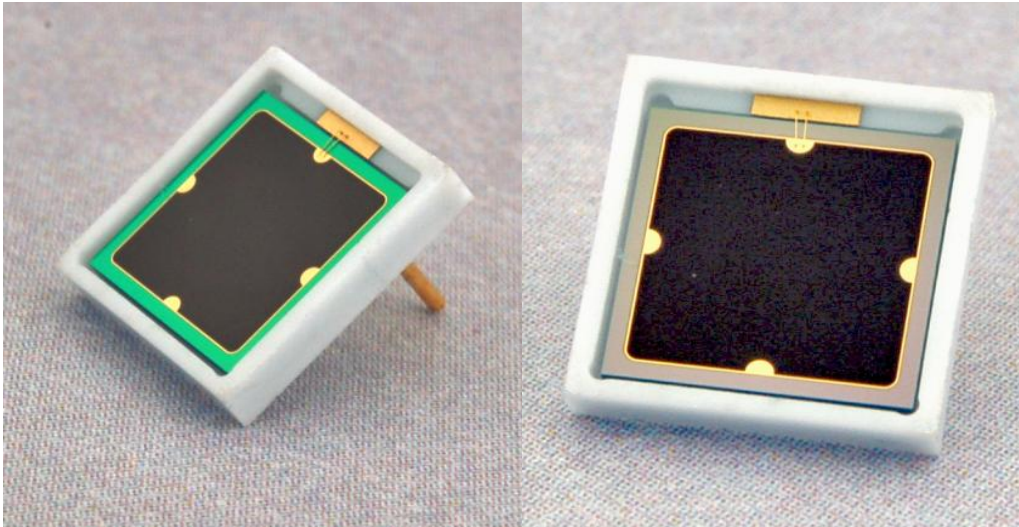


C30739ECERH Series

Large Area Silicon Avalanche Photodiodes – Short Wavelength Enhanced



Excelitas' C30739ECERH Large Area Silicon Avalanche Photodiodes (APDs) are intended for use in a wide variety of broadband low light level applications covering the spectral range from below 400 nm to over 700 nm.

The devices are designed to have enhanced short wavelength responsivity with quantum efficiency typically exceeding 75% at 430 nm. In addition, the large area APD is optimized for low noise and low capacitance (60 pF). Operation at an avalanche gain of up to $M = 400$ at 430 nm is feasible with a special high gain version.

The standard ceramic carrier package allows for easy handling and coupling to scintillating crystals such as LSO and BGO. Combined with the superior short wavelength responsivity, it makes this APD ideal in demanding high-volume applications such as Positron Emission Tomography (PET).

While the devices are warranted over the entire specification, customers are welcome to discuss their custom requirements; Excelitas is pleased to accommodate special design, packaging or testing needs.

Key Features

- Large Area silicon APD
- Short Wavelength enhanced responsivity
- High quantum efficiency (75% at short wavelength(430 nm)
- Easy coupling to scintillating crystals
- Non-magnetic package
- Custom packaging available
- Excellent timing resolution
- RoHS compliant

Applications

- Molecular imaging (PET)
- Nuclear medicine
- Fluorescence detection
- High energy physics
- Safety radiation detection
- Optical tomography
- Environmental monitoring

C30739ECERH Series**Large Area Short Wavelength Enhanced Silicon Avalanche Photodiodes****Table 1. Package and Chip Dimensions**

Parameter	Measurement	Unit
Package Size	8.50 x 8.00 x 1.55	mm
Chip size	6.5 x 6.5	mm
Active area	5.6 x 5.6	mm

Table 2. Electrical Characteristics, at $T_A = 22\text{ }^\circ\text{C}$; at typical operating voltage- V_b

