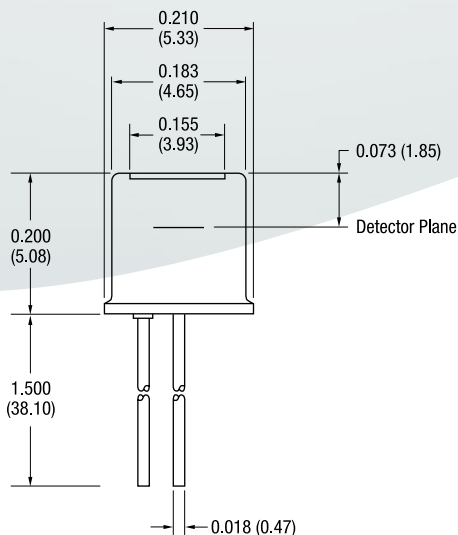
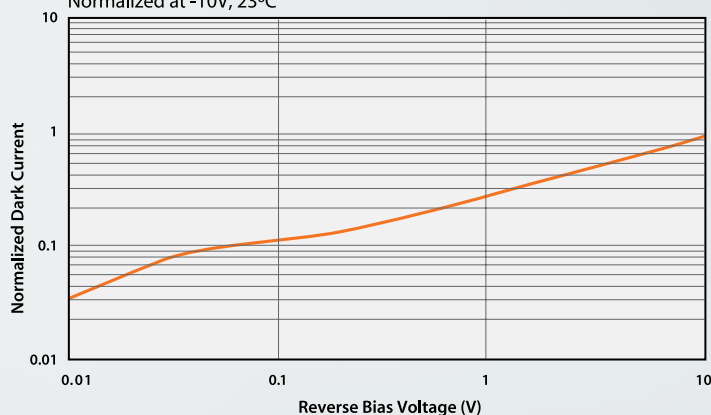
Typical Dark Current vs. Temperature

Normalized at -10V, 23°C



Typical Dark Current vs. Bias Voltage

Normalized at -10V, 23°C



Notes:

- All units in inches (mm).
- The flat window devices have broadband AR coatings centered at 850nm.

100Mbps / 155Mbps / 622Mbps

Large Active Area and High Speed Silicon Photodiodes

OSI Optoelectronics's family of large active area and high speed silicon detector series are designed to reliably support short-haul data communications applications. All exhibit low dark current and low capacitance at 3.3V bias. The base unit comes in a 3 pin TO-46 package with micro lens cap or AR coated flat window. Standard fiber optic receptacles (FC, ST, SC and SMA) allow easy integration of OSI Optoelectronics's fast silicon photodiodes into systems.

APPLICATIONS

- High Speed Optical Communications
- Single/Multi-Mode Fiber Optic Receiver
- Fast Ethernet/FDDI
- SONET/SDH, ATM

FEATURES

- Silicon Photodiodes
- High Responsivity
- Large Sensing Area
- Low Capacitance @ 3.3V Bias
- Low Cost



Absolute Maximum Ratings

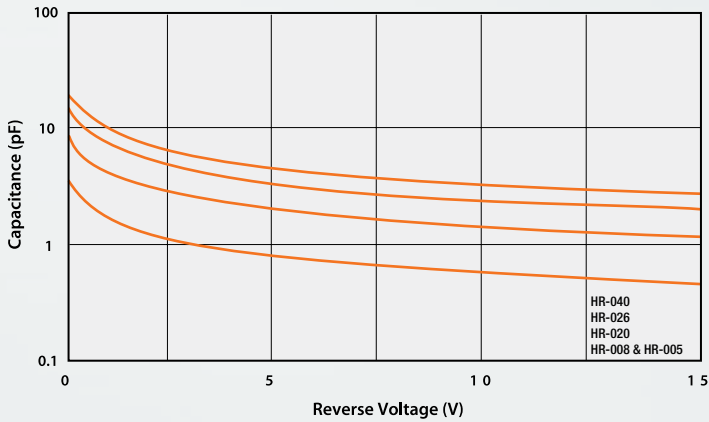
PARAMETERS	SYMBOL	MIN	MAX	UNITS
Storage Temperature	T_{stg}	-55	+125	°C
Operating Temperature	T_{op}	-40	+75	°C
Soldering Temperature	T_{slid}	---	+260	°C

