

EVERYTHING

IN A

NEW

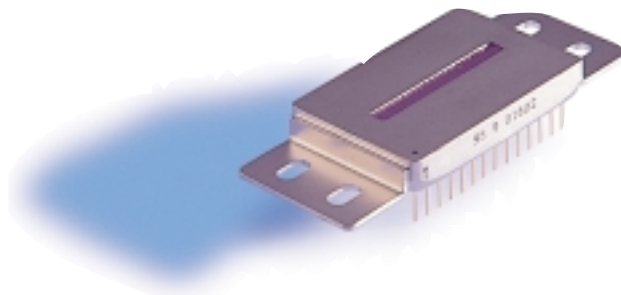
LIGHT.

Description

The MXA-256-X detector is a hybrid focal plane Indium Gallium Arsenide PIN photodiode array with wavelength response ranging from 800 nm to 1700 nm. The array has 256 elements configured in a linear orientation with standard pixel height of 0.5 mm. A buffered multiplexer provides individual CMOS amplifiers for each photodiode. The integrating amplifier maintains zero volt bias across each InGaAs photodiode, minimizing dark current and low frequency noise and allowing for longer exposure times with increased sensitivity. A static shift register scanning circuit sequentially selects sample-and-hold integrator output voltages which are proportional to input optical power. On-chip correlated double sampling removes integrator offsets and further suppresses low frequency noise. The array is available in a 28 pin dual-in-line package. Included in the assembly are a single-stage thermoelectric cooler, silicon multiplexer, bias resistor and bypass capacitors.

Multiplexed InGaAs PIN Photodiode Array MXA-256-X

800 - 1700 nm



Features

- 256 multiplexed elements
- High resolution (50 micron pitch)
- Exposure times 10 micro sec. - 10 sec.
- Wide dynamic range (14-bit)
- Correlated double sampling
- 800 - 1700 nm response

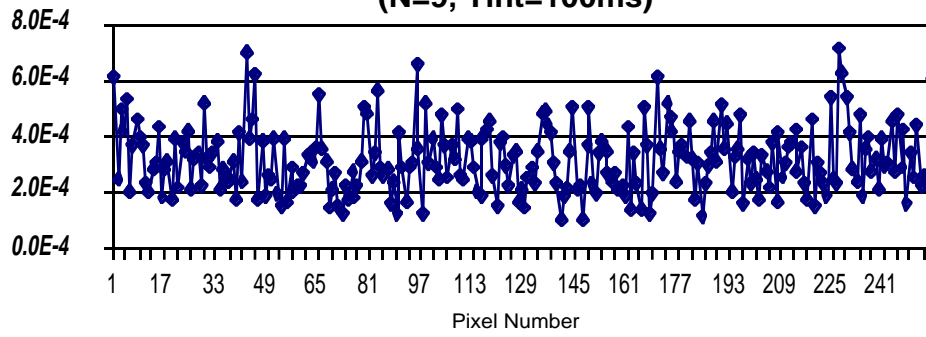
Applications

- Fiber optics, WDM monitor
- NIR spectroscopy
- NIR imaging
- NIR astronomy
- Far-field analysis

