

SG02-APD-D5

Broadband SiC based UV avalanche photodiode A = 0.20 mm²

GENERAL FEATURES

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Properties of the SGo2-APD-D5 UV photodiode

- SiC based avalanche photodiode (APD)
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area A = 0.20 mm²
- TO5 hermetically sealed metal housing, two isolated pins, one additional grounded pin
- max. responsivity is 100 A/W

About the sglux SiC UV APD photodiodes

Silicon Carbide (SiC) Avalanche Photodiodes (APDs) are highly sensitive photodetectors that convert UV radiation into electrical signals with internal gain. Operating at high reverse bias close to the diode breakdown voltage (V_{BR}), they exploit the avalanche multiplication effect: a single photon generates electron-hole pairs, which are accelerated in a strong electric field, creating further carriers through impact ionization. This results in a multiplication factor or internal gain M of up to several hundred, enabling detection of very weak radiation signals. In linear mode (reverse bias 3-5 V below V_{BR}), the output current is proportional to the incident UV irradiance, providing precise measurements with high dynamic range and good linearity. Typical applications include fire and flame detection or radiation monitoring. In Geiger mode (reverse bias just below V_{BR}), SiC APDs act as single-photon avalanche diodes (SPADs), generating one digital pulse per detected photon. This enables single-photon counting for ultra-low irradiance applications such as fluorescence detection, time-correlated single-photon counting (TCSPC), and quantum optics. SiC APDs offer superior UV sensitivity, low breakdown voltage, low noise, visible blindness and robustness under harsh environmental conditions.

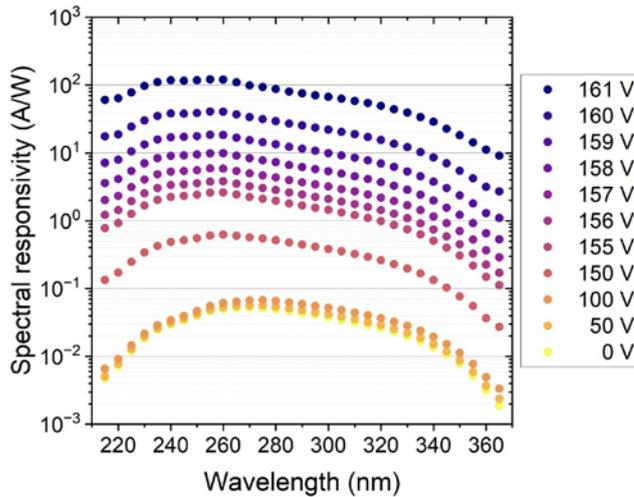
SPECIFICATIONS

Parameter	Symbol	Value	Unit
General Characteristics (T=25°C)			
Active Area	A	0.20	mm ²
Breakdown Voltage (I=10μA)	V_{BR}	150 - 160	V
Responsivity Range (S=0.1*S _{max})	–	220 ... 360	nm
Wavelength of max. Spectral Responsivity@ V_{BR}	λ_{max}	240	nm
Gain M @ $V_{BR} - 5$ V, $\lambda_{max} = 275$ nm	M_{-5}	100	–
Gain M @ $V_{BR} - 3$ V, $\lambda_{max} = 275$ nm	M_{-3}	1000	–
Responsivity @Gain 100, $\lambda_{max} = 275$ nm	R_{100}	10	A/W
Responsivity @Gain 0, $\lambda_{max} = 275$ nm	R_0	0.12	A/W
Dark Current ($V_{BR} - 5$ V)	I_d	100	pA
Capacitance	C	77	pF
Temperature Coefficient of V_{BR}	T_c	60	mV/K
Visible Blindness (S _{max} /S _{>405nm})	VB	> 10 ¹⁰	–
Maximum Ratings			
Operating Temperature	T_{opt}	-55 ... +170	°C
Storage Temperature	T_{stor}	-55 ... +170	°C
Soldering Temperature (3s)	T_{sold}	260	°C

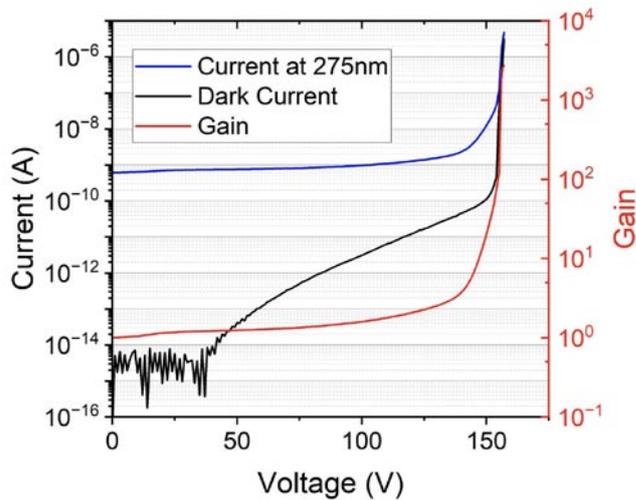
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NORMALIZED SPECTRAL RESPONSIVITY, DEPENDING ON BIAS VOLTAGE



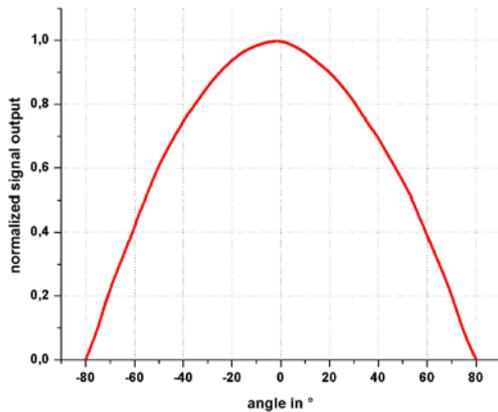
CURRENT - VOLTAGE CHARACTERISTICS



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FIELD OF VIEW



Measurement Setup:

lamp aperture diameter: 10 mm
distance lamp aperture to second aperture: 17 mm
second aperture diameter: 10 mm
distance second aperture to detector: 93 mm

pivot level = top surface of the photodiode window

DRAWINGS

