

RF MILITARY

MMRF2010N | MMRF1312H

MMRF1314H | MMRF1317H

HIGH POWER LDMOS AVIONICS DEVICES



APRIL 2016



EXTERNAL USE



SECURE CONNECTIONS
FOR A SMARTER WORLD

NXP RF Military Overview

- NXP RF (formerly Freescale) 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**

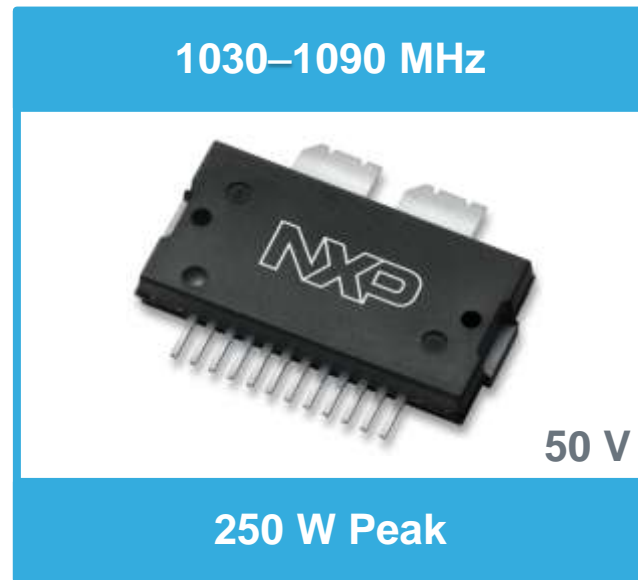
NXP RF Military Value Proposition

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

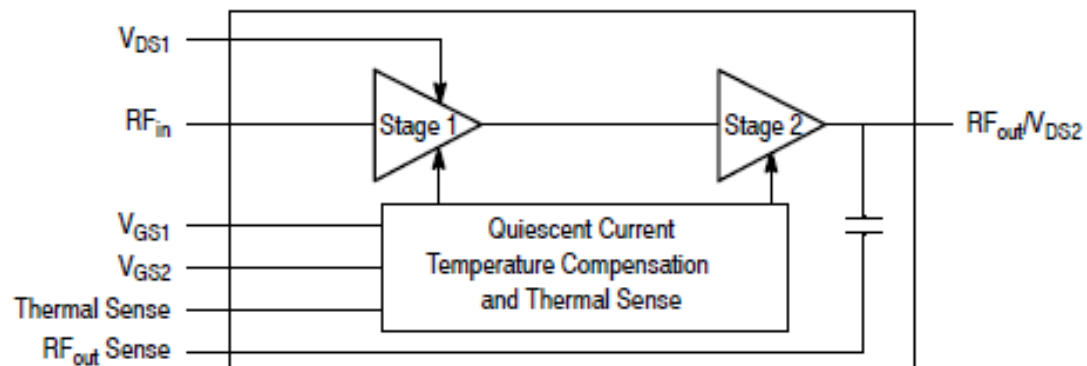
*Source: ABI 2013 Report



MMRF2010N: 250 W Peak – L-Band Transistor



- 1030 to 1090 MHz
- 250 W Peak, 50 V
 - Gain: 32.1 dB @ 1090 MHz, Drain Efficiency: 61.4%
- Housed in TO-270WB plastic package
- Ruggedness: > 10:1 VSWR
- Product Longevity Program: warranted availability until 2029
- Typical Applications
 - IFF and secondary radar



Available Reference Circuits:

