



GLOBALFOUNDRIES®



8SW RF SOI

Leading RF FEM platform for best-in-class LNAs and RF switches

Highlights

- Industry's first fully qualified RF SOI foundry solution manufactured on 300 mm wafers
- Designed to deliver best-in-class RF switch, LNA and logic performance
- Keeps pace with 4G LTE advanced and sub-6 GHz 5G FEM requirements
- Built on trap rich high-resistivity substrate
- Features all-copper interconnects, optimized metal stacks and MIM capacitors
- Silicon-based, fully qualified v1.0 PDK available for design

Leverage superior performance and 300 mm manufacturing and substrate benefits

The 8SW platform is the most advanced RF SOI technology in the GLOBALFOUNDRIES RF portfolio, and the industry's first fully qualified RF SOI foundry solution manufactured on 300 mm wafers. The technology is optimized for low noise amplifiers (LNAs), switches and tuners for front-end modules (FEMS) in 4G LTE advanced and sub-6 GHz 5G IoT, mobile device and wireless communications applications.

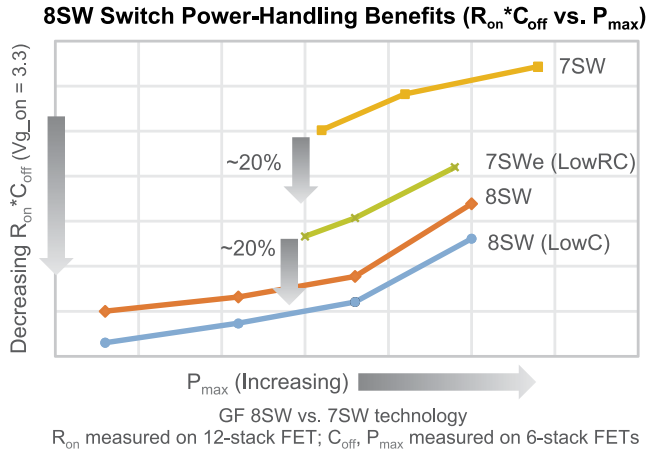
GF's 8SW platform features up to 70 percent power reduction and 20 percent smaller overall die size compared to its predecessor, with higher voltage handling and a best-in-class on-resistance (R_{on}) and off-capacitance (C_{off}) for reduced insertion loss with high isolation.

Sub-6 GHz 5G will co-exist with LTE, adding more components and complexity to RF requirements. As the industry leader in RF technologies, GF has optimized 8SW to handle these growing numbers of frequency bands, a diverse variety of RF signals and the incorporation of integrated processing and control functions. In an era where connected intelligence is the new "smart", this combination helps designers develop solutions that enable seamless, reliable data connectivity everywhere.

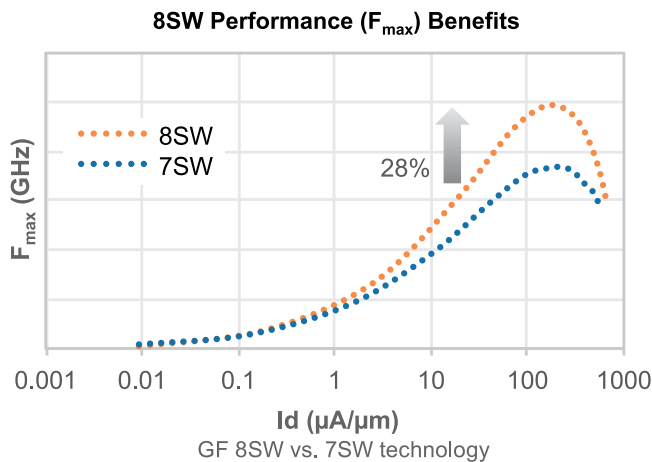
The 8SW technology gives designers a cost-effective platform with an optimal combination of performance, power efficiency and greater digital integration ability. GF's 8SW technology implements a specialized substrate optimization that helps maximize the quality factor for passive devices, reduce parasitic capacitances for active circuits and minimize the disparity in phase and voltage swing for devices operating in the sub-GHz frequency range.

8SW takes performance to new levels

8SW is the leading industry technology for $R_{on} * C_{off}$ performance, featuring an all-copper interconnect that helps maximize power-handling capability.



8SW delivers a high f_t/f_{max} , supporting diversity receive and main antenna path LNA applications for today's 4G and future sub-6 GHz 5G operating frequencies.



8SW at a glance

GF's 8SW platform takes advantage of 300 mm manufacturing capacity and 300 mm RF SOI substrates for cycle time, cost, capacity and uniformity benefits. Qualified process design kits are available now, and regularly scheduled multi-project wafer runs enable fast prototyping so you can see results in hardware early.

Feature overview

- 130 nm lithography
- 300 mm manufacturing
- Trap rich high-resistivity 300 mm substrate
- Copper intensive BEOL
- Four optimized metal stack options
- ESD library
- Electrically programmable fuse
- Wire bond, C4, Cu pillar and WLCSP-RDL interconnect options

Standard features

Optional features

| Standard features | Optional features |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| FETs | |
| <ul style="list-style-type: none"> • Thick oxide 2.5 V switch • Thick oxide 2.5 V logic | <ul style="list-style-type: none"> • Thin oxide 1.2 V LNA |
| Resistors | |
| <ul style="list-style-type: none"> • P+ poly resistor | <ul style="list-style-type: none"> • PC poly RR serpentine |
| Capacitors | |
| <ul style="list-style-type: none"> • HV BEOL VNCAIP | <ul style="list-style-type: none"> • Single nitride MIM • High voltage dual MIM |
| Inductors | |
| <ul style="list-style-type: none"> • Parallel (high Q) inductors • Series (high density) inductor • Single-layer inductor | |
| Varactors and diodes | |
| <ul style="list-style-type: none"> • Thick oxide NMOS varactor • Forward bias diode | |

8SW RF SOI
Comprehensive
Design Enablement

| | | |
|--------------------------------------------------------------------------|-----------------------|------------------|
| Libraries (Standard Cells, Memories) | Analog / Mixed-Signal | RF Demonstrators |
| Full RF PDK, Reference Flow and 3 rd -Party Simulator Support | | |
| 130 nm RF SOI CMOS Process Technology | | |
| SoC Packaging | RF Test Services | |



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