



CCSiCUVPL265-A

SiC Ultraviolet Photodiodes

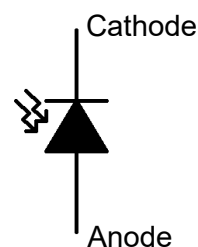
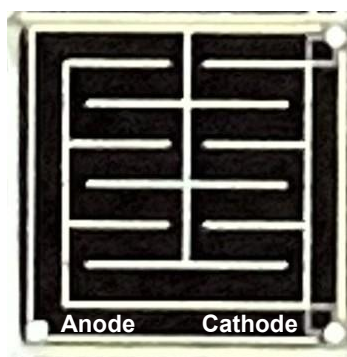
CoolCAD SiC Photodetectors have a unique set of advantages over Silicon Photodetectors, including, but not limited to, their incredibly low dark current, inherent visible light blindness, wide temperature range with no degradation (up to 400C), and long-term UV exposure and radiation robustness. These factors greatly reduce system volume, as the need for cooling mechanisms and filters is eliminated. Fabricated on high-quality SiC epitaxial layers, our proprietary fabrication processes allow us to customize these devices to your exact specifications.

BENEFITS

- ✓ Higher sensitivity
- ✓ Reduced need for cooling
- ✓ Low dark-current
- ✓ Visible-blind

APPLICATIONS INCLUDE

Ultraviolet signal detection, water filtration systems, pathogen detection, flame detection, and defect monitoring.



Part Number	Package	Marking
CCSiCUVPL265-A	Bare Die	N/A

** For description only. No rights are granted. No liability is assumed for choice of products.*

Electrical and Thermal Characteristics				
*Characteristics	Symbol	Comments	Typ	Units
Peak Responsivity	$R_{\max}$	$V_R < 3V$; $\lambda = 270nm$; $T_A = 25^\circ C$	0.137	A/W
Peak Quantum Efficiency	η	$V_R < 3V$; $\lambda = 270nm$; $T_A = 25^\circ C$	0.63	-
Spectral Range, 90% max QE	$\lambda_{\min_{90\%}} - \lambda_{\max_{90\%}}$	$V_R < 3V$; $T_A = 25^\circ C$	260-285	nm
Spectral Range, FWHM QE	$\lambda_{\min_{FWHM}} - \lambda_{\max_{FWHM}}$	$V_R < 3V$; $T_A = 25^\circ C$	225-315	nm
Dark Current ¹	I_D	$V_R < 3V$; $T_A = 25^\circ C$	<500	fA/mm ²
Visible Blindness	-	Peak responsivity/resp. @ 400nm, $V_R = 2V$	>5000	-
Active Area	A_{pd}	-	CCSiCUVPL265-A-28 – 7.06 CCSiCUVPL265-A-27 – 6.55 CCSiCUVPL265-A-25 – 5.6	mm ²
Capacitance	C	$V_R = 10V$; $T_A = 25^\circ C$	CCSiCUVPL265-A-28 – 250 CCSiCUVPL265-A-27 – 230 CCSiCUVPL265-A-25 – 200	pF
Series Resistance	R_{series}	$T_A = 25^\circ C$	CCSiCUVPL265-A-28 – 150 CCSiCUVPL265-A-27 – 140 CCSiCUVPL265-A-25 – 150	Ω
Shunt Resistance	R_{shunt}	$T_A = 25^\circ C$	> 250	G Ω /mm ²

1. Measurement system noise floor limited
2. Back side of die should always be left floating

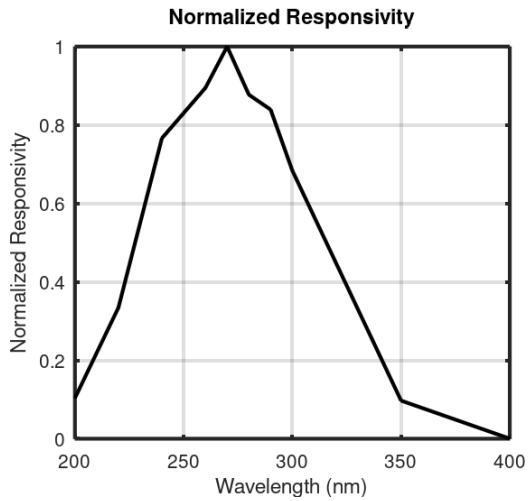


Figure 1: Normalized Responsivity of sample device.

