

DAPD-TO39 Series Discrete Amplification Photon Detector



Amplification Technologies DAPD-TO39 series photodetector is a near infrared spectral range high-speed photodetector designed for the detection of extremely low-level light signals (from one photon to several thousand photons).

The DAPDNIR series takes advantage of the breakthrough Discrete Amplification method of amplifying low level photo-generated electrical signal using multi-channel amplification, developed and patented by Amplification Technologies. The use of Discrete Amplification technology in this photon detector for internal amplification creates the ability for low light signal detection with very high gain (~100,000), fast response (< 0.4 ns rise time) and negligible excess noise factor (< 1.05).

The design of the DAPD-TO39 series photodetector was developed to provide both high Photon Detection Efficiency and a wide dynamic range.

The NIRDAP series photodetector is packaged in a hermetically sealed TO-39 (aka TO5), and is available in two active areas: 80 μ m and 200 μ m.

Key Features

Electro-optical

- Near infrared spectral response from 950nm to 1650 nm
- Continuous Direct Bias operation; always on
- Monolithically integrated Negative Feedback Mechanism
- No bias quenching necessary; DAPD operates with a constant bias
- Fast response: rise time(10% to 90%) is 0.4ns
- Wide dynamic range: from a single photon up to ~3000 photons (200 μ m active area aperture)
- Proportionality: signal out is proportional to the number of arriving photons
- No dead time after an event (detection of a single or multi photon signal)
- High gain
- Low noise-factor

Applications

- 3D LiDAR imaging
- LiDAR environmental monitoring
- Quantum Communications
- Spectroscopy and Instrumentation
- Biological Sensors

Specifications

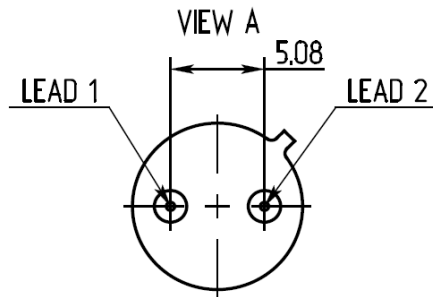
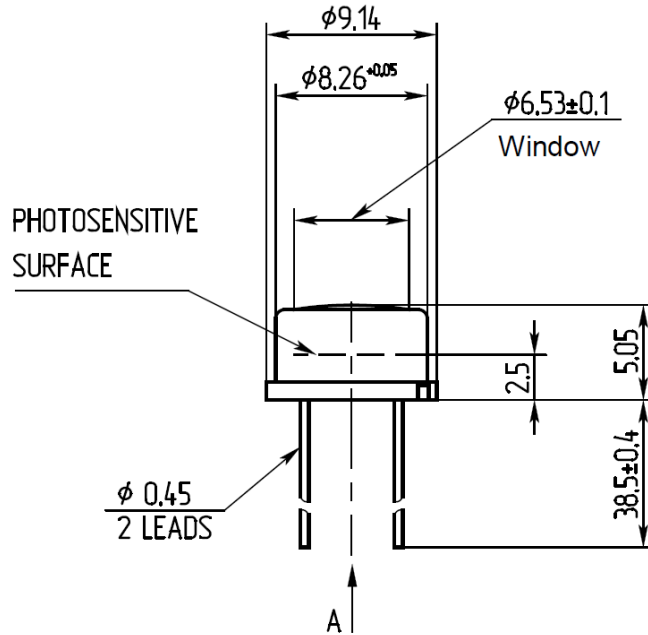
(at an ambient temperature of 23°C)

Parameter / Conditions	DAPD-TO39 Series		Unit
	-80	-200	
Active area diameter	80	200	μm
Single-Photon Detection Efficiency (PDE) @ 1550nm (typical)	15 ⁽¹⁾		%
Spectral response range	950 – 1650		nm
Single Electron Response pulse width (FWHM)	0.8	1.0	ns
Rise time (10% to 90% of response pulse)	0.4	0.5	ns
Gain (typical)	100,000		
Time resolution between two consecutive photon pulses	0.5		ns
Excess Noise Factor	1.05	1.05	
Dark Event Rate (typical; T=23°C)	30	80	Mcps
Operating Bias	50 - 80		V

