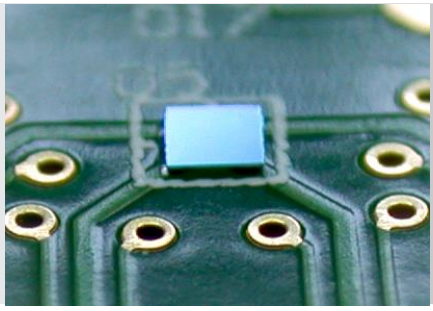
excelitas®

XPDA-200 Series



Space saving photo diode arrays

The XPDA-200 Series products are high-sensitive photodiode arrays for light-barrier, light-curtain and the like applications. The photodiodes are designed to be used in a reverse-bias mode.

Using chips from the XPDA-200 Series product line, linear or two dimensional arrays can be used for any application, be it triangulation, spot location, angle measurement, rotary encoders or the like. Also, spectral sensitive detectors can easily be designed by applying color filters in front of the photodiodes. Other applications are linear photodiode arrays, differential photo diodes, smoke detectors, liquid detectors, level detectors, heartbeat monitors, etc.

The basic building block of the photo diode arrays is a 0.5 by 1.0 mm photo diode, arranged in an array. Each of the photodiodes are individually accessible.

It is possible to customize these photodiodes arrays of up to 15×15 mm. Such a device would contain 450 individual photodiodes, each of them is individually accessible.

APPLICATIONS

- Position detection (linear, rotary, angular)
- Triangulation and spot location
- Differential photodiodes
- Heartbeat monitors

YOUR BENEFITS

- Very small footprint with chip scale package
- Very high dynamic range of 5 decades
- Easy SMT assembly by tape-on-reel packing
- No shelf-time limitation due to all non-organic materials used

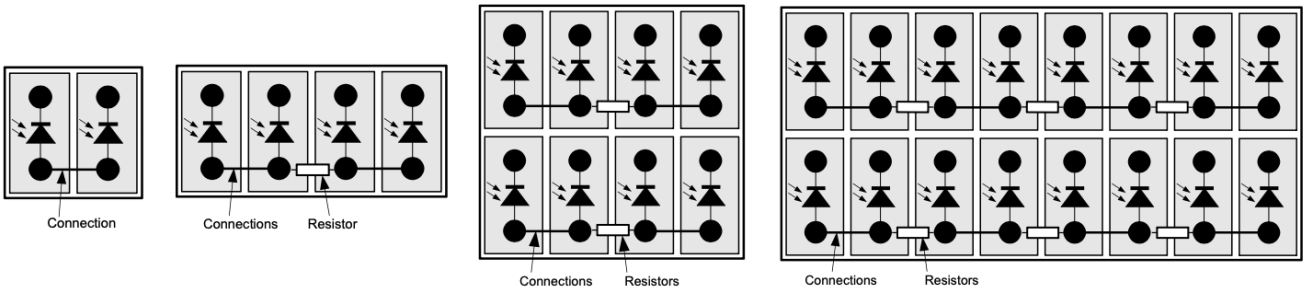
SPECIFICATIONS

- Dual photo diode with an active area of 0.86 mm^2 on PCB foot print of 1 x 1 mm
- Common anode design for optimal EMC design
- Quantum efficiency 90 % @ 850 nm
- Low noise of 4.2 x 10^{-15} W/√Hz
- Rise/fall time 90 ns @ 10 V

Standard Arrays

The standard product range consists of four models shown below:

- XPDA-200-1 : 2 x 1
- XPDA-201-1 : 4 x 1
- XPDA-202-1 : 4 x 2
- XPDA-203-1 : 8 x 2



Key characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Bias Voltage		Vbd	1.5		20	V
Responsivity	λ = 850 nm	R		0.6		A/W
Wavelength		λ	400		1030	nm
Quantum Efficiency	λ = 850 nm	QE		90		%
Half angle		ϕ		± 75		°
Open Circuit Voltage	0.5 mW/cm^2	V_O		250		mV
Photo Current [1]	λ = 850 nm V_R = 5 V I_e = 0.5 mW/cm^2	I_P		2.5		µA
Dark Current [1]	V_R = 5 V T_A = 20°C	I_R		40	2.5 nA	pA
Capacitance [1]	V_R = 5V ƒ = 100 kHz E = 0	C_0		5		pF
Noise Equivalent Power	V_R = 5V	NEP		1.2 x 10^{-14}		W/√Hz

Note 1: Values refer to a single photo diode (basic building block)