Symbol	Parameter	C30739ECERH (standard version)			C30739ECERH-1 (low gain version)			C30739ECERH-2 (high gain version)			Unit	Conditions
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
V_b	Operating Voltage	-	400	475	-	390	475	-	400	475	V	
dV	$dV = V_{br} - V_b$	-	25	-	-	40	-	-	10	-	V	defines relation of operating voltage V_b to breakdown voltage V_{bd}
M	Gain at V_b	100	150	-	30	50	-	200	250	-		
Q.E.	Quantum Efficiency	60	75	-	60	75	-	60	75	-	%	at 430 nm
R	Responsivity	-	39	-	-	13	-	-	65	-	A/W	at 430 nm and Typical Gain M
C_j	Capacitance	-	60	-	-	60	-	-	60	-	pF	at V_b
t_R	Rise Time	-	2	-	-	2	-	-	2	-	ns	
I_D	Dark Current	-	3	-	-	3	-	-	3	-	nA	at V_b
I_N	Noise Current	-	0.4	-	-	0.4	-	-	0.5	-	pA/ $\sqrt{\text{Hz}}$	at V_b

Table 3. Maximum ratings

Parameter	Min	Typical	Max	Unit
Operating Temperature	0	-	50	$^\circ\text{C}$
Storage Temperature	-20	-	70	$^\circ\text{C}$
Maximum Humidity (non-condensing)	-	-	60	%

C30739ECERH Series

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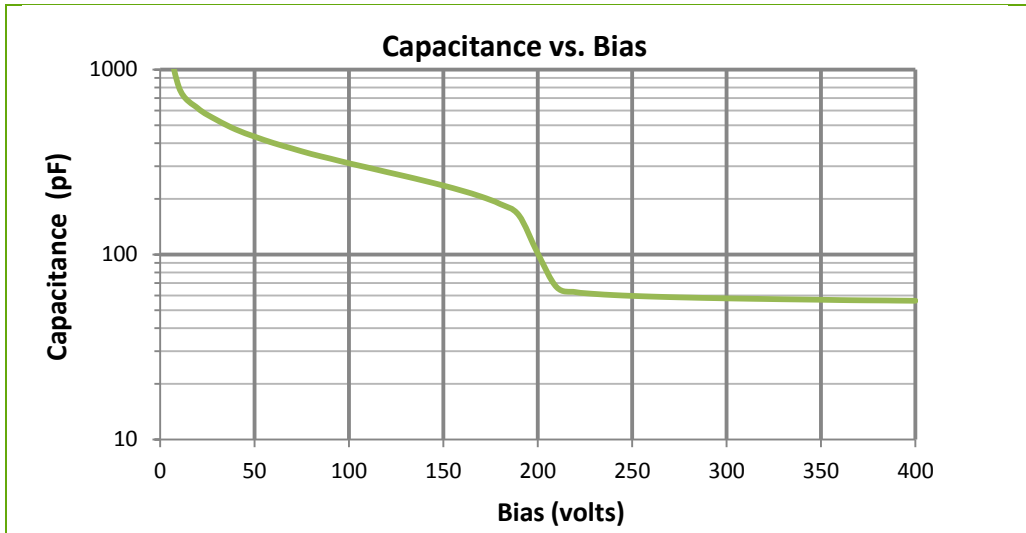


