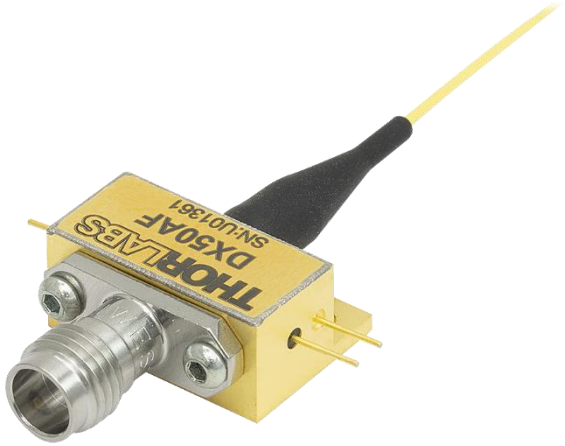
DX50AF: 50 GHz Photodetector

FEATURES

- DC - 50 GHz Bandwidth
- 1250 - 1650 nm Sensitivity
- SM Input Fiber
- 1.85 mm Coaxial Output Connector
- 50 Ω Reverse Termination

APPLICATIONS

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



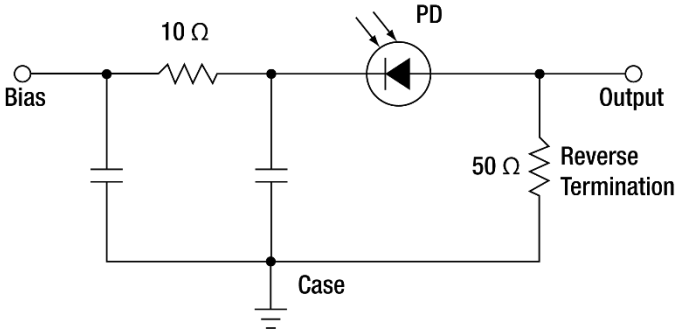
DX50AF

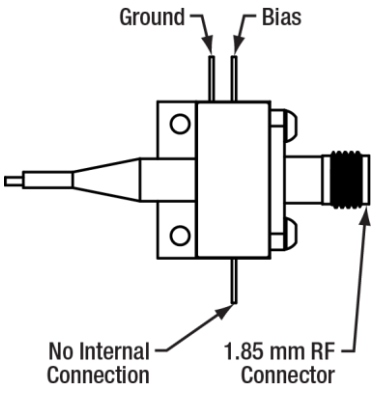
DESCRIPTION

The DX50AF is a hermetically sealed detector module with a 50 GHz bandwidth that uses an InGaAs-based photodetector for applications primarily in the 1250 - 1650 nm wavelength range. The module is supplied with SM (SMF-28e) fiber optic input. Signal output is provided via a field-replaceable, female, 1.85 mm RF connector, which may be connected to a measurement instrument with suitable adapters or cables. Order by the following model numbers:

- **DX50AF** Single Mode Ultrafast Detector Module, 1250 - 1650 nm, DC - 50 GHz, FC/PC

BLOCK DIAGRAM





Absolute Maximum Ratings

All specifications are at 25 °C and at 1550 nm unless noted.

Parameter	Min	Typical	Max	Unit	Note
Optical Input Power, Average	-	-	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	-	70	°C	-
Storage Temperature	-40	-	75	°C	-
Relative Humidity	-	-	85	%	Non-Condensing
Photodiode Bias Voltage	2.5	4	5	V	-

O-E Specifications

All specifications are at 25 °C and at 1550 nm unless noted.

Parameter	Min	Typical	Max	Unit	Note
Wavelength Range	1250	-	1650	nm	See Performance Graphs for Full Spectral Response
-3 dB Bandwidth	-	50	-	GHz	-
Low Frequency Cutoff	-	DC	-	-	-
Impulse Response	-	11	-	ps	FWHM at 1560 nm[a]
Responsivity	-	0.7	-	A/W	-
Conversion Gain	-	18	-	V/W	Across 50 Ω External Load
Noise-Equivalent Power	-	32	-	pW/√Hz	25 Ω Load Limited
Optical Return Loss	-	-	-25	dB	-
Dark Current	-	-	50	nA	-
Reverse Termination Impedance	44	47	55	Ω	RF Output
Electrical Return Loss	-	-10	-	dB	To 40 GHz
		-3		dB	To 50 GHz

a. Pulse measured on a 70 GHz sampling scope. Scope response not deconvolved.