FIG 1. SPECTRAL SENSITIVITY

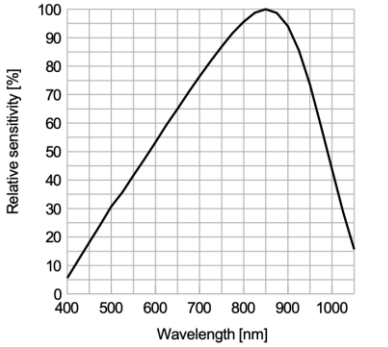


FIG 2. ANGULAR SENSITIVITY

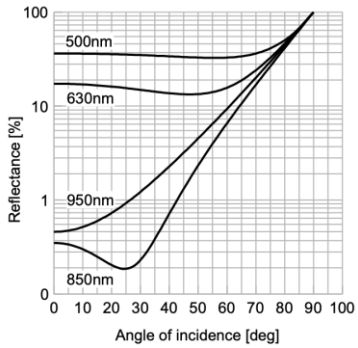


FIG 3. RISE/FALL TIME

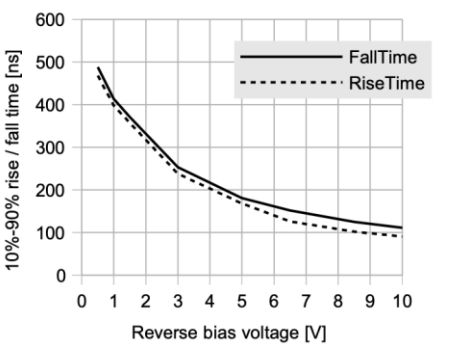
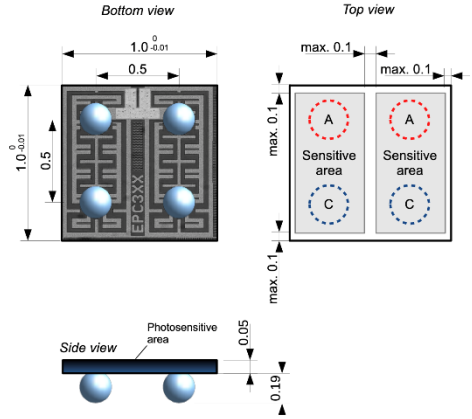
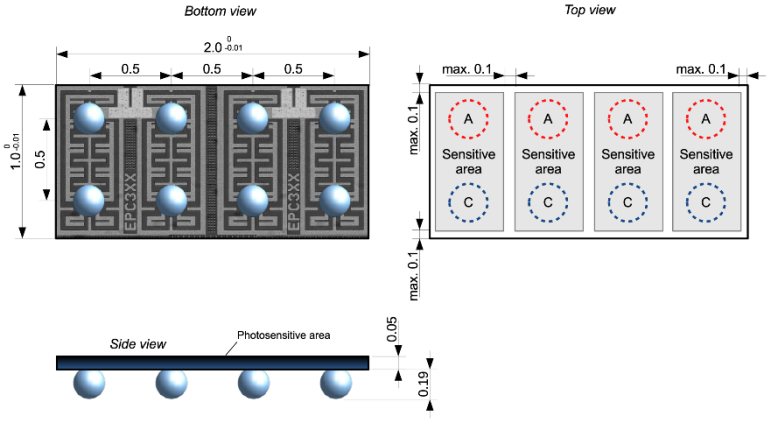