Electro-Optical Characteristics

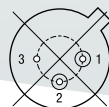
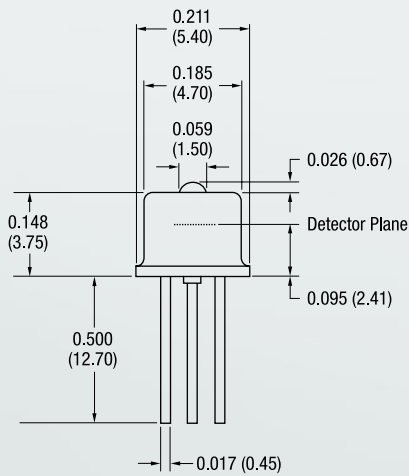
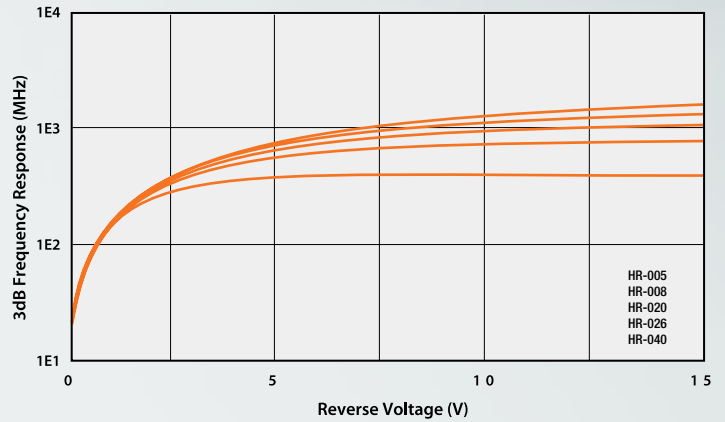
$T_A = 23^\circ\text{C}$

PARAMETERS	SYMBOL	CONDITIONS	FCI-HR005			FCI-HR008			FCI-HR020			FCI-HR026			FCI-HR040			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
Active Area Diameter	AA_ϕ	---	---	127	---	---	203	---	---	508	---	---	660	---	---	991	---	μm
Responsivity (Flat Window Package)	R_λ	$\lambda = 850\text{nm}$	---	0.50	---	---	0.50	---	---	0.50	---	---	0.50	---	---	0.50	---	A/W
Dark Current	I_d	$V_R = 5.0\text{V}$	---	0.02	0.80	---	0.03	0.80	---	0.06	1.00	---	0.09	1.50	---	0.30	2.00	nA
Capacitance	C_j	$V_R = 3.3\text{V}$	---	0.9	---	---	0.9	---	---	2.1	---	---	2.8	---	---	5.2	---	pF
		$V_R = 5.0\text{V}$	---	0.80	---	---	0.80	---	---	1.8	---	---	2.6	---	---	4.9	---	
Rise Time	t_r	10% to 90% $R_L = 50\Omega$ $\lambda = 850\text{nm}$	---	0.75	---	---	0.75	---	---	1.00	---	---	1.10	---	---	1.20	---	ns
		$V_R = 3.3\text{V}$ $V_R = 5.0\text{V}$	---	0.60	---	---	0.60	---	---	0.80	---	---	0.90	---	---	1.00	---	
Max. Reverse Voltage	---	---	---	---	20	---	---	20	---	---	20	---	---	20	---	---	20	V
NEP	---	---	---	5.95E-15	---	---	6.19E-15	---	---	8.76E-15	---	---	1.07E-14	---	---	1.96E-14	---	W/√Hz

