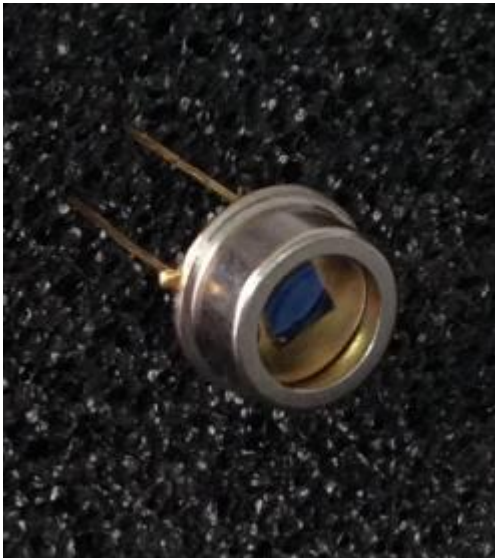


Silicon Photomultiplier Detector

SiPM3-VT



Description

The SiPM3-VT is a photon counting solid state replacement for photomultiplier tubes. The low dark count rates made

Available be TO CAN(TO-5) package, combined Extremely fast

Rise time and short recovery time, facilitate high performance operation: both in analog/linear mode, as multi-photon detectors in which the output signal is proportional to the number of input photons, as well as in digital mode, as high speed photon counters with a wide dynamic range.

Features

- * Very low dark current
- * High speed (1ns rise time typical)
- * Wide single photon counting dynamic range (>20MHz)
- * Operating temperature is from -25 to +60°C
- * Storage temperature is from -45 to +70°C

Applications

- | | |
|--------------------------------------|------------------------|
| * High Energy Physics(HEP) | * PET scanning |
| * Fluorescence lifetime measurements | * Dynamic spectrometry |
| * DNA sequencing | * Nuclear medicine |

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Specifications are subject change without notice

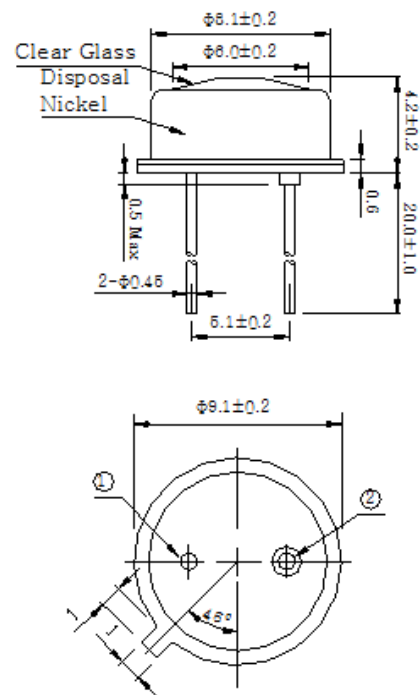
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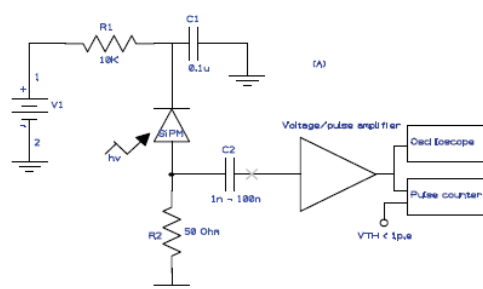


Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Chip size	A			9		mm ²
Light sensitive/Active area				196		um ²
Interconnect elements	Pix	120*120 circular		14400		pixels
	pitch	Pixel ptich		25		um
	Fill factor	Per pixel	31			%
Breakdown Voltage	Vbr	-20°C, I=1nA		36		V
Vbr Temperature Coefficient	TC Vbr			50		mV/°C
Over voltage range		20°C	1		5	V
Pixel gain	Gain	Depending on overvoltage (Ubr+5V)	10 ⁵		10 ⁶	
Pixel capacitance	C			300		pF
Dark current	I _D	room temperature, before breakdown			0.5	nA
Dark count rate		+20°C and Ubr+5V	400		1200	Kcps
Spectral Response Range	λ _{range}		350		1100	nm
Photon detection efficiency*	E	λ=500nm	25%			
Pulse width		FWHM	2.2	3.2	6	ns
Rise time	Tr	Up=Ubr+5V, λ=500nm	Leading edge	1		ns
Fall time	Tf		Trailing edge	1.5		ns
Single photon counting dynamic range		Comparator threshold<1 p.e.	40			MHz
Saturation power	Pmin				10	uW

