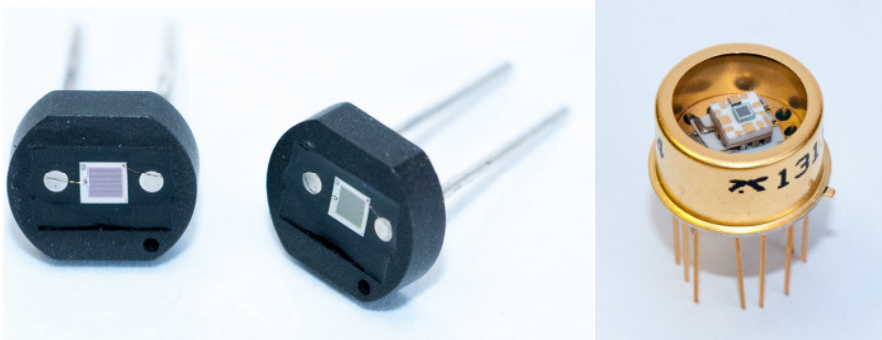


C30742-11 Series

Silicon Photomultipliers with 1x1 mm² active area



The Excelitas C30742-11 Series SiPM is offered in 2 standard package configurations: the hermetically sealed TO-8 package with built-in single TE cooler, and the two-lead through-hole black ceramic mount.

The Excelitas C30742-11 Series Silicon Photomultiplier is designed for photon detection in the 350 nm to 850 nm range. Its innovative design based on Excelitas' proprietary high-performance APD processes is optimized for low timing resolution, low dark count, low cross talk and high photon detection efficiency. This unique set of performance parameters makes the Excelitas SiPM especially advantageous for demanding low noise applications such as photon counting, analytical measurements and radiation detection.

The Excelitas C30742-11 SiPM is offered in the standard 50 μ microcell size. This part also comes in 2 standard package configurations: Hermetically sealed TO-8 package with built-in single stage TE cooler, and the two-lead through-hole black ceramic package.

Excelitas Technologies is committed to supplying the highest quality product to our customers. This specification sheet covers our standard products. Please contact us directly to discuss your custom requirements and how we can accommodate your special design, packaging, or testing needs.

Key Features

- Low timing resolution
- High gain at low bias voltage
- Low dark count rate
- High photon detection efficiency
- Low capacitance
- Excellent gain – temperature – voltage characteristics
- RoHS-compliant

Applications

- Photon Counting
- Analytical Detection
- High Energy Physics experiments
- Radiation Detection
- Fluorescence Detection

C30742-11 Series
Silicon Photomultipliers

Table 1: Electrical Characteristics, at TA = 25 °C, typical V_{op}⁽¹⁾ - unless otherwise indicated

Parameter	Symbol	C30742-11-050-C ⁽²⁾			Unit
		Minimum	Typical	Maximum	
Active area	-		1x1		mm
# of microcells	-		400		-
Microcell size	-		50		um
Breakdown Voltage	V _{bd}		95		V
Over Voltage ⁽¹⁾	ΔV		5	12	V
Spectral response range	λ		350-850		nm
Photon detection efficiency ⁽³⁾	PDE				%
@ 420nm			30		
@ 520nm			33		
@ 635nm			18		
Rise Time	T _r		400		ps
Dark count	DCR		150	300	Kcps
Dark Current	I _d		60	120	nA
Terminal Capacitance	C _t		20		pF
Gain	M		1.50E+06		
Single photon timing resolution (FWHM) at 440nm	SPTR		200		ps
Temperature coefficient of V _{br}	T _c = ΔV/ΔT		90		mV/°C
Gain variation with over-voltage	ΔM/MΔV		1		%/50mV
Gain variation with temperature	ΔM/MΔT		1.8		%/°C

Note 1: Typical recommended operating voltage is V_{op} = V_{bd} +5V

Note 2: See Table 2 for part number system of this series of SiPM.

Note 3: True PDE value on potted device. After pulse and crosstalk are not included.

Table 2: Ordering Guide

Excelitas C30742-11 Series SiPM	50 x 50 μm ² microcell size
Through-hole Ceramic Package with Pins	C30742-11-050-C
TO-8 Hermetic package with Single stage TEC	C30742-11-050-T1

