

General Description

epc300 or epc330 photodiodes in CSP-housing on LCC-housing carrierboard for part evaluation purpose of the epc3xx family products.

The epc3xx family products are high-sensitive photodiodes for light-barrier, light-curtain and the like applications. They allow the design of sensors or of short to long range light barriers from a few millimeters up to tens of meters. Linear or two dimensional arrays can be formed for any application: Triangulation, spot location, angle measurement, rotary encoder, sensor or similar. Spectral sensitive detector can easily be designed by applying color filters in front of the photodiodes.

The photodiodes are designed to be used in reverse-bias mode. They feature a very high quantum efficiency of 90% in the near IR range. The reverse breakdown voltage is up to 30 Volts. The response time is less than 100ns.

Other mechanical dimensions are available upon request up to 15x15 mm or even bigger. A 15x15 mm device contains 450 single photodiodes, each individually accessible.

Features

- Carrierboard in LCC-housing design with epc300 or epc330 photodiodes for easy part evaluation by users.
- High dynamic range.
- High quantum efficiency.
- Low dark current.
- Diodes can be used in parallel.

Applications

- Light barrier ranging from millimeters to tens of meters
- Light curtain
- Light, smoke, liquid, leveling, triangulation detectors
- Position detection (rotary, linear, angle, etc.)
- Differential measurement
- Linear photodiode arrays

Model	No. of Photo Diodes	Diode Length (mm)	Diode Width (mm)	Total Active Area (mm ²)	Typ. Dark Current at 20°C (pA)	Ideal Bias Voltage (V)	Wavelength (nm)	Footprint
Single diode	1	1.0	0.5	0.43	20	5	400 - 1050	---
epc300-LCC4	2	1.0	1.0	0.86	40	5	400 - 1050	LCC4
epc330-LCC32	16	4.0	2.0	6.84	320	5	400 - 1050	LCC32

Wiring diagram

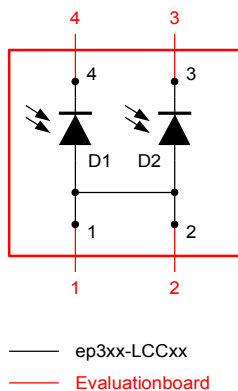


Figure 1: Schematic epc300-LCC4

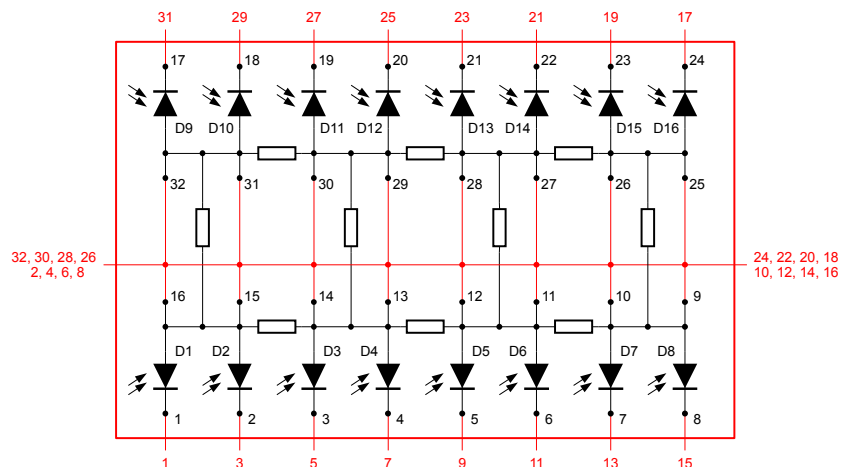


Figure 2: Schematic epc330-LCC32

Absolute Maximum Ratings

Reverse Voltage V_R	30.0 V
Breakdown Voltage between Diodes	10.0 V
Storage temperature (T_A)	-40°C to +85°C
Soldering Lead Temperature (T_L), 4 sec	+260°C

Operating Ratings

Reverse Voltage V_R	+1.5V to +20V
ESD rating of JEDEC	HBM class 2 (<2kV)
Operating temperature (T_A)	-40°C to +85°C
Humidity, non-condensing	5% to 95%

Note 1: Information only. Refer to the datasheet epc3xx for detailed and valid technical specifications.

