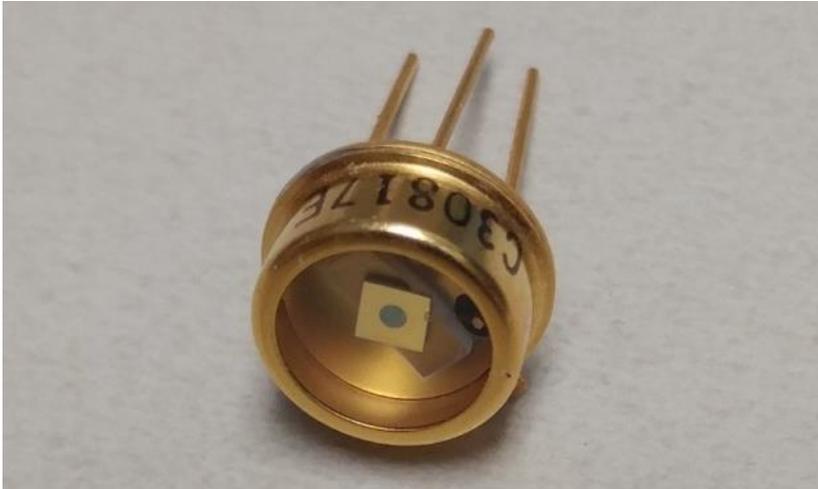


Photodiode C30817EH series

Silicon Avalanche Photodiode for General-Purpose Applications



The C30817EH is a general-purpose silicon avalanche photodiode made using a double-diffused “reach through” structure. This structure provides high responsivity between 400 to 1100 nanometers as well as fast rise and fall times at all wavelengths. Because the fall time characteristics had no “tail”, the responsivity of the device is independent of modulation frequency up to about 200 MHz.

The C30817 is hermetically sealed behind a flat glass window in a modified low-profile TO-5 package.

The device is useful in a wide variety of applications including laser detection, ranging, optical communications, high-speed switch, and transit-time measurements.

Key Features

- High Quantum Efficiency
 - 85% typical at 900nm
 - 18% typical at 1060 nm
- Spectral Response range – 400 to 1100nm
- Fast Time Response
 - Rise time and Fall time typically 2ns
- Wide Operating Temperature Range

Applications

- Laser detection
- Ranging
- Optical communications
- High-speed switching
- Transit-time measurements

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| Parameter | Symbol | | Units | Remarks / Conditions |
|---|--------|------------|-----------------------|----------------------|
| Package | | | | TO-5 |
| Photosensitive Surface: Useful area Useful diameter | A d | 0.5 0.8 | mm ² mm | Shape : Circular |
| Field of View: Nominal field of view α (see Figure 9) Nominal field of view α' (see Figure 9) | FoV | 119 132 | Degrees | |

Table 2 – Electro-Optical Characteristics

Test conditions: Case temperature = 22°C, ; at the DC reverse operating voltage V_{op} supplied with device

