DX30 Series: 30 GHz Photodetectors

Features

- DC - 30 GHz Bandwidth
- 15 ps Impulse Response
- 750 nm – 1650 nm Sensitivity
- SM or MM Input Fiber Options
- 2.92 mm Coaxial Output Connector
- 50 Ω Reverse Termination

Applications

- Test and Measurement
- High-Speed Communications
- Microwave Photonics
- OEM Integration



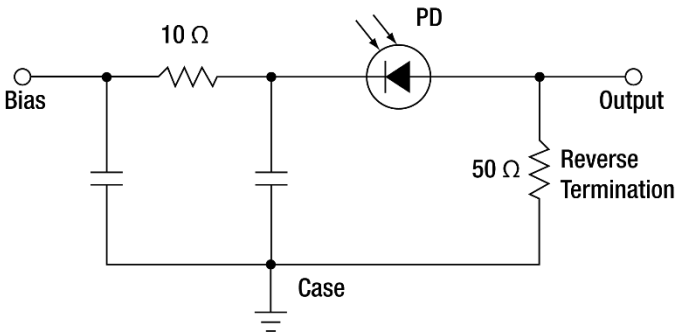
DX30AF

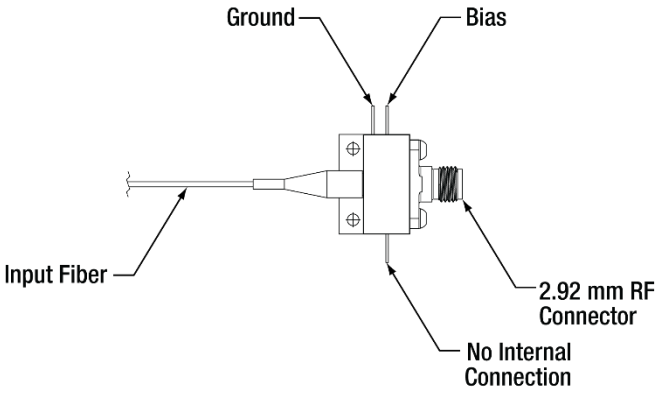
Description of Models

The DX30 Series are hermetically sealed detector modules with a 30 GHz bandwidth that use a broad-wavelength, InGaAs-based photodetector for applications primarily in the 750 nm - 1650 nm wavelength range. The module can be supplied with either SM (SMF-28) or MM (Ø50 µm core, OM4) fiber optic input. Signal output is provided via a field-replaceable, female, 2.92 mm RF connector, which may be connected to a measurement instrument with suitable adapters or cables. Order by the following model numbers:

- **DX30AF** DX30 Series Module with SM Fiber (SMF-28), Yellow Buffer, and FC/PC Connector
- **DX30BF** DX30 Series Module with Ø50 µm Core MM Fiber (OM4), Aqua Buffer, and FC/PC Connector

Block Diagram





Absolute Maximum Ratings

All specifications are at 25 °C and at 1310 nm unless noted.

Parameter	Min	Typical	Max	Unit	Note
Optical Input Power, Avg.	-	-	10	dBm	-
Optical Input Power, Peak	-	-	13	dBm	50% Duty Cycle
Photodiode Bias Voltage	-	-	5	V	-
Fiber Bend Radius	15	-	-	mm	Breakage

Operating Conditions

Parameter	Min	Typical	Max	Unit	Note
Operating Temperature	0	-	40	°C	-
Storage Temperature	-40	-	50	°C	-
Relative Humidity	-	-	85	%	Non-Condensing
Photodiode Bias Voltage	3	4	5	V	-

Specifications

All specifications are typical at 25 °C and at 1310 nm unless noted.