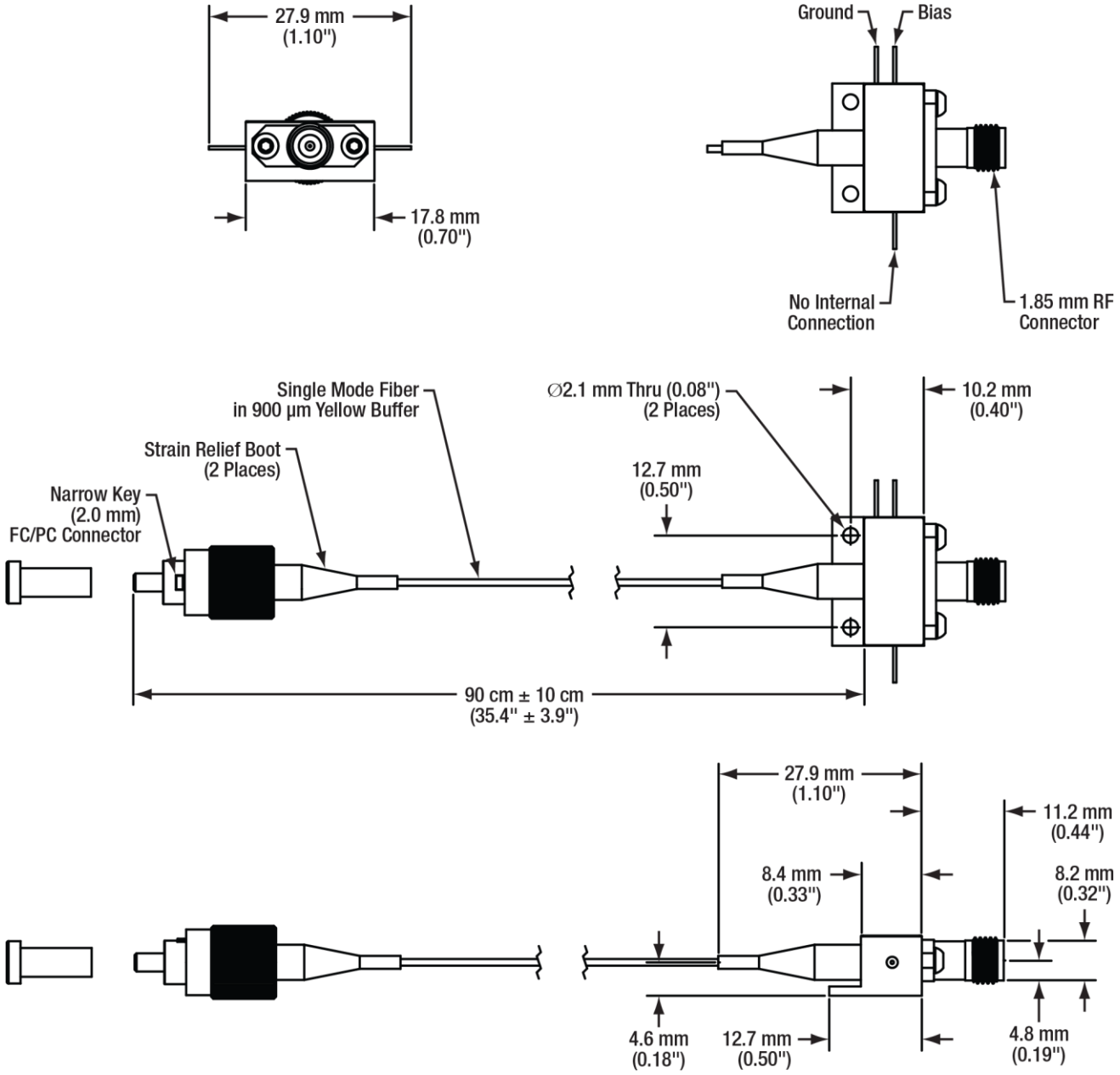
Qualification Testing

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

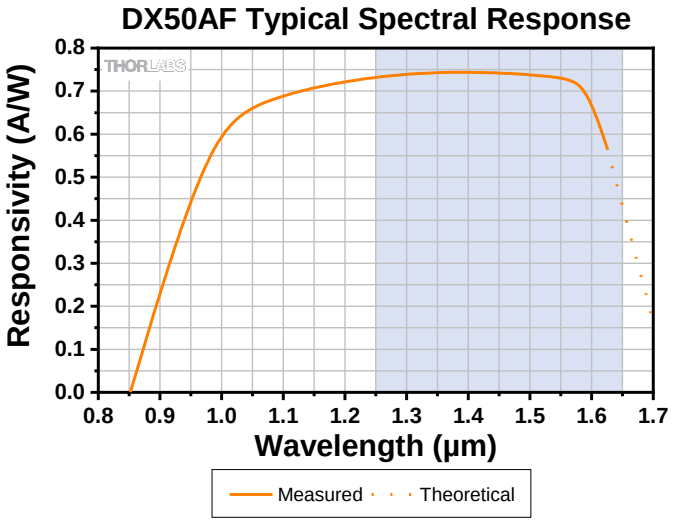
MECHANICAL SPECIFICATIONS

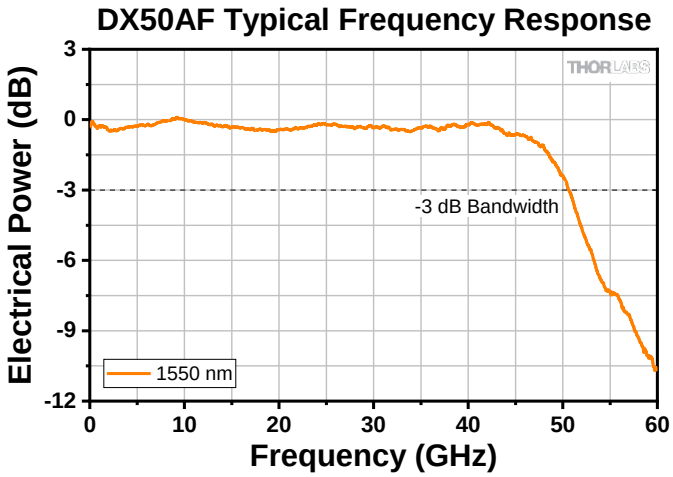
Parameter	Value
Fiber Connector	2.0 mm Narrow Key FC/PC
Fiber Type	SMF-28e
Fiber Length	90 cm ± 10 cm
Fiber Buffer	Ø900 µm, Yellow
RF Output Connector	Female 1.85 mm, 50 Ω, Field Replaceable; 8 in-lbs Torque Spec.