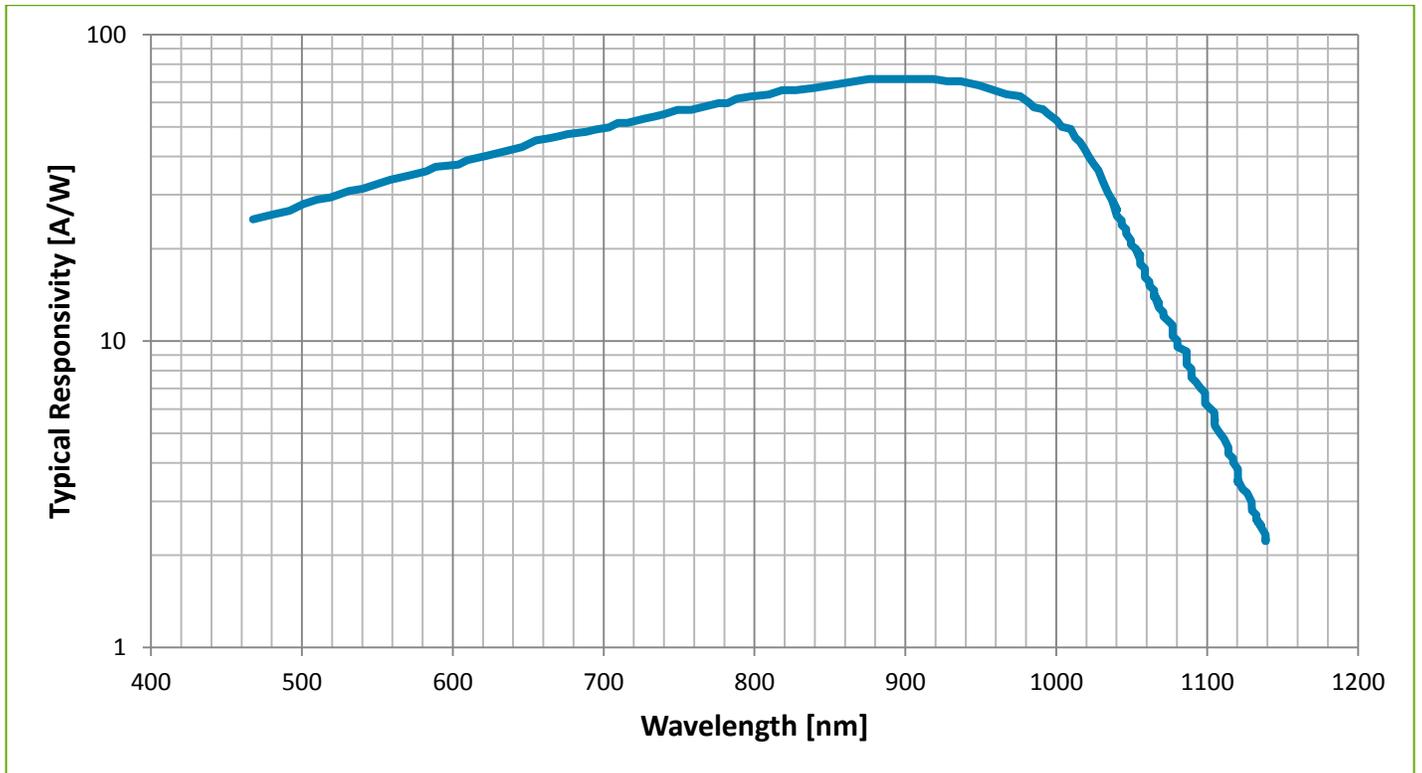
| Parameter | Symbol | Minimum | Typical | Maximum | Units |
|--|----------------|----------|----------|---------|----------|
| Breakage Voltage | V_{br} | 300 | 375 | 475 | V |
| Operating Voltage | V_{op} | 275 | | 425 | |
| Temperature Coefficient of V_{op} for Constant Gain | | | 2.2 | | V/°C |
| Gain | M | | 120 | | |
| Responsivity at 900 nm at 1060 nm | R | 65 15 | 75 18 | | A/W |
| Quantum Efficiency: at 900 nm at 1060 nm | Q.E. | | 85 18 | | % |
| Total Dark Current | I_d | | 50 | 200 | nA |
| Noise Current f = 10 kHz $\Delta f = 1$ Hz; See Figure 5 | i_n | | 1.0 | 2.0 | pA/√Hz |
| Capacitance | C_d | | 2 | 4 | pF |
| Series Resistance | R_s | | | 15 | Ω |
| Rise/Fall Time, $R_L = 50\Omega$, $\lambda = 900$ nm: 10% to 90% points 90% to 10% points | t_r t_f | | 2 | 3 | ns |

