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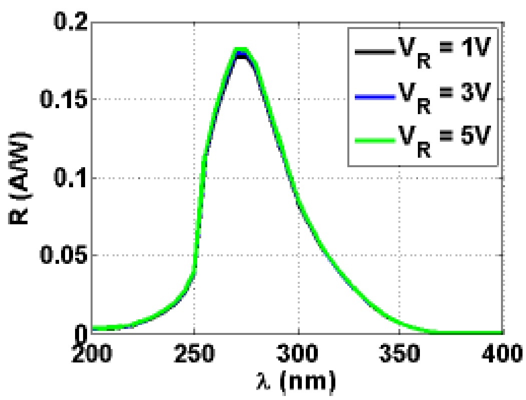
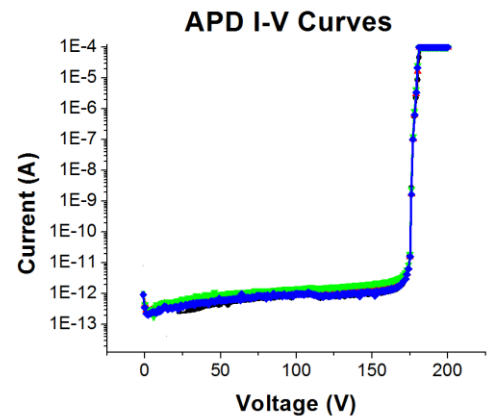
Silicon Carbide UV Avalanche Photodiode (APD)
EOC-SiC-UV-APD-1.45-QFN-16

Electro Optical Components introduces UV Solar Blind Silicon Carbide (SiC) Avalanche Photodiode (APD) for low signal applications in the UV range.





The Silicon Carbide (SiC) UV APD has many of the properties of other APDs in that it is extremely sensitive and has high signal gain, but is only sensitive to UV (see wavelength response curve above). Because the substrate is tougher SiC, the bias voltage is higher than silicon based devices, around 180 VDC. These SiC UV APDs are a solid state replacement for UV PMTs (Photo Multiplier Tubes). Besides responding only to the UV, the tough silicon carbide (SiC) gives you:

Stability in high energy UV applications
Higher temperature stability than silicon

The general specifications are:

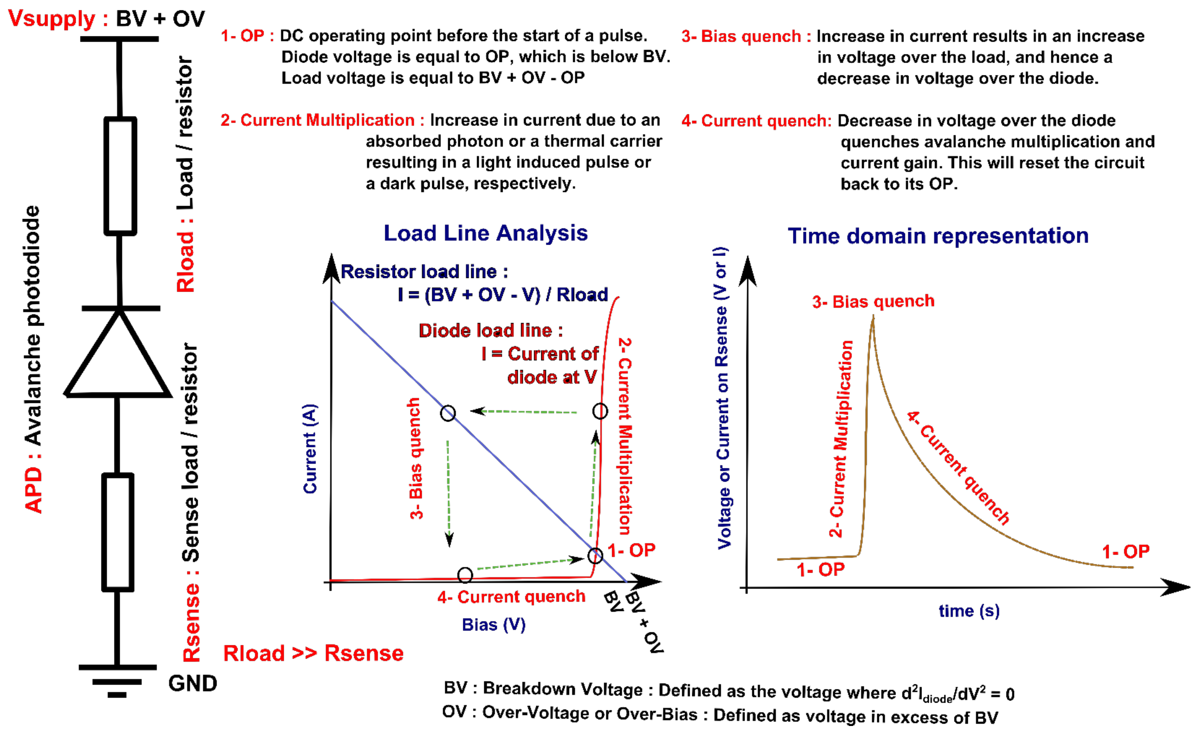
Sensitivity	1 nW/cm^2
Gain	10^5 - 10^6
Bias Voltage	~180 VDC
APD Chip Size	1.2mm^2
Active Area	0.0044 mm^2
Package	QFN-16 (4mm x 4mm); Pin 11 + Positive, Pin 2 - Negative

