

RF MMIC

GaAs Solutions

Leadership in wireless communications

Advantages

- Low thermal resistance
- Devices operate directly from 5V supply voltages and regulators—no external resistors are required
- Third-generation Darlington InGaP HBT devices with integrated thermal compensation schemes greatly reduce performance variation over temperature
- Latest generation of E-pHEMT process results in devices with extremely low RDS(on) channel resistivity for superior RF performance characteristics
- Broad base of available GaAs technologies, including InGaP HBT, E-pHEMT, EPI MESFET and HFET
- Historical strength in RF design and GaAs MMIC technology
- World-class global sales and applications support

Expanded—Freescale's GaAs Solutions Portfolio

Leveraging our extensive GaAs capabilities and a near half century of RF power device experience, Freescale has developed both a broad general purpose amplifier (GPA) portfolio and an extensive selection of MMIC devices. This portfolio offers amplifier devices with P1dB from 15 to 33 dBm and low noise amplifiers (LNA) with noise figures below 0.5 dB.

Freescale's GaAs MMIC portfolio offers products utilizing enhancement mode pHEMT (E-pHEMT), HFET and InGaP HBT device technologies. The E-pHEMT and HFET devices offer higher OIP3 relative to HBT devices biased at the same current. This enables system designers to achieve excellent linearity with lower power consumption. The E-pHEMT devices offer superior noise figure in conjunction with excellent linearity at reduced biased currents, relative to standard low-voltage InGaP HBT technology. All products offer single positive supply operation.

With the expansion of the GaAs MMIC portfolio, Freescale is well positioned to offer designers a complete lineup for low- to medium-power applications and components suitable for the receive or transmit side of the radio communications system.

Complementing Freescale's expanded GaAs portfolio is our outstanding world-class global sales and applications support. Our infrastructure products group allows for a consolidated supply chain, creating simplified procurement logistics and additional cost saving for the customer. Plus, Freescale customers can order with confidence, as our manufacturing capabilities and robust quality systems ensure a stable and secure product supply.



MMIC

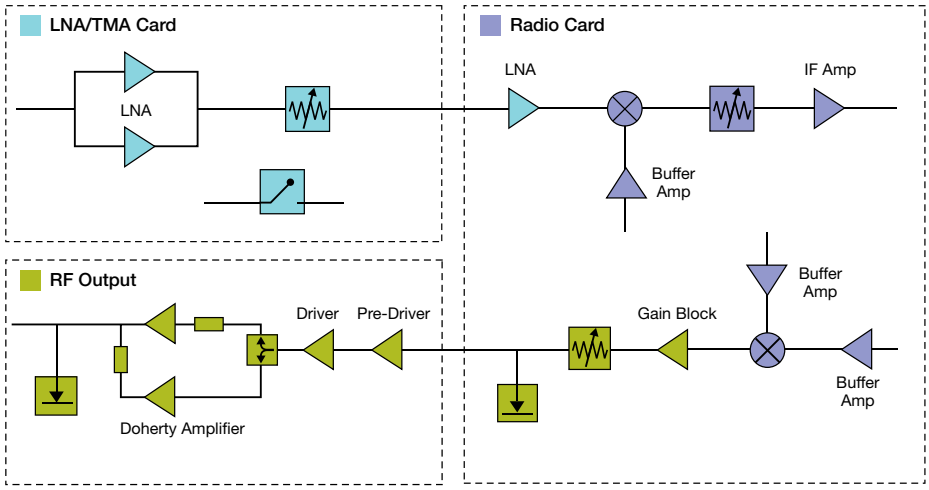
Applications

The current GaAs MMIC portfolio includes a selection of two-stage linear power amplifiers and LNAs that offer RF performance numbers optimized for the stringent base station requirements of the latest 3G and 4G networks as well as femtocell applications, smart grid and general wireless applications. The GaAs MMIC products are characterized and specified under the latest base station operating and test signal conditions. Future products will include voltage variable and digital attenuators, mixers and other specialty amplifiers and ICs.

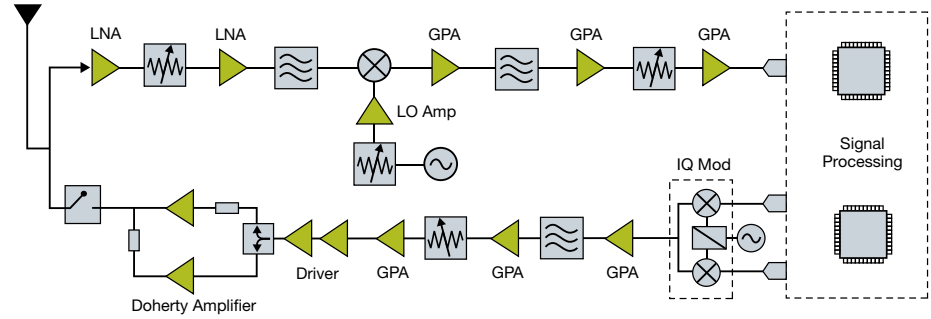
Examples

- IF amplifiers in the receive signal path
- Pre-driver amplifiers in the base station transmit and control path
- Buffer amplifiers in mixer applications
- LNAs in the receivers' front end