1. 1090 MHz
2. 1030-1090 MHz

MMRF2010N: Featured Device

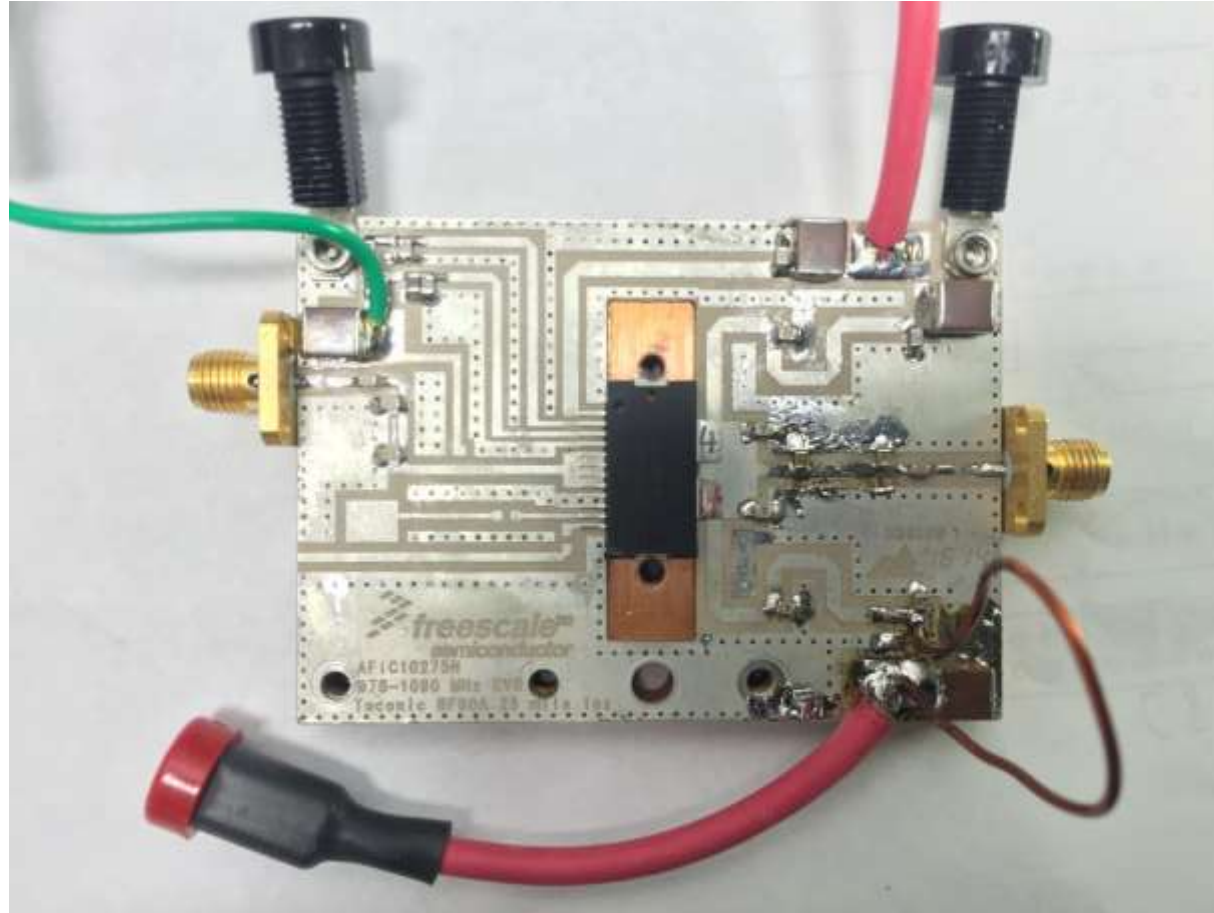
Features

- Characterized over 1030–1090 MHz
- On-chip input (50 ohm) and interstage matching
- Single ended
- Integrated ESD protection
- Low thermal resistance
- Integrated quiescent current temperature compensation with enable/disable function

Competitive Advantages

- Suitable for use in pulse applications with large duty cycles and long pulses
- Device in NXP 15 year Product Longevity Program
- Able to replace multiple RF amplifiers with one wideband PA
- Application circuit support
- Dedicated RF Military team
- Availability: Device is in production as earless and gull winged. Orderable part number is MMRF2010NR1.

MMRF2010N Applications Circuit: 1030 to 1090 MHz



MMRF1312H: 1200 W Peak – L-Band Transistor

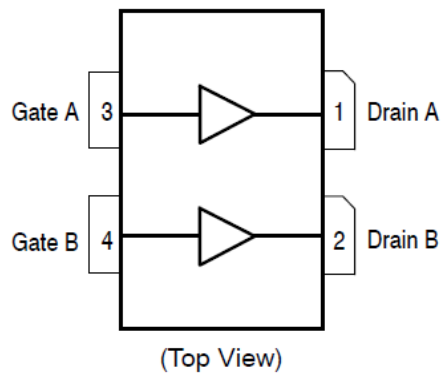
900–1215 MHz



52 V

1200 W Peak

- High power 1200 W Peak @ P3dB across 900 to 1215 MHz in one circuit
 - Gain: 17.3 dB @ 960–1215 MHz, Drain Efficiency: 54%
- Housed in NI-1230 air-cavity ceramic package
- High Ruggedness: > 20:1 VSWR
- Product Longevity Program: warranted availability until 2030
- Typical Applications
 - High power L-Band radar applications
 - Avionics navigation applications
 - Commercial aviation secondary surveillance radar



Available Reference Circuits:

1. 1030 MHz
2. 900-1215 MHz

MMRF1312H: Featured Device

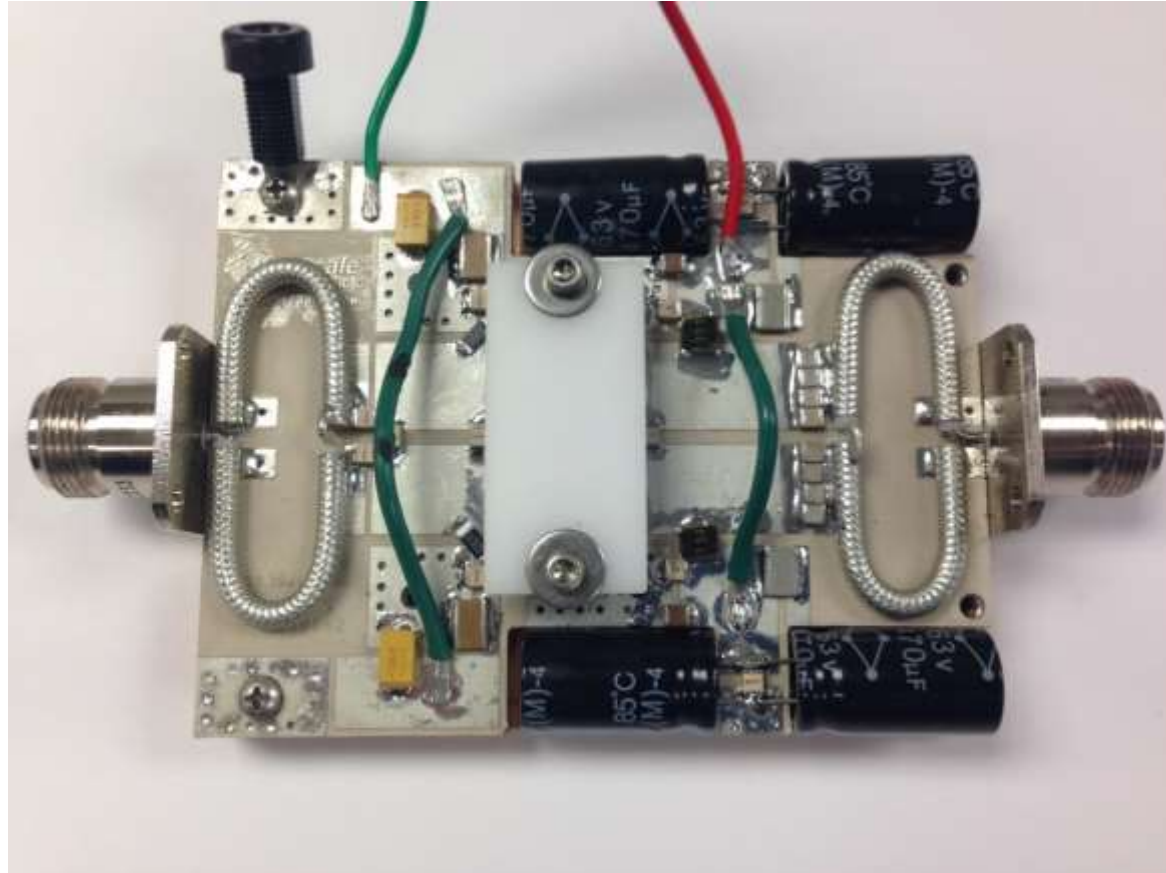
Features

- Internally input and output matched for broadband operation and ease of use
- Device can be used in a single-ended, push-pull or quadrature configuration
- High ruggedness, handles > 20:1 VSWR
- Integrated ESD protection with greater negative voltage range for improved Class C operation and gate voltage pulsing
- Characterized with series equivalent large-signal impedance parameters

