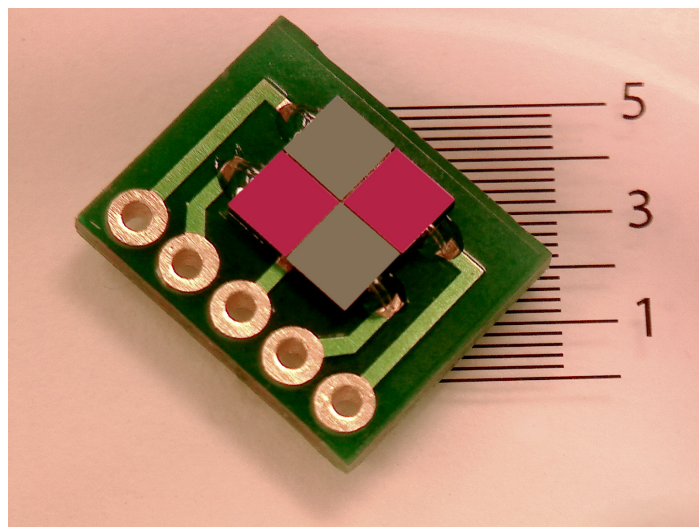




PixelSensor™ Multispectral Photodiodes combine customized multi-band detection with the fast linear response of photodiodes – opening up new possibilities for application-specific sensors. Through PIXELTEQ's exclusive micro-patterning capability, optical sensors are coated with multiple wavelength-selective filters, creating an integrated device with improved sensitivity and contrast for multispectral applications from portable fluorescence detection to biomedical instrumentation.

PixelSensor photodiodes are available with spectral response between 350 – 1050nm, supporting UltraViolet (UV), Visible (VIS), and Near InfraRed (NIR) detection. Spectral band requirements are customized to fit each application – selectively transmitting and blocking light across the targeted wavelength range.

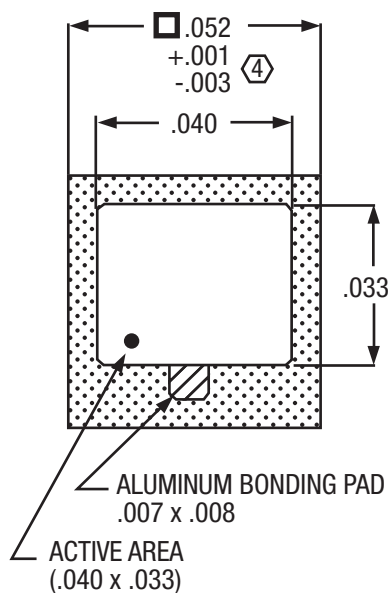
The pictured example shows a 4-element PixelSensor photodiode array arranged in a 2x2 grid on a quad printed circuit board – capable of supporting up to 4 discrete wavelength bands. In this case, the array includes two alternating narrow bandpass filters. Each quadrant of the array responds only to the light spectrum within the respective filtered pass-band by



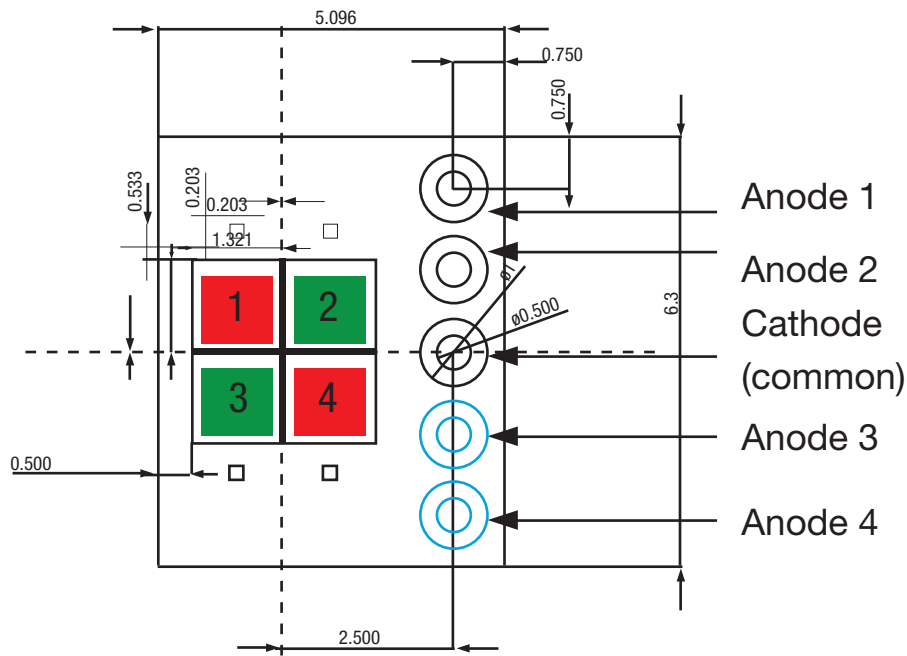
generating an intensity-dependent current flowing from the anode to the cathode, while other wavelengths are rejected by the filter coatings. In this configuration the photodiodes are configured for common cathode operation, providing low noise and fast temporal response.