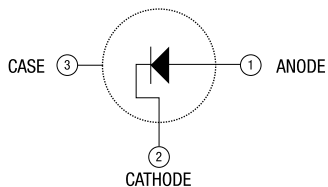
Typical Capacitance vs. Bias Voltage



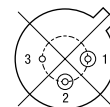
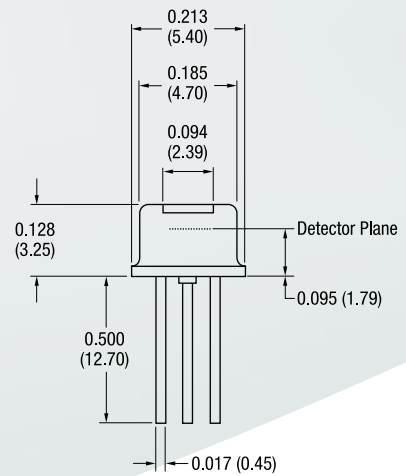
Frequency Response vs. Bias Voltage



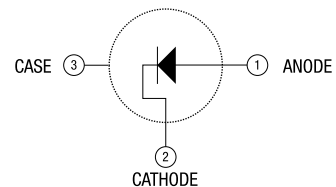
Bottom View



Pin Circle Diameter = 0.100 (2.54)



Bottom View



Pin Circle Diameter = 0.100 (2.54)

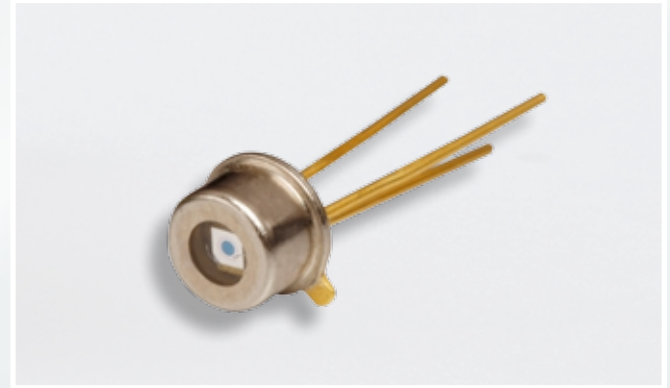
Notes:

- All units in inches (mm).
- All tolerances: 0.005 (0.125).
- Please specify when ordering the flat window or len cap devices.
- The flat window devices have broadband AR coatings centered at 850nm.
- The thickness of the flat window=0.008 (0.21).

850nm, 1.25Gbps

Large Active Area and High Speed Silicon Photodiodes

OSI Optoelectronics's family of large active area and high speed silicon PIN photodiodes possesses a large sensing area optimized for short-haul optical data communication applications at 850nm. The photodetectors exhibit high responsivity, wide bandwidth, low dark current and low capacitance at 3.3V. They are designed to match the most widely used transimpedance amplifiers. The photodiodes can be used in all 850nm transceivers and GBICs up to 1.25Gbps applications such as Gigabit Ethernet and Fibre Channel. The chip is isolated in a 3 pin TO-46 package with options of micro lens cap or an AR coated flat window. They are also available in standard fiber receptacles such as FC, ST, SC and SMA. For availability in chip form please contact our sales department.



APPLICATIONS

- High Speed Optical Communications
- Single/Multi-Mode Fiber Optic Receiver
- Gigabit Ethernet/Fibre Channel
- SONET/SDH, ATM

FEATURES

- Silicon Photodiodes
- High Responsivity
- Large Sensing Area
- Low Capacitance @ 3.3V
- Low Cost