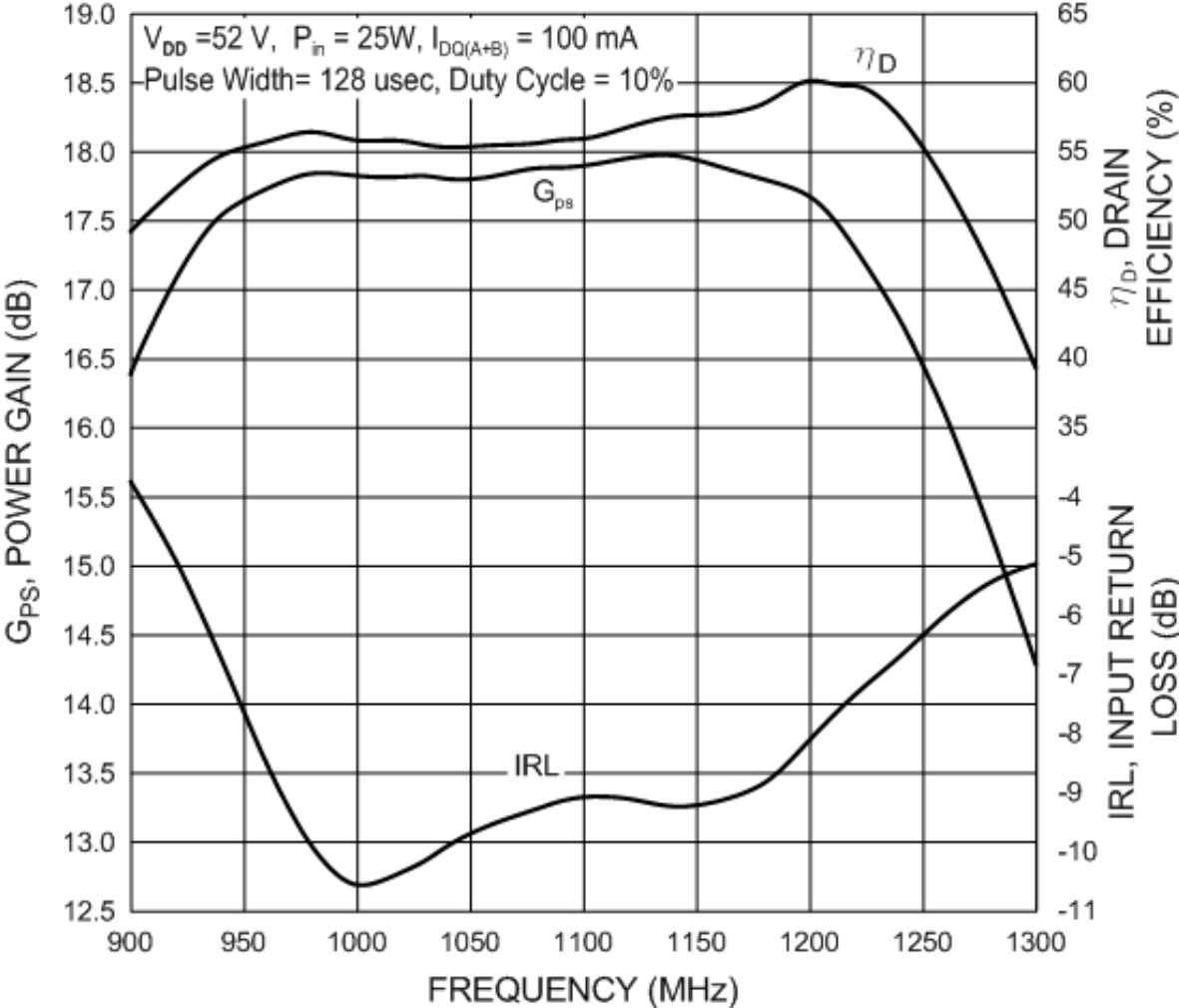
Competitive Advantages

- Suitable for use in pulse applications with large duty cycles and long pulses
- Device in NXP 15 year Product Longevity Program
- Able to replace multiple RF amplifiers with one wideband PA
- Application circuit support
- Dedicated RF Military team
- Availability: Device is in production as eared, earless and gull winged. Orderable part number is MMRF1312HR5.

