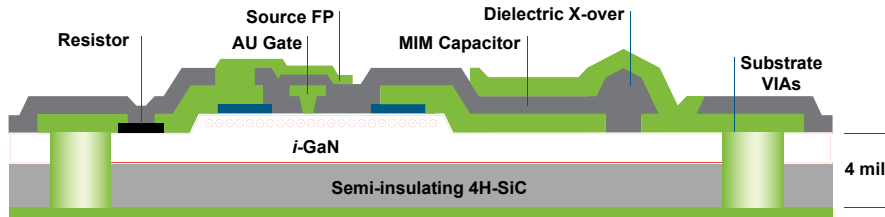


G50V4: GaN-on-SiC 0.25 μm MMIC Foundry Process

Enabling 50 V RF Designs through X-Band



G50V4 process cross section

The G50V4 is a high performance 50 V microwave process targeting applications operating at frequencies from DC through 14 GHz. The process has been fully qualified with the qualification report available upon request. The drain voltage of 50 V with breakdown of 150 V optimizes this process for high performance applications where high power and efficiency over wide bandwidths is required.

The process features two gold RF interconnect layers, MMIC capacitors, thin film and bulk GaN resistors, and dielectrically-supported bridges for connections to circuit elements such as capacitors and inductors. The Silicon Carbide substrate thickness is 100 microns and has the smallest substrate VIA sizes available in a GaN-on-SiC MMIC process, which enables very compact FET footprint for high frequency applications. Process Design Kits (PDKs) with scalable, accurate models of the G50V4 devices are available for Microwave Office (MWO) or Advanced Design System (ADS) simulators. The PDKs have been vetted for both small signal and large signal accuracy.

FEATURES

- 0.25 μm Gate Length
- $V_P \sim -2.7\text{ V}$
- 50 V Bias with $>150\text{ V}$ Breakdown
- Performance DC – 14 GHz
- $>15\text{ dB}$ Gain @ 10 GHz
- $P_{\text{sat}} = 8.5\text{ W/mm}$ @ 10 GHz
- Peak PAE = 55% @ 10 GHz
- Metal1 = 3 μm ;
Metal2 = 3 μm
- MIM Cap 180 pF/mm²
- TFR 12 Ω/sq
- GaN Resistors: 70 and 395 Ω/sq
- Protective Scratch Coat Top Layer
- Substrate Thickness: 100 μm
- Substrate VIAs
- Au Back Metal

APPLICATIONS

- Radar
- TeleCom
- Point-to-Point Radio
- Ultra-wideband EW
- ECM

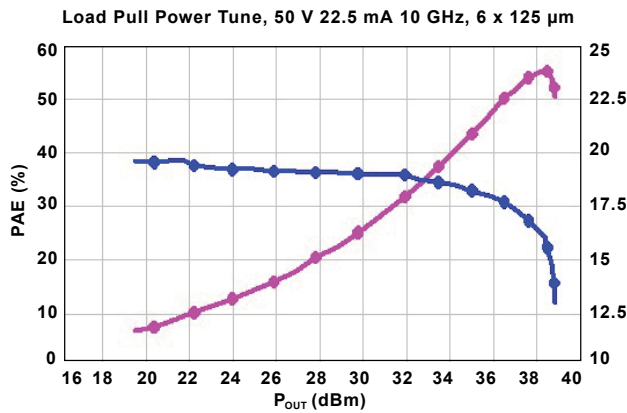
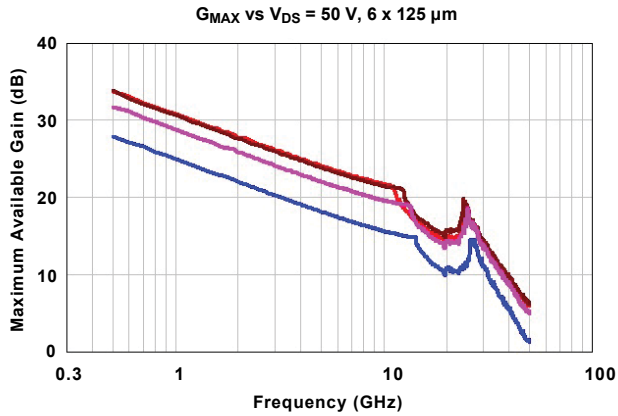
CIRCUIT TYPES

- High Power Amplifiers
- Low Noise Amplifiers
- RF Switches
- Phase Shifters
- Attenuators

G50V4: GaN-on-SiC 0.25 μm MMIC Foundry Process (continued)

FOUNDRY SERVICES

Customers can design and fabricate circuits through MACOM's foundry using development or production lots. Designs from development masks are easily ported to production mask sets for volume production. MACOM's foundry is a high volume manufacturer and can handle a variety of production needs.



DESIGN TOOLS

- Device Library of Circuit Elements: FETs, Thin Film Resistors, Bulk Resistors, Capacitors, Inductors
- Design Kit for ADS Design Environment
- Design Kit for AWR Microwave Office
- Design Rule Check
- Thermal Reference Designs

SUPPORT FEATURES

- Process Design Kits
- Design Rule Check
- Tiling of GDSII Stream Files
- On-wafer Test Development
- Failure Analysis
- Mask Procurement
- Production 100 mm Wafer
- Wafer Thinning
- Wafer Singulation
- Substrate VIAs
- DC Test
- RF On-wafer Test
- Custom Design Services
- Die Pick
- Wafer Delivery on UV Tape