



Press Release

X-FAB Introduces New Generation of Enhanced Performance SPAD Devices focused on Near-Infrared Applications

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[X-FAB Silicon Foundries SE](#), the leading analog/mixed-signal and specialty foundry, has introduced a specific near-infrared version to its single-photon avalanche diode (SPAD) device portfolio. Like the previous SPAD generation, which launched in 2021, this version is based on the company's 180nm XH018 process. The inclusion of an additional step to the fabrication workflow has resulted in significant increases in signal while still retaining the same low noise floor, without negatively affecting parameters such as dark count rate, afterpulsing and breakdown voltage.

Through this latest variant, X-FAB is successfully expanding the scope of its SPAD offering, improving its ability to address numerous emerging applications where NIR operation proves critically important. Among these are time-of-flight sensing in industrial applications, vehicle LiDAR imaging, biophotonics and FLIM research work, plus a variety of different medical-related activities. Sensitivity is boosted over the whole near-infrared (NIR) band, with respective improvements of 40% and 35% at the key wavelengths of 850nm and 905nm.

Using the new SPAD devices will reduce the complexity of visible light filtering, since UV and visible light is already suppressed. Filter designs will consequently be simpler, with fewer component parts involved. Furthermore, having exactly the same footprint dimensions as the previous SPAD generation provides a straightforward upgrade route. Customers' existing designs can gain major performance benefits by just swapping in the new devices.

X-FAB has compiled a comprehensive PDK for the near-infrared SPAD variant, with extensive documentation and application notes featured. Models for optical and electrical simulation will provide engineers the additional design support they need, enabling them to integrate these devices into their circuitry within a short time period.



As Heming Wei, Product Marketing Manager Sensors at X-FAB explains; “Our SPAD technology has already gained a very positive market response, seeing uptake with a multitude of customers. Thanks to continuing innovation at the process level, we have now been able to develop a solution that will secure business for us within various NIR applications, across automotive, healthcare and life sciences.”

The new NIR enhanced SPAD is available now. Engineers can start their design with the new device immediately.

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Acronyms

FLIM - Fluorescence-Lifetime Imaging Microscopy

LiDAR - Light Detection and Ranging

NIR - Near-Infrared

PDK - Process Design Kit

SPAD - Single-Photon Avalanche Diode

ToF - Time of Flight

About X-FAB

X-FAB is the leading analog/mixed-signal and MEMS foundry group manufacturing silicon wafers for automotive, industrial, consumer, medical and other applications. Its customers worldwide benefit from the highest quality standards, manufacturing excellence and innovative solutions by using X-FAB’s modular CMOS and SOI processes in geometries ranging from 1.0 µm to 130 nm, and its special silicon carbide and MEMS long-lifetime processes. X-FAB’s analog-digital integrated circuits (mixed-signal ICs), sensors and micro-electro-mechanical systems (MEMS) are manufactured at six production facilities in Germany, France, Malaysia and the U.S. X-FAB employs more than 4,200 people worldwide. Learn more at [xfab.com](https://www.xfab.com).

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