The number, performance, spectral filters, and board design of PixelSensor photodiodes can be customized for application-specific requirements. In addition to delivering multispectral photodiodes, PIXELTEQ provides expert electro-mechanical and subassembly services for OEM device configuration and production. Contact PIXELTEQ for a free consultation on your application.

Layout & Dimensions



Chip Dimensions (in)



Package Dimensions: 5.1 x 6.3 (mm)

Applications



- Biomedical instrumentation & devices
- Agriculture & food processing
- Authentication & taggant sensors
- Fluorescence & quantum dot detection
- Security & intrusion detection
- Fluid & gas sensors
- Industrial sensing & instrumentation
- Optical scanning & in-line inspection
- Ambient & narrow-band light sensors
- Remote / wireless sensors
- Custom multi-band devices available

Benefits



- Custom devices with selectable multi-band detection
- Integrated high performance spectral filters
- UltraViolet (UV), Visible (VIS), and Near Infrared (NIR) versions available
- Single and multi-element photodiodes and arrays
- Fast, linear response
- Small form factor, weight & power requirements
- Robust packaging options
- Rapid prototype packages
- Scalable process for volume production

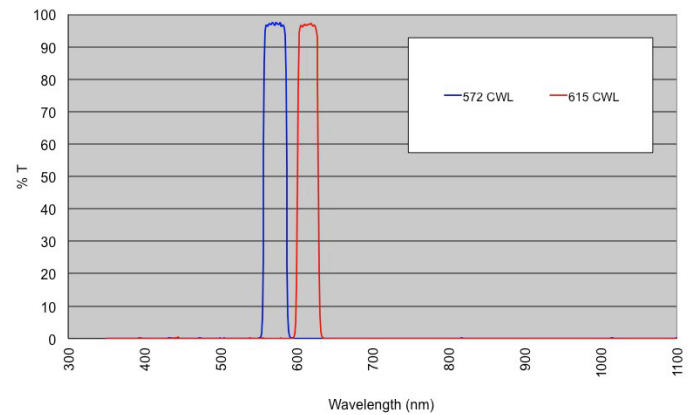
Specifications



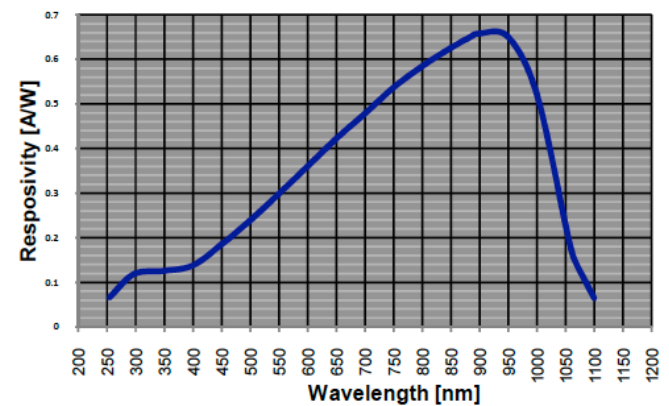
SYMBOL	CHARACTERISTIC	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{SC}	Short Circuit Current	$H = 100 \text{ fc}$, 2850 K	1	2		μA
I_D	Dark Current	$V_R = 10 \text{ V}$		2	30	nA
R_{SH}	Shunt Resistance	$V_R = 10 \text{ mV}$		100		$\text{M}\Omega$
C_J	Junction Capacitance	$V_R = 10 \text{ V}$, $f = 1 \text{ MHz}$		1	5	pF
$\lambda \text{ RANGE}$	Spectral Application Range*	Spot Scan	400		1100	nm
V_{BR}	Breakdown Voltage	$I = 10 \mu\text{A}$	30	100		V
NEP	Noise Time	$V_R = 10 \text{ V}$ @ $\lambda = \text{Peak}$		2.5×10^{-15}		$\text{W}/\sqrt{\text{Hz}}$
t	Response Time	$R_L = 50 \Omega$, $V_R = 50 \text{ V}$		6.0		nS
ABSOLUTE MAXIMUM RATING (TA = 23°C unless otherwise noted)						
V_{BR}	Reverse Voltage				50	V
T_O	Operating Temperature		-40		80	°C

* Response time of 10% to 90% is specified at 660nm wavelength light for the uncoated detector.
All electronic specifications listed are for uncoated devices.

Photodiode Bandpass Filter Transmission



Uncoated Photodiode Responsivity



The total spectral response is the product of the responsivity of the uncoated photodiode with the transmission of the coated bandpass filter at a given wavelength. Customized photodiode and bandpass filters available.