FIG 4. MECHANICAL DIMENSIONS

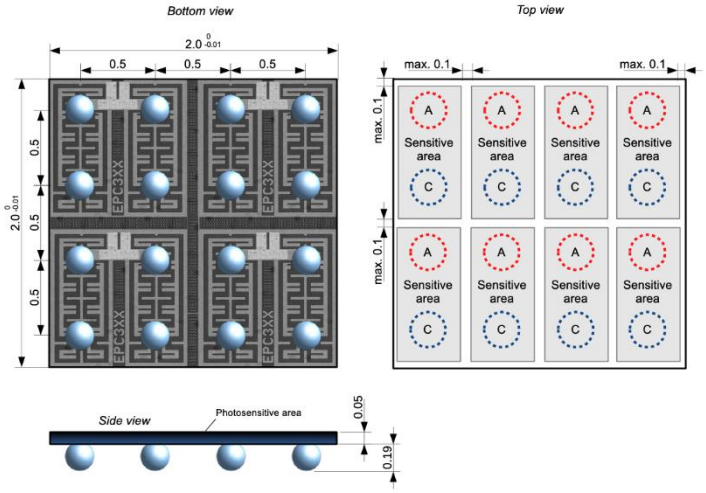
XPDA-200-1



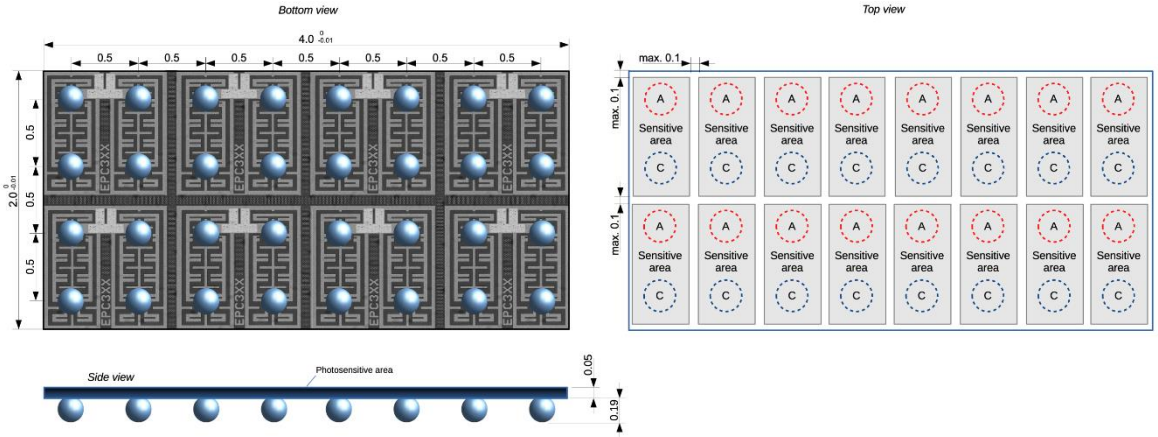
XPDA-201-1



XPDA-202-1



XPDA-203-1



Notes:

1) 'A' refers to the anode, 'C' to the cathode of the diode
2) The individual diodes are located on a monolithic silicon chip. Always two anodes of a diode pair are connected with a metal track. In between, the anode of the next diode pair is connected with a resistance of approx. 20kΩ. These Resistors shall not be used as resistor components.

Ordering Information

Part Number	No. of photodiodes	Diode length (mm)	Diode width (mm)	Total active area (mm^2)	Dark current (pA)	Packaging	Tape-on reel Packing	
							Tape width (mm)	Diode pitch on tape (mm)
XPDA-200-1	2	1	1	0.86	80	CSP4	8	2
XPDA-201-1	4	2	1	1.71	160	CSP8	8	2
XPDA-202-1	8	2	2	3.42	320	CSP16	8	4
XPDA-203-1	16	4	2	6.84	640	CSP32	12	4

Testing and operation methods

Excelitas verifies the electro optical specifications on every device.

Visual inspection during fabrication is performed as per our quality standard and failed dies are removed.

Excelitas Technologies is certified to meet ISO-9001.

Packaging and shipping

The devices are mounted on embossed tape for automatic placement systems. The tape is wound on 178 mm (7 inch) or 330 mm (13 inch) reels and individually packaged for shipment. General tape-and-reel specification data are available in a separate datas sheet and indicate the tape sizes for various package types. Further tape-and-reel specifications can be found in the Electronic Industries Association (EIA) standard 481-1, 481-2, 481-3.

Storage and handling

Excelitas highly recommends following the notes below:

- Keep devices in an ESD controlled environment until final assembly.
- Open the sealed packing just before SMT assembly. Once the sealed packing is open, keep the devices under N2 atmosphere to avoid corrosion and oxidation of the solder ball surface.
- PCB design and SMD manufacturing process shall be according to our Chip-Scale Package Assembly Process Guidelines.

RoHS compliance

This series of silicon photodiodes is designed and built to be fully compliant with the European Union Directive on restrictions on the use of certain hazardous substances in electrical and electronic equipment.



Warranty

A standard 12-month warranty following shipment applies.



Excelitas Technologies
22001 Dumberry Road
Vaudreuil-Dorion, Quebec
Canada J7V 8P7
Telephone: (+1) 450.424.3300
Toll-free: (+1) 800.775.6786
Fax: (+1) 450.424.3345

Excelitas Technologies GmbH & Co. KG
Wenzel-Jaksch-Str. 31
D-65199 Wiesbaden
Germany
Telephone: (+49) 611 492 430
Fax: (+49) 611 492 165

Excelitas Technologies Singapore, Pte. Ltd.
8 Tractor Road
Singapore 627969
Telephone: (+65) 6775 2022 (Main number)
Telephone: (+65) 6770 4366 (Customer Service)
Fax: (+65) 6778-1752

For a complete listing of our global offices, visit **www.excelitas.com/locations**

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