Freescale Introduces
MMRF5014H
125 W CW, 50 V GaN on SiC RF Power Transistor

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Freescale RF Military Overview

- Freescale RF is **#1 in RF power** for cellular infrastructure*
- Strong presence in ISM, mobile radio, broadcast and avionics
- June 2013: Freescale RF announced new focus supporting U.S. defense industry

Freescale RF Military Value Proposition

- **Products and Technology**
  - Leveraging 20 years of innovation in RF power
  - Highest performing RF portfolio
- **Support**
  - U.S. LDMOS fabrication and dedicated internal manufacturing
  - Freescale product longevity program (10 or 15 years)
  - Dedicated U.S.-based applications & systems engineering support
- **Compliance**
  - ITAR compliant, secure technical data handling

*Source: ABI 2013 Report*
**Product Overview**

**Product Performance**
- Output Power: 125 W
- Supply Voltage: 50 V
- Frequency of Operation: up to 2690 MHz
- Gain: 16 dB min
- Drain Efficiency: 58% min
- Wideband GaN on SiC RF Power Transistor

**Description**
This 125 W RF power transistor is designed for wideband operation up to 2690 MHz. The high gain, rugged and wideband performance of this device make it ideal for large-signal, common-source amplifier applications for linear and compressed amplifier circuits.

**Features**
- Advanced GaN on SiC, offering high power density
- Suitable for octave and decade bandwidth wideband amplifiers
- Input matching for extended wideband performance
- High ruggedness, 20:1 VSWR
- Low thermal resistance
- 200-2500 MHz wideband reference circuit
**Applications**
- Wideband or narrowband amplifiers
- Ideal for multi octave communication applications
- Professional and military radios
- Radar, jammers and electronic warfare
- General purpose wideband amplifiers

**Competitive Advantages**
- Industry leading wideband 200-2500 MHz performance
  - 12 dB min gain and 40% min efficiency
- Low thermal resistance due to die attached technology and packaging
- 125 watts CW capable
- Device will be on Freescale’s 15 year Product Longevity Program
- Able to replace multiple RF amplifiers with one wideband PA
- Application circuit support
- Dedicated RF Military team
- Availability: Sampling now. In production Q4 2014. (Orderable Part#: MMRF5014HR5)
MMRF5014H
125 W GaN
Power Drive Up
MMRF5014H 100W GaN CW Performance
VDD = 50 V, IDQ=350 mA

- 100 W CW
- 200-2500 MHz
- 12 dB min gain
- 40% min eff
- 0.8⁰ C/W

Design Goals Met

MMRF5014H 200-2500 MHz Circuit
**MMRF5014H — 500-1000 MHz Circuit CW Performance**

The diagram illustrates the CW Performance of MMRF5014H across different frequencies (500 MHz, 675 MHz, 850 MHz, 1000 MHz) with varying output power and efficiency. The key parameters are:

- **VDD = 50 V**
- **IDQ = 350 mA**

The graph shows the gain (dB) and efficiency (%) as functions of output power (W) for each frequency range.
MMRF5014H — 1300-1900 MHz Circuit
Pulsed Performance

VDD = 50 V
IDQ = 350 mA, Pulse Width = 500 μsec 50% Duty Factor