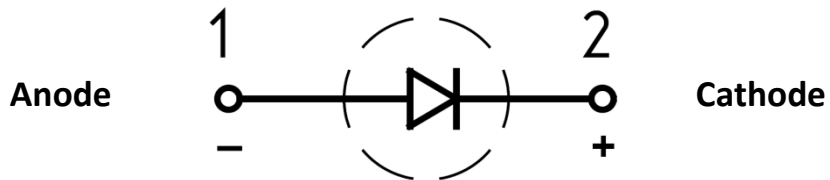
(1) Photon detection efficiency PDE includes cross talk and afterpulsing

Package Dimensions

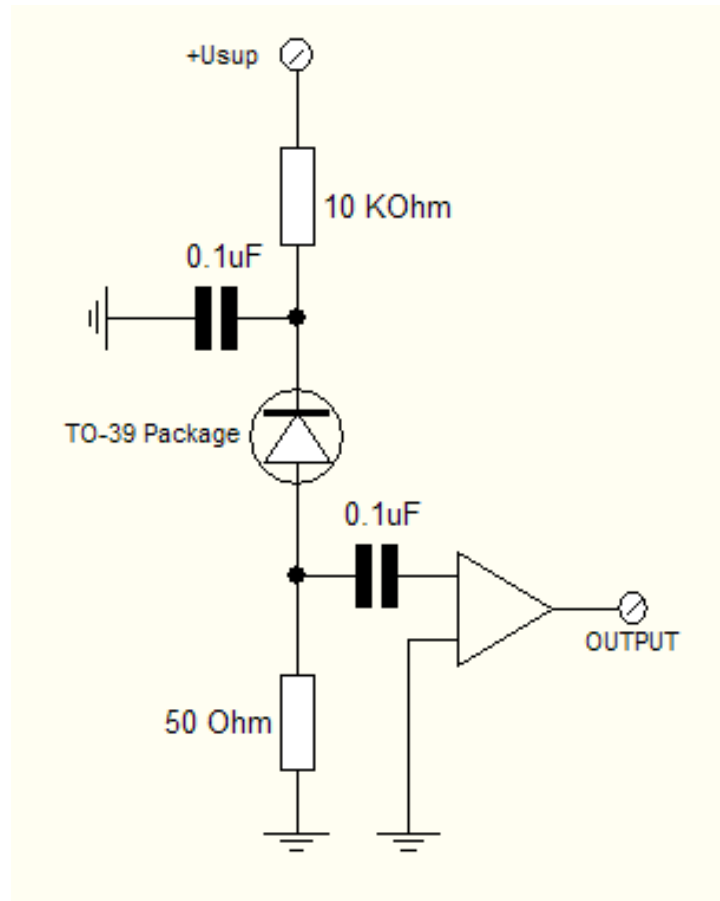
DAPD-TO39- -200 / -80



Lead Polarity:



Basic Connection Diagram for DAPDNIR Series



Precautions for Use

Use of grounding straps, anti-static mats and other standard electrostatic discharge protective equipment and methods are recommended when handling or testing these devices.

Quality Vision

Amplification Technologies Inc is committed to providing products with the highest levels of quality and reliability using best available manufacturing processes. Our top priority is total customer satisfaction. Amplification Technologies Inc maintains a strict quality control program to ensure that all products meet or surpass published specifications.

Ordering Information

When ordering, please specify the following information: DAPD-TO39-XXX where XXX corresponds to the photodetector chip active area. Please call for other custom options such as custom chip active area, custom optical windows, etc.

Contact Information:

AMPLIFICATION TECHNOLOGIES
1203 West St. Georges Ave.
Second Floor
Linden, NJ 07036
USA

Phone: +1(908) 486-7400

sales@amplificationtechnologies.com
www.amplificationtechnologies.com