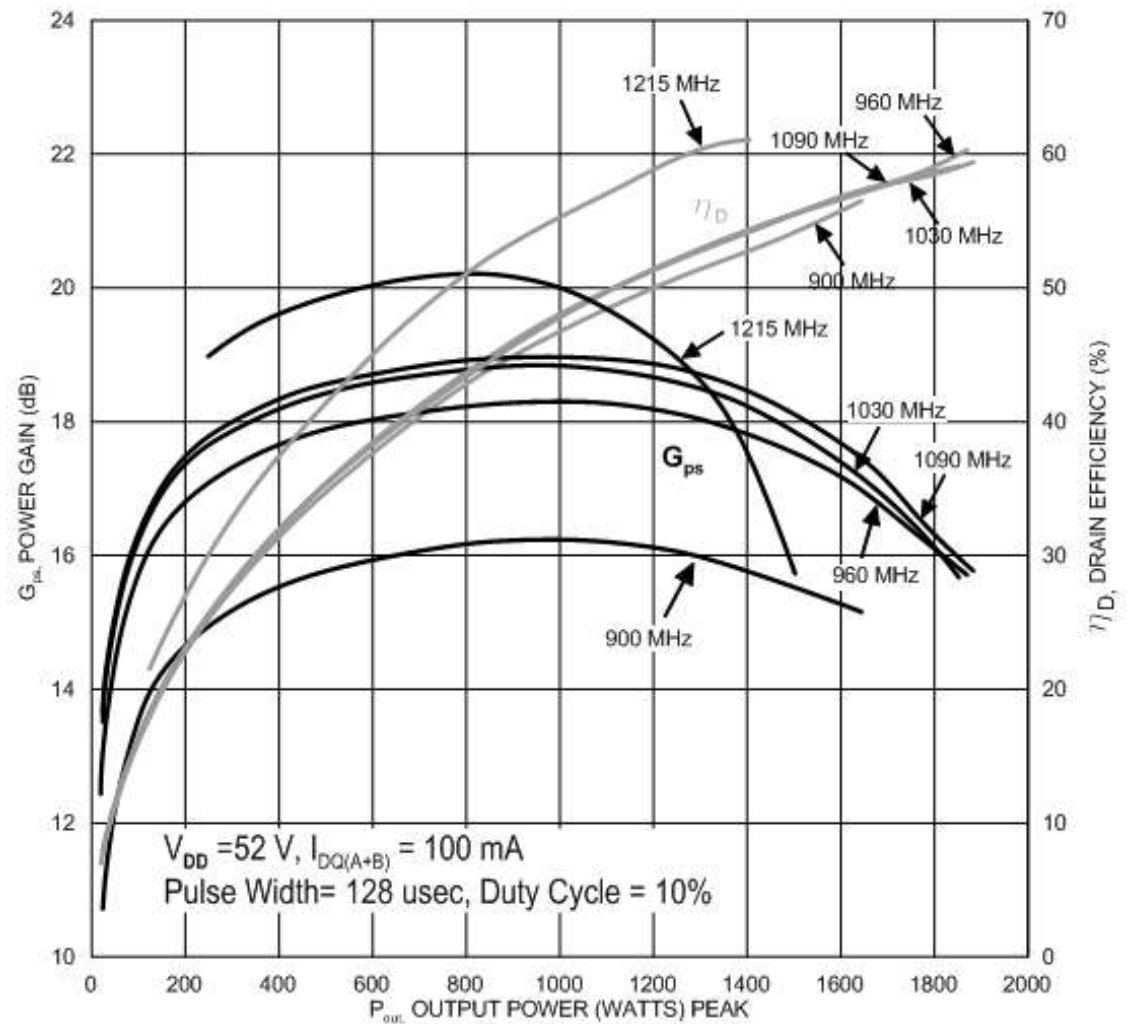
MMRF1312H Applications Circuit: 900 to 1215 MHz



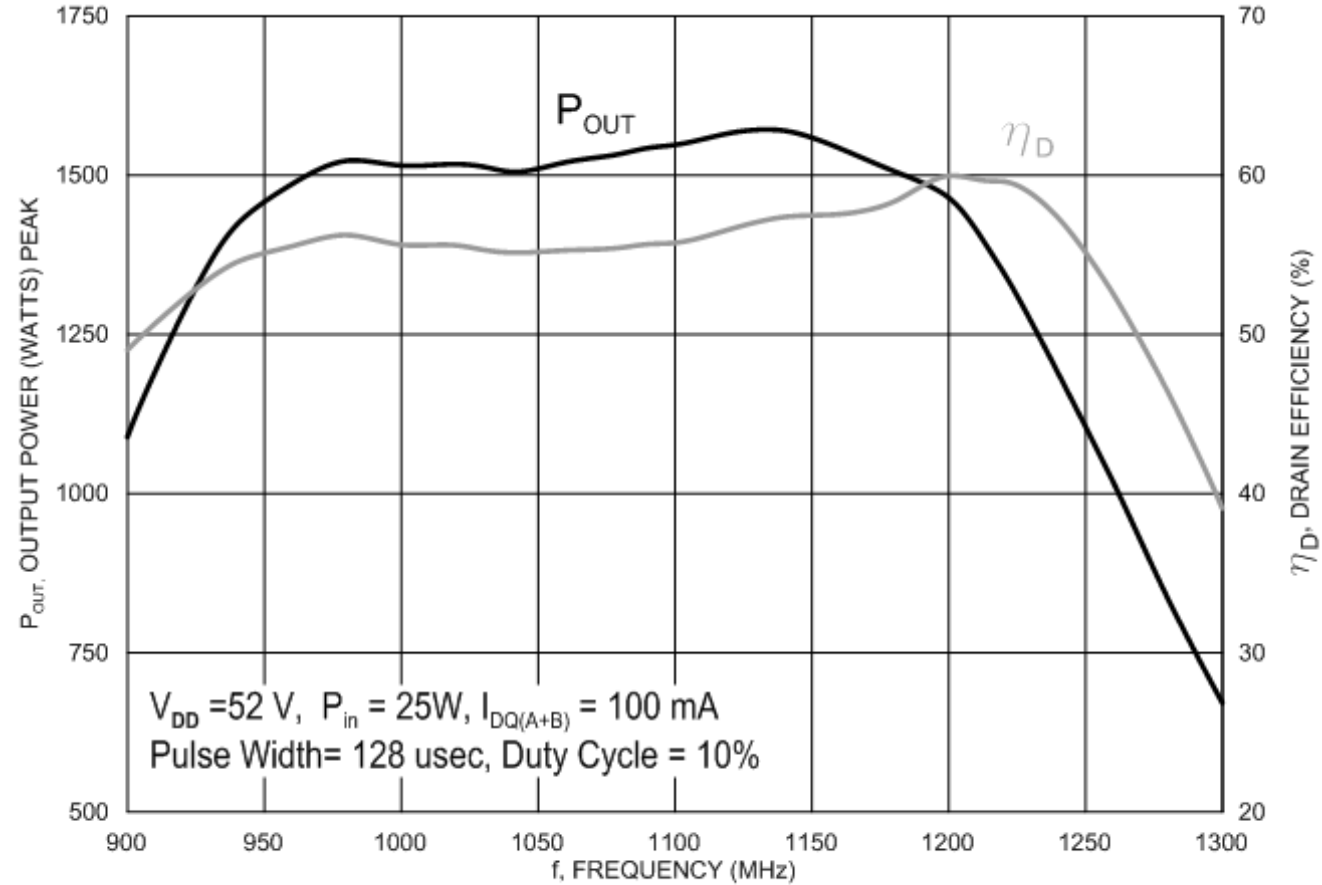
MMRF1312H: Gain, Efficiency and IRL versus Frequency