Absolute Maximum Ratings

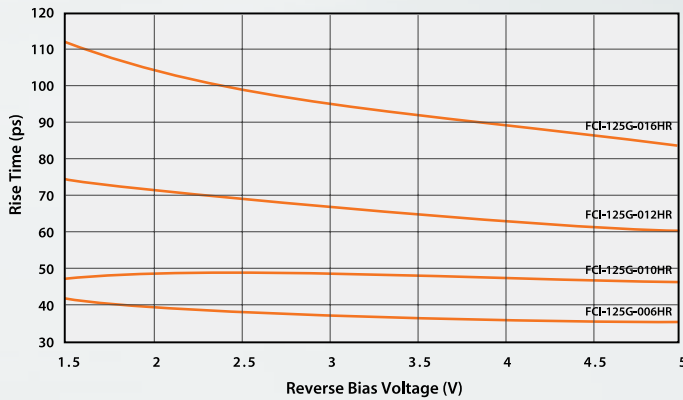
PARAMETERS	SYMBOL	MIN	MAX	UNITS
Storage Temperature	T_{stg}	-55	+125	°C
Operating Temperature	T_{op}	-40	+75	°C
Soldering Temperature	T_{sld}	---	+260	°C

Electro-Optical Characteristics

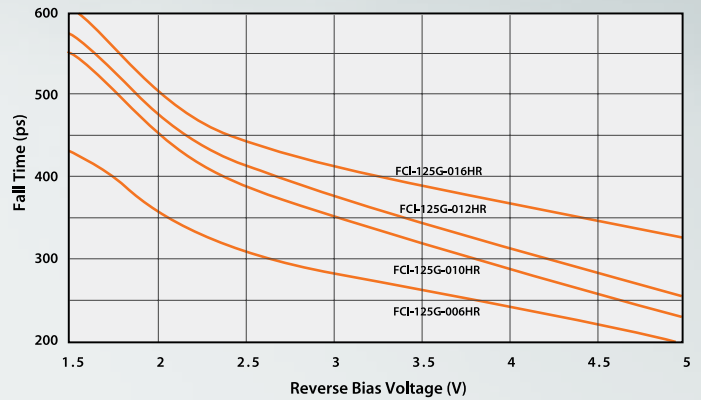
$T_A = 23^\circ\text{C}$

PARAMETERS	SYMBOL	CONDITIONS	FCI-125G-006HRL			FCI-125G-010HRL			FCI-125G-012HRL			FCI-125G-016HRL			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
Active Area Diameter	AA_ϕ	---	---	150	---	---	250	---	---	300	---	---	400	---	μm
Responsivity (Flat Window Package)	R_λ	$\lambda = 850\text{nm}$	---	0.36	---	---	0.36	---	---	0.36	---	---	0.36	---	A/W
Dark Current	I_d	$V_R = 3.3\text{V}$	---	20	500	---	25	500	---	30	500	---	40	500	pA
		$V_R = 5.0\text{V}$	---	30	500	---	35	500	---	40	500	---	50	500	
Capacitance	C_j	$V_R = 3.3\text{V}$	---	0.66	---	---	0.96	---	---	1.16	---	---	1.73	---	pF
		$V_R = 5.0\text{V}$	---	0.65	---	---	0.94	---	---	1.13	---	---	1.70	---	
Rise Time	t_r	20% to 80% $R_L = 50\Omega$ $\lambda = 850\text{nm}$ $V_R = 3.3\text{V}$	---	38	---	---	50	---	---	69	---	---	100	---	ps
		$V_R = 5.0\text{V}$	---	35	---	---	47	---	---	60	---	---	84	---	
Fall Time	t_f	80% to 20% $R_L = 50\Omega$ $\lambda = 850\text{nm}$ $V_R = 3.3\text{V}$	---	313	---	---	429	---	---	436	---	---	449	---	ps
		$V_R = 5.0\text{V}$	---	200	---	---	246	---	---	265	---	---	329	---	
Max. Reverse Voltage	---	---	---	---	20	---	---	20	---	---	20	---	---	20	V
NEP	---	---	---	8.60E-15	---	---	9.29E-15	---	---	9.93E-15	---	---	1.11E-14	---	W/√Hz