Figure 1
Capacitance vs. operating voltage

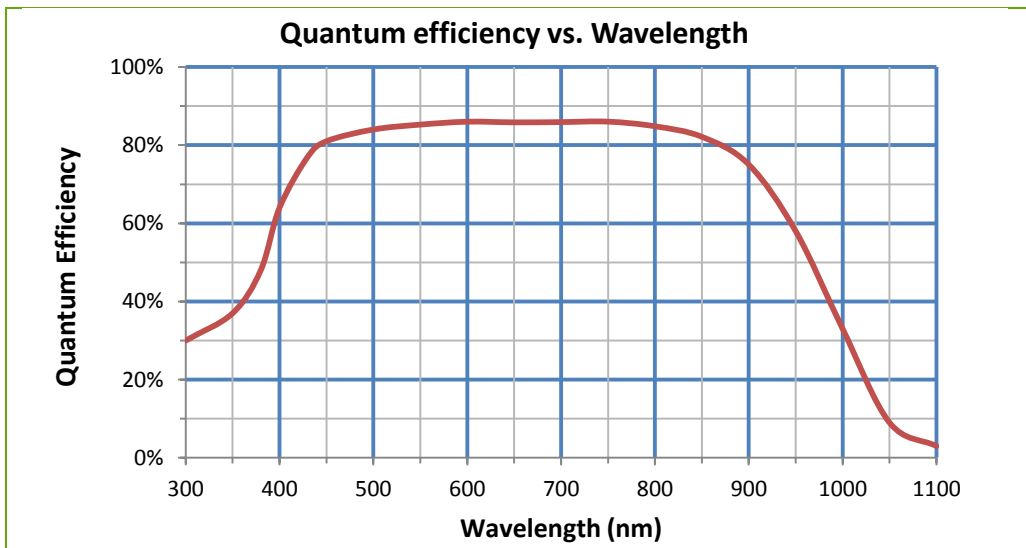


Figure 2
Quantum Efficiency vs. Wavelength

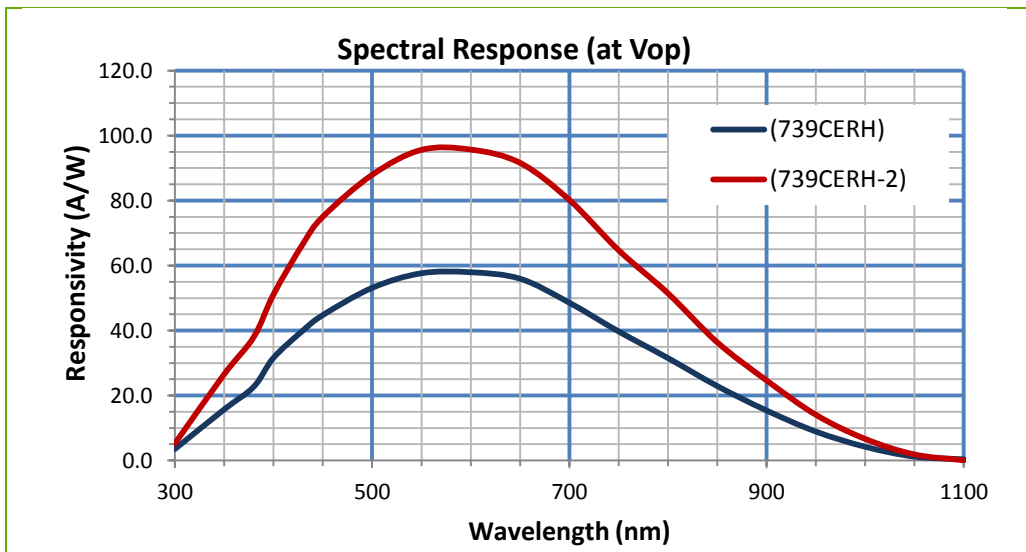


Figure 3
Spectral Response vs. Wavelength

C30739ECERH Series

Large Area Short Wavelength Enhanced Silicon Avalanche Photodiodes

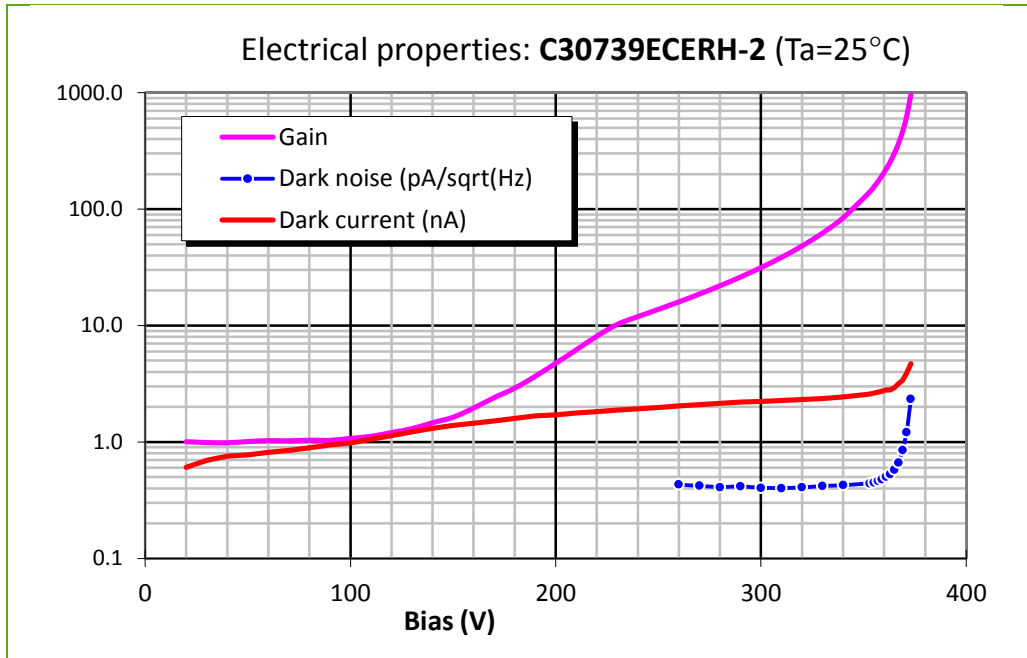


Figure 4
Electrical properties vs. bias voltage

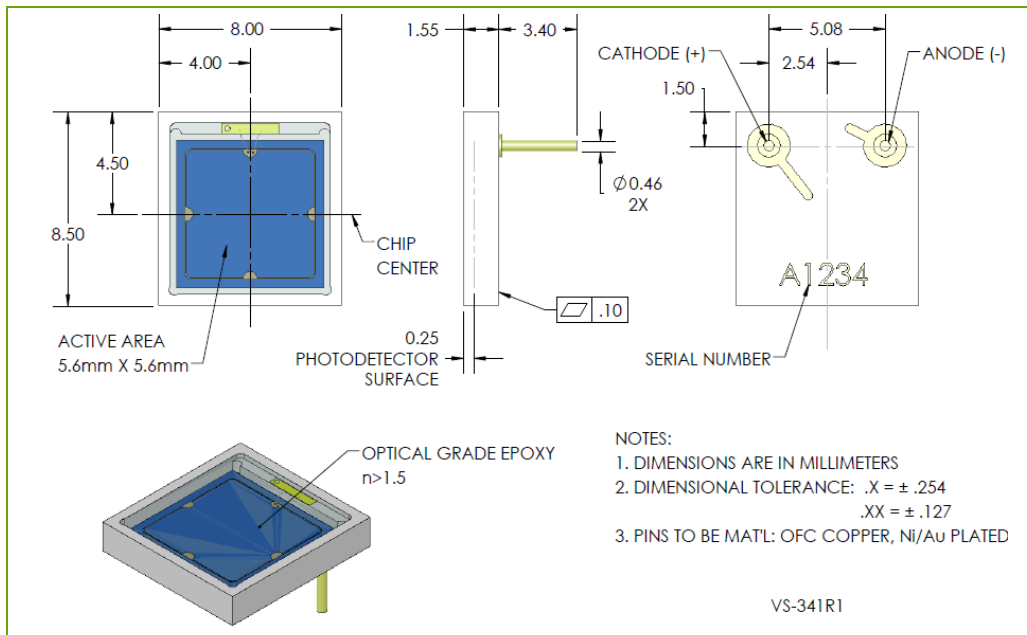


Figure 5
Package Dimensions in mm

RoHS Compliance

The C30739ECERH Si APD is designed and built to be fully compliant with the European Union Directive 2002/95/EC – Restriction of the use of certain Hazardous Substances in Electrical and Electronic equipment.



C30739ECERH Series

Large Area Short Wavelength Enhanced Silicon Avalanche Photodiodes

Warranty

A standard 12-month warranty following shipment applies.

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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