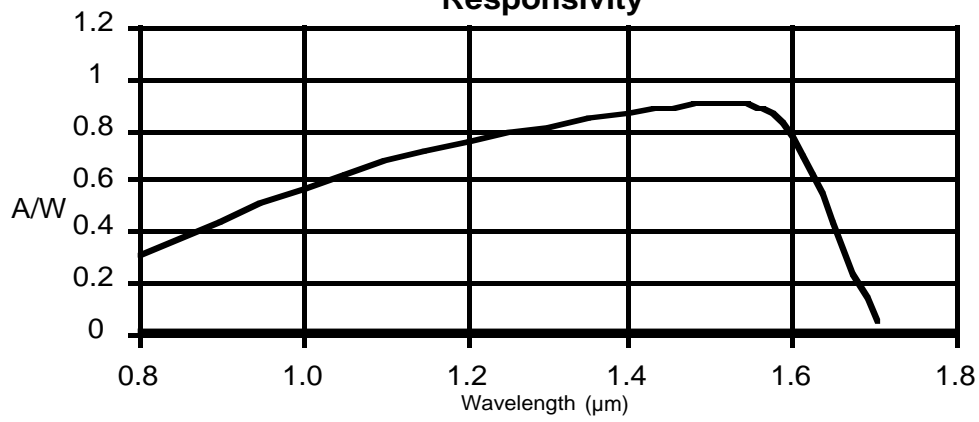
PARAMETER	CONDITIONS	MXA-256-X
Number of elements		256
Pixel height		0.5 mm
Pixel pitch		0.05 mm
Package		28 pin with 1-stage TE Cooler
Dark Current		±5pA
Response	Typical @1550 nm	65 mV/pJ (0.97A/W onto 15 pF)
	Minimum@1550 nm	60 mV/pJ
Wavelength response		800 to 1700 nm
Response uniformity	@ 1550 nm	±10%
Pixel dropouts		Grade A = none; Grade B ≤ 2%
Noise equivalent charge		1.8fC
Full well capacity	100 KHz readout	400M e- (4V onto 15 pF)
Read noise		15000 e- (150μV onto 15 pF)
NEP (pW/Hz ^{1/2}) @25°C	t = 1 msec	0.15
	t = 100 msec	0.025
Optical Dynamic range ¹ @ 25°C	Tint <10ms 25°C, Vn = 400μV -5°C, VN = 150μV	42 dB (>14 bits)
Dark voltage rate @ 25°C	Typical pixel	0.6 V/sec
	Maximum pixel	6.0 V/sec
Dark voltage rate @ 5°C	Typical pixel	0.1 V/sec
	Maximum pixel	1.0 V/sec
Pixel readout rate		10 KHz to 500KHz
TE cooler (One stage)	Hot side temperature 27°C	Tmax=64°C @ 1.8A,8V T=45°C @ 0.85A, 5V(Nominal)
Storage		-40°C to 70°C
Case operating temperature range	No cooler	0° to 40°C
	With cooling	-5° to 70°C

Note 1: Optical Dynamic Range defined as: $10V_{\max} \log(-V_{\text{dark}}/V_{\text{noise}})$
 $V_{\max} = 1.8 \text{ volts}$ $V_{\text{ref}} = 3.5 \text{ volt}$

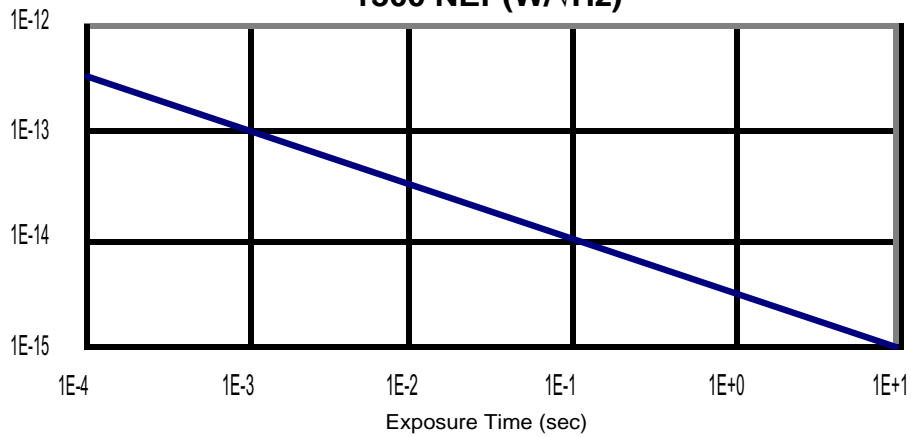
Standard Deviation of Dark Drift (V)
(N=9, Tint=100ms)