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Table 3 – Absolute – Maximum Ratings, Limiting Values

| Parameter | Symbol | Min. | Typ. | Max. | Units | Remarks / Conditions |
|--|-----------|------|------|---------|-------------------------|---------------------------------------|
| Reverse Bias Dark Current | | | | 100 | max. μA | |
| Photocurrent Density: average value peak value | J_p | | | 5 20 | mA/mm^2 | At 22 °C ; Continuous operation |
| Forward Current: average value peak value | I_F | | | 5 50 | max. mA | For 1 second duration, non-repetitive |
| Maximum Total Power | | | | 0.1 | W | Dissipation at 22 °C |
| Operating Temperature | T_o | -40 | | 70 | °C | |
| Storage Temperature | T_{stg} | -60 | | 100 | °C | |
| Soldering | | | | 200 | °C | 5 seconds, leads only |

Figure 1 – Typical Spectral Responsivity Characteristic at a Gain of 120



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Figure 2 – Typical Responsivity at 900 nm as a function of Operating Voltage, V_{op}

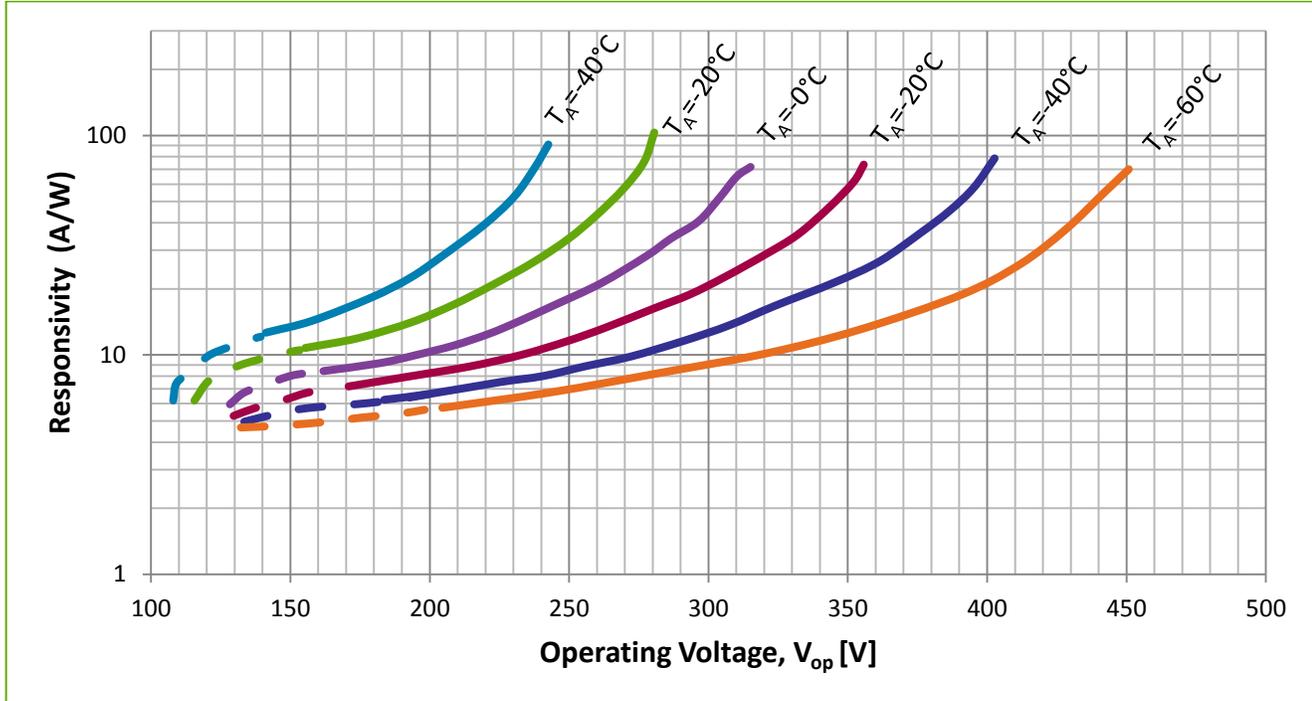
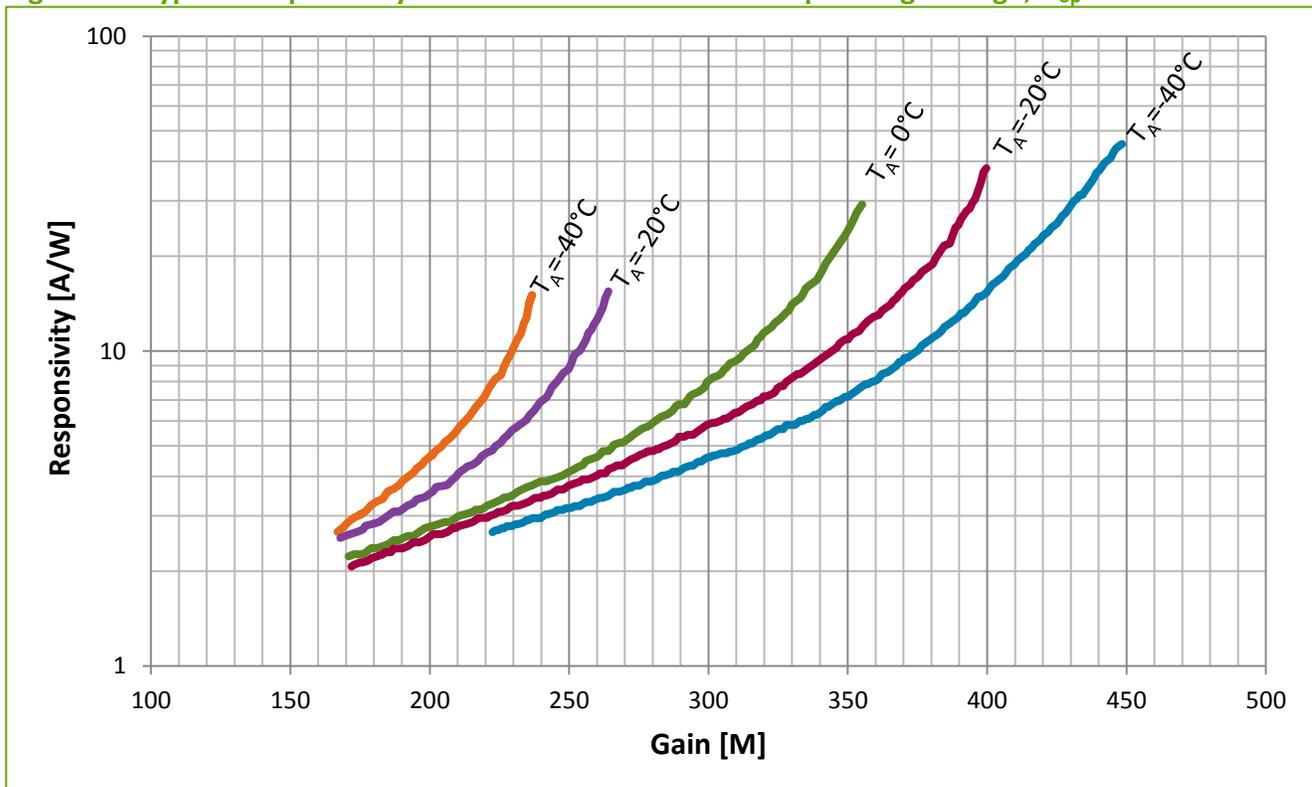


Figure 3 – Typical Responsivity at 1060 nm as a function of Operating Voltage, V_{op}



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Silicon Avalanche Photodiode for General-Purpose Applications

Figure 4 – Typical Dark Current as a function of Operating Voltage, V_{op}
Test conditions: Case temperature = 22°C

