

# Optimize smart sensors for RADAR innovation

GlobalFoundries solutions are integral to today's advanced automotive designs

**RADAR-based technologies are key to performance and business success.**



**More than 300M**

Number of automotive radar modules that will be shipped annually by 2030.\*



**10%**

CAGR for long/medium/short range RADAR (2019-2030).\*

**“We chose to partner with GlobalFoundries for their proven leadership in RF and mmWave technology, which is reinforced by their deep expertise in the automotive market.”**

— Oliver Wolst, Bosch senior vice president (GF press release Mar 9, 2021)



When driver and passenger safety is on the line, a vehicle's advanced driver-assistance systems (ADAS) need to operate at the highest levels. These systems must reliably and accurately carry out a critical chain of events using sensors that analyze data input from RADAR and other sources, add artificial intelligence to interpret the meaning of the data, and enable corrective action if necessary. GlobalFoundries® (GF®) provides three levels of industry-leading solutions that support short- and long-range RADAR functions to enable these critical ADAS safety functions.

## Three levels of industry-leading solutions

GF solution	Key features <sup>1</sup>
40 nm sensor	With great image quality and high reliability, these sensors enable SoC integration of memory, DSP, analog and RF features to handle ADAS complexity.
22FDX™ sensor	The flagship GF sensor provides higher resolution and longer range than current RADAR sensors providing unprecedented levels of integration of RF, analog and digital block on the same die, thereby minimizing total system cost.
High-performance SiGe BiCMOS sensor	With excellent image quality, these sensors built on the 130 nm platform are optimal for ultra-high performance very large-scale MIMO imaging RADAR.

**At a glance: The high resolution, longer range of 22FDX™**

**RADAR solution**

22FDX

**Platform**

22FDX (planar FD-SOI)

**Key features**

- Highest mmWave RADAR performance and quality†
- Excellent thermal performance with 40% lower power consumption†
- Automotive Grade 1 qualified
- Highly integrated solution for reduced system/package cost

**From range to resolution, rely on GF RADAR solutions**

Today’s miniaturized smart sensors that support ADAS have big challenges to overcome—from delivering superior power output to ensuring low power consumption, with plenty of requirements in between.



**Range and accuracy**

The lower power digital and RF capabilities of 22FDX enable the integration of more digital and higher number of RF channels into a single SoC compared to 28 nm bulk CMOS technologies, resulting in a chip area that is 20% smaller with significantly better flicker and thermal noise. The result? Longer range, higher RF output power and efficiency, and higher resolution for RADAR.



**Thermal management**

The increased power efficiency of 22FDX also helps avoid the performance degradation that accompanies high power consumption and elevated temperatures. For extra protection, the 22FDX back-gate bias feature enables tight control of output power. The improved thermal management resulting from the 50% higher PAE has earned GF® a Grade 1 rating on the automotive industry’s scale for thermal management.



**Integrated processing**

The ability to handle more processing functions on a single SoC means less silicon and less power consumed for lower cost. 22FDX allows for smaller and lower-power digital circuits compared to 28 nm bulk CMOS, which leads to the smallest sensor size, maximum performance at ISO power, and a more highly integrated solution.



**Design cycle and time to market**

Proven GF technology, with a focus on product differentiation rather than design complexity, ensures low-cost, high-efficiency, high-performance RADAR solutions. The lower sensitivity of 22FDX to layout dependent effects (LDE) over bulk 28 nm CMOS technologies enables ease of design as well as design cost savings, faster time to market (TTM) and lower risk. GF also bolsters confidence in product timelines and robustness with silicon-proven mmWave reference designs, application-specific IP, turnkey services and RF expertise.



**Auto Grade 1 volume production**

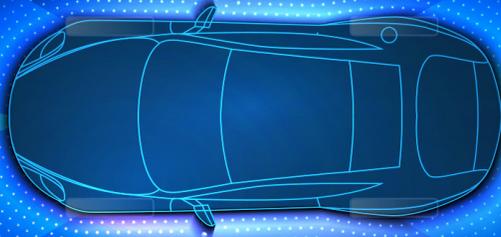
GF warrants its solutions meet or exceed client specifications on quality and reliability for all industries and markets. GF Fab 1 plant in Dresden, Germany enables production that is co-located with Tier 1 manufacturers that GF serves. The location, close to the center of the automotive world, also provides GF with low geo-political and low natural disaster risks, strong protection of intellectual property and a highly reliable supply chain.

## In the automotive market, sensors are more important than ever



### Short-Range RADAR

GF 40 nm and 22FDX™ solutions provide excellent image quality and high reliability in a variety of operating conditions.



### Long-Range RADAR

GF HP SiGe solutions enable longer range of detection along with excellent image quality. GF 22FDX solutions provide high resolution along with 4-D image quality in varying operating conditions.

## GlobalFoundries service packages enable fast, reliable time to market

The GF® AutoPro™ service package provides a broad set of solutions and manufacturing services that minimize automotive certification efforts and speed time to market.

GF is the first and only foundry to offer world-class in-house mmWave test capabilities (including 80 GHz test) built on 20 years of RF experience. This makes chip verification easier and the production process faster and more efficient, helping customers increase design efficiency and accelerate time to market.

GF turnkey manufacturing services include package design, package and supplier selection, custom tooling, pricing negotiation, quality/capacity/project management, operations management and supplier audit.

Post-fab services utilize both in-house and expert partner services that are tightly integrated into the overall manufacturing flow.

### LEARN MORE

GF is a global leader in specialty semiconductor manufacturing, with 15+ years of automotive production experience and more than two billion die shipped to date. Learn more about automotive smart sensors and the complete GF portfolio at [globalfoundries.com/contact-us](https://globalfoundries.com/contact-us)

### Contact Us



\* IHS Markit Automotive ECU Database - 2019

† Compared to equivalent competitor nodes that use planar CMOS process technology

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