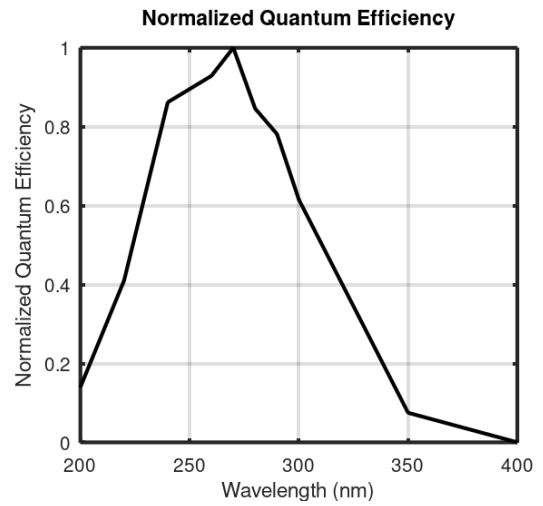


Figure 2: Normalized Quantum Efficiency of sample device.

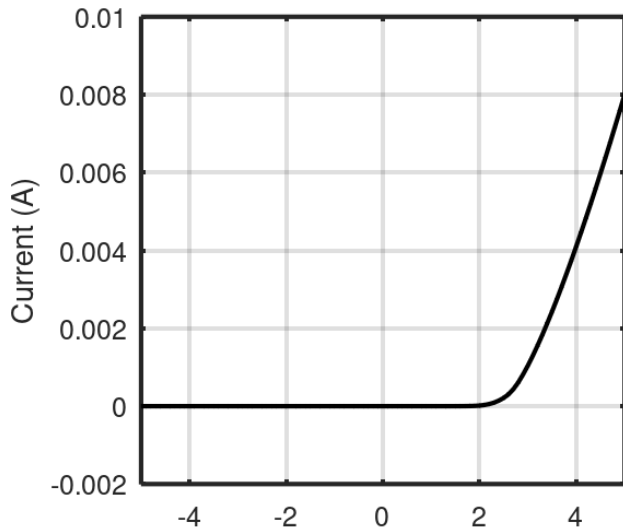


Figure 3: Sample device IV characteristics, linear scale

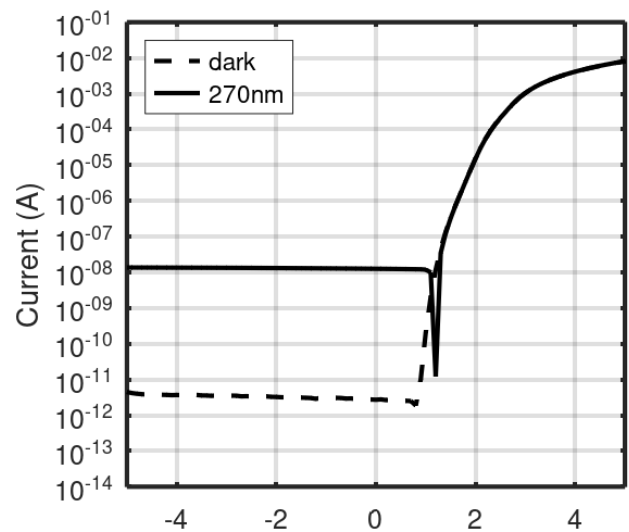


Figure 4: Sample device IV characteristics, logarithmic scale. Photocurrent under 270nm illumination

