

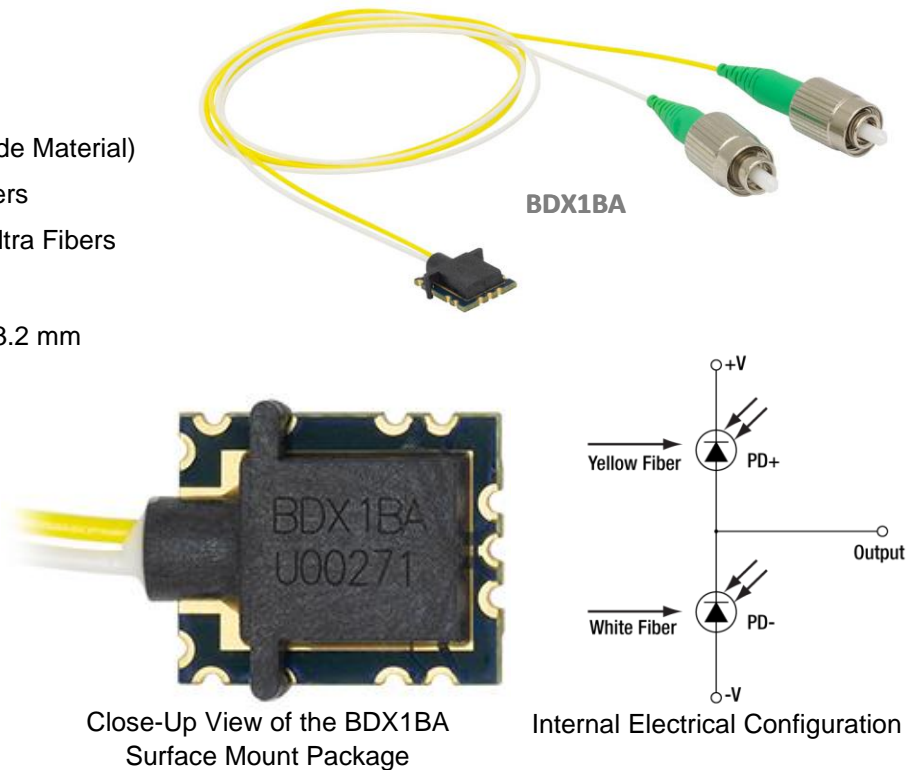
BDX1 Series: 5 GHz Balanced Photodetectors

FEATURES

- DC - 5 GHz Bandwidth
- 70 ps Impulse Response
- 950 - 1650 nm Sensitivity (Photodiode Material)
 - 980 - 1650 nm with HI1060 Fibers
 - 1260 - 1625 nm with SMF-28 Ultra Fibers
- Compact Surface Mount Package
- Dimensions: 13.0 mm x 11.2 mm x 3.2 mm
- Very Low Artifacts/Reflections
- Matched Length Fibers

APPLICATIONS

- OEM Balanced Detection
- OCT Systems
- LIDAR Systems
- Compact Detection Systems



DESCRIPTION OF MODELS

The BDX1 series of high-speed, InGaAs, balanced detectors are designed for demanding OEM applications in the 950 - 1650 nm wavelength range. The surface mount package comes standard with FC/APC connectors on two loose-tube buffered input fibers (SMF-28 Ultra or HI1060). Units with FC/PC or bare fiber termination can be requested using the item numbers listed below. The modules are designed to be an optical daughter board with all connections made by soldering the half-vias around the perimeter. The optical design provides for very low reflections and signal artifacts. Signal output is provided through a GSG arrangement of the output connections. An evaluation board is also available for soldering a BDX1 series detector in place so that power and output connections can be made with common cables and connectors. Order using the following item numbers:

- | | |
|------------------|--|
| • BDX1BA | 5 GHz Module with SMF-28 Ultra Input Fiber, 900um Buffers, FC/APC Connectors |
| • BDX1BF | 5 GHz Module with SMF-28 Ultra Input Fiber, 900um Buffers, FC/PC Connectors |
| • BDX1BN | 5 GHz Module with SMF-28 Ultra Input Fiber, 900um Buffers, Bare Fiber |
| • BDX1CA | 5 GHz Module with HI1060 Input Fiber, 900um Buffers, FC/APC Connectors |
| • BDX1CF | 5 GHz Module with HI1060 Input Fiber, 900um Buffers, FC/PC Connectors |
| • BDX1CN | 5 GHz Module with HI1060 Input Fiber, 900um Buffers, Bare Fiber |
| • BDX1EVB | Evaluation Board for BDX1 Series Detectors |