MMRF1312H: Gain and Efficiency versus Power



MMRF1312H: Power and Efficiency versus Frequency



MMRF1314H: 1000 W Peak – L-Band Transistor

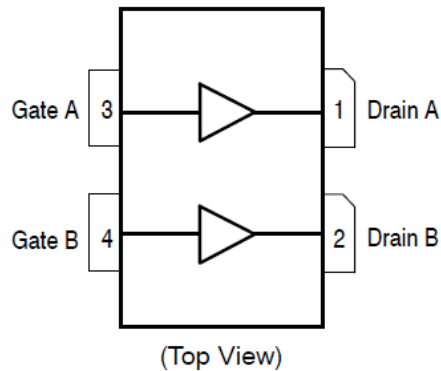
1200 –1400 MHz



52 V

1000 W Peak

- High power 1000 W Peak across 1200 to 1400 MHz in one circuit
 - Gain: 15.5 dB @ 1200–1400 MHz, Drain Efficiency: 46.5%
- Housed in NI-1230 air-cavity ceramic package
- High Ruggedness: > 20:1 VSWR
- Product Longevity Program: warranted availability until 2030
- Typical Applications
 - High power L-Band radar applications



Available Reference Circuits:

1. 1400 MHz
2. 1200-1400 MHz

MMRF1314H: Featured Device

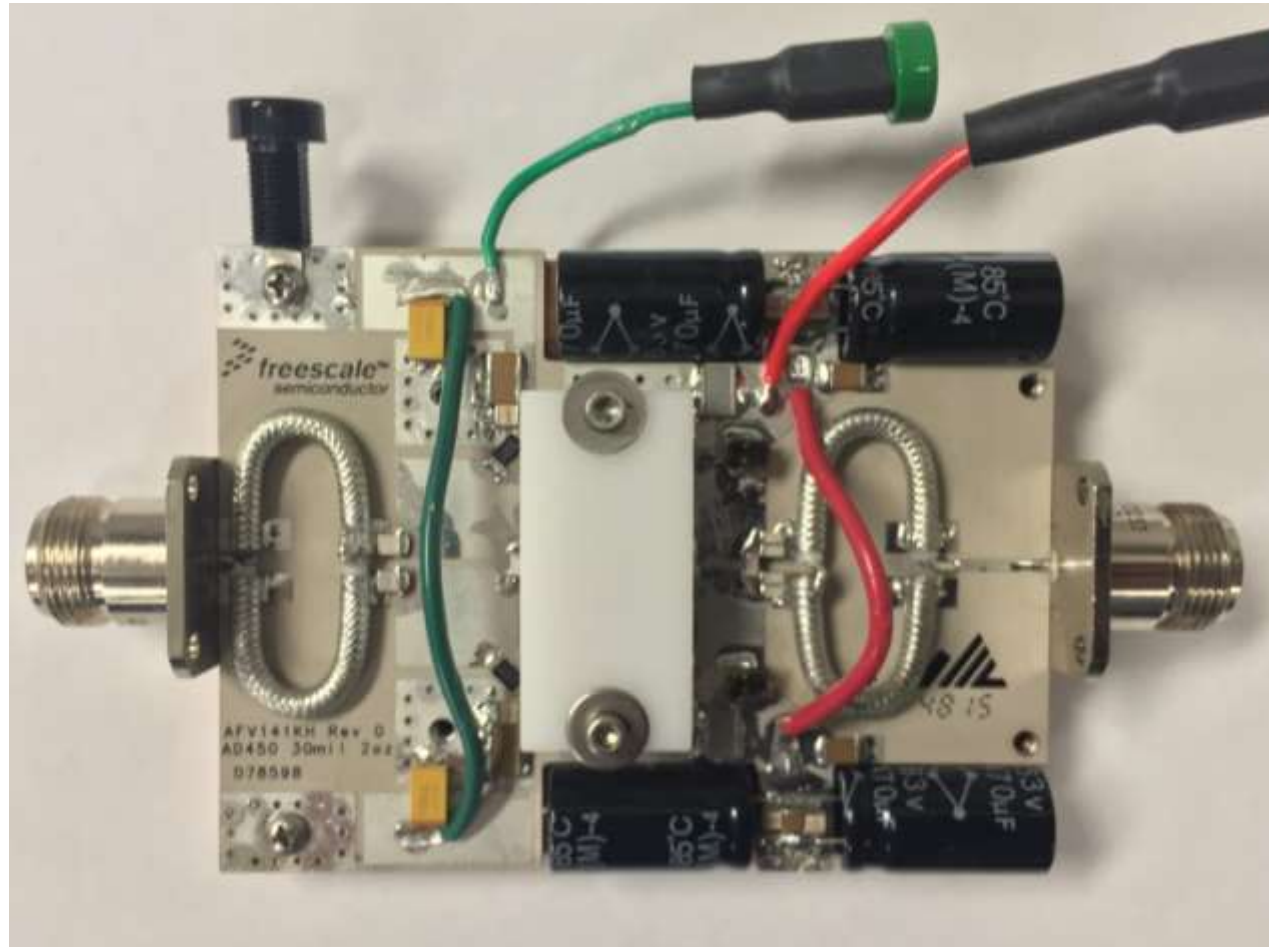
Features

- Internally input and output matched for broadband operation and ease of use
- Device can be used in a single-ended, push-pull or quadrature configuration
- High ruggedness, handles > 20:1 VSWR
- Integrated ESD protection with greater negative voltage range for improved Class C operation and gate voltage pulsing
- Characterized with series equivalent large-signal impedance parameters

