

DAPD10C Series Discrete Amplification Photon Detector



Amplification Technologies DAPD10C series photodetector is a wide spectral range high-speed photodetector designed for the analog detection of extremely low-level light signals (from one photon to several thousand photons).

The DAPD10 series takes advantage of the breakthrough Discrete Amplification (DA) method of amplifying weak electrical signal using multi-channel amplification, developed and patented by Amplification Technologies. Use of DA technology in a photodetector for internal amplification allows proportional detection of a light signal with very high gain ($>1E5$), fast response (< 0.5 ns rise time) and negligible excess noise factor (< 1.05).

The patented design of the DAPD10 series photodetector was developed to provide both high Photon Detection Efficiency (PDE $> 30\%$) and a wide dynamic range. Its fill factor is greater than 60% while the density of pixels is greater than 3000 pixel/mm².

The DAP10C series photodetector is packaged in a hermetically sealed TO-5(39) package and is available in four different active areas ranging from 0.18mm to 1.0mm.

Key Features

Electro-optical

- Wide and flat spectral response from UV to near IR
- High PDE at wide dynamic range
- Fast response (< 0.5 ns rise time and < 1.5 ns SER pulse width)
- High voltage and thermal stability
- High gain
- Low noise-factor

Applications

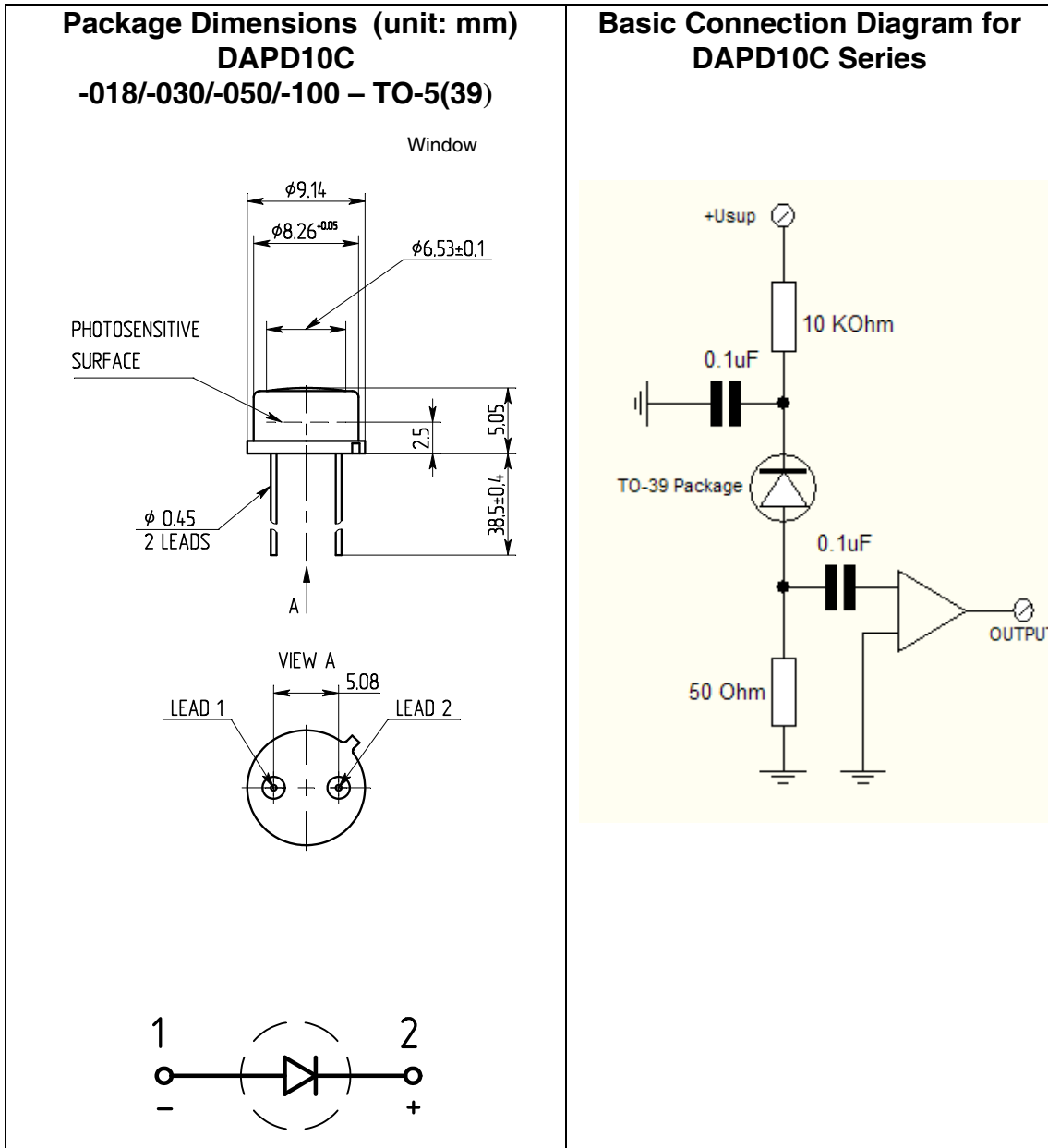
- Medical imaging & fluorescence detection
- Spectroscopy and Instrumentation
- Homeland security
- Lidar and environmental monitoring
- High energy physics
- Biological Sensors
- Confocal microscopy
- Flow cytometry

Specifications (at an ambient temperature of 25°C)

Parameter	DAPD10C series				Unit
	-018	-030	-050	-100	
Chip size	1.7 x 1.7				mm
Active area diameter	0.18	0.30	0.50	1.00	mm
Number of pixels	110	280	740	2900	-
Typical Fill Factor	65				%
Photon Detection Efficiency @ 440 nm (PDE) ¹	30 - 40				%
Spectral response range (λ)	Glass Window 350 - 950				nm
	UV Window ² 250 - 950				
Single Electron Response pulse width (FWHM)	0.6	0.7	0.8	1.2	ns
Typical gain (M)	3x10 ⁵				-
Excess Noise Factor	< 1.05				-
Typical time resolution (FWHM)	300	300 - 400			ps
Typical dark count equivalent noise @ 5 ns gate, rms	0.1	0.2	0.3	0.5	electron
Terminal capacitance	3	5	7	16	pF
Typical temperature coefficient of operating bias	25				mV/°C
Operating bias	40 - 60				V

(1) Photon detection efficiency includes cross-talk and afterpulsing.

(2) TO-5/39 cap with UV glass window, transmission 80% @250 nm (Sinclair WUV360-147-262 or similar).



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: DAPD10C-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

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