



# Integrated 5G mmWave infrastructure and SATCOM FEMs using 22FDX RF and 22FDX RF+

## Exceptional performance/power benefits for RF SoCs

**22FDX RF and 22FDX RF+ are the industry's only solutions that world-class power and performance benefits in a single-chip 5G mmWave SoC.**

**22FDX RF+ is designed to deliver 30% better  $R_{on} * C_{off}$  and IL performance.†**

**GF is the only foundry in the industry with in-house RF mmWave test capabilities.**

The build-out of 5G mmWave cellular infrastructure and satellite communications (SATCOMs) is critical to making high-bandwidth, low-latency user experiences—such as buffer-free 8K video streaming and autonomous driving—from anywhere, a reality.

22FDX™ RF and 22FDX RF+ from GlobalFoundries® (GF®) deliver outstanding power/performance ratios for cellular infrastructure and SATCOM FEMs and beamformers, as well as enable designers to integrate low noise amplifiers (LNAs), power amplifiers (PAs), SERDES and switches with the transceiver (TRX) into a single chip. These platforms present system-level cost efficiencies and industry-leading RF performance—all at ultra-low power levels that minimize heat dissipation for improved reliability.

### 22FDX RF at a glance

Platform	Solution	Key Features
22FDX	22FDX RF	<ul style="list-style-type: none"> <li>• 22 nm FD-SOI with RF</li> <li>• Outstanding <math>f_{max}</math> (&gt; 350 GHz) mmWave PA, with device stacking</li> <li>• Back-gate control for low-power logic (0.4 V) operation and reduced thermal load</li> <li>• Low-power mmWave LNA</li> <li>• Low-power digital performance and rich IP portfolio</li> </ul>
22FDX+	22FDX RF+	<ul style="list-style-type: none"> <li>• Builds on 22FDX RF features, offering 30% better switch insertion loss and <math>R_{on} * C_{off}</math> performance, and up to 3 dBm better <math>P_{sat}</math> at the same PAE†</li> </ul>


**Integrate critical elements:**

22FDX RF and RF+ offer up to a 40% logic scaling advantage‡ and are the industry's only solutions that enable fully integrated 5G mmWave SoCs with best-in-class performance and power benefits, so customers can use the saved space for other features and meet phased array lattice-spacing requirements.


**Maximize performance and coverage:**

22FDX RF combines high  $P_{sat}$  with superior noise-figure and insertion-loss performance (IL) to help boost signal strength and extend signal reach up to 6% for better coverage over wider areas.◊ 22FDX RF+ extends GF 5G leadership by offering 30% better  $R_{on} * C_{off}$  and IL.†


**Stay cool:**

22FDX RF and RF+ incorporate low-power logic with back-gate control to minimize power consumption, so customers can optimize designs to prevent overheating while improving reliability and extending hardware life.


**Comprehensive IP portfolio:**

A rich intellectual property (IP) portfolio from GF and GF business partners enables the seamless incorporation of pre-validated building blocks, which optimizes and differentiates designs while accelerating time to market.


**Get results faster:**

Tap into GF's unrivaled, two-decade-long RF expertise and post-fab turnkey services, which feature in-house mmWave test capabilities, to get products to market faster.

**LEARN MORE**
**GF 5G cellular infrastructure and SATCOM solutions**

<b>22FDX™ RF</b> Superior performance with highest level of integration and up to 20 dBm $P_{sat}$ (with power combiners) for 5G mmWave cellular infrastructure and SATCOM FEMs and beamformers	<b>22FDX RF+</b> Superior performance with digital and RF enhancements that deliver 30% better IL and $R_{on} * C_{off}$ † for 5G mmWave cellular infrastructure and SATCOM FEMs and beamformers	<b>45RFSOI</b> Superior performance with high $P_{sat}$ (up to 23 dBm) for 5G mmWave cellular infrastructure and SATCOM FEMs and beamformers
<b>8SW RF SOI</b> Outstanding performance for 5G sub-6 GHz cellular infrastructure FEMs	<b>SiGe HP</b> High performance and efficiency with $P_{sat} > 23$ dBm for 5G sub-6 GHz and mmWave cellular infrastructure and SATCOM discrete power amplifiers	

**Contact Us**


GF knows RF. Learn about GF's extensive cellular infrastructure and SATCOM solutions portfolio at [gf.com/contact-us](https://gf.com/contact-us)

† Compared to 22FDX RF.

‡ Compared to 28 nm bulk CMOS. Benefits will vary with chip/system design.

◊ Assumes 28 GHz band, TX and RX antenna gain of 20 dB, line of sight communication. Benefits will vary with chip/system design.

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