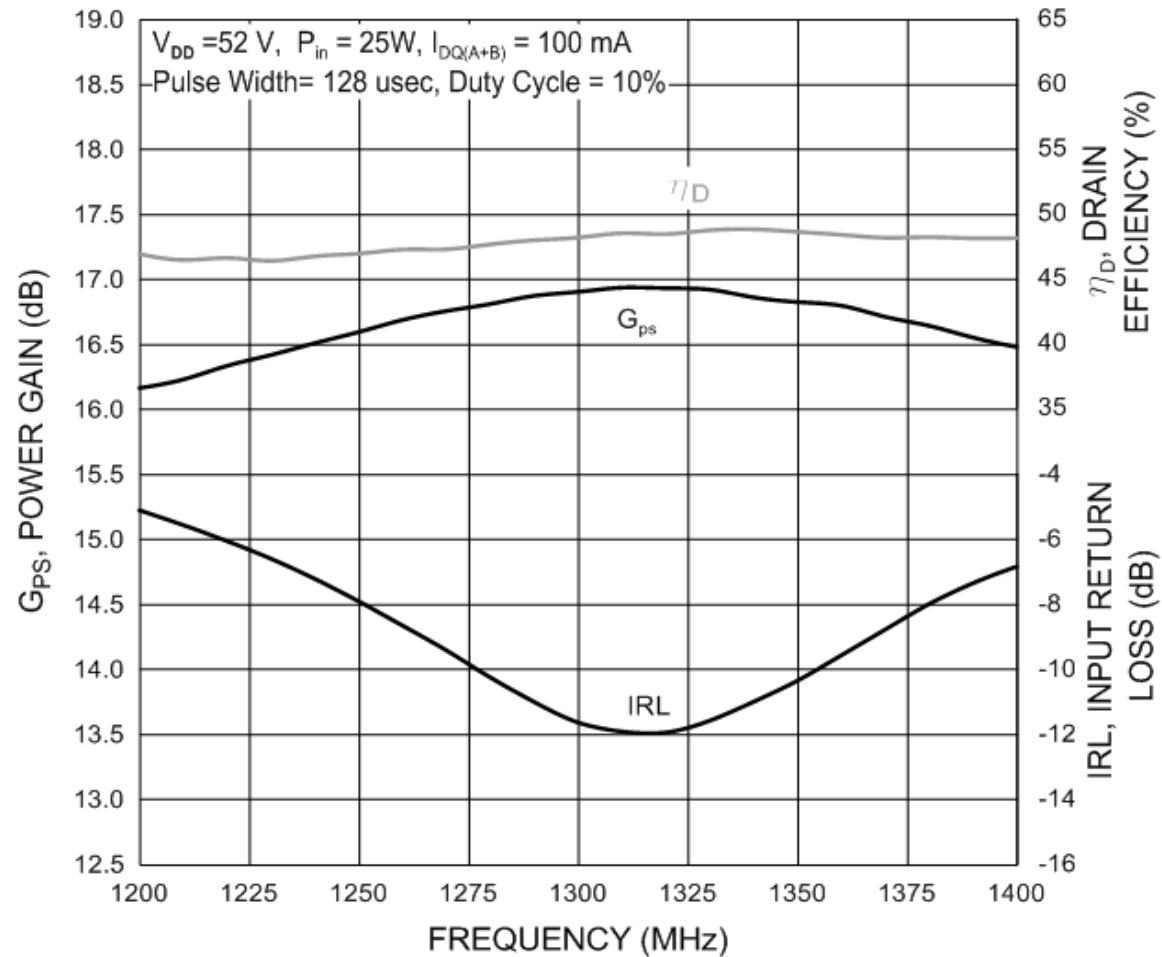
Competitive Advantages

- Device in NXP 15 year Product Longevity Program
- Able to replace multiple RF amplifiers with one wideband PA
- Application circuit support
- Dedicated RF Military team
- Availability: Device is in production as eared, earless and gull winged. Orderable part number is MMRF1314HR5.