Parameter	Fiber Type[a]	Min	Typical	Max	Unit	Note
Wavelength Range		750	-	1650	nm	See Performance Graphs for Full Spectral Response
-3 dB Bandwidth		-	30	-	GHz	At 1560 nm
Low Frequency Cutoff		-	DC	-	-	-
Impulse Response		-	15	-	ps	FWHM at 1560 nm
Responsivity	SM	-	0.45 0.75	-	A/W	At 850 nm At 1550 nm
	MM	-	0.42 0.7	-	A/W	At 850 nm At 1310 nm
Conversion Gain	SM	-	11.3 18.7	-	V/W	At 850 nm (50 Ω External Load) At 1550 nm (50 Ω External Load)
	MM	-	10.5 17.5	-	V/W	At 850 nm (50 Ω External Load) At 1310 nm (50 Ω External Load)
Noise-Equivalent Power	SM	-	32	-	pW/√Hz	25 Ω Load Limited
Optical Return Loss	SM	-	-19 -21	-14 -18	dB	At 850 nm At 1550 nm
	MM	-	-	-8	dB	At 850 nm and 1310 nm
Dark Current		-	-	50	nA	-
Reverse Termination Impedance		45	50	55	Ω	RF Output
Electrical Return Loss		-	-10 -7	-	dB	To 18 GHz To 30 GHz

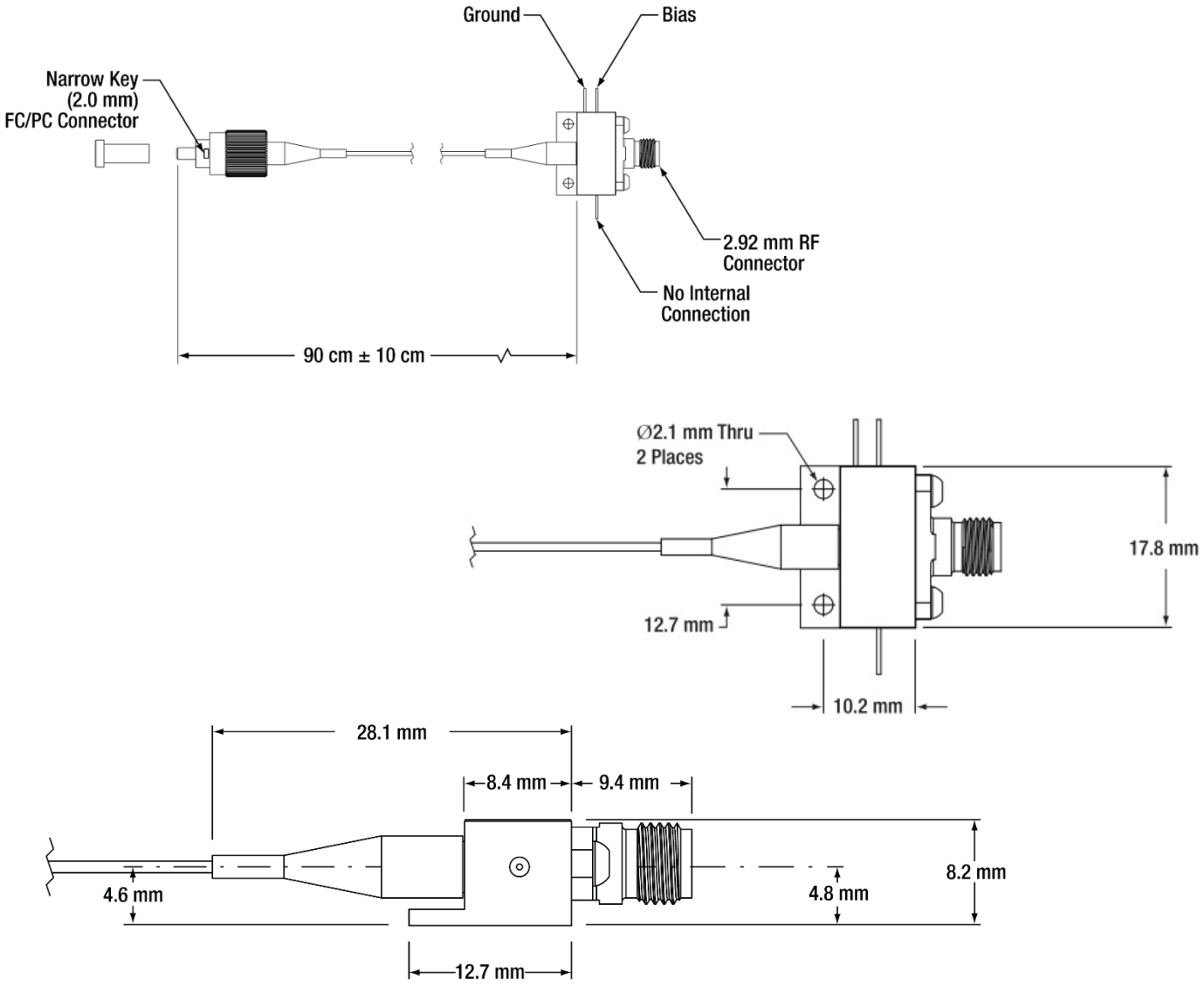
a. Specifications are dependent on the fiber type chosen. See the Description section on page 1 for ordering information for SM and MM item #s.

