



YOU DESIGN IT. WE BUILD IT.
PREFERRED, FASTER AND WITH HIGHER RELIABILITY.

CREE FOUNDRY SERVICES

Cree® GaN MMIC Foundry Services

Cree is the leader in GaN-on-SiC MMIC technology. We have the design assistance, proven process, testing and support to realize your specifications from initial development to recurring production. Cree can do it with faster cycle times, higher first pass design success and greater reliability than our competitors.†

Full-Wafer Service for GaN MMICs

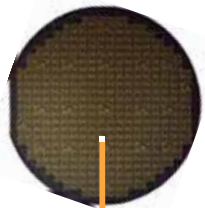


Cree offers non-linear, scalable GaN HEMT models for MMICs, as well as full PDKs for both AWR's Microwave Office (MWO) and Agilent Technologies' Advanced Design System (ADS).

- Custom designs
- DRC, layout and model support
- 10 mm X 10 mm reticule size
- 4 PCM good wafers
- DC/RF on-wafer testing optional
- Production mask & wafer quantities

Design Stage	Duration
Preliminary design review	4 weeks
Critical design review	4 weeks
Fabrication & Testing	Duration
MMIC fabrication	8 weeks
MMIC testing	2 weeks
Delivery	1 week

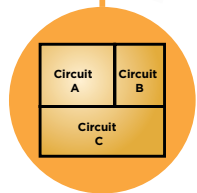
Shared Mask Service for GaN MMICs



Cree offers the SMS service with reduced cost and MMIC size, providing multiple customers the opportunity to get their MMIC designs fabricated faster.

Available areas from 2 mm x 2 mm to 6 mm x 6 mm. Forty die will be delivered. See www.cree.com/foundry for details.

Eight weeks fabrication time and twelve weeks delivery from start.



† Based on publicly available competitor data and customer feedback.

Cree offers foundry services for development and production using GaN HEMT MMIC processes in two basic families:

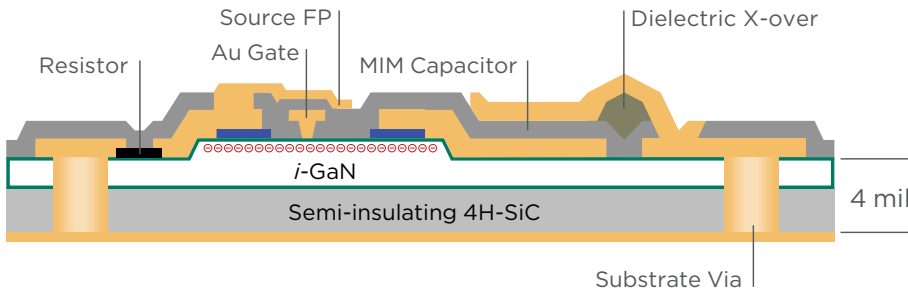
0.4 μm gate length HEMT that can be operated at drain bias of 28 to 50 V

0.25 μm gate length HEMT that can be operated at 28 to 40 V

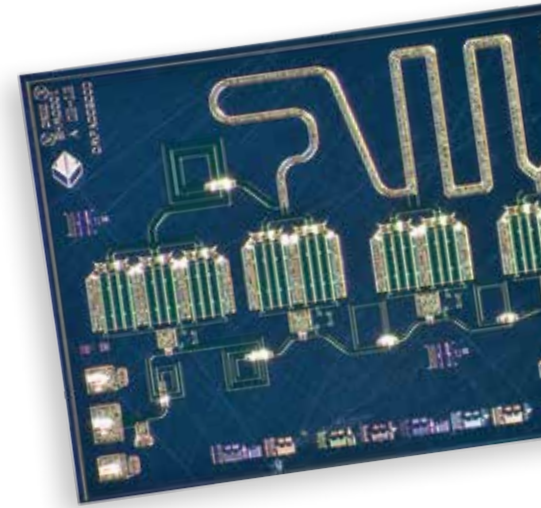
Customers can design into the foundry using the ADS or MWO design kits or have Cree perform the design service. The processes feature high-power density (4 to 8 watts/mm) transistors, slot vias, resistors, capacitors, high-reliability up to 225°C operating junction temperatures, and scalable unit FET cells. Both the processes and the design kit models are extremely robust, enabling first-pass design success with first-to-market for your high-power, high-efficiency MMIC products.



