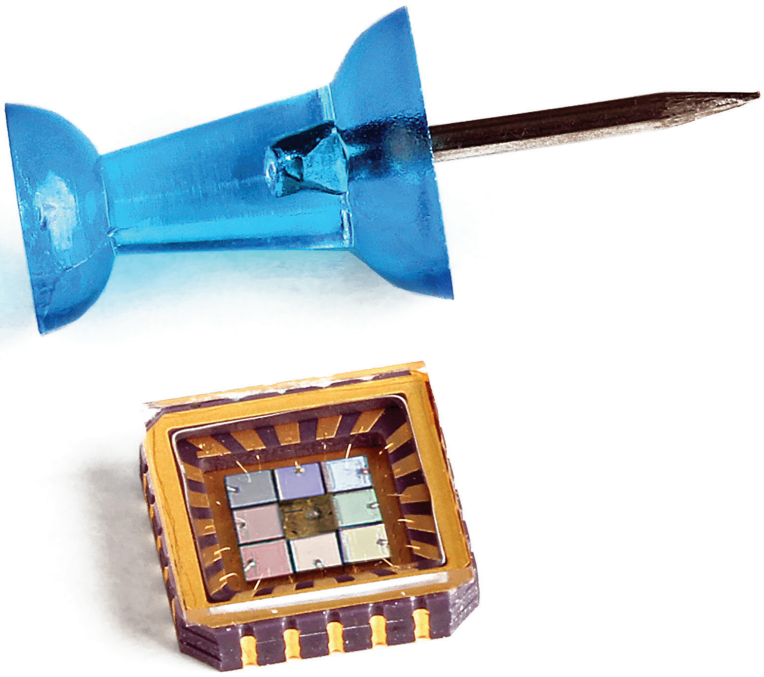
PCR SENSOR



PCR Sensor

Multispectral Sensor for Point-of-Care Testing

Point-of-care (POC) molecular diagnostics is transforming medicine by bringing sophisticated diagnostic testing to the patient, underscoring the need for compact optical detection technologies. The PCR Sensor fits the bill. This highly integrated multispectral sensor reduces the complexity, footprint and cost of POC instrumentation, collecting data only at the wavelength bands of most interest for the application. It allows optical designers ultimate flexibility in spectral detection, from the choice of optical filter bands to the number of channels, package type, and electronics.

On-chip Coating Technology Maximizes Sensor Efficiency

Unlike most multiple-wavelength sensors, the PCR Sensor uses micro-patterned optical filters that are deposited at the wafer level onto the surface of active photodiodes, which are then diced and recombined in a two-dimensional array. The specific photodiodes are chosen to detect the desired set of spectral bands corresponding to a specific POC diagnostic test or assay chemistry. Up to 8 detector elements (channels) may be accommodated in the small 9 mm x 9 mm LCC package.

Ocean Optics

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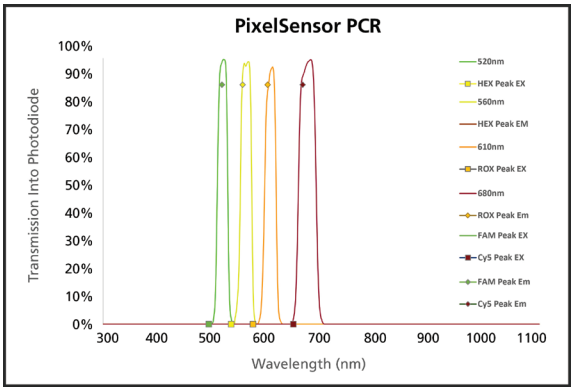
Key Features

- Compact, robust sensor for POC testing at patient bedside, medical facilities and mobile labs
- Ideal for quantitative polymerase chain reaction (qPCR) testing
- Up to 8 sensor arrays in a 9 mm x 9 mm footprint
- 20-pin LCC package for surface or socket mounting
- Evaluation kit with electronics board, software and sampling optics



Photodiode Performance Characteristics

Characteristic	Symbol	Test	Min.	Typical	Max.	Unit
Dark current	I_D	V_R = 10V		2	8	nA
Shunt resistance	R_{SH}	V_R = 10mV		100		MΩ
Junction capacity	C_J	V_R = 0V, f=100kHz V_R = 50V, f=100kHz		6 0.6	7 0.7	pF
Spectral range	λ_{range}	Spot scan	400		1100	nm
Breakdown voltage	V_{BR}	I = 10µA		75		V
Noise equivalent power	NEP	V_R = 5V @ λ = peak		$5x10^{-14}$		W/√Hz
Response time	T_r	RL = 50Ω, V_R = 50V		6.0		ns
Absolute maximum rating						
Reverse voltage	V_{BR}			75		V
Operating temperature	T_O		-40		+80	°C

PCR Filter Usable Dyes

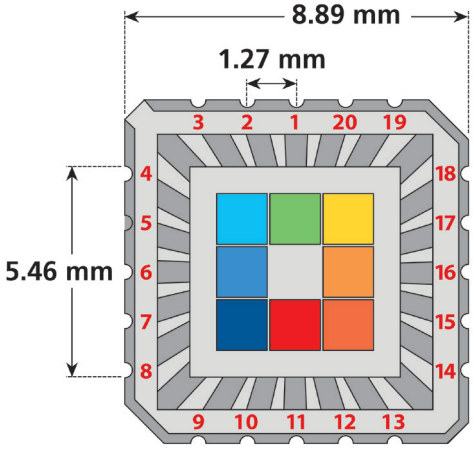
Channel	Fluorophore	Excitation (nm)	Emission (nm)
Green	FAM FITC (Fluorescein) Alexa Fluor 488	494 489 496	518 517 519
Yellow	JOE VIC HEX TET CAL Fluor Orange 560	520 538 535 521 538	548 554 556 536 559
Orange/Red	ROX Cy 3.5 Alexa Flour 568	575 578 578	602 591 603
Deep Red	Cy5 Quasar 670 Alexa Flour 633	649 647 632	666 670 647

LCC Sensor

Spectral filters	Standard and custom 10-100 nm FWHM
Photodiodes	Si, 1.0 x 0.8 mm
Package	LCC 20

OEM Board

Integration time	1-1024 ms
Gain reference	20–5120 nA
Interface	USB 2.0
Protocol	HID-compliant
Package	Si, 1.0 x 0.8 mm
Software	Windows 32-/64-bit compatible



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