ABSOLUTE MAXIMUM RATINGS

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

Parameter	Min	Typ.	Max	Unit	Note
Optical Input Power, Avg.	-	-	10	dBm	-
Photodiode Bias Voltage (PD+)	-	-	+10	V	Negative Voltage for PD-
Fiber Bend Radius	15	-	-	mm	Breakage

OPERATING CONDITIONS

Parameter	Min	Typ.	Max	Unit	Note
Operating Temperature	10	-	40	°C	-
Storage Temperature	0	-	50	°C	-
Relative Humidity	-	-	50	%	Non-Condensing
Photodiode Bias Voltage (PD+)	+3	+5	+7	V	Negative Voltage for PD-

SPECIFICATIONS

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

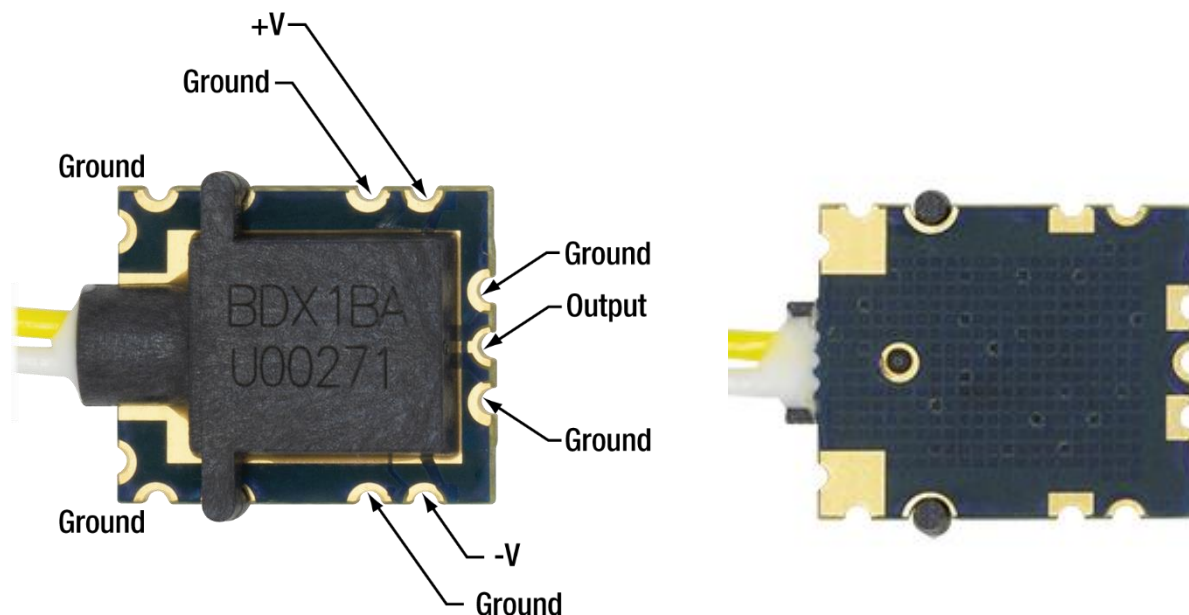
Parameter	Min	Typ.	Max	Unit	Note
Wavelength Range	950	-	1650	nm	Photodiode Material
-3 dB Bandwidth	4	5	-	GHz	at 1560 nm
Low Frequency Cutoff	-	DC	-		-
Impulse Response	-	70	-	ps	FWHM at 1560 nm
Responsivity	-	0.85 1.00 0.70	-	A/W	at 1310 nm at 1550 nm at 1050 nm
Responsivity Matching	-	-	5	%	Depends on Connector Alignment
Optical Return Loss	-	-45	-40	dB	Each Fiber
Crosstalk	-	-	-40	dB	Between Detectors
Dark Current	-	< 10	50	nA	Each PD
Photodiode Diameter	-	65	-	µm	-
Capacitance (per PD)	-	260	300	fF	Each PD