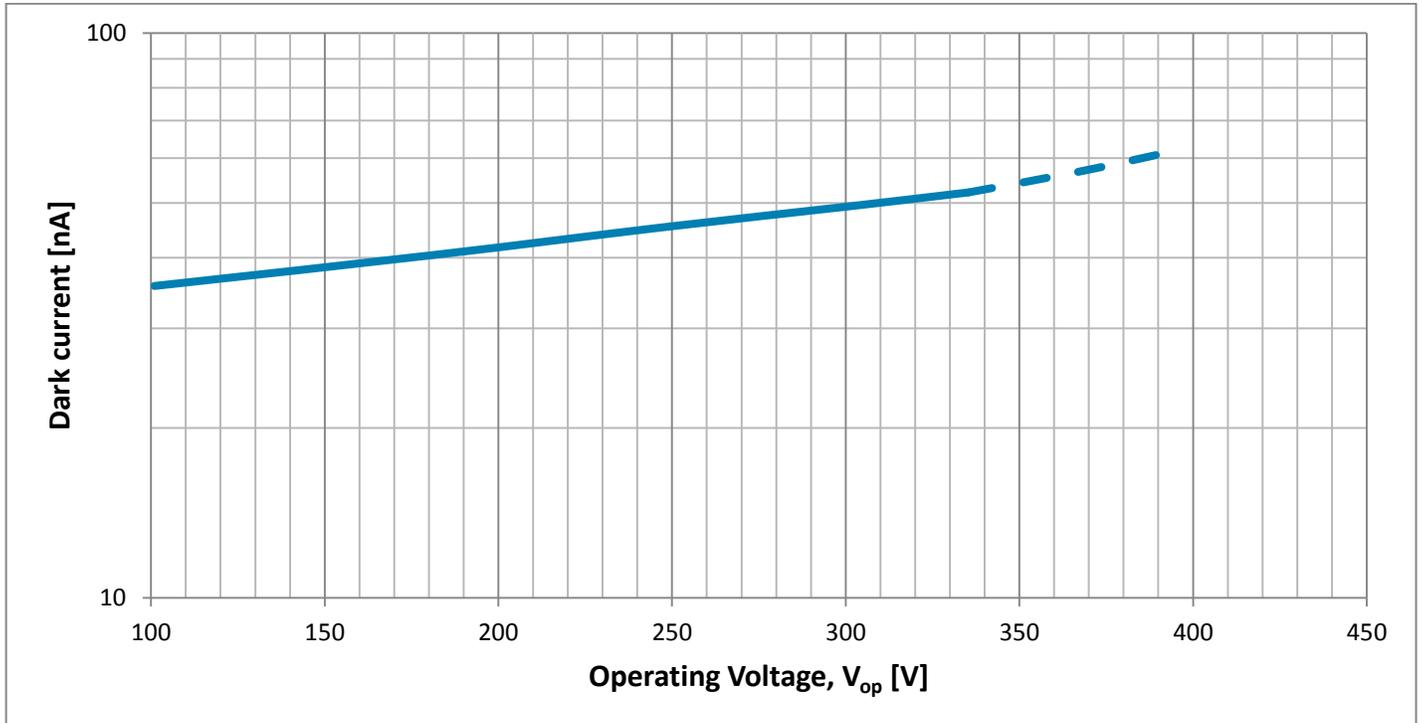