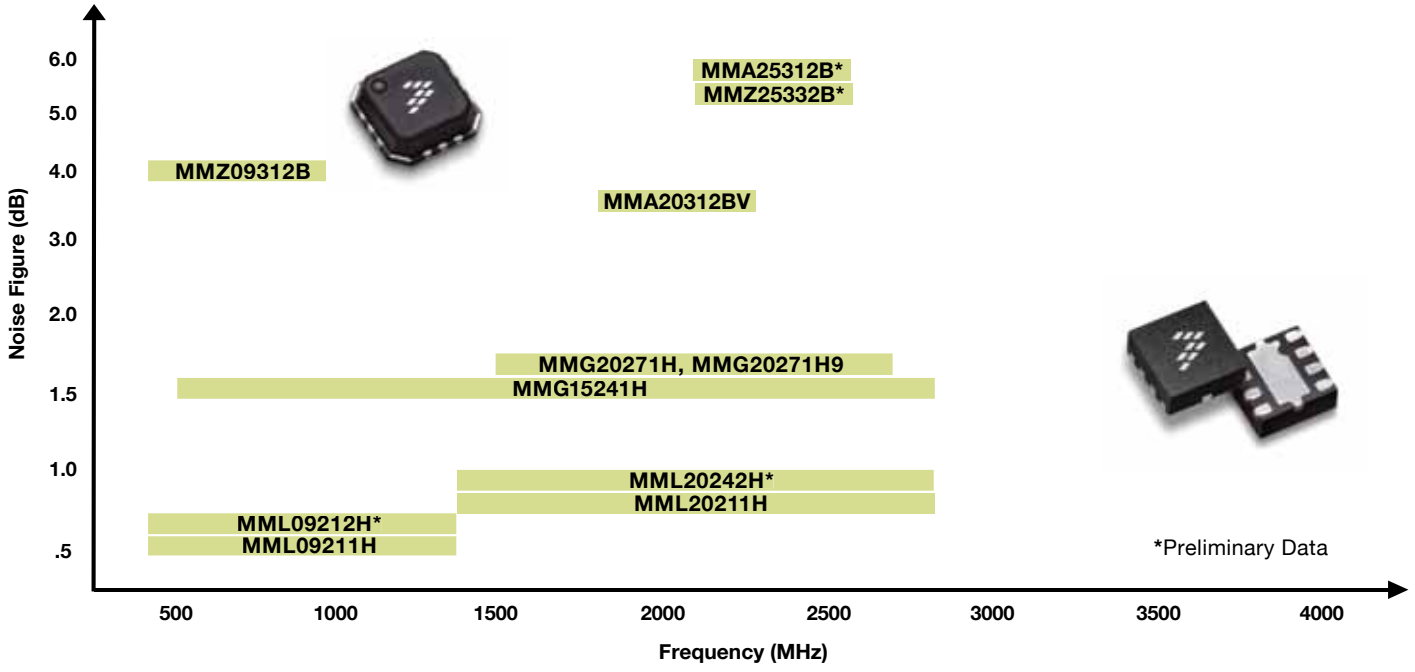
Areas of Focus



Tower Top Power Amplifier



MMIC Product Portfolio



GPA

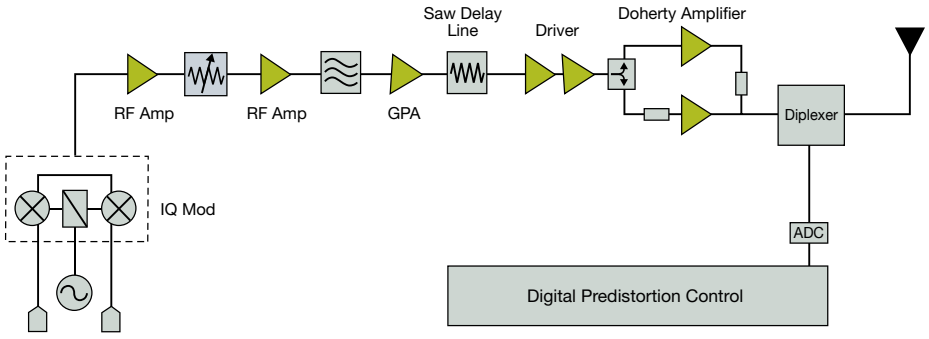
Applications

GPAs are ideal for applications where small signal gain is necessary. Freescale's portfolio of GPAs combine the right level of gain, noise and power consumption specifications to meet the industry's most demanding applications. Freescale GPAs provide excellent solutions for small-signal applications in cellular, industrial, broadcast and commercial aerospace markets.