MECHANICAL

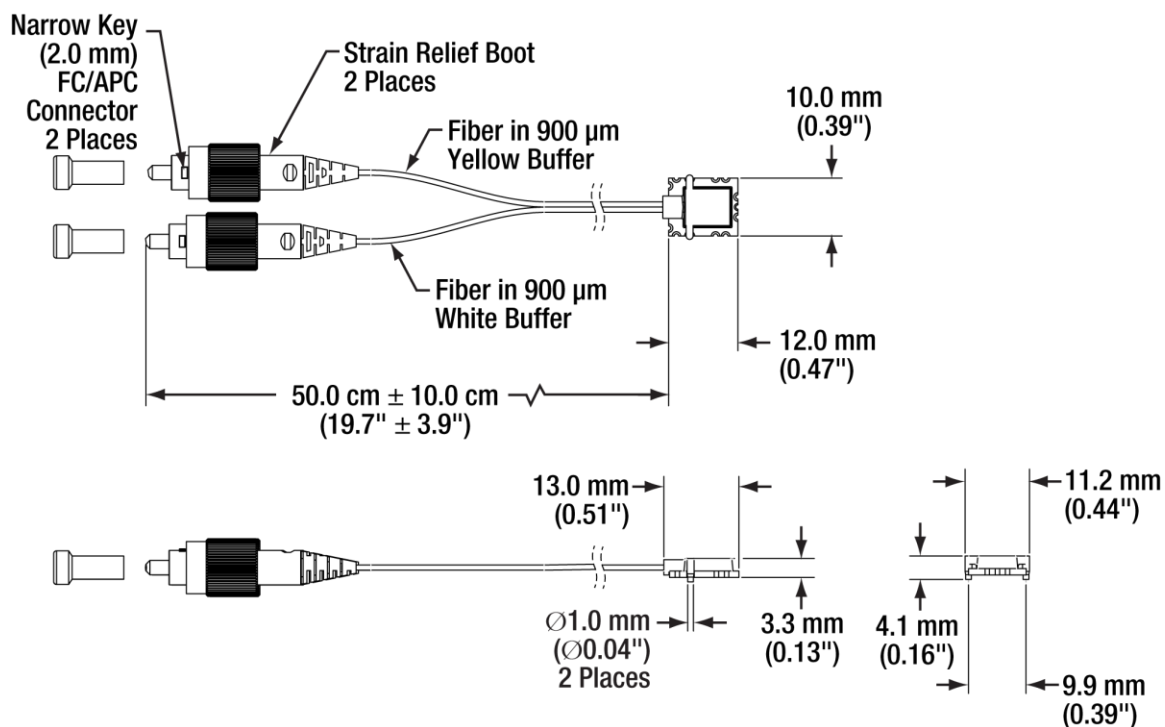
Parameter	Value
Fiber Connector	2.0 mm Narrow Key FC/APC Connectors
Fiber Type	BDX1BA: SMF-28 Ultra BDX1CA: HI1060
Fiber Length & Match	50 cm ± 10 cm; Length Matched to <1 mm (with Connectors)
Fiber Buffer	Ø900 µm Loose-Tube, Yellow on PD+, White on PD-
RF Output Connector	Solderable Half-Vias in GSG Configuration
Soldering ^a	Max 5 seconds at 250 °C per Location

a. All soldering must be done by hand; a reflow oven will damage the device.

