

## C30742-33 Series

# Silicon Photomultipliers with 3x3 mm<sup>2</sup> active area



The Excelitas C30742-33 Series SiPM is offered in 3 standard package configurations: Leadless laminated carrier surface mount, the hermetically sealed TO-8 package with built-in single stage TE cooler, and the two-lead ceramic mount (not pictured).

### 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
- Positron Emission Tomography (PET)
- Flow Cytometry
- Analytical Detection
- High Energy Physics experiments
- Radiation Detection
- Fluorescence Detection

The Excelitas C30742-33 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 high volume applications such as Positron Emission Tomography (PET), high energy physics experiments, analytical measurements and radiation detection.

The Excelitas C30742-33 SiPM is offered in 3 standard package configurations: Hermetically sealed TO-8 package with built-in single stage TE cooler, two-lead ceramic mount and leadless laminated carrier surface mount (XLLC, SMT, tile-able) allowing for easy handling and coupling to scintillating crystals such as LSO and BGO.

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.

**C30742-33 Series**

**Silicon Photomultipliers**

**Table 1: Electrical Characteristics, at TA = 25 °C, typical V<sub>op</sub><sup>(1)</sup> - unless otherwise indicated**

Parameter	Symbol	C30742-33-50 <sup>(2)</sup>			Unit
		Minimum	Typical	Maximum	
Active area	-		3x3		mm
# of microcells	-		3600		-
Microcell size	-		50		um
Breakdown Voltage	V <sub>bd</sub>		95		V
Over Voltage <sup>(1)</sup>	ΔV		5	12	V
Spectral response range	λ		350-850		nm
Photon detection efficiency <sup>(3)</sup> @ 420nm @ 520nm @ 635nm	PDE		30 33 18		%
Rise Time	T <sub>r</sub>		600		ps
Dark count	DCR		1350	2700	Kcps
Dark count / mm <sup>2</sup>			150	300	Kcps
Dark Current	I <sub>d</sub>		0.7	1.4	μA
Terminal Capacitance	C <sub>t</sub>		175		pF
Gain	M		1.5x10 <sup>6</sup>		
Single photon timing resolution (FWHM) at 440nm	SPTR		300		ps
Temperature coefficient of V <sub>br</sub>	T <sub>c</sub> = δV/δT		90		mV/°C
Gain variation with over-voltage	δM/MδV		1.0		%/50mV
Gain variation with temperature	δM/MδT		1.8		%/°C

Note 1: Typical recommended operating voltage is V<sub>op</sub> = V<sub>bd</sub> +5V

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

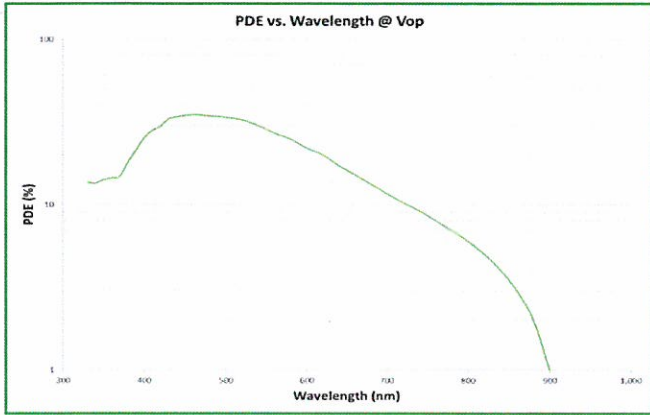
Note 3: True PDE value on potted device. After pulse and crosstalk are not included.

**Table 2: Ordering Guide**

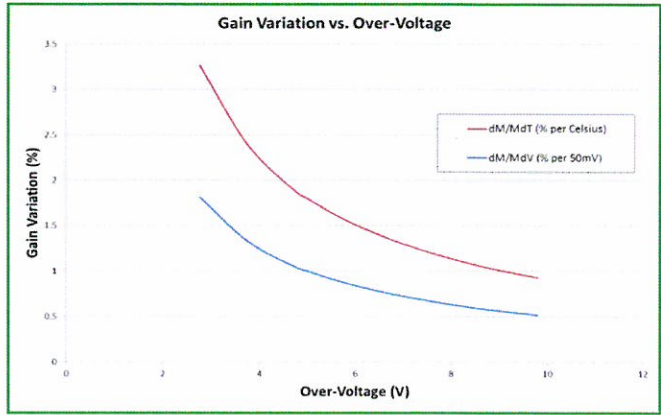
Excelitas <b>C30742-33 Series SiPM</b>	50 x 50 μm <sup>2</sup> microcell size
Ceramic Package with Pins	C30742-33-050-C
XLLC (Leadless Laminate Carrier)	C30742-33-050-X
TO-8 Hermetic package with Single stage TEC	C30742-33-050-T1