The SiC UV APD is ideal for a variety of low UV light applications including:

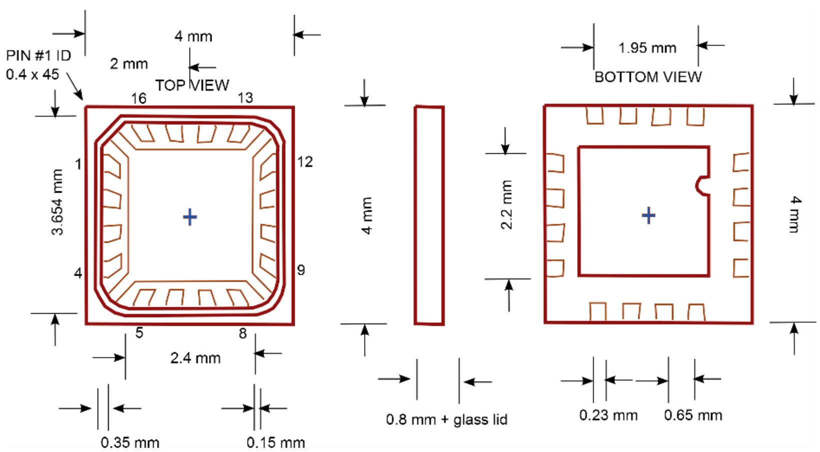
Flame detection
UV photon counting
Low level UV monitoring

Rev 6, 7/2021

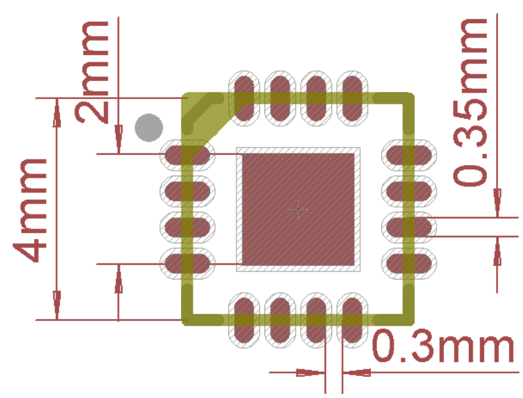
Passively quenched Geiger Circuit / Counter : Brief explanation of operation



QFN-16 Package Drawing



QFN-16 PCB Pad Layout



Pin 11 + Positive, Pin 2 - Negative

Rev 6, 7/2021

One possible circuit is on the data sheet (below). It consists of two resistors. One Mega-Ohm (RL) on the N-side (cathode) and one 50-Ohm (RS) on the P-side (anode). The output can be taken between the 50-ohm resistor and the anode, as illustrated.. This is the quenching circuit that facilitates Geiger mode operation.

If you need more circuit design than that, you should contact us about employing a bias control circuit.