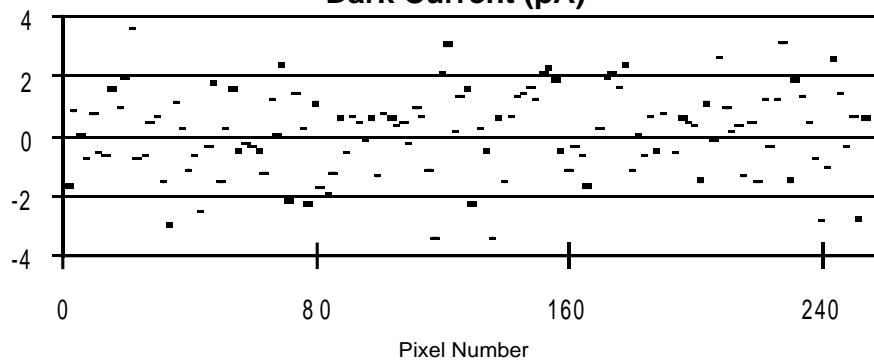
Responsivity



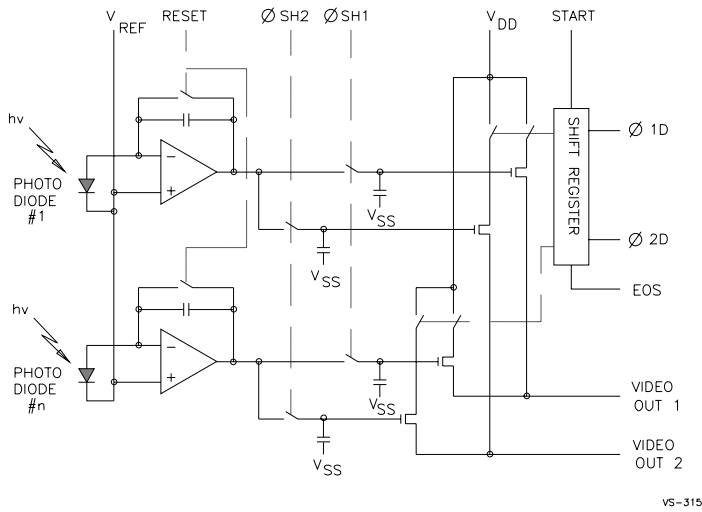
1300 NEP(W/√Hz)



Dark Current (pA)

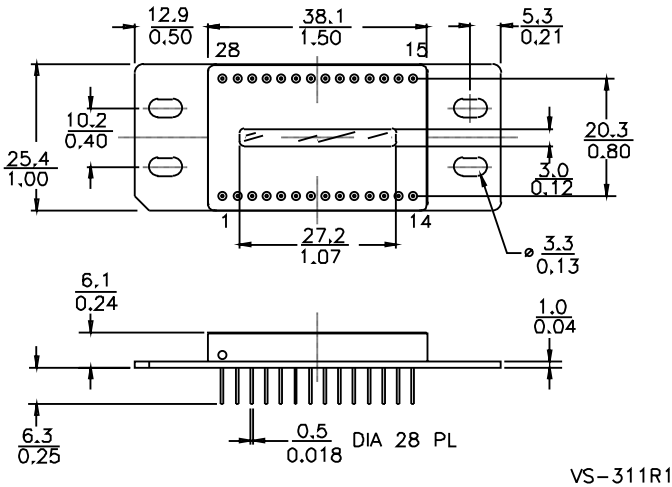


MXA-256-X Multiplexed Array Schematic Diagram



Note: Timing information as per PerkinElmer Optoelectronics MB Series Multiplexers

Mechanical Specifications



PIN OUT TABLE			
PIN #	FUNCTION	PIN #	FUNCTION
1	ϕ SH2	28	ϕ SH1
2	N/C	27	RESET
3	T.E. COOLER (+)	26	T.E. COOLER (-)
4	N/C	25	ODD ϕ ST
5	EVEN ϕ ST	24	MUX SENSE*
6	THERMISTOR	23	VDD
7	THERMISTOR	22	VSS
8	GND	21	VREF
9	EVEN ϕ 1D	20	ODD ϕ 1D
10	EVEN ϕ 2D	19	ODD ϕ 2D
11	EVEN EOS	18	ODD EOS
12	N/C	17	N/C
13	EVEN OUT 1	16	ODD OUT 1
14	EVEN OUT 2	15	ODD OUT 2

* Internally connected to Vss with MB Series multiplexer

For more information e-mail us at opto@perkinelmer.com or visit our web site at www.perkinelmer.com/opto