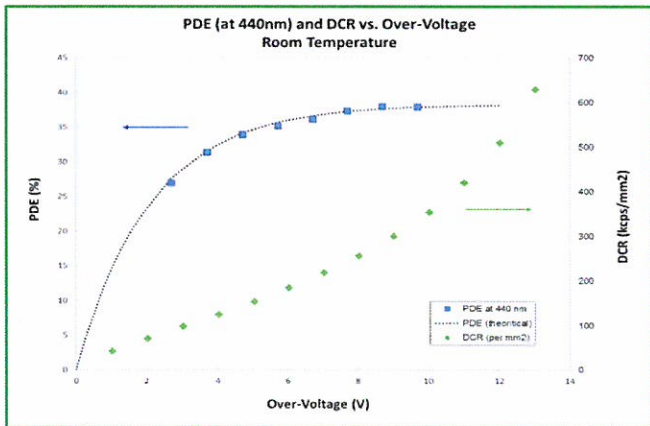
**C30742-33 Series**  
**Silicon Photomultipliers**



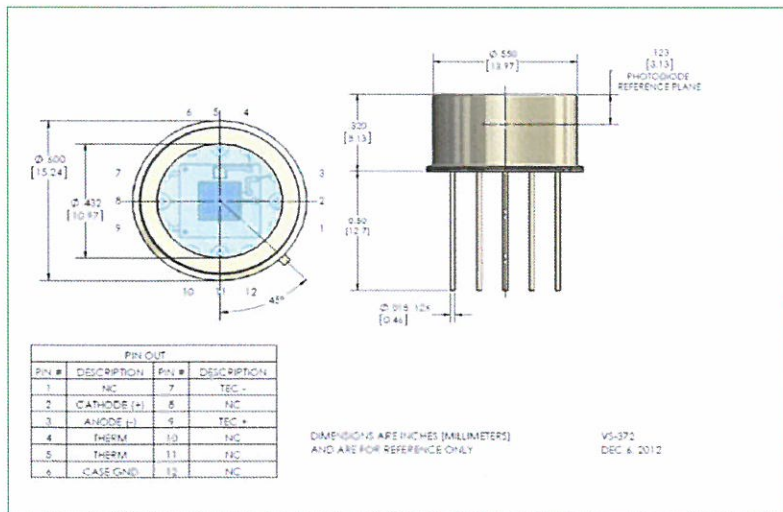
**Figure 1:**  
 Photon Detection Efficiency (PDE) vs. Wavelength



**Figure 2:**  
 Gain variation vs. over-voltage

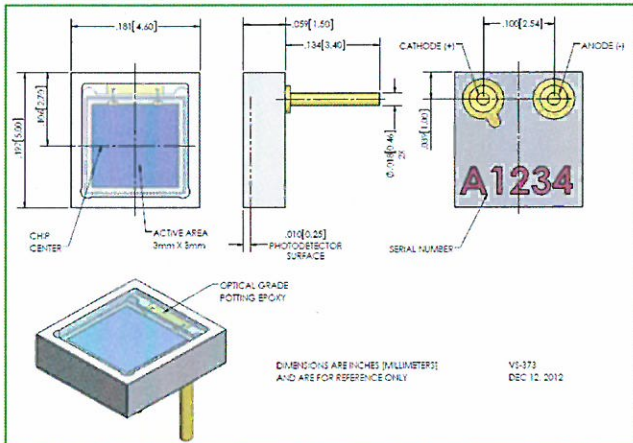


**Figure 3:**  
 PDE and Dark Count vs. over-voltage at room temperature

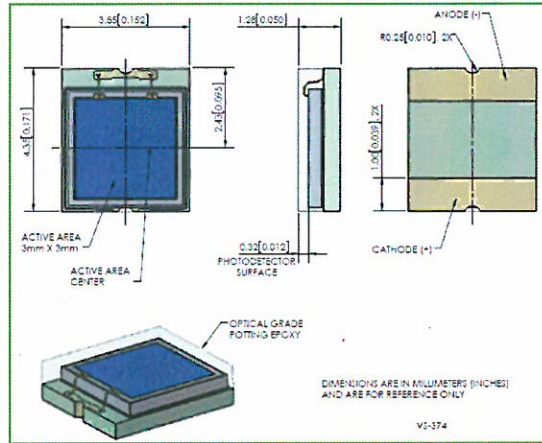


**Figure 4:**  
 TO-8 Hermetic Package drawing  
 Part#: C30742-33-050-T1

## C30742-33 Series Silicon Photomultipliers



**Figure 5:**  
Two-lead ceramic carrier dimensions,  
Part#: C30742-33-050-C



**Figure 6:**  
Leadless laminated carrier surface mount (XLLC)  
dimensions, Part#: C30742-33-050-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.

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  
detection.na@excelitas.com

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

Excelitas Technologies Singapore, Pte. Ltd.  
1 Fusionopolis Walk, #11-02  
Solaris South Tower  
Singapore 138628  
Telephone: (+65) 6775 2022 (Main)  
Telephone: (+65) 6770 4366 (Cust. Svc.)  
Fax: (+65) 6778 1752  
detection.asia@excelitas.com

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