PIN-OUT DIAGRAM

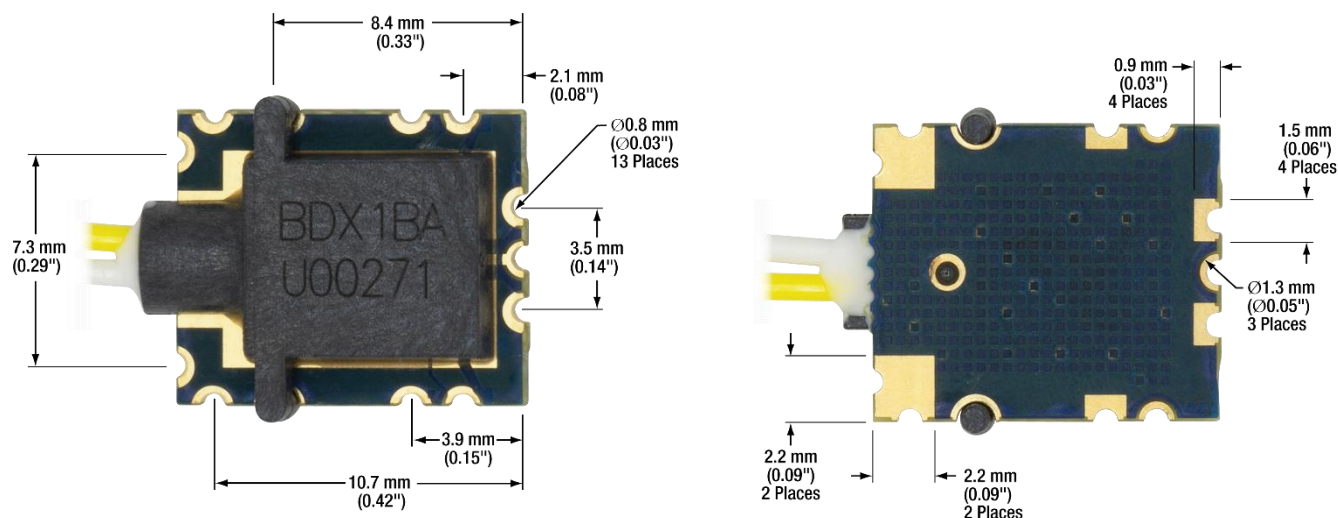


MECHANICAL DRAWINGS



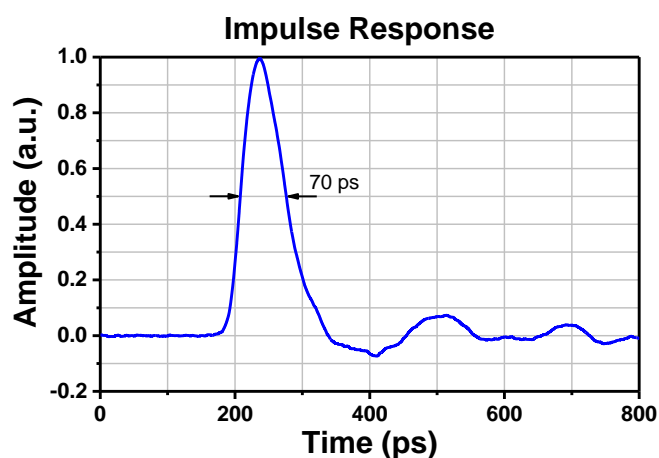
Drawing of a BDX1BA detector with FC/APC Connectors. This drawing is representative of the BDX1 series as other part numbers will have different connectors.

MOUNTING DIMENSIONS

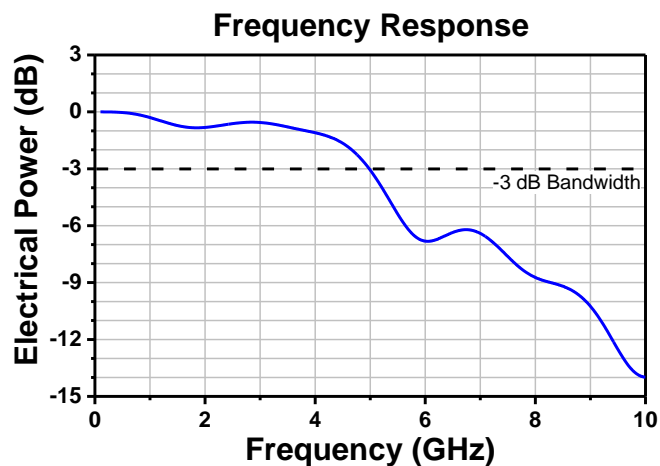


TYPICAL PERFORMANCE GRAPHS

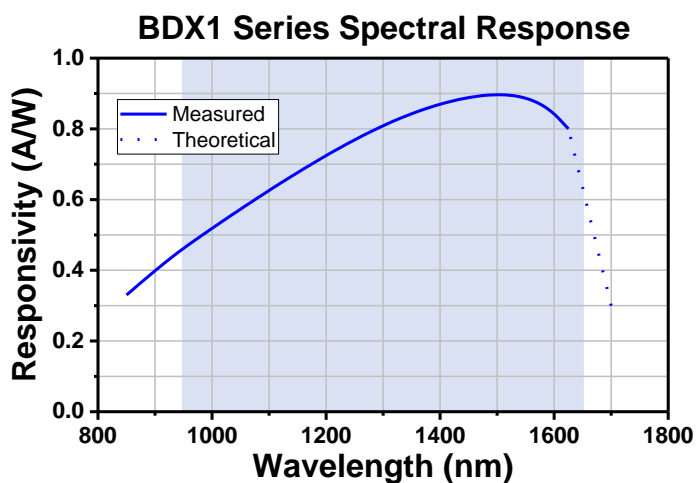
Data is collected on evaluation board with a coaxial cable and a 50 Ω load on an oscilloscope.



Typical Time Domain Pulse Response to a 100 fs Optical Input Pulse at 1560 nm



Typical Frequency Response at 1560 nm



The blue shaded region indicates the wavelength range of the photodiode material.

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