5G mmWave cellular infrastructure and SATCOM FEMs using 45RFSOI

Boost RF performance, signal power and reliability

5G smartphones are already available. This availability, combined with rising expectations for high-bandwidth immersive user experiences such as always-available HD video streaming and multi-user video conferencing, is fueling the demand for rapid deployment and expansion of 5G and satellite communication (SATCOM) networks so 5G can live up to its hype.

The GlobalFoundries (GF®) 45RFSOI solution offers unparalleled performance for 5G mmWave applications. Optimized for 5G mmWave cellular front-end module (FEM) and SATCOM applications, 45RFSOI combines high transmission power capabilities with industry-leading mmWave performance and reliability for beamformers and integrable low-noise amplifiers (LNAs), power amplifiers (PAs) and switches.

**45RFSOI at a glance‡**

<table>
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<tr>
<th>Platform</th>
<th>Key Features</th>
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<tbody>
<tr>
<td>45 nm PD-SOI</td>
<td>FET stacking for 23 dBm Psat at &gt; 40% PAE‡ for PAs, with high reliability (up to 10-year operation)</td>
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<td></td>
<td>Innovative, output-power enhanced PA FET</td>
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<td>Higher Pmax and Fmax combined with lower noise figure per element for area and system-level cost efficiencies</td>
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Maximize coverage:
45RFSOI delivers superior \( f_t/f_{\text{max}} \), \( P_{\text{out}} \), 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 \( P_{\text{sat}} \) 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.\(^9\)

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

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

<table>
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<tr>
<th>22FDX™ RF</th>
<th>22FDX RF+</th>
<th>45RFSOI</th>
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<tr>
<td>Superior performance with highest level of integration and up to 20 dBm ( P_{\text{sat}} ) (with power combiners) for 5G mmWave cellular infrastructure and SATCOM FEMs and beamformers</td>
<td>Superior performance with digital and RF enhancements that deliver 30% better IL and ( R_{\text{on}}\cdot R_{\text{off}} )† for 5G mmWave cellular infrastructure and SATCOM FEMs and beamformers</td>
<td>Superior performance with high ( P_{\text{sat}} ) (up to 23 dBm) for 5G mmWave cellular infrastructure and SATCOM FEMs and beamformers</td>
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<th>8SW RF SOI</th>
<th>SiGe HP</th>
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<tr>
<td>Outstanding performance for 5G sub-6 GHz cellular infrastructure FEMs</td>
<td>High performance and efficiency with ( P_{\text{sat}} &gt; 23 \text{ dBm} ) for 5G sub-6 GHz and mmWave cellular infrastructure and SATCOM discrete power amplifiers</td>
</tr>
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\(^*\) For both mobile and wireless infrastructure applications.

\(\dagger\) Compared to bulk CMOS and competitive solutions.

\(\diamond\) At 26 GHz.

\(\dagger\) Compared to 22FDX RF.

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