

# CCSiCUVPA01 SiC Ultraviolet Avalanche Photodiodes and Geiger Mode (Single Photon Counting) Operation

High sensitivity, low dark-current SiC avalanche photodiode for UV detection applications.

## Features

- Detection range: 200 nm – 340 nm
- Package: 16-pin QFP
- Peak Sensitivity: 290 nm
- Max. Gain: > 1e6
- Device Area: 0.0044 mm<sup>2</sup>
- Included: External Board to Operate in Geiger Mode

## Applications

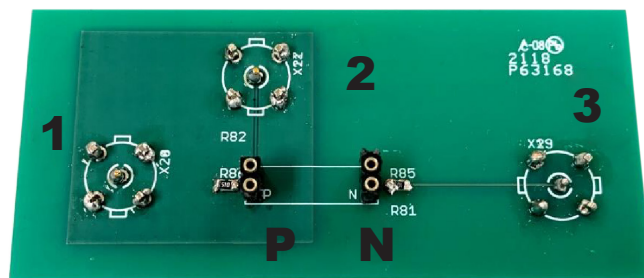
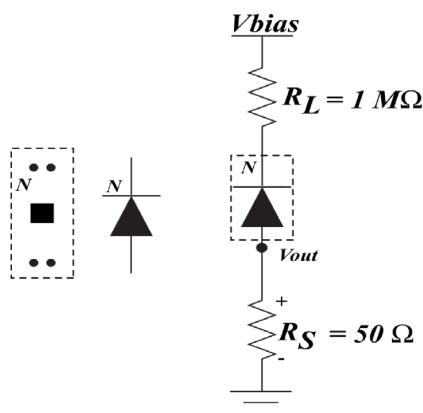
- Ultraviolet signal detection
- Single photon detection
- Visible-blind flame detection
- Water filtration systems
- Pathogen detection
- Defect monitoring

## Package Ratings

Parameter	Symbol	Value	Unit
Photocurrent (VR=178 V, λ = 290 nm, Pinc = 86.1 nW, Apd = 0.0044 mm <sup>2</sup> )	I <sub>p</sub>	0.61	mA/ mm <sup>2</sup>
Peak Linear Responsivity (λ <sub>max</sub> = 290 nm, VR= 1 V)	R <sub>max</sub>	0.21	A/W
Peak Linear Quantum Efficiency (λ <sub>max</sub> = 290 nm, VR= 1 V)	η	0.91	-
Spectral Range, 90% max (VR= 1 V)	λ <sub>min_90%</sub> λ <sub>max_90%</sub>	280 - 305	nm
Spectral Range, FWHM (VR= 1 V)	λ <sub>min_FWHM</sub> - λ <sub>max_FWHM</sub>	255 – 325	nm
Dark Current (T= 25 °C, VR= 1 V)	I <sub>D</sub>	< 5	nA/ mm <sup>2</sup>
Active Area	A <sub>pd</sub>	0.0044	mm <sup>2</sup>
Avalanche Reverse Bias Voltage	V <sub>Av</sub>	179	V
Gain (VR= 179 V, λ = 290 nm)	M	> 1e6	-
Dark Count (T= 25 °C, VR= 179 V)	-	< 5,000	counts/ sec

## Package Ratings (T<sub>A</sub>=25°C)

Parameter	Parameter	Parameter	Parameter	Parameter
Op. Temperature Range	T <sub>L</sub> :T <sub>H</sub>	- 40:100	°C	Package rating. Unpackaged diodes can be operated up to 200°C.



- 1: GND
- 2: Vout
- 3: Vbias

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

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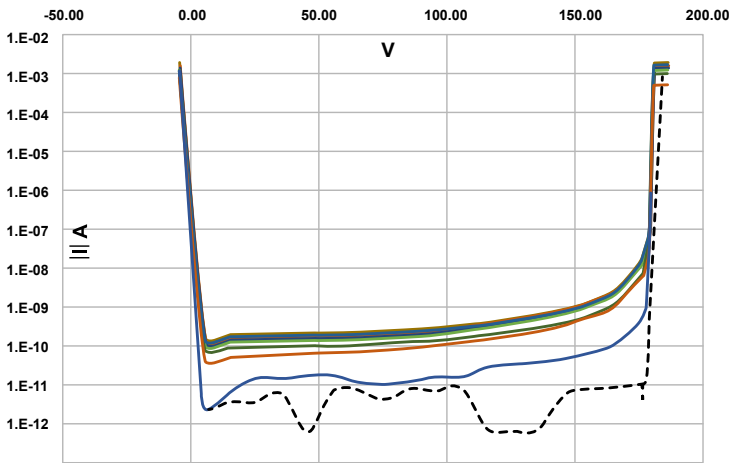


Fig. 2: Reverse I-V characteristics. Black Dashed Line: Dark current. Solid Lines: Photo response between 200 - 340 nm.