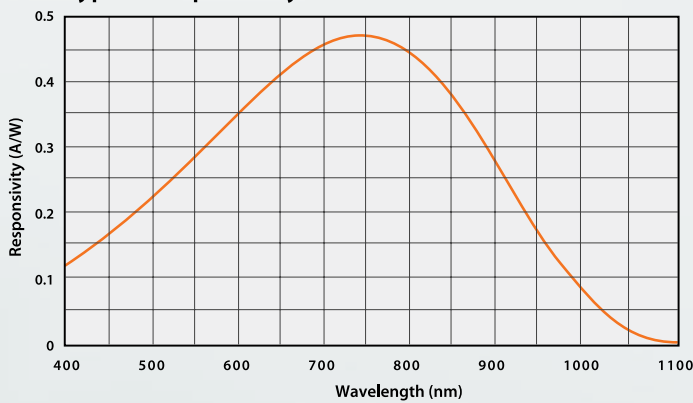
Rise Time vs. Bias Voltage



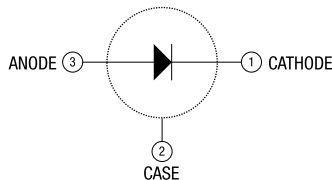
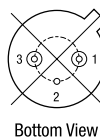
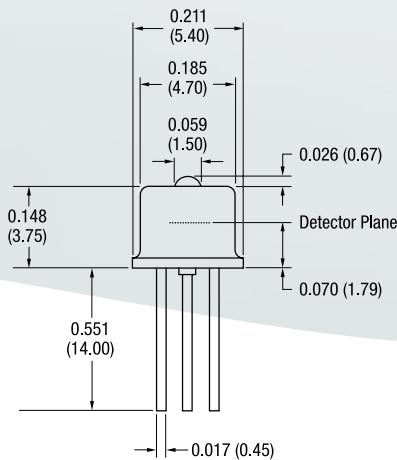
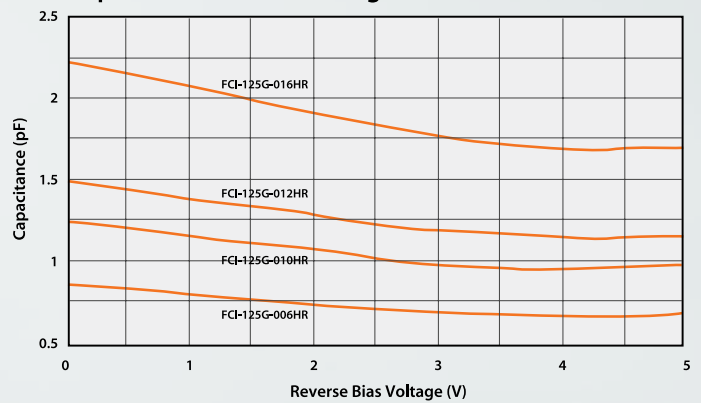
Fall Time vs. Bias Voltage



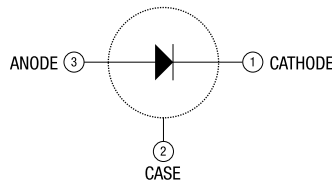
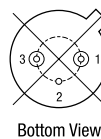
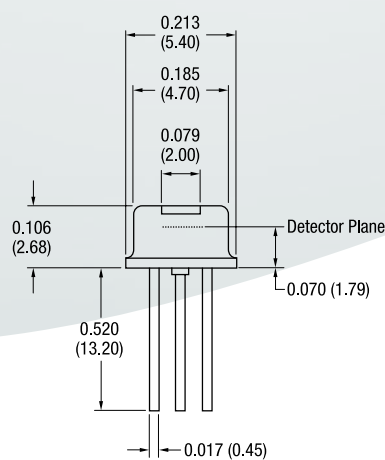
Typical Responsivity