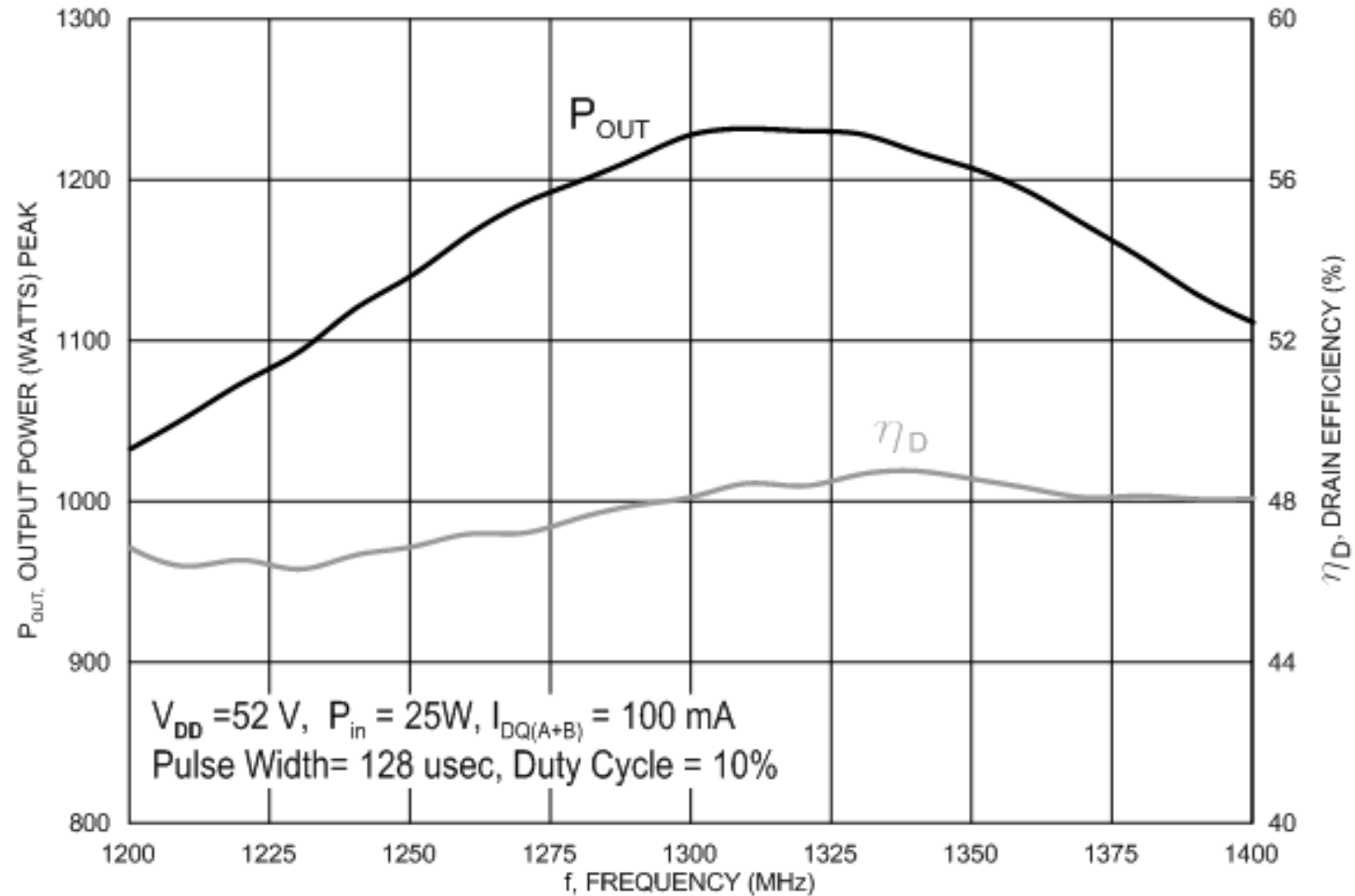
MMRF1314H Applications Circuit: 1200 to 1400 MHz



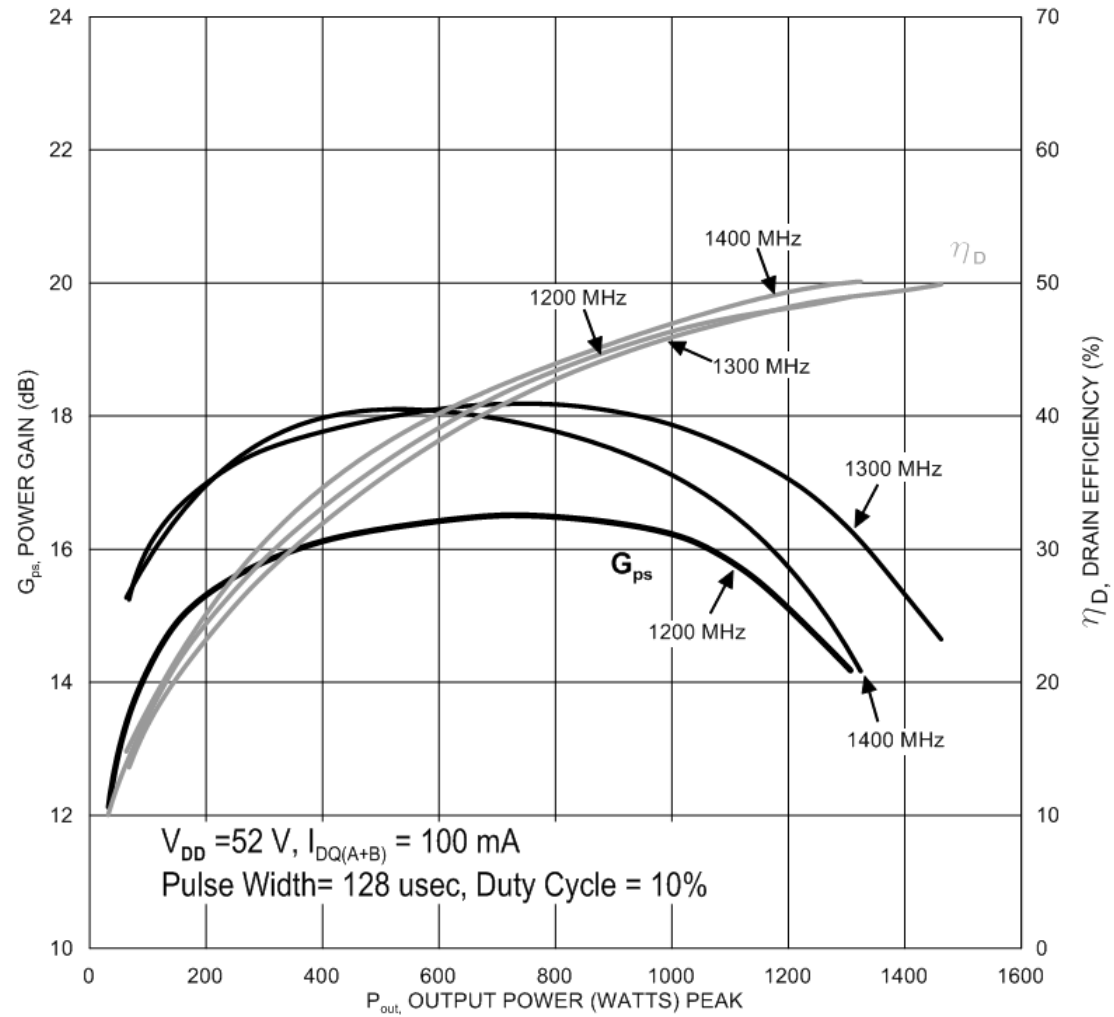
MMRF1314H: Gain, Efficiency and IRL versus Frequency