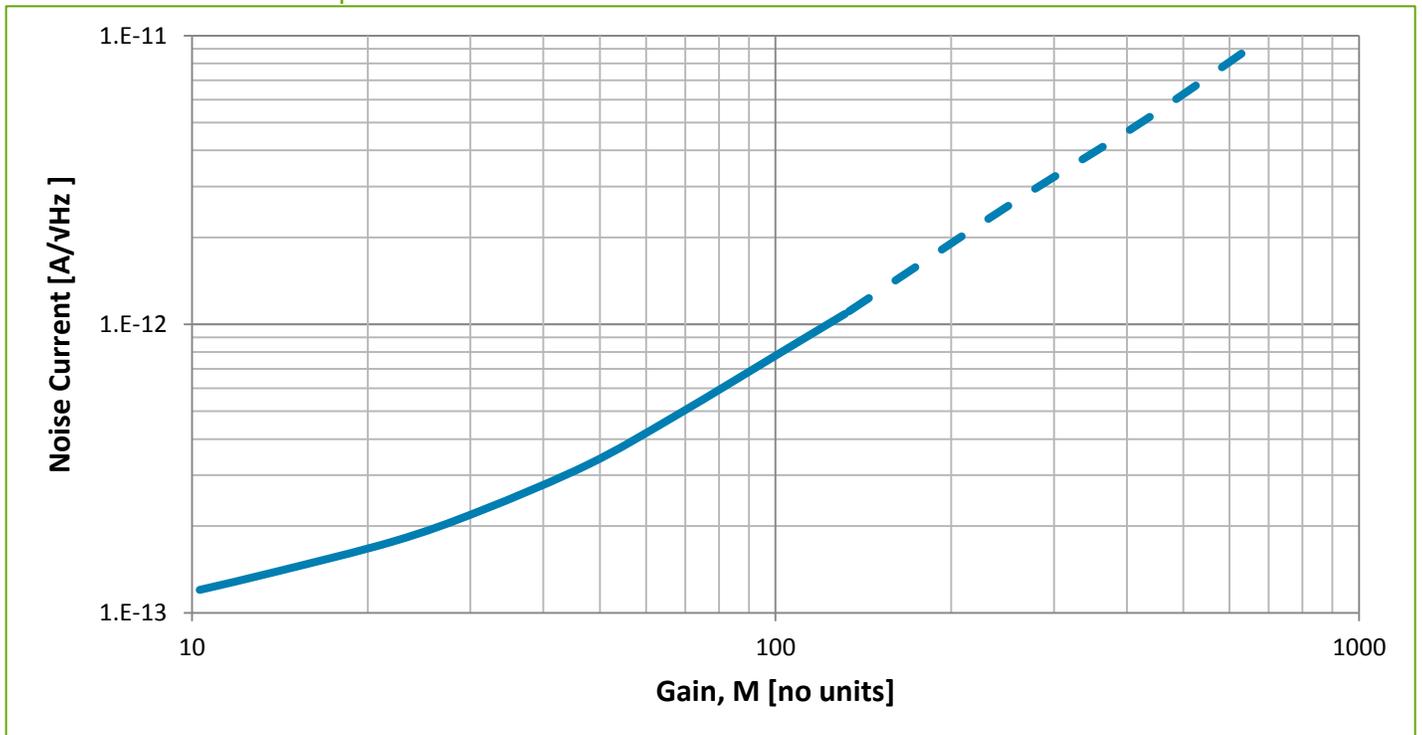