Capacitance vs. Bias Voltage



Pin Circle Diameter = 0.100 (2.54)



Pin Circle Diameter = 0.100 (2.54)

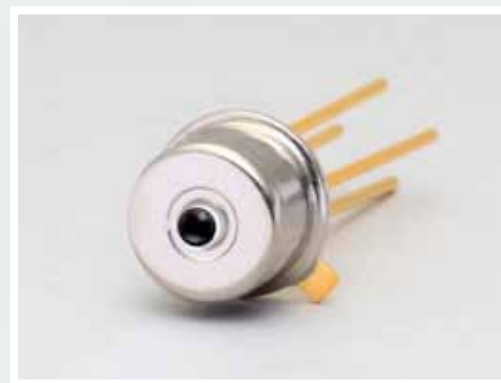
Notes:

- All units in inches (mm).
- All tolerances: 0.005 (0.125).
- Please specify when ordering the flat window or lens cap devices.
- The flat window devices have broadband AR coatings centered at 850nm.

FCI-H125G-010

1.25Gbps Silicon Photodetector / Transimpedance Amplifier

FCI-H125G-010 is a low noise, high bandwidth photodetector plus transimpedance amplifier designed for short wavelength (850nm) high speed fiber optic data communications. The hybrid incorporates a 250 μ m diameter large sensing area, high sensitivity silicon photodetector. It also includes a high gain transimpedance amplifier producing a differential output voltage for latching to post amplifiers used in electro-optical receivers and transceivers for Gigabit Ethernet and Fibre Channel applications up to 1.25Gbps over multi-mode fiber. The photodetector converts the light into an electrical signal while the output voltage increases with light input. This is achieved by a single +3.3V to +5V positive power supply. These devices are available in 4 pin TO-46 metal packages with either a double sided AR coated window cap or an integrated lens cap. The 250 μ m diameter sensing area eases fiber alignment for connectorization or receptacle attachment. Furthermore, the proximity of the transimpedance amplifier to the photodetector lowers the capacitance associated with long traces, therefore allowing higher bandwidth and sensitivity.



APPLICATIONS

- High Speed Optical Communications
- Gigabit Ethernet
- Fibre Channel

FEATURES

- Silicon Photodetector / Low Noise Transimpedance Amplifier
- Low Cost
- Large Active Area of 250 μ m
- High Bandwidth / Wide Dynamic Range
- Automatic Gain Control (AGC)
- Hermetically Sealed TO-46 Can
- Single +3.3V to +5V Power Supply
- Differential Output

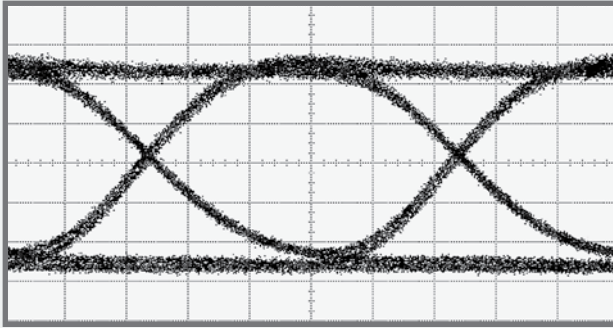
Absolute Maximum Ratings

PARAMETERS	SYMBOL	MIN	MAX	UNITS
Storage Temperature	T _{stg}	-55	+125	°C
Operating Temperature	T _{op}	-40	+75	°C
Supply Voltage	V _{cc}	0	+6	V
Input Optical Power	P _{IN}	---	+5	dBm