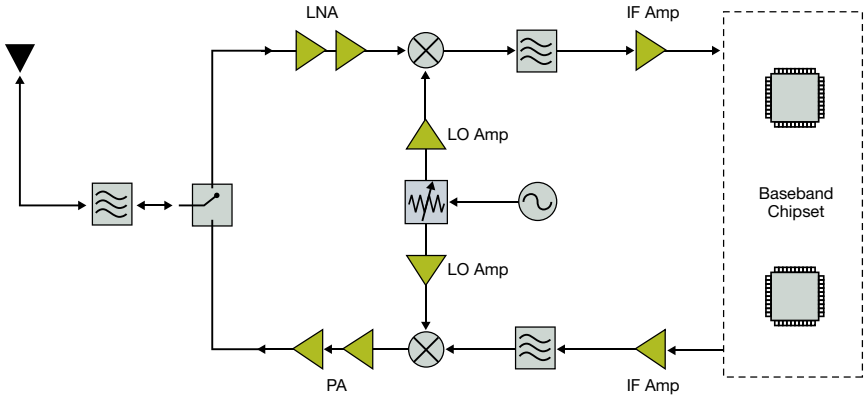
Examples

- Drivers or pre-drivers in base station applications and repeaters
- Buffer amplifiers in mixer applications
- Fiber to the premise (FTT-P) applications both as laser drivers and cost-effective small signal RF boosters at the premise
- Wireless LAN systems based on the IEEE® 802.11 a/b/g/n variants
- Radar
- WiMAX IEEE 802.16
- TV and DTV broadcast
- ZigBee® wireless networks
- Emergency radio systems and military SDR applications

