

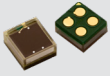
AFBR-S4N Series

Broadcom High-Sensitivity NUV Silicon Photomultipliers

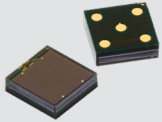
Product Brief

Single SiPM

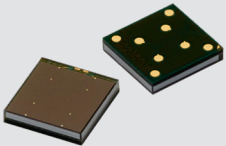
2x2 mm²
AFBR-S4N22P014M



4x4 mm²
AFBR-S4N44P014M

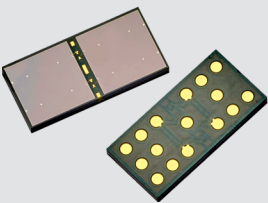


6x6 mm²
AFBR-S4N66P014M

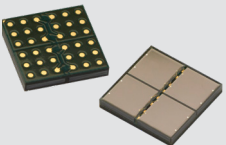


SiPM Arrays

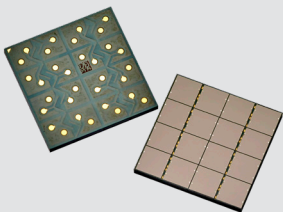
2x1 Channels (6x6 mm²)
AFBR-S4N66P024M



2x2 Channels (4x4 mm²)
AFBR-S4N44P044M



4x4 Channels (4x4 mm²)
AFBR-S4N44P164M



Broadcom® silicon photomultipliers (SiPMs) are ultra-sensitive optical sensors for the detection of near-ultraviolet to visible photons. Detectable light levels range from single photons up to 6.8×10^5 photons/ μ s. The compact design and various form factors of Broadcom SiPMs also make them the ideal sensor for many channel applications where high numbers of readout channels must fit in a limited design area.

Boost Your System Performance

The recently released NUV-MT SiPM series brings performance to unprecedented levels and allows customers to achieve best-in-class performance in their applications; for example:

- Flow cytometry/Fluorescence detection
- Radiation spectroscopy
- X-ray detection, X-ray photon counting
- Radon detection
- TOF-PET
- Line-of-sight data communication

Broadcom SiPM Leading-Edge Technology

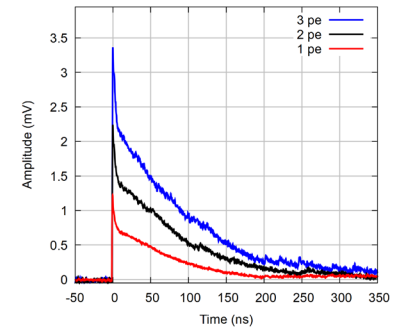
The Broadcom NUV-MT brings sensitivity, low-light detection, and fast timing applications to unreached levels by combining:

- Best-in-class photo-detection efficiency (PDE)
- Excellent gain and breakdown uniformity
- Low noise characteristics

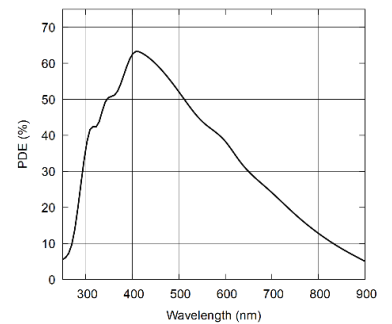
At the same time, high linearity and dynamic range is achieved by:

- 40- μ m SPAD pitch
- 55-ns recharge time constant

Waveforms (Over 25 Ohm)



Spectral Sensitivity (PDE) at 12V OV



Comparison of Low-Light Sensors	PMT Photomultiplier Tube	APD Avalanche Photodiode	SiPM Silicon Photomultiplier
Quantum Efficiency	25% ... 40%	60% ... 80%	... 80% (PDE: ... 65%)
Single Photon Detectability	✓	—	✓
Single Photon Time Resolution	✓	—	✓
Excess Noise Factor	Good	Poor	Good
Operation Voltage	1 kV ... 3 kV	100V ... 500V	20V ... 60V
Gain	10^4 ... 10^9	30 ... 300	10^5 ... 10^7
Robustness	—	✓	✓
Insensitivity to Magnetic Fields	—	✓	✓
No Damage in Bright Light	—	✓	✓
Miniaturization	—	✓	✓
Low Pitch Tileability	Poor	Good	Good



For further details and contact information, visit our webpage (<https://www.broadcom.com/products/optical-sensors/silicon-photomultiplier-sipm>) or contact us directly at sipm@broadcom.com.

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