Lead Soldering	Max 10 s at 250 °C per Lead

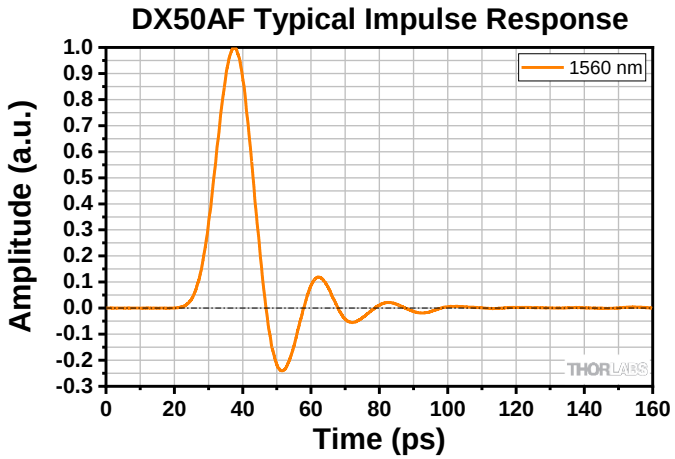
PIN-OUT & MECHANICAL DRAWING

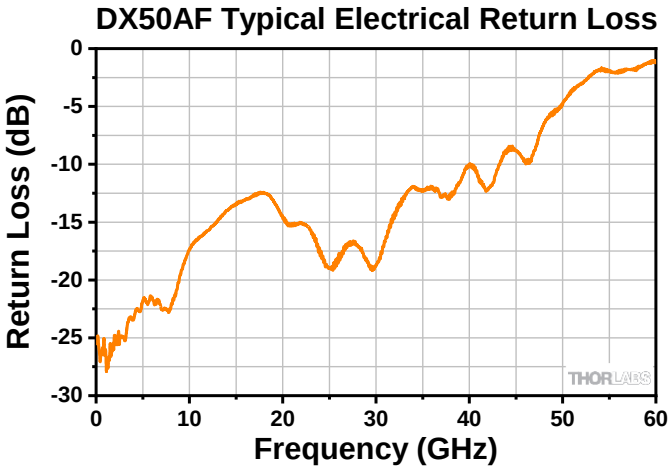


Typical Performance Graphs









Pulse measured on a 70 GHz sampling scope.
Scope response not deconvolved.

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 charge.

Manufacturing and Compliance

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

All specifications are subject to change without notice.