* PDE includes crosstalk and afterpulsing

Typical application circuit



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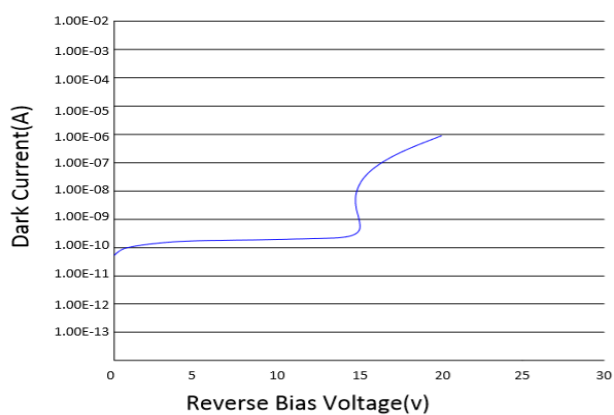
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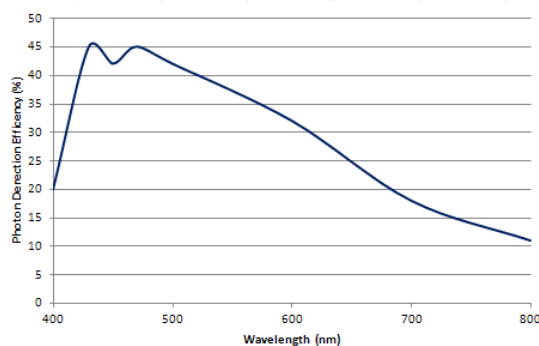
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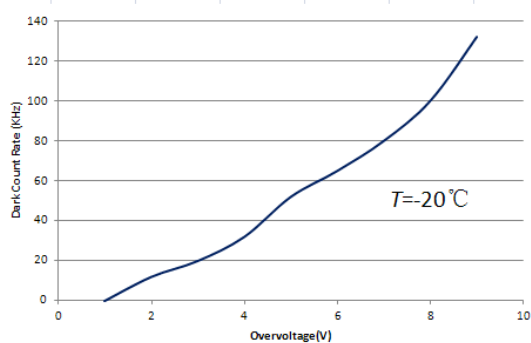
■ Dark current vs. reverse voltage



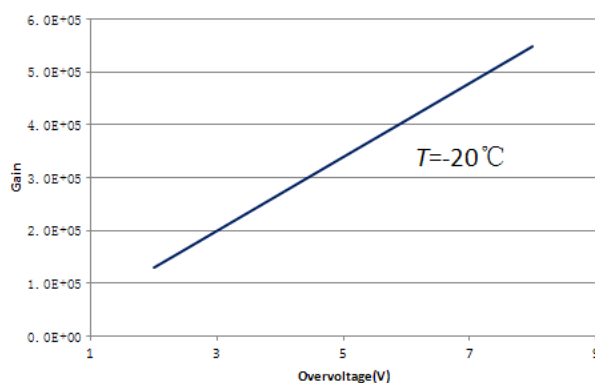
■ Photon detect efficiency vs. wavelength



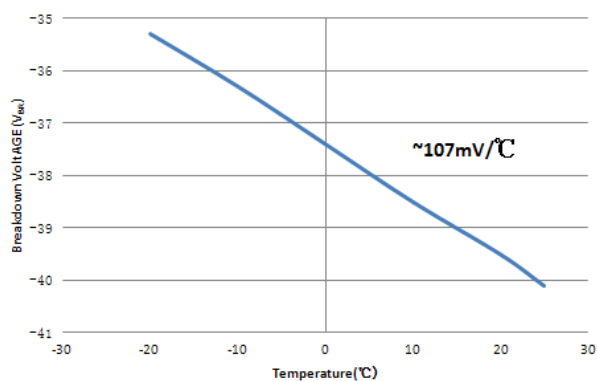
■ Dark count Vs. Overbias



■ Gain Vs. Overbias



■ Breakdown voltage VS. Temperature



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