



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


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

22FDX™ RF 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	22FDX RF+ 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	45RFSOI Superior performance with high P_{sat} (up to 23 dBm) for 5G mmWave cellular infrastructure and SATCOM FEMs and beamformers
8SW RF SOI Outstanding performance for 5G sub-6 GHz cellular infrastructure FEMs	SiGe HP High performance and efficiency with $P_{sat} > 23$ dBm for 5G sub-6 GHz and mmWave cellular infrastructure and SATCOM discrete power amplifiers	

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GF knows RF. Learn about GF's extensive cellular infrastructure and SATCOM solutions portfolio at 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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Maximize coverage:

45RFSOI delivers superior f_t/f_{max} , P_{out} , insertion loss, gain and noise figure benefits that help maximize connectivity properties and range, so consumers can keep enjoying data-greedy apps even when there's no cell tower in sight.


Boost mmWave performance:

With a trap-rich, high-resistivity substrate and back-end-of-line processing featuring thick copper levels that reduce transmission line and parasitic losses, 45RFSOI takes mmWave performance to the next level with best-in-class LNA and switch performance.


Performance and reliability you can count on:

45RFSOI provides the tools needed to maximize reliability and performance. GF offers the industry's first silicon-validated reliability model and PAs that deliver up to 23 dBm P_{sat} at > 40% PAE which helps reduce power dissipation and overheating issues.


Minimize total cost of ownership:

45RFSOI enables customers to achieve greater coverage using fewer base stations or equal coverage using smaller, lower-power base stations.◊


Get results faster:

Tap into GF's unrivaled RF expertise built on two decades of experience and partner with the industry's only Foundry with RF post-fab turnkey services, which feature proprietary mmWave test capabilities to get your products to market faster.

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GF 5G cellular infrastructure and SATCOM solutions

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

GF knows RF. Learn how GF's extensive cellular infrastructure and SATCOM solutions portfolio strengthens customers' 5G leadership position at [gf.com/contact-us](https://www.globalfoundries.com/contact-us)

* For both mobile and wireless infrastructure applications.

‡ Compared to bulk CMOS and competitive solutions.

◊ At 26 GHz.

† Compared to 22FDX RF.

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