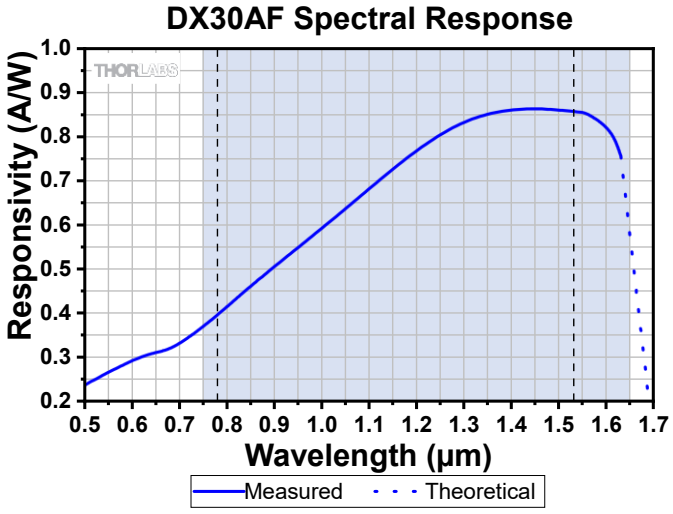
QUALIFICATION TESTING

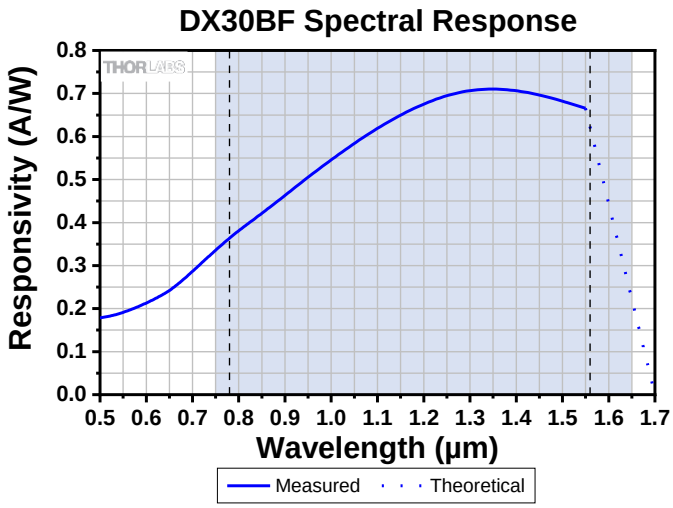
Parameter	Conditions
Mechanical Shock	500 g, Six Axes, 5 Times
Thermal Cycling	100 Cycles, 0 °C to 70 °C
Temperature Storage	100 hours at -40 °C
Fiber Pull	Straight Pull: 0.5 kg, 60 s Side Pull: 0.25 kg, 10 s, 4 Directions