C30742-11 Series Silicon Photomultipliers

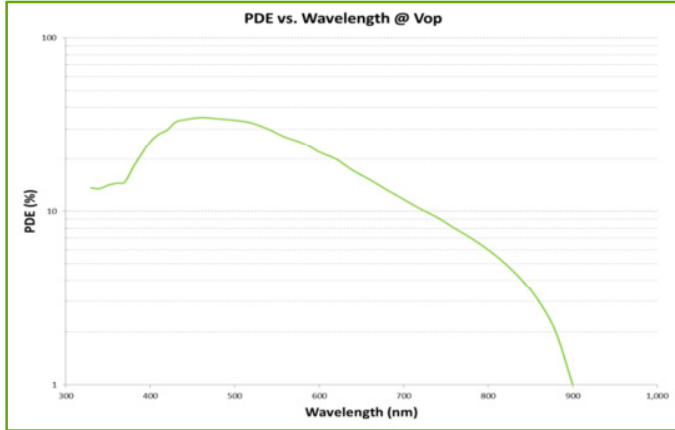


Figure 1:
Photon Detection Efficiency (PDE) vs. Wavelength

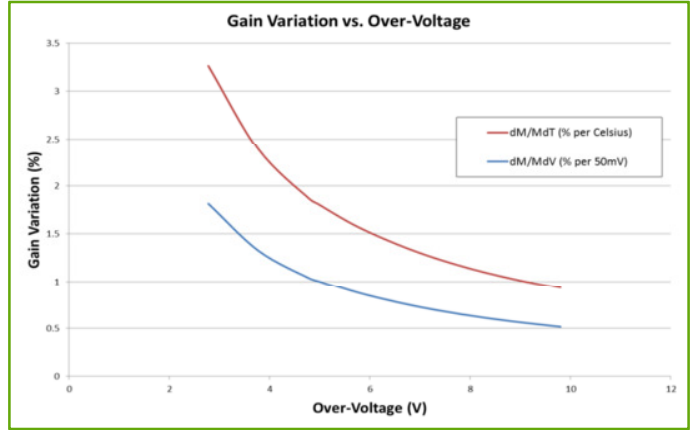


Figure 2:
Gain variation vs. over-voltage

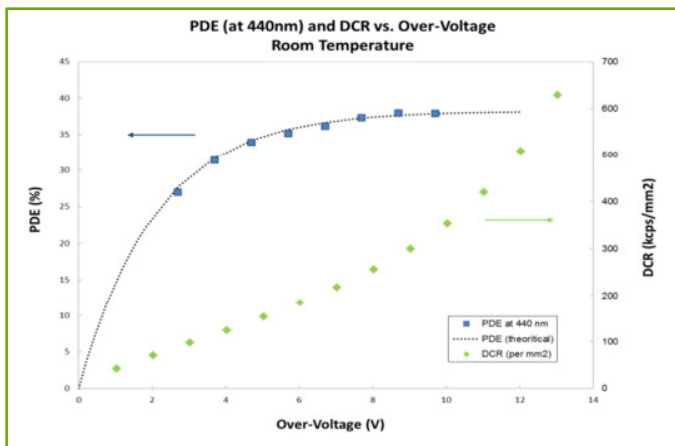


Figure 3:
PDE and Dark Count vs. over-voltage at room temperature

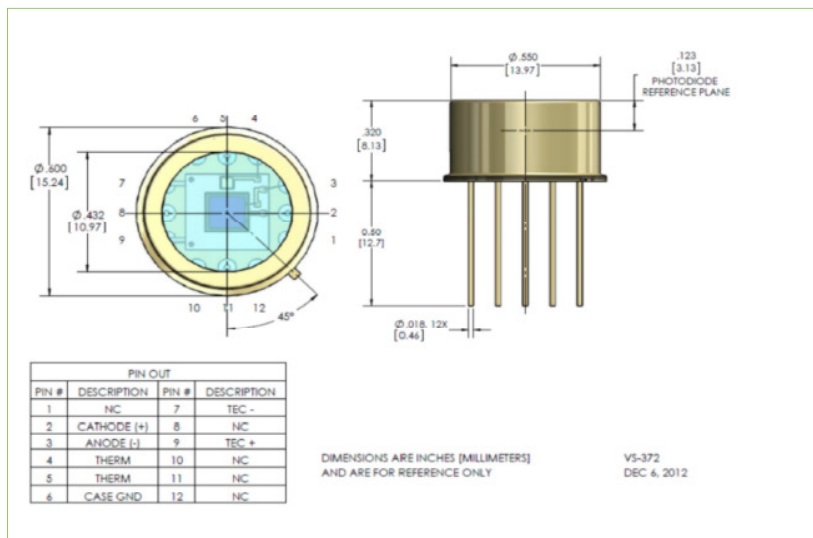


Figure 4:
TO-8 Hermetic Package drawing
Part#: C30742-11-050-T1

C30742-11 Series Silicon Photomultipliers

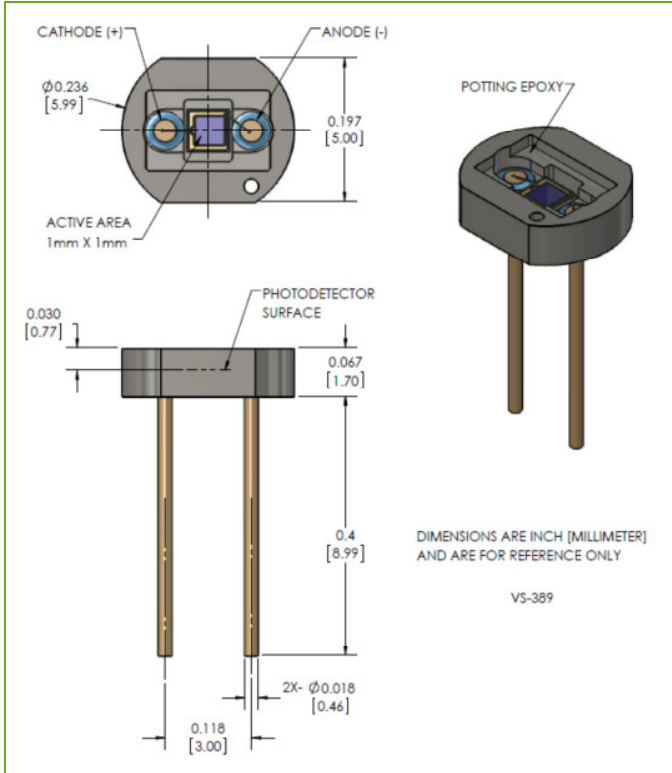


Figure 5:
Through-hole Two-lead ceramic carrier dimensions,
Part#: C30742-11-050-C

Excelitas Technologies' Silicon Photomultiplier development program is supported by financial contribution of the Government of Canada.

About Excelitas Technologies

Excelitas Technologies is a global technology leader focused on delivering innovative, customized solutions to meet the lighting, detection and other high-performance technology needs of OEM customers. From analytical instrumentation to clinical diagnostics, medical, industrial, safety and security, and aerospace and defense applications, Excelitas Technologies is committed to enabling our customers' success in their specialty end-markets. Excelitas Technologies has approximately 3,000 employees in North America, Europe and Asia, serving customers across the world.

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