Freescale Semiconductor General Purpose Amplifiers

GPA Solutions
Amplify your next design

Expanded—Freescale’s General Purpose Amplifier Portfolio
Leveraging Freescale Semiconductor’s extensive GaAs capabilities and a near half-century of RF power device experience, Freescale has developed a broad General Purpose Amplifier (GPA) portfolio. This portfolio offers devices with P1dB from 12 to 33 dBm with gain options at various power increments.

Freescale’s GPA portfolio offers products utilizing HFET and InGaP HBT device technologies. The 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.

With the expansion of the GPA portfolio, Freescale is well positioned to offer designers a complete lineup for low- to medium-power applications.

Freescale Competitive Advantages
• Low thermal resistance
• Devices operate directly from 5 V supply voltages and regulators—no external resistors are required
• Second-generation darlington InGaP HBT devices with integrated thermal compensation schemes that greatly reduce performance variation over temperature

• Third-generation darlington devices with active bias further reduce variation over temperature and supply voltages
• Broad base of available GaAs technologies, including InGaP HBT, PHEMT, EPI MESFET and HFET
• Historical strength in RF design and technology
• World-class global sales and applications support
• Experience and reliability with manufacturing and quality systems ensures a secure supply
• SOT-89 has MSL1 rating @ 260°C package peak temperature

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Applications
GPAs are ideal for applications where 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. From general small-signal applications found in consumer and commercial to industrial and military applications, Freescale GPAs provide excellent solutions.

Examples
- Drivers or pre-drivers in base-station applications and repeaters
- UMTS, PCS, UHF, VHF, WLL, PHS
- Buffer amplifiers in mixer applications
- Fiber to the Premise (FTT-P) applications both as laser drivers and as cost-effective small signal RF boosters at the premise
- Wireless LAN systems based on the IEEE® 802.11a, b and g variants
- Radar
- WiMAX IEEE 802.16
- TV and DTV broadcast
- ZigBee® wireless networks
- Emergency radio systems and military SDR applications
- Industrial, Scientific and Medical (ISM)
- Radio Frequency Identification (RFID)

GPA Product Selection Guide

Base Station Linear Power Amplifier

From Transmitter
Amplifier (GPA)
Isolator
Pre-Driver GPA
Driver GPA
High Output Power LDMOS Amplifiers
Coupler
Combiner
Isolator
Variable Delay Line
Error Amp (GPA)
Variable Gain Amp
Variable Delay Line
GPA
Coupler
Fixed Delay
Attenuator
Vector Modulator
Isolator
BPF
Pre-Driver GPA
Driver GPA
High Output Power LDMOS Amplifiers
Coupler
Combiner
Isolator
Variable Delay Line
Error Amp (GPA)
Variable Gain Amp
Variable Delay Line
GPA
Coupler
Fixed Delay
Attenuator
Vector Modulator
Isolator
BPF

RFID

Phase Lock Loop
Clock
GPA
Splitter
VGA
Power Amp
I/Q
A/D
Filter
GPA
Filter

GPA Product Selection Guide

MMG3008N
MMG3007N
MMG3006N
MMG3002N
MMG3012N
MMG3015N
MMG3014N
MMG3004N
MMG3005N
MMH3111N
MMG30XX 20dB Gain
MMG30XX 15dB Gain
HFET
InGaP HBT

One dB Compression Point in dBm (P1dB)
Third Output Intercept Point in dBm (OIP3)
**Featured Products**

**MMH3111N GaAs HFET**
Freescale’s MMH3111N is a Class A GaAs HFET offering high OIP3, low noise figure and broadband performance. This device is internally input and output prematched, and is suitable for applications with frequencies from 250 to 4000 MHz.

- Frequency: 250–4000 MHz
- P1dB: 22 dBm @ 2140 MHz
- Small-signal gain: 11.3 dB @ 2140 MHz
- Third order output intercept point: 44 dBm @ 2140 MHz
- Single 5 Volt supply
- Internally prematched to 50 Ohms
- Internally biased
- Cost-effective SOT–89 surface mount package
- RoHS compliant

**MMG3008N InGaP HBT**
The MMG3008N is a InGaP HBT GPA that is internally input and output prematched. The frequency coverage of DC to 6000 MHz makes it applicable for a broad range of wired and wireless applications.

- Frequency: DC-6000 MHz
- P1dB: 15 dBm @ 900 MHz
- Small-signal gain: 18.5 dB @ 900 MHz
- Third order output intercept point: 26 dBm @ 900 MHz
- Single 5 Volt supply
- Internally matched to 50 Ohms
- Cost-effective SOT–89 surface mount package
- RoHS compliant

**MMG3006N InGaP HBT**
The MMG3006N is a InGaP HBT GPA that is internally input pre-matched. The frequency coverage of 400 to 2400 MHz makes it applicable for a broad range of wired and wireless applications.

- Frequency: 400-2400 MHz
- P1dB: 33 dBm @ 2140 MHz
- Small-signal: 14 dB @ 2140 MHz
- Third order output intercept point: 49 dBm @ 2140 MHz
- Single 5 Volt supply
- RoHS compliant

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**MMH3111N TYPICAL PERFORMANCE (1)**

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(1) $V_{DD} = 5$ Vdc, $T_c = 25^\circ$C, 50 ohm system

**MMG3008N TYPICAL PERFORMANCE (1)**

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(1) $V_{CC} = 5$ Vdc, $T_c = 25^\circ$C, 50 ohm system

**MMG3006N TYPICAL PERFORMANCE (1)**

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