5G mmWave mobile FEMs using 45RFSOI

Boost RF performance, signal power and reliability

Mobile devices have become more feature-packed and indispensable each successive generation. With 5G rollouts promising ultrafast data rates over wider coverage areas, consumers are expecting more from their devices. Making advances like glitch-free, high-bandwidth 8K video streaming possible requires new dimensions of innovation.

GlobalFoundries (GF®) delivers this innovation with 45RFSOI. Optimized for 5G mmWave cellular front-end module (FEM) 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>
<thead>
<tr>
<th>Platform</th>
<th>Key Features</th>
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| 45 nm PD-SOI | • 23 dBm P_{sat} at > 40% PAE‡ for PAs, with 10-year operation  
              • Innovative, output-power enhanced PA FET  
              • High f_s/f_m and device stacking  
              • Lower insertion loss and noise figure |
**Mobile**

**Stretch your reach:**
45RFSOI delivers superior ft/fmax, Pmax, insertion loss, gain and noise figure benefits that maximize connectivity properties and range, so consumers can keep enjoying data-greedy apps even when there’s no cell tower in sight.

**Nix the noise:**
45RFSOI is built on a high-resistivity substrate and uses loss-optimized, back-end-of-line processing to improve noise isolation and harmonics suppression for high-quality, interference-free connections.

**Amp up battery life:**
PAs that leverage 45RFSOI have higher power gain and efficiency—up to 23 dBm Psat at > 40% PAE—and deliver extended battery life to consumers when they’re on the go and keep their smartphones cool when downloading that full-length 8K video.

**Pack more into less space:**
45RFSOI enables the integration of multiple RF elements into mmWave FEMs that have superior transmission power—or develop beamformers that use fewer chips for smaller, more cost-effective arrays.

**Fast track time to market:**
Tap into GF’s unrivaled RF expertise build 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**

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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_{in} (with power combiners) for 5G mmWave smartphones</td>
<td>Superior performance with digital and RF enhancements that deliver 30% better IL and R_{on} x C_{off} for 5G mmWave smartphones</td>
<td>Superior performance with high P_{sat} (up to 23 dBm) for 5G mmWave smartphones</td>
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<th>7SW RF SOI</th>
<th>8SW RF SOI</th>
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<tr>
<td>Great performance for entry and mid-tier 4G LTE and 5G sub-6 GHz smartphones, smart watches and other connected mobile devices</td>
<td>Outstanding performance for premium and high-tier 5G sub-6 GHz smartphones</td>
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GF knows RF. Learn how GF’s extensive mobile solutions portfolio strengthens customers’ 5G leadership position at [gf.com/contact-us](http://gf.com/contact-us)

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* 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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