Note 2: Unless otherwise stated, data apply for individual photodiodes @ $V_R = 5.0\text{ V}$, $-40^\circ\text{C} < T_A < +85^\circ\text{C}$, $R_L = 50\ \Omega$.

General Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
$\lambda_{S\text{ max}}$	Wavelength @ max. Sensitivity		850		nm
λ	Wavelength Range: $S = 20\%$ to S_{max}	400		1050	nm
S_λ	Spectral Sensitivity @ $\lambda = 850\text{nm}$, $V_R = 5\text{V}$, $I_e = 1\text{ mW/cm}^2$, type epc300		0.6		A/W
η	Quantum Efficiency @ $\lambda = 850\text{nm}$, $V_R = 5\text{V}$, $I_e = 1\text{ mW/cm}^2$, type epc300		90		%

Type Specific Characteristics @ +25°C (all diodes of the array connected in parallel)

Symbol	Parameter	Type	Min.	Typ.	Max.	Unit
I_P	Photo Current @ $V_R = 5\text{V}$, $I_e = 1\text{ mW/cm}^2$, $\lambda = 850\text{ nm}$	per diode		2.5		μA
		epc300		5		
		epc330		40		
I_R	Dark Current @ $V_R = 5\text{ V}$, $T_A = 20^\circ\text{C}$	per diode		20	250	pA
		epc300		40	500	
		epc330		320	4000	
I_{sc}	Short-circuit Current @ $I_e = 1\text{ mW/cm}^2$	per diode		2.5		μA
		epc300		5		
		epc330		40		
t_r	Rise/Fall Time; all types @ $R_L = 50\ \Omega$, $\lambda = 850\text{ nm}$, $I_P = 200\ \mu\text{A}$	$V_R = +1.5\text{ V}$		300		ns
		$V_R = +5.0\text{ V}$		150		
		$V_R = +10.0\text{ V}$		90		
C_T	Cross Talk Suppression between individual photo diodes on the same chip, if the voltage difference V_{diff} is $<100\text{mV}$ between individual diodes (cathodes)	epc330		50		dB

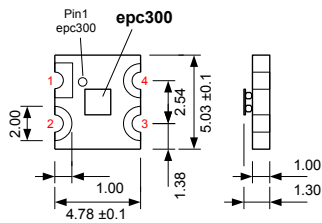


Figure 3: Dimensions epc300-LCC4

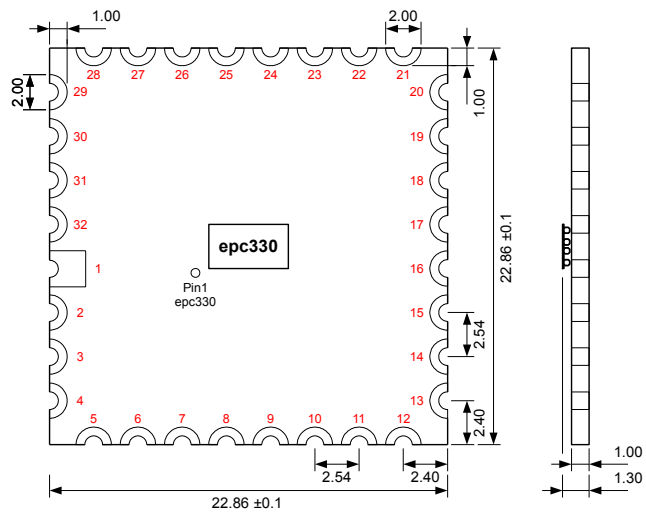


Figure 4: Dimensions epc330-LCC32