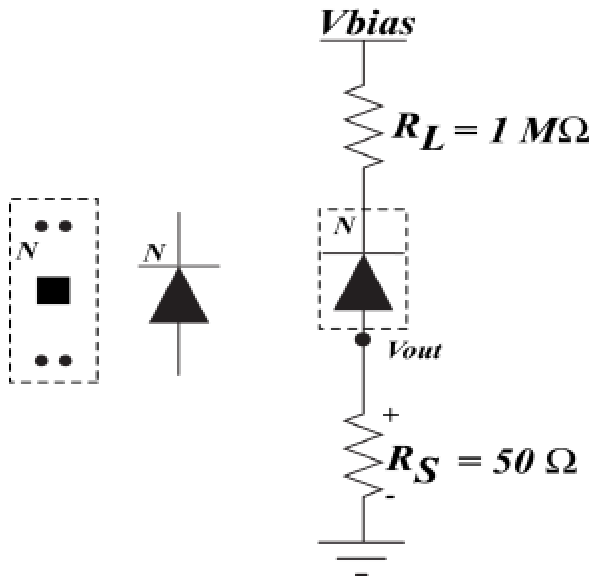


Fig. 1 Pinout and sample Geiger mode readout circuit configuration.

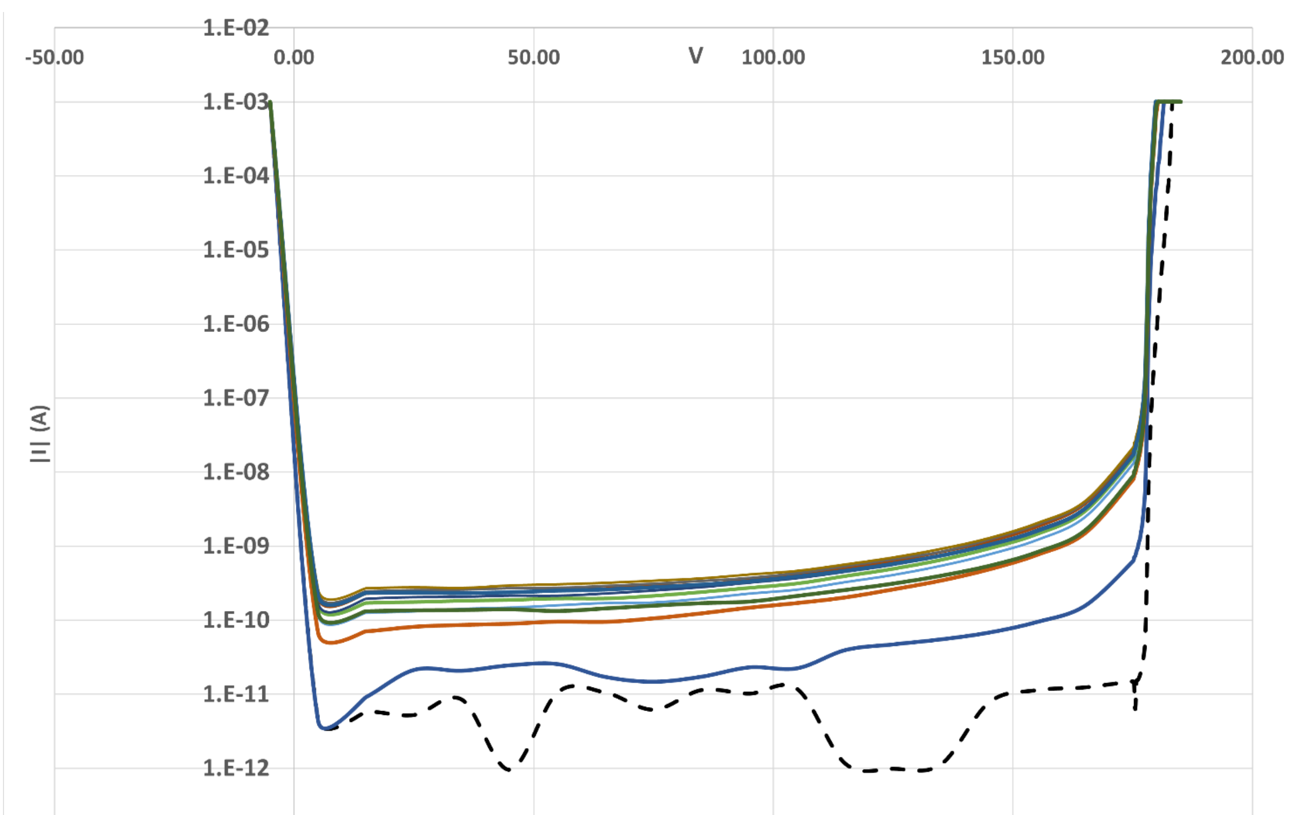


Fig. 2 Reverse I-V characteristics. Black Dashed Line: Dark current. Solid