Figure 5 – Typical Noise Current as a function of Gain
Test conditions: Case temperature = 22°C



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Figure 6 – Typical Gain as a function of Light Spot Position

Test conditions: Case temperature = 22°C, Detector center = 0, Spot diameter= 0.0254 mm

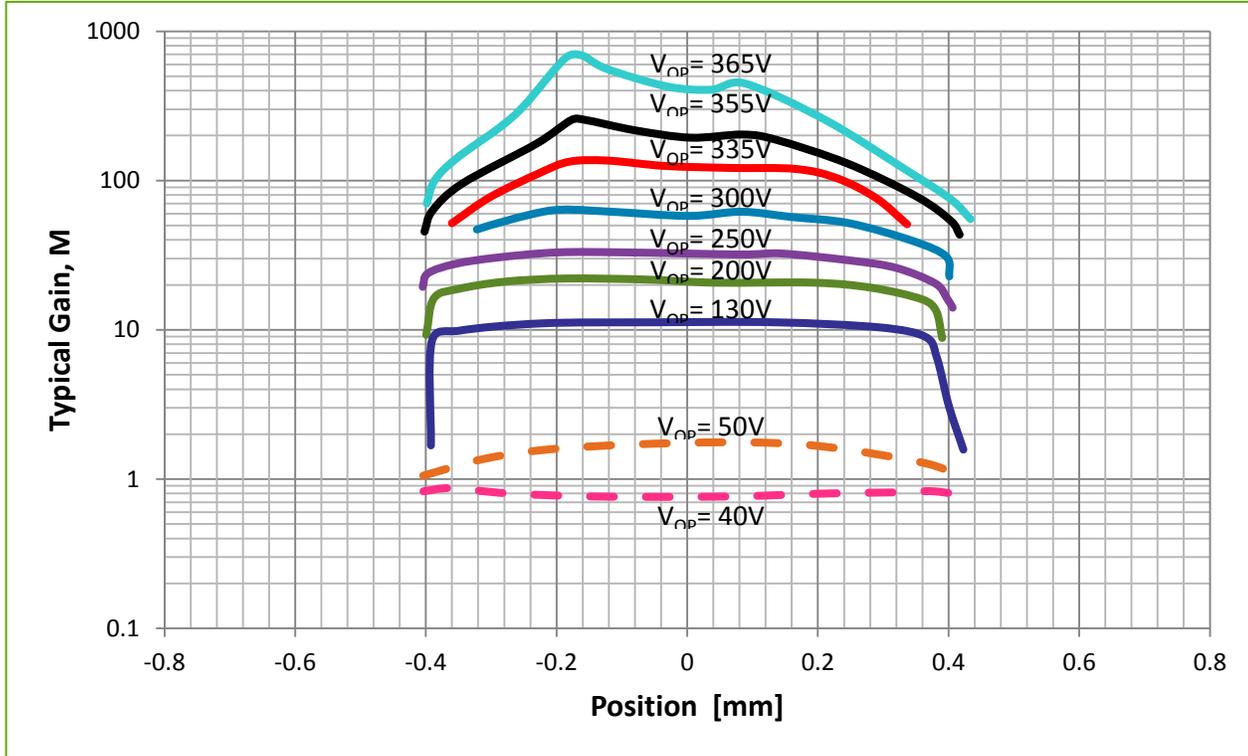
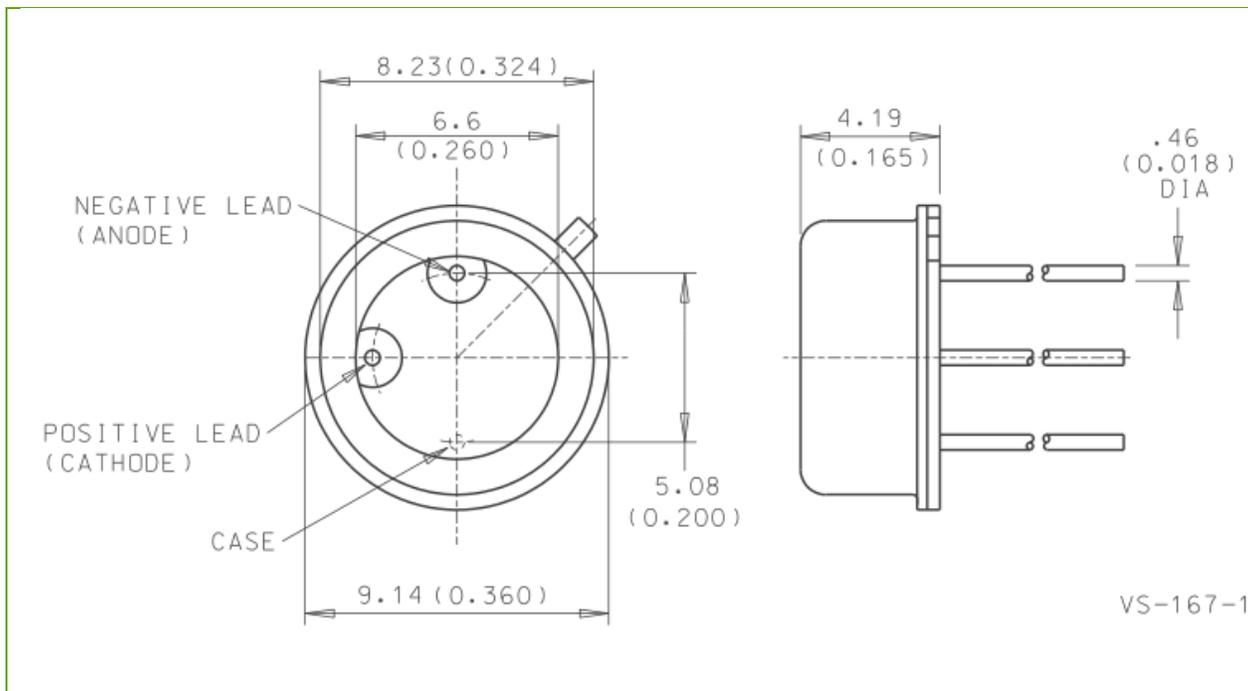