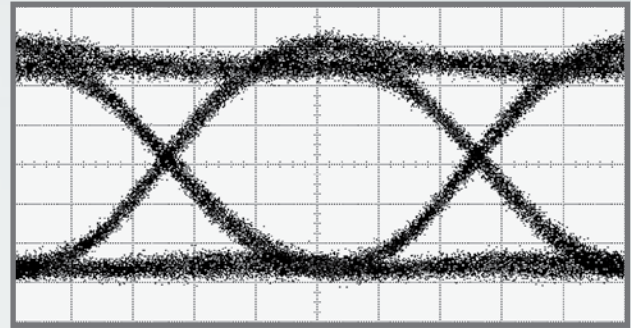
Electro-Optical Characteristics T_A=23°C, V_{cc}=+5.0V, 850nm, 100 Ω Differential AC Load

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Voltage	V _{CC}	---	+3	---	+5.5	V
Supply Current	I _{CC}	---	---	38	50	mA
Active Area Diameter	AA ϕ	---	---	250	---	μ m
Operating Wavelength	λ	---	---	850	---	nm
Responsivity	R _{λ}	-19dBm, Differential	---	3000	---	V/W
Transimpedance	---	-19dBm, Differential	---	8300	---	Ω
Sensitivity	S	BER 10 ⁻¹⁰ , PRBS2 ⁷ -1	-20	-23	---	dBm
Optical Overload	---	---	-3	0	---	dBm
Bandwidth	BW	-3dB, Small Signal	800	1000	---	MHz
Differential Output Voltage	V _{OUT, P-P}	---	---	200	---	mV _{P-P}
Output Impedance	---	---	40	50	62	Ω

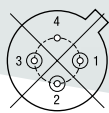
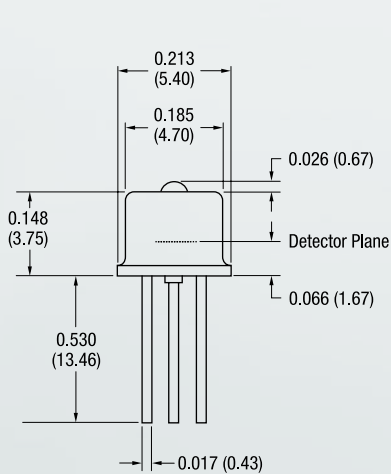
Use AC coupling and differential 100 Ω load for the best high-speed performance. Devices are not intended to drive DC coupled, 50 Ω grounded load.



40mV / div, 160ps / div, -12dBm, 850nm, PRBS2⁷-1, Diff.



20mV / div, 160ps / div, -17dBm, 850nm, PRBS2⁷-1, Diff.

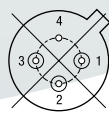
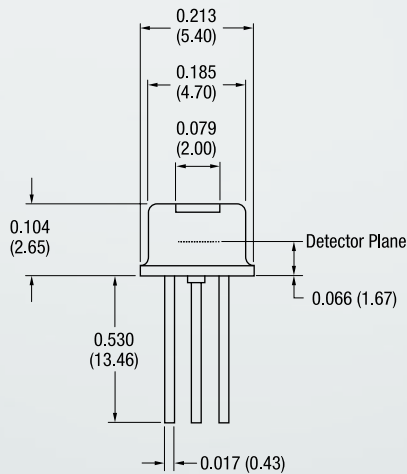


Bottom View

PINOUT

1	D _{out}
2	V _{CC}
3	\overline{D}_{out}
4	GND

Pin Circle Diameter = 0.100 (2.54)

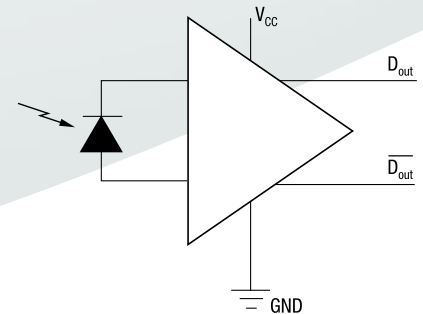


Bottom View

PINOUT

1	D _{out}
2	V _{CC}
3	\overline{D}_{out}
4	GND

Pin Circle Diameter = 0.100 (2.54)