Lines: Photo response between 200-340 nm.

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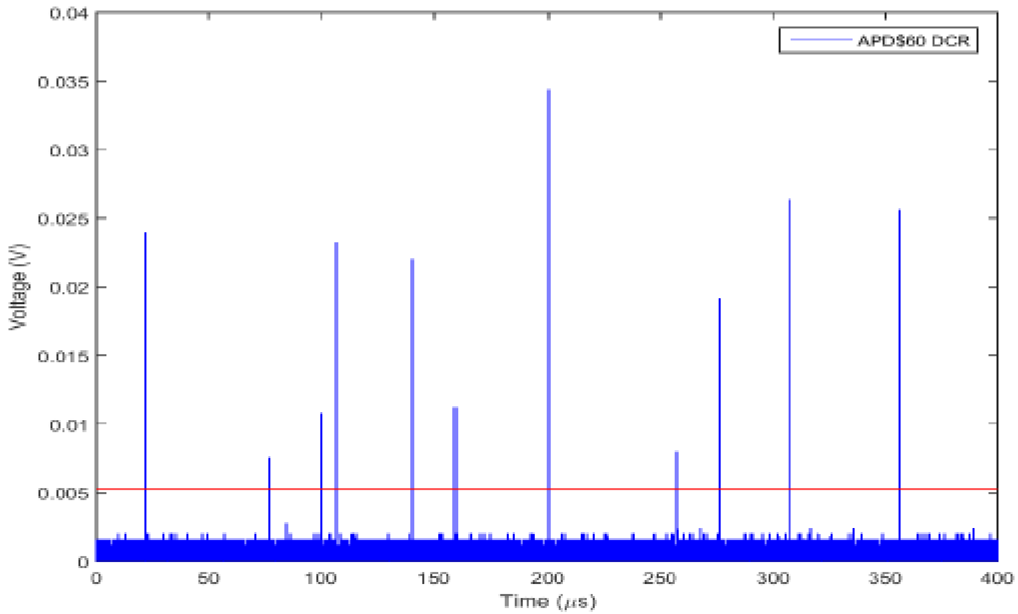

Fig. 3 Sample Geiger mode response in the dark. The horizontal line is the counting threshold.