MECHANICAL & PIN-OUT

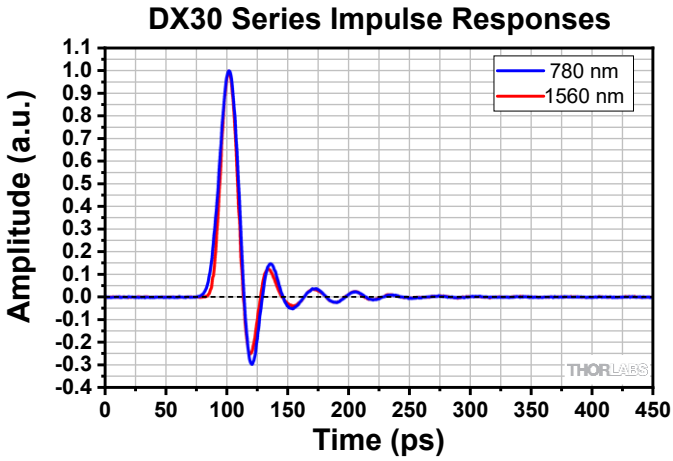
Parameter	Value
Fiber Connector	2.0 mm Narrow Key FC/PC
Fiber Type	SMF-28 (Item # DX30AF) or Ø50 µm Core, OM4 (Item # DX30BF)
Fiber Length	90 cm ± 10 cm
Fiber Buffer	Ø900 µm, Yellow for SM, Aqua for MM
RF Output Connector	Female 2.92 mm, 50 Ω, Field Replaceable
Lead Soldering	Max 10 s at 250 °C per Lead

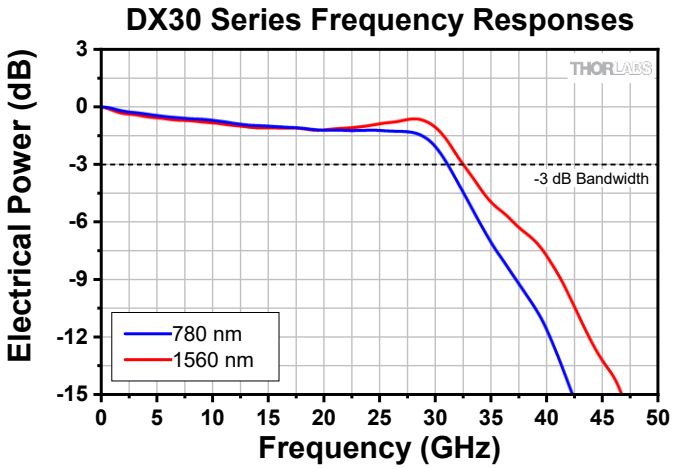


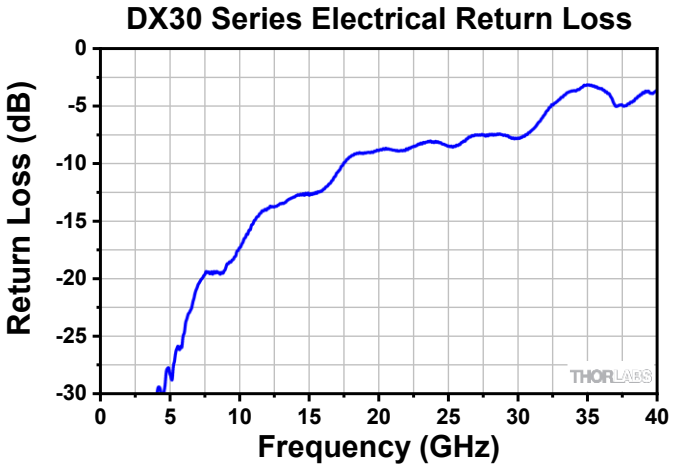




Vertical dashed lines indicate the wavelengths where the frequency and impulse responses are measured. The blue-shaded region indicates the wavelength range.







Precautions



The components inside this module are ESD sensitive. Take all appropriate precautions to discharge personnel and equipment before making any electrical connections to the unit. This also applies to coaxial cables that easily accumulate capacitive change.

Manufacturing and Compliance

Manufactured by: Thorlabs Inc., Ann Arbor, MI 48103 USA