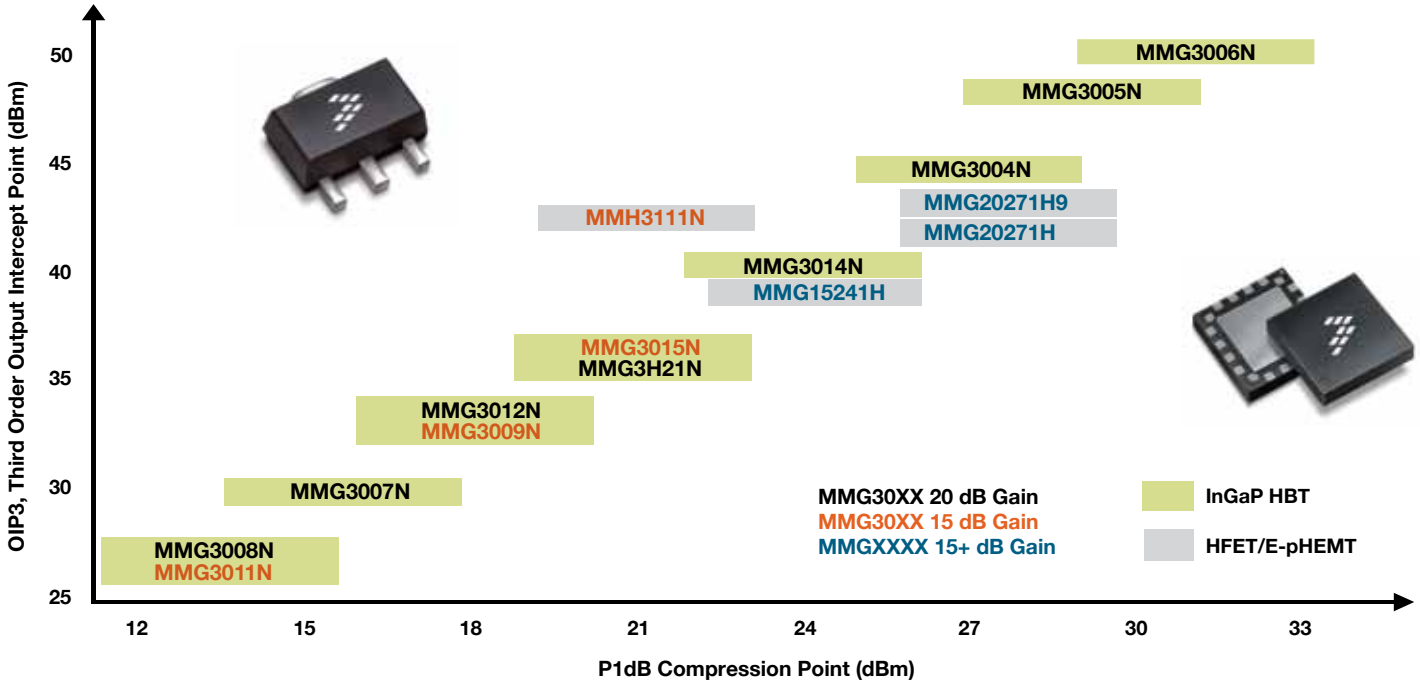
Digital Predistortion Power Amplifier



Femtocell



GPA Product Portfolio



Transmit Solutions

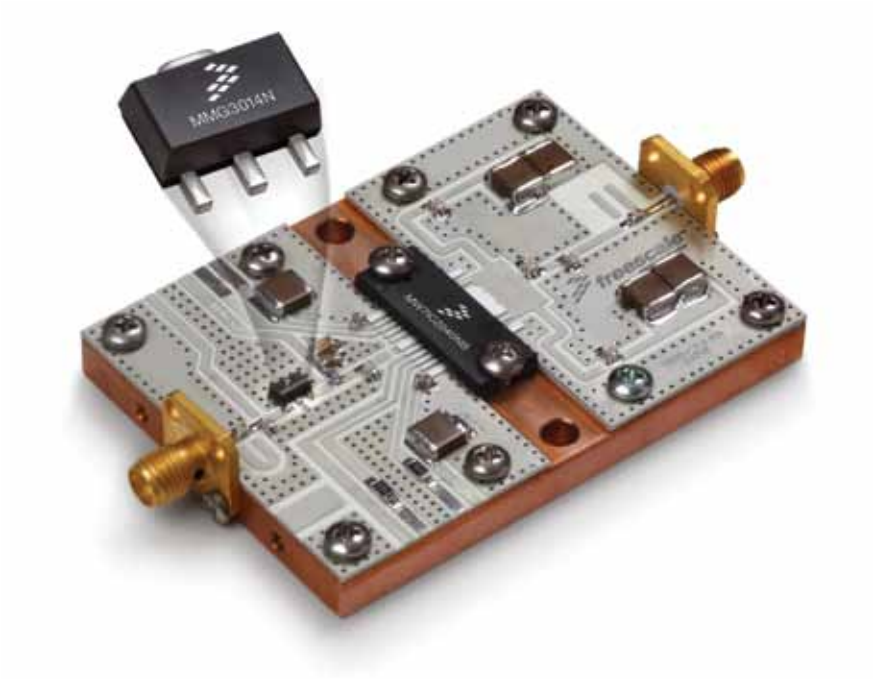
Smart Demo Reference Designs

Leveraging the extensive portfolio of LDMOS driver ICs and the portfolio of GaAs GPAs, Freescale creates turn-key pre-driver/driver solutions for all cellular infrastructure air interfaces. Evaluation circuits are fully characterized over frequency and temperature using real-world test signals. Performance of the design is completely documented and hardware is available as an evaluation kit for hands-on assessment and customization. The evaluation kit includes a removable EMI shield. Contact your local Freescale sales representative or authorized Freescale distributor for more information on the evaluation kits.

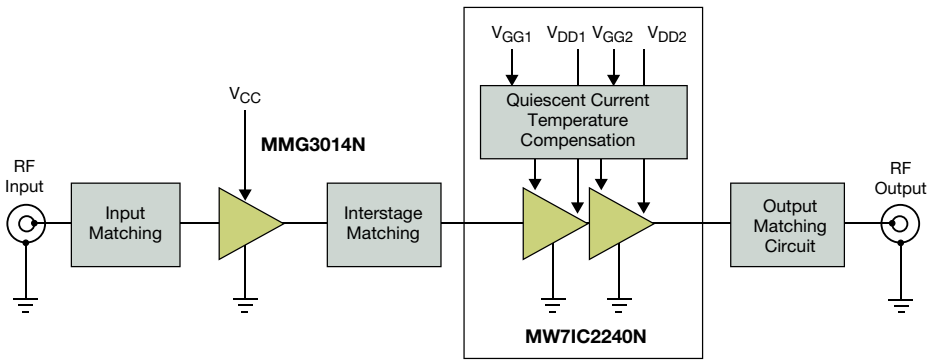
Examples

- MMG3014N driving an MW7IC2240N for W-CDMA
- MMG15241H driving an MD7IC2250N (Class-AB) for W-CDMA
- MMG3014N driving an MD7IC2050N (Doherty) for TD-SCDMA*
- MMG3014N driving an MW7IC2240N for TD-SCDMA*

** In development*



Smart Demo Block Diagram



For more information, visit freescale.com/RFMMIC

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