



PRESS RELEASE

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Booth #546

X-FAB Introduces Highly-Sensitive SPAD and APD Devices Based on its Modular 180nm Process Technology

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X-FAB Silicon Foundries, the leading analog/mixed-signal and specialty foundry, continues to develop ground-breaking semiconductor solutions to address the most difficult of design challenges. It has now announced the availability of avalanche photodiode (APD) and single-photon avalanche diode (SPAD) products for implementation in scenarios where there are extremely low light conditions to contend with and augmented sensitivity is required, as well as tight timing resolutions involved.

Based on the company's popular 180nm high-voltage [XH018](#) process, these function block devices deliver a combination of elevated performance parameters and straightforward integration. The APD has a strong linear gain figure, and is fully scalable - going from just ten to several hundred micrometer dimensions. The proprietary X-FAB quenching circuit used in the SPAD results in a dead time of less than 15ns - thereby supporting high bandwidth. In addition, its low dark count rate (<100 counts/s/μm²) means that it is far less susceptible to thermal noise. The high photon detection probability (PDP) of the SPAD ensures that a much higher proportion of incident photons trigger an avalanche, and this is maintained across an extensive range of wavelengths (e.g. 40% at 400nm).

The X-FAB APD and SPAD can be utilized in a broad spectrum of different applications - including proximity sensing, LiDAR, time of flight (ToF), medical imaging (CT and PET) and scientific research. Being AEC-Q100 compliant, they are suitable for deployment within automotive systems. Furthermore, the low breakdown voltage (<20V) that has been achieved facilitates their incorporation onto customer dies. As integral parts of the X-FAB design kit, they are fully characterized, and can easily be combined with other modules featured in the XH018 process. Models for optical and electrical simulation, along with a specific application note, will help designers to integrate these devices into their circuitry within a short time period. As well as being supplied in a function block format, a quenching reference circuit that fully demonstrates the capabilities of the SPAD is also available.

Members of the X-FAB team will be able to discuss the new APD and SPAD products when the company exhibits at Sensors Expo (Booth #546, McEnery Convention Center, San Jose, 25th-27th June).

<https://www.sensorexpo.com>



About X-FAB

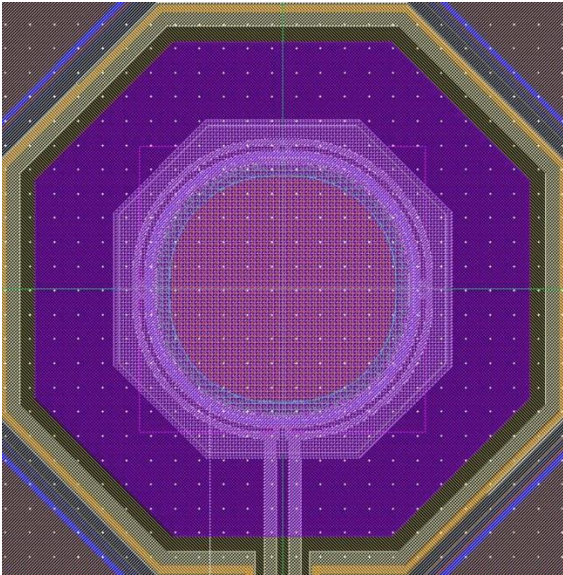
X-FAB is the leading analog/mixed-signal and MEMS foundry group manufacturing silicon wafers for automotive, industrial, consumer, medical and other applications. Its customers worldwide benefit from the highest quality standards, manufacturing excellence and innovative solutions by using X-FAB's modular CMOS and SOI processes in geometries ranging from 1.0 to 0.13 μm , and its special SiC 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 about 4,000 people worldwide. www.xfab.com

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Acronyms

APD	Avalanche Photo Diode
CT	Computer Tomography
DCR	Dark Count Rate
PDP	Photon Detection Probability
PET	Photon Emission Tomography
SPAD	Single Photon Avalanche Diode
ToF	Time of Flight



Layout of APD/SPAD primitive device