

# Large-area InGaAs Photodiodes

## ETX 500 and ETX 1000 Series



### Key Features

- High responsivity in near infrared spectrum
- Low dark current for high accuracy
- High shunt resistance
- Linear over wide range of input optical power
- Active diameters of 0.5 and 1 mm

### Applications

- Optical power meters
- Optical fiber identifiers
- Optical attenuation test sets
- Near infrared spectroscopy
- Infrared range finders

The JDSU ETX 500T and ETX 1000T series large-area InGaAs PIN photodetectors have photosensitive areas with diameters of 500 and 1000  $\mu\text{m}$ , respectively. These photodiodes offer high responsivity in the 800 – 1700 nm spectrum, and are designed for use in instrumentation, sensing, and range-finding applications.

The detectors feature high sensitivity and linear spectral responsivity over a broad range of input powers. When operating in photovoltaic mode, a noise current density of 10 fA/Hz<sup>1/2</sup> is typical at room temperature. When reverse-biased for greater bandwidth, a noise floor of 60fA/Hz<sup>1/2</sup> at -5 V is typical. Linear spectral response results from the low series resistance of the photodiodes.

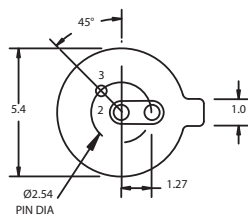
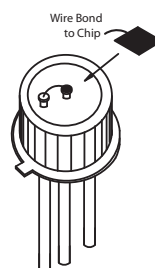
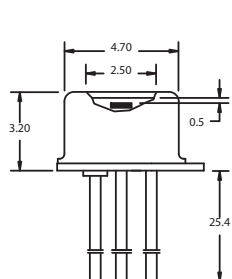
The ETX 500T and ETX 1000T series are optimal for the high-speed, differential mode measurements common in precision optical power meters, optical fiber identifiers, and optical loss test sets.

The ETX 500T and ETX1000T photodiodes are packaged in hermetically-sealed TO cans.

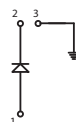
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**Dimensions Diagram: ETX 500T, ETX 1000T**

(Specifications in mm unless otherwise noted.)



Electrical Schematic



## 3

## Specifications

Parameter		ETX 500T	ETX 1000T
<b>Electrical and Optical Specifications</b>			
Conditions		25 °C, $V_R = 5\text{ V}$	25 °C, $V_R = 5\text{ V}$
Active diameter	Typical	0.5 mm	1.0 mm
Responsivity at 850 nm	Minimum	0.10 A/W	0.10 A/W
	Typical	0.20 A/W	0.20 A/W
Responsivity at 1300 nm	Minimum	0.80 A/W	0.80 A/W
	Typical	0.90 A/W	0.90 A/W
Responsivity at 1500 nm	Typical	0.95 A/W	0.95 A/W
Dark current	Typical	12 nA	50 nA
	Maximum	100 nA	400 nA
Shunt resistance <sup>1</sup>	Minimum	5.0 M $\Omega$	2.0 M $\Omega$
	Typical	250 M $\Omega$	50 M $\Omega$
Linearity <sup>2</sup>	Typical	$\pm 0.15\text{ dB}$	$\pm 0.15\text{ dB}$
Total capacitance <sup>3</sup>	Typical	35 pF	100 pF
	Maximum	50 pF	150 pF
Bandwidth <sup>4</sup>	Typical	140 MHz	35 MHz
<b>Maximum Ratings</b>			
Reverse voltage	Typical	20 V	20 V
Reverse current <sup>5</sup>	Typical	10 mA	10 mA
Forward current <sup>6</sup>	Typical	10 mA	10 mA
Power dissipation	Typical	100 mW	100 mW
Operating temperature		-40 to 85°C	-40 to 85°C
Storage temperature		-40 to 85°C	-40 to 85°C

1.  $V_R = 10\text{ mV}$

2. For ETX 500T and ETX 1000T, to 9 dBm

3. For ETX 500T and ETX 1000T,  $V_R = 0\text{ V}$

4. -3 dB point into a 50  $\Omega$  load

5. Under reverse bias, current at which device may be damaged

6. Under forward bias, current at which device may be damaged

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**Ordering Information**

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide, or via e-mail at [customer.service@jdsu.com](mailto:customer.service@jdsu.com).

**Sample: ETX 500T**

Product Code	Description
ETX 500T	0.5 mm diode in TO46 package
ETX 1000T	1.0 mm diode in TO46 package

**Precaution for Use**

Glass windows must be cleaned with 99 percent pure, reagent grade Isopropanol.

ESD PROTECTION IS IMPERATIVE. Use of grounding straps, antistatic mats, and other standard ESD protective equipment is recommended when handling or testing any InGaAs PIN or any other junction photodiode.

**Quality and Reliability**

JDSU maintains a strict quality control program throughout the design and manufacturing process of its photodetectors. All products are evaluated against MIL-STD 883C, GR468, or custom specifications. JDSU purges each photodiode for 18 hours at 125°C, with bias applied. Long-term life-testing has indicated an expected lifetime of at least 10<sup>7</sup> hours for the large area InGaAs photodiodes ETX 500 and ETX 1000T. Contact JDSU for details of specific qualification tests performed on the large-area InGaAs photodiode series.