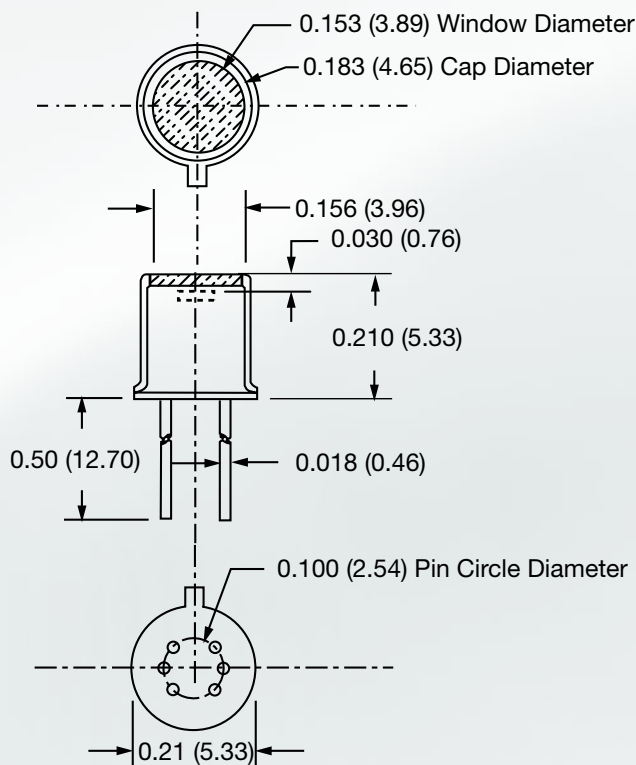
Notes:

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- The thickness of the flat window=0.008 (0.21).

BPX65-100

Fiberoptic Receiver

The BPX65-100 receiver contains a BPX-65 ultra high speed photodiode coupled to an NE5212 (Signetics) transimpedance amplifier. Standard products include ST and SMA connector versions.

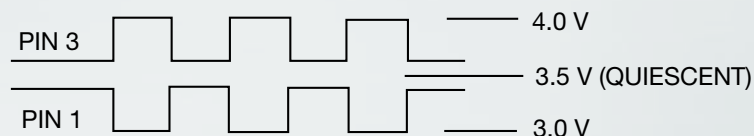


APPLICATIONS

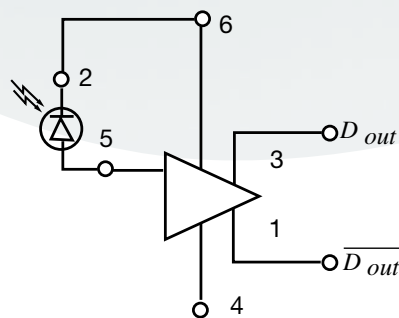
- 100Mbps Optical Communications
- Fiber Patchcord Coupling
- Silicon-based Optical Receivers

FEATURES

- 140MHz Bandwidth
- 14K Ω Differential Transresistance
- 400 nm to 1000nm Spectral Range
- $2.5 \frac{pA}{\sqrt{Hz}}$ Transimpedance Amplifier



OUTPUT WAVEFORMS (NOMINAL VALUES)



Pin Designations

- 1 - \overline{D}_{out}
- 2 - Cathode
- 3 - D_{out}
- 4 - Ground
- 5 - Anode
- 6 - Vcc (5 V)

Absolute Maximum Ratings

	MAX	UNITS
Maximum Voltage	6	V
Operating Temp. Range	-20 to +70	°C

Receiver Data at 25°C

MODEL NUMBER	FIBER CONNECTOR	POWER SUPPLY	DETECTOR RESPONSIVITY $\lambda=850nm$	AMPLIFIER GAIN	MAX DATA RATE
BPX65-100	None	5V	0.5 A/W	14 K Ω	100 Mbps
BPX65-100ST	ST				
BPX65-100SMA	SMA				