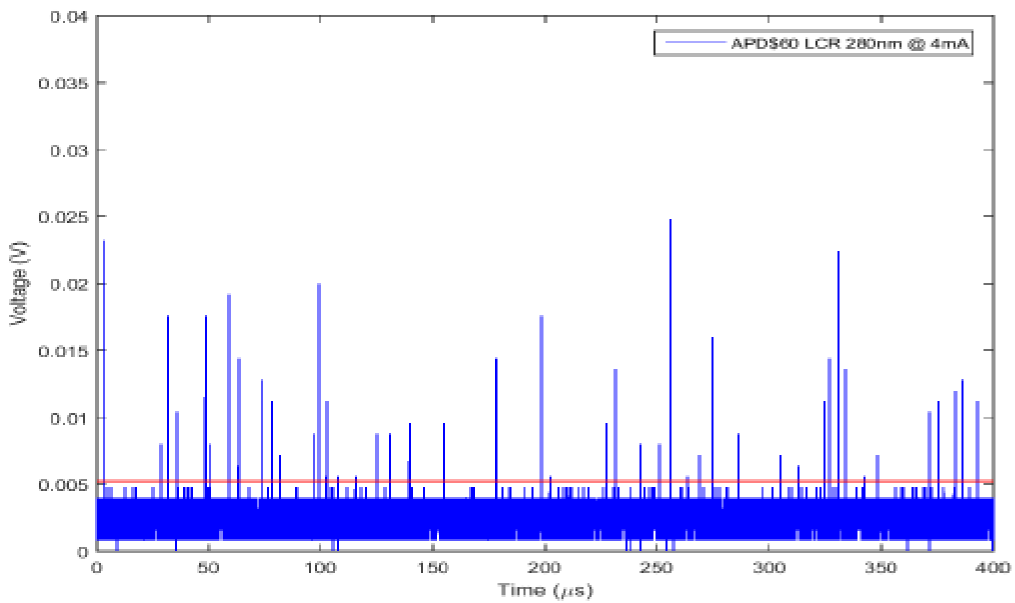

Fig. 4 Sample Geiger mode response under 280 nm illumination.

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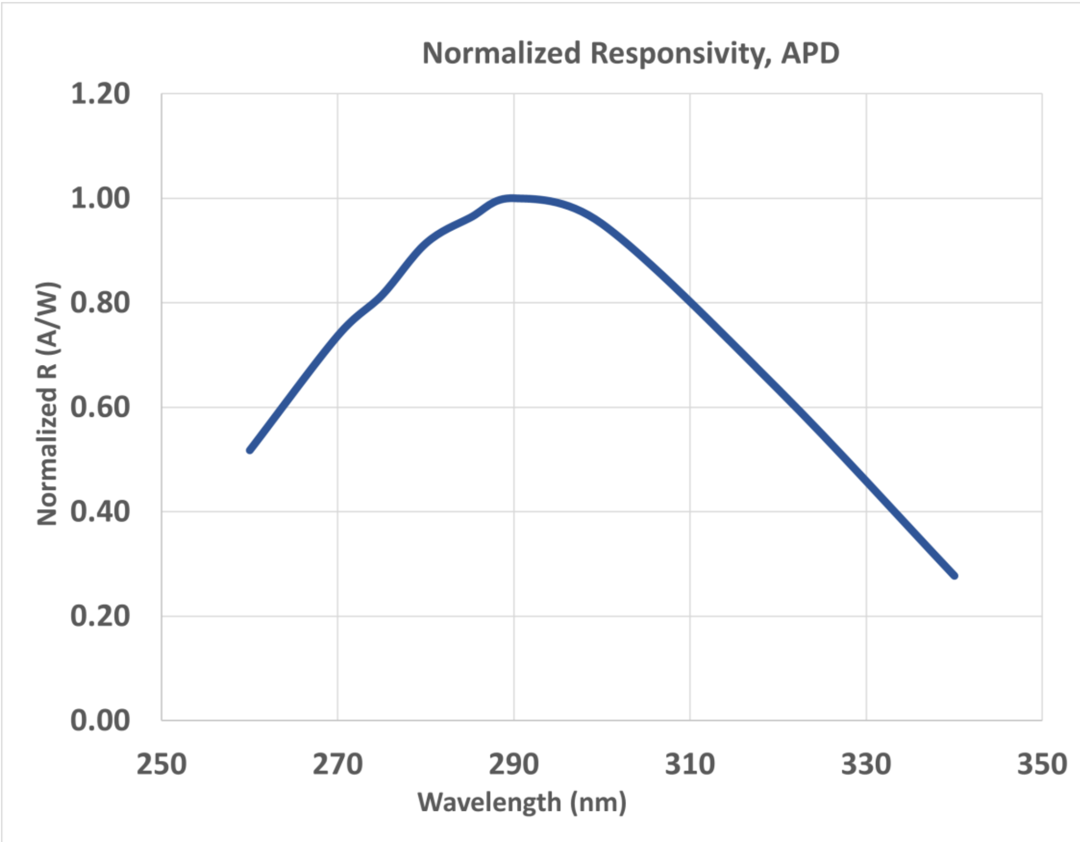

Fig. 5 Normalized Linear Responsivity at $V_R = 1$ V

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