

High Speed Digital Fiber Coupled InGaAs PIN Photodiode

1260 to 1600nm, SM, MM, 5, 12, 25Gbps, TIA integrated, differential output



DATASHEET

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Features

- 25 Gbps
- Wide Temperature Operating Range
- Received Signal Strength Indicator
- TIA Built-in
- 1K Ohm Transimpedance Gain

Applications

- Communication
- RF over Fiber (RFoF)



The HSFD is a fiber-coupled InGaAs PIN photodiode integrated with a high-speed transimpedance amplifier (TIA), supporting data rates up to 25 Gb/s with differential output. It provides a flat frequency response over a wide operating temperature range and is available with both single-mode and multimode fiber coupling options, offering versatility for high-speed optical communication applications. The multimode version utilizes fiber-tip lens technology to achieve high coupling efficiency. A matching evaluation PCB is available, featuring up to 8 GHz 3 dB analog bandwidth and SMA RF interfaces, with a single connector for single-ended output and dual connectors for differential outputs, enabling convenient testing and system integration.

Due to their high sensitivity to electrostatic discharge, warranty coverage applies only to fully metal covered modules the benchtops, which include proper protection. Other versions of the lasers and photodetectors are not covered by any warranty. Please use them with great caution.

Specifications

(Measure at 23 for SM28 fiber)

Parameter	Min	Typical	Max	Unit	Test Condition
Supply Voltage		3.3	3.6	V	
Supply Current		26	35	mA	@3.3V
Response Spectrum	1260		1600	nm	@3.3V
Bandwidth		18		GHz	-3 dB bandwidth
Overload	2.2			dBm	@3.3V
Sensitivity			-14.5	dBm	25.78 Gbps, 1310 nm, ER = 4 dB, BER = 10 ⁻⁵
Optical Return Loss			-27	dB	CW = 1310 nm
RSSI Offset Current			100	nA	@3.3V
Responsivity	0.7	0.8		A/W	1310 nm, 50 % VBR, M=2, Pin -20 dBm
Dark Current		100		nA	VBr
Output Impedance		100			Differential
Max. Output Voltage		300		mV _{p-p}	Differential
Low Frequency Cutoff	25	100		KHz	

Photodiode Absolute Maximum Ratings

Parameter	Min	Typical	Max	Unit	Condition
Voltage			3.6	V	
Input Optical Power			5	dBm	
Storage Temperature		-40	90	°C	
Storage Humidity			85	% r.H.	
Operating Temperature		-40	85	°C	
Soldering Temperature			260	°C	10 sec
ESD Susceptibility		100		V	HBM

Note:

The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [\[click this link\]](#):

Operating at maximum operating specs for prolong periods of time will damage the device.

Rev 04/17/26

P +1 781-935-1200

E sales@agiltron.com

W www.agiltron.com

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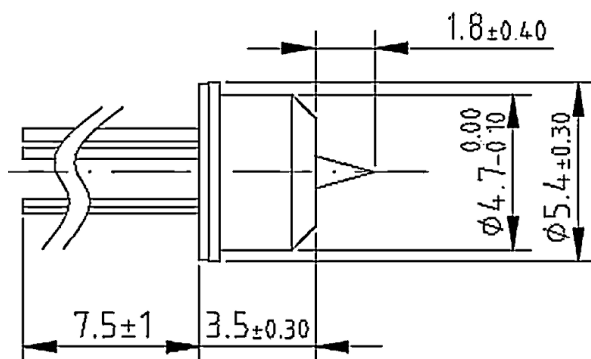
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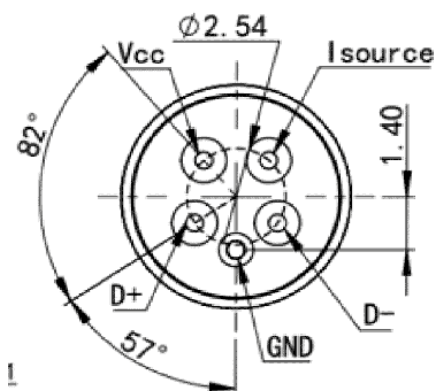
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Mechanical Dimensions (mm)



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

PIN Configuration (Bottom View)



Pin	Function
Vcc (3.3V)	DC Power
GND	Ground
Dout(-)	Detector Signal Output Negative
Dout(+)	Detector Signal Output Positive
I source	Readout photodiode current

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Ordering Information (Part Number)

Prefix	Wavelength	Speed	Driver PCB	Package	Fiber Type	Fiber Cover	Fiber Length	Connector ^[1]
HSFD-	1230 - 1620 = 1	25 GHz = H 12 GHz = 1 5 GHz = 5	Non = 1 Single Output = 2 Differential = 3	Standard = 1 Special = 0	SM28 = 1 50/125 = 2	0.9mm tube = 3 Bare fiber = 1 Special = 0	0.25m = 1 0.5m = 2 1.0 m = 3 1.5 m = 5 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 LC/APC = A LC/UPC = U Special = 0

[1]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

Detector Mounted on Driver



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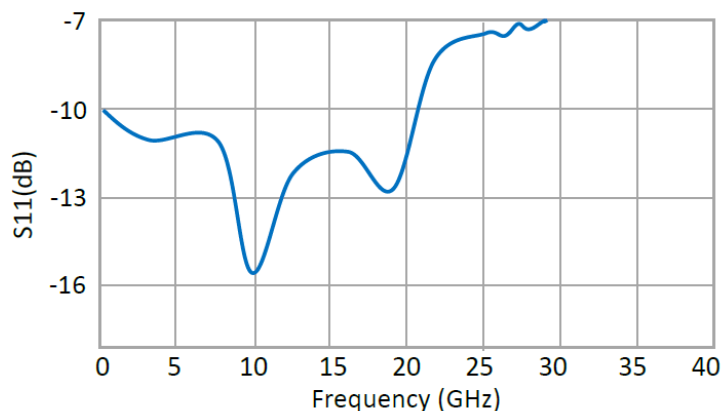
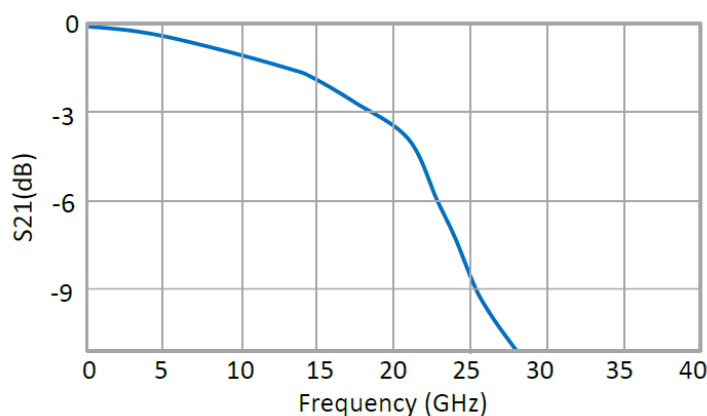
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Typical Performance Curves (Top 23°C, 801 PTs, 16 AVGs, 1.5% smoothing)

RF performance dependent on PCB design and optimization. Data shown with Ground-backed Co-planar waveguide. Single ended measurement, port two is terminated with 50 Ohm load.



Caution Electrostatic Sensitivity



- Never touch laser diode and the module using hands
- Always use protections when handle a laser diode
- Recommend mounting the laser diode using an ionic gun and ESD finger cots



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