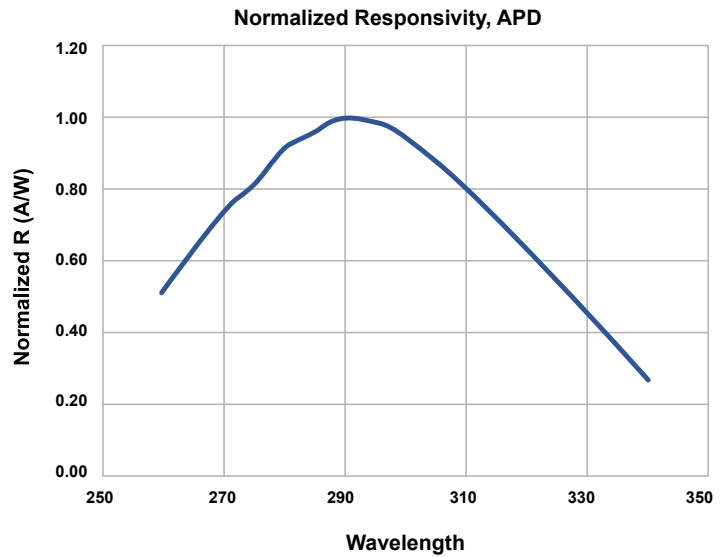


Fig. 3: Normalized Linear Responsivity at VR = 1 V

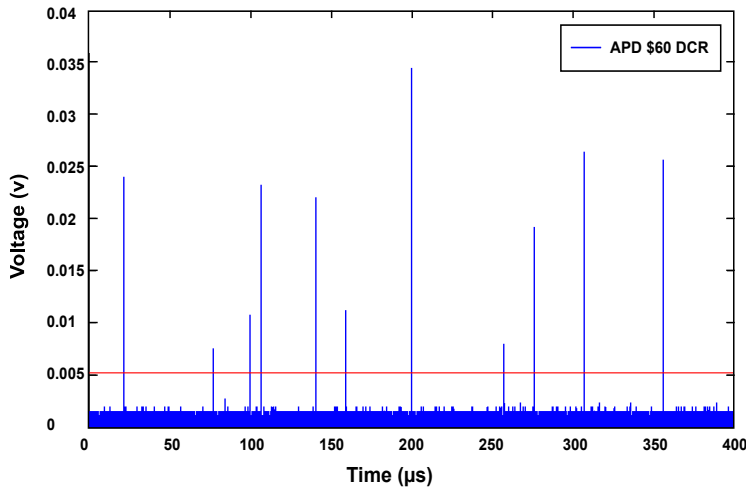


Fig. 4: Sample Geiger mode response in the dark. The horizontal line is the counting threshold.

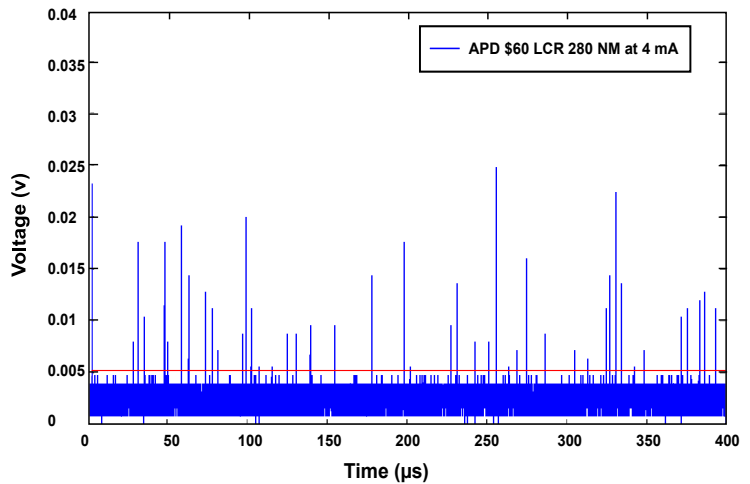


Fig. 5: Sample Geiger mode response under 280 nm illumination.