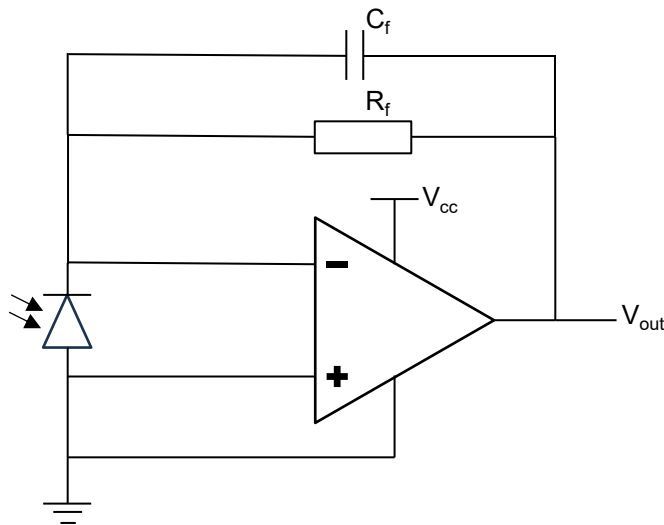
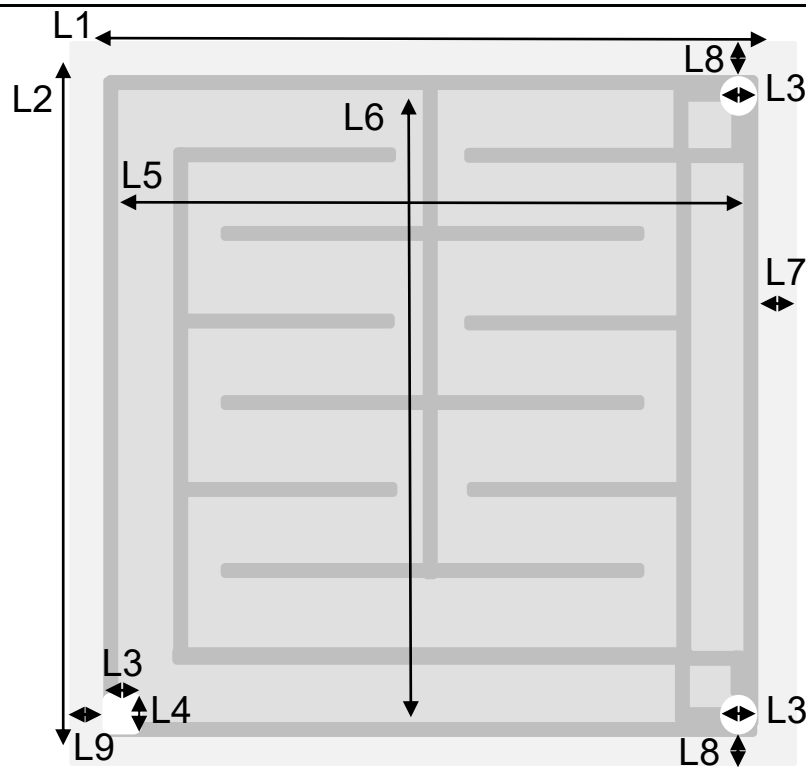


Figure 5: Sample readout circuit with integrated photodiode



Die dimensions		
Parameter	Dimensions	Units
Die size (including dicing streets)	L1×L2 ~ 3×3	mm ²
Anode pad*	L3×L4 ~ 0.14×0.14	mm ²
Cathode pad diameter*	L3 ~ 0.14	mm
Lateral Active Area	CCSiCUVPL265-A-28 - L5 ~ 2760 CCSiCUVPL265-A-27 - L5 ~ 2660 CCSiCUVPL265-A-25 - L5 ~ 2460	μm
Vertical Active Area	CCSiCUVPL265-A-28 - L6 ~ 2760 CCSiCUVPL265-A-27 - L6 ~ 2660 CCSiCUVPL265-A-25 - L6 ~ 2460	μm
Device to Die Edge	CCSiCUVPL265-A-28 - L7 ~ 100 CCSiCUVPL265-A-27 - L7 ~ 150 CCSiCUVPL265-A-25 - L7 ~ 250	μm
Cathode Pad to Die Edge	L8 ~ 105	μm
Anode Pad to Die Edge	L9 ~ 105	μm
Chip thickness	355±10	μm

* Pads made of aluminum

CAUTION: These devices are ESD sensitive. Use proper handling procedures.

Disclaimer: These specifications may not be considered as a guarantee of components characteristics. Components have to be tested depending on intended application as adjustments may be necessary. The use of CoolCAD Electronics components in life support appliances and systems are subject to written approval of CoolCAD Electronics.