GaN HEMT MMIC process components



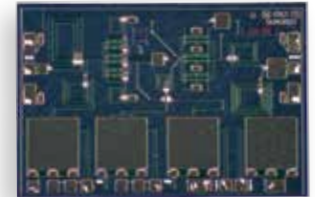
FEATURES	G28V3 MMIC	G28/40V4 MMIC	G50V3 MMIC
Gate length	0.4 μm	0.25 μm	0.4 μm
Bias	28 V	28 V to 40 V	50 V
Breakdown	>120 V	>120 V	>120 V
Density	4.5 W/mm	6 W/mm	8 W/mm
Performance	DC - 8 Ghz	DC - 18 Ghz	DC - 6 Ghz
Dual metal 3 μm -thick interconnects	•	•	•
Thin film & bulk resistors	•	•	•
MIM capacitors >100 V	•	•	•
Slot substrate via's	•	•	•
Power FETs & Switch FETs	•	•	•



EXAMPLE: HPA 3.99 x 2.40 mm



EXAMPLE: SPDT switch 2.67 x 2.39 mm



EXAMPLE: LNA 1.7 x 2.5 mm

APPLICATIONS

- 2-Way private radio
- Test instrumentation
- Broadband amplifiers
- EW jammers
- Class A, AB, linear amplifiers suitable with OFDM, QPSK, QAM, FM waveforms
- Radar
- Military communications

SERVICE FEATURES

- Agilent ADS & AWR MWO Process Design Kits (PDK)
- Layout support and DRC
- Development lots in dedicated & shared mask options
- Electrical test services available
- Visual screening
- Typically 4 PCM good wafers for FWS service
- Delivery in gel paks or tape frames
- SMS pizza mask service

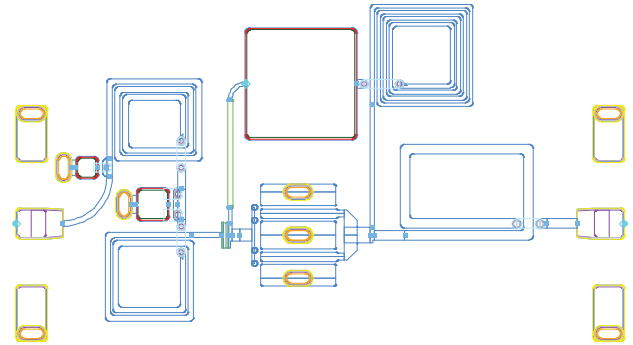
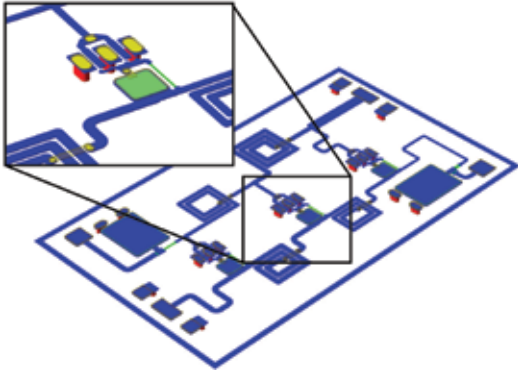
CIRCUIT TYPES

- High power FET amplifiers
- Broadband amplifiers
- High efficiency amplifiers
- High IP₃ amplifiers
- Multi-function integrated MMICs
- FET limiters
- High power FET switches
- High IP₃ FET mixers
- Attenuators
- Phase Shifters
- Low noise amplifier

GaN HEMT MMIC process design kits



Agilent Technologies



- Cree's scalable non-linear model
- All passives created with Cree design rules
- Full schematic driven layout
- Real time design rule checking
- AWR test design example:
DC-6 GHz Drive Amplifier

- Cree's scalable non-linear model
- All passives created with Cree design rules
- Design rule checking



To put our years of GaN experience to work for you, please contact Cree for a complete capabilities evaluation at cree.com/foundry.

Need more incentive to try Cree GaN foundry services? Ask about our new lower prices.

CREE FOUNDRY FACILITIES

Since 2006 this foundry has supported large-scale commercial production and advanced research in SiC and GaN RF and power products.

- World's largest dedicated commercial WBG production device facility
- 100 mm cleanroom
- RF MMIC on-wafer probe / dice
- Microwave reliability labs
- RF applications support

For inquiries, please contact the Cree team at: 919-313-5300 or Cree_Foundry@cree.com



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