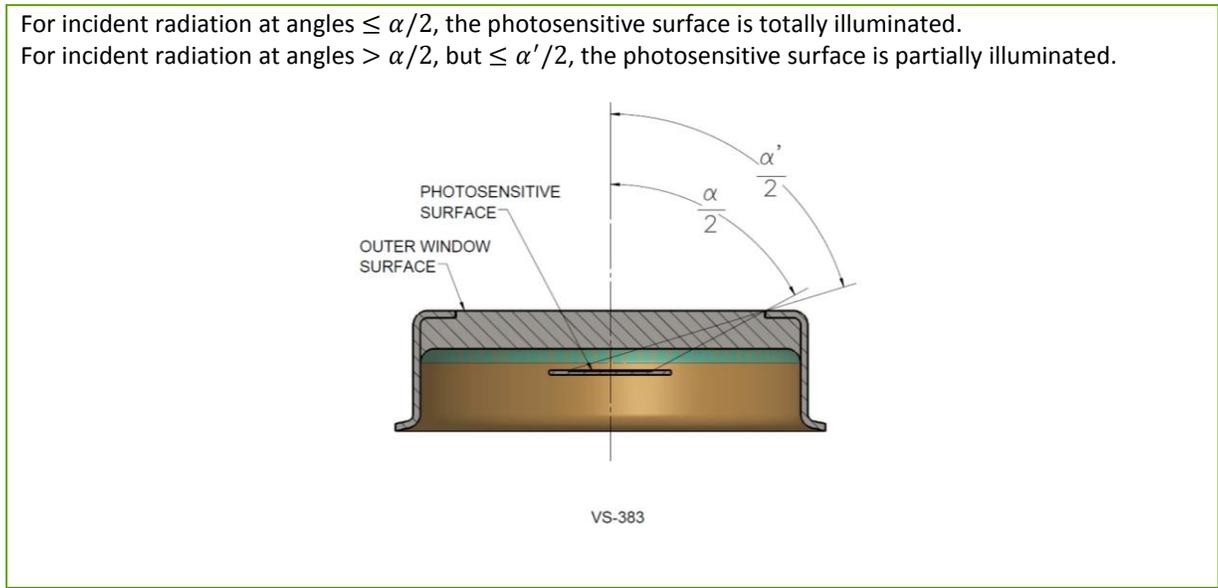
Figure 7 – Mechanical Characteristic – C30817EH – reference dimensions shown in mm (inches)



Photodiode C30817EH series

Silicon Avalanche Photodiode for General-Purpose Applications

Figure 9 – Approximate field of view



RoHS Compliance

The C30817EH is designed and built to be fully compliant with the European Union Directive 2011/65/EU – Restriction of the use of certain Hazardous Substances (RoHS) in Electrical and Electronic equipment.



Warranty

A standard 12-month warranty following shipment applies. Any warranty is null and void if the photodiode window has been opened.

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.

Excelitas has a long and rich history of serving our OEM customer base with optoelectronic sensors and modules for more than 45 years beginning with PerkinElmer, EG&G, and RCA. The constant throughout has been our innovation and commitment to delivering the highest quality solutions to our customers worldwide.

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 5,000 employees in North America, Europe and Asia, serving customers across the world.

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