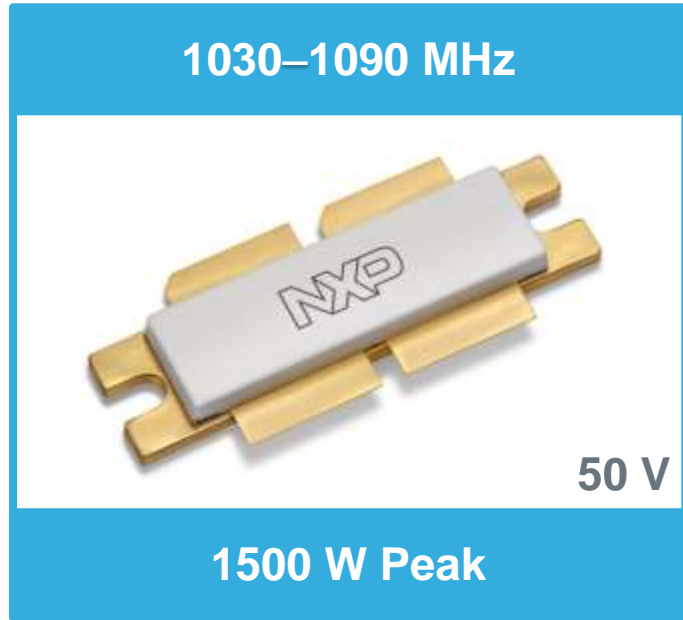
MMRF1314H: Power and Efficiency versus Frequency



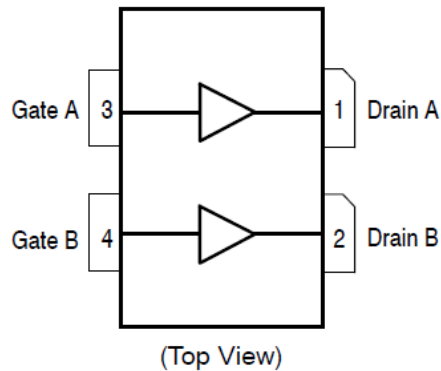
MMRF1314H: Gain and Efficiency versus Power



MMRF1317H: 1500 W Peak – IFF Transistor



- High power 1500 W Peak @ P3dB
 - Gain: 18.9 dB @ 1030 MHz, Drain Efficiency: 56%
- Housed in NI-1230 air-cavity ceramic package
- High Ruggedness: > 10:1 VSWR
- Product Longevity Program: warranted availability until 2030
- Typical Applications
 - Defense and commercial pulse applications, such as IFF and secondary surveillance radars



Available Reference Circuit:
1. 1030 to 1090 MHz

MMRF1317H: Featured Device

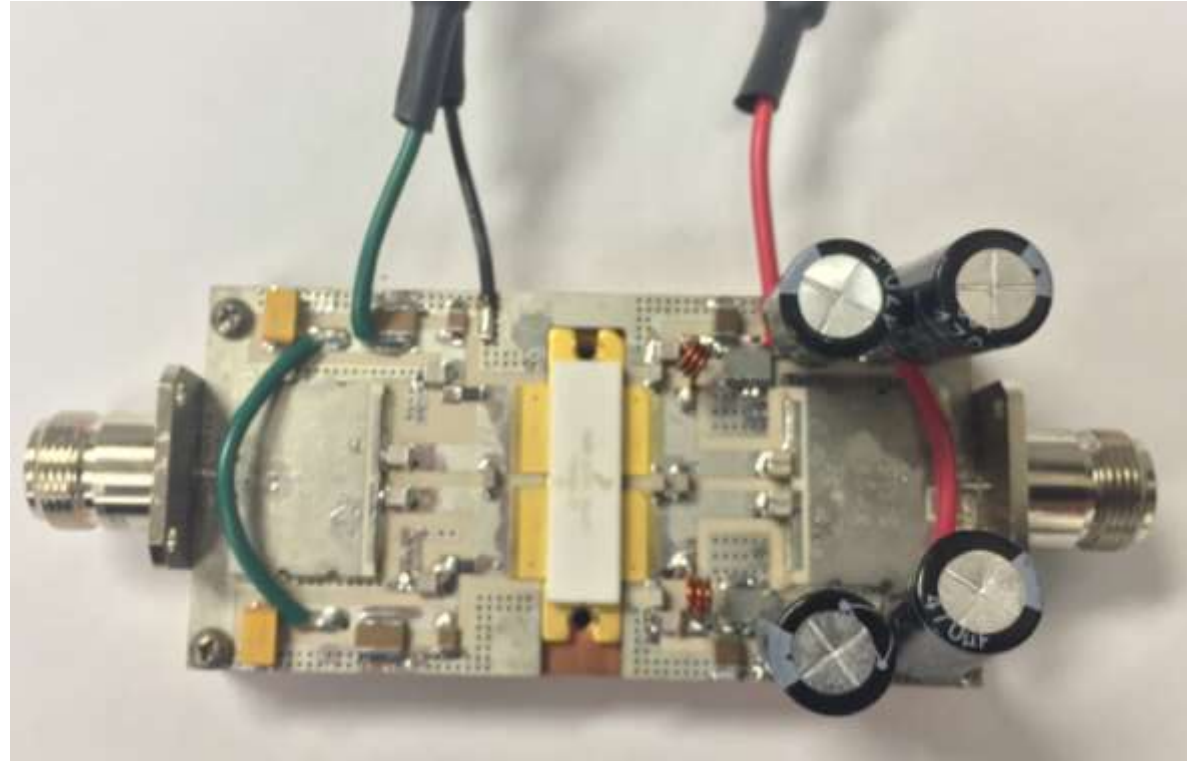
Features

- Internally input and output matched for broadband operation and ease of use
- Device can be used in a single-ended, push-pull or quadrature configuration
- High ruggedness, handles $> 10:1$ VSWR
- Integrated ESD protection with greater negative voltage range for improved Class C operation and gate voltage pulsing
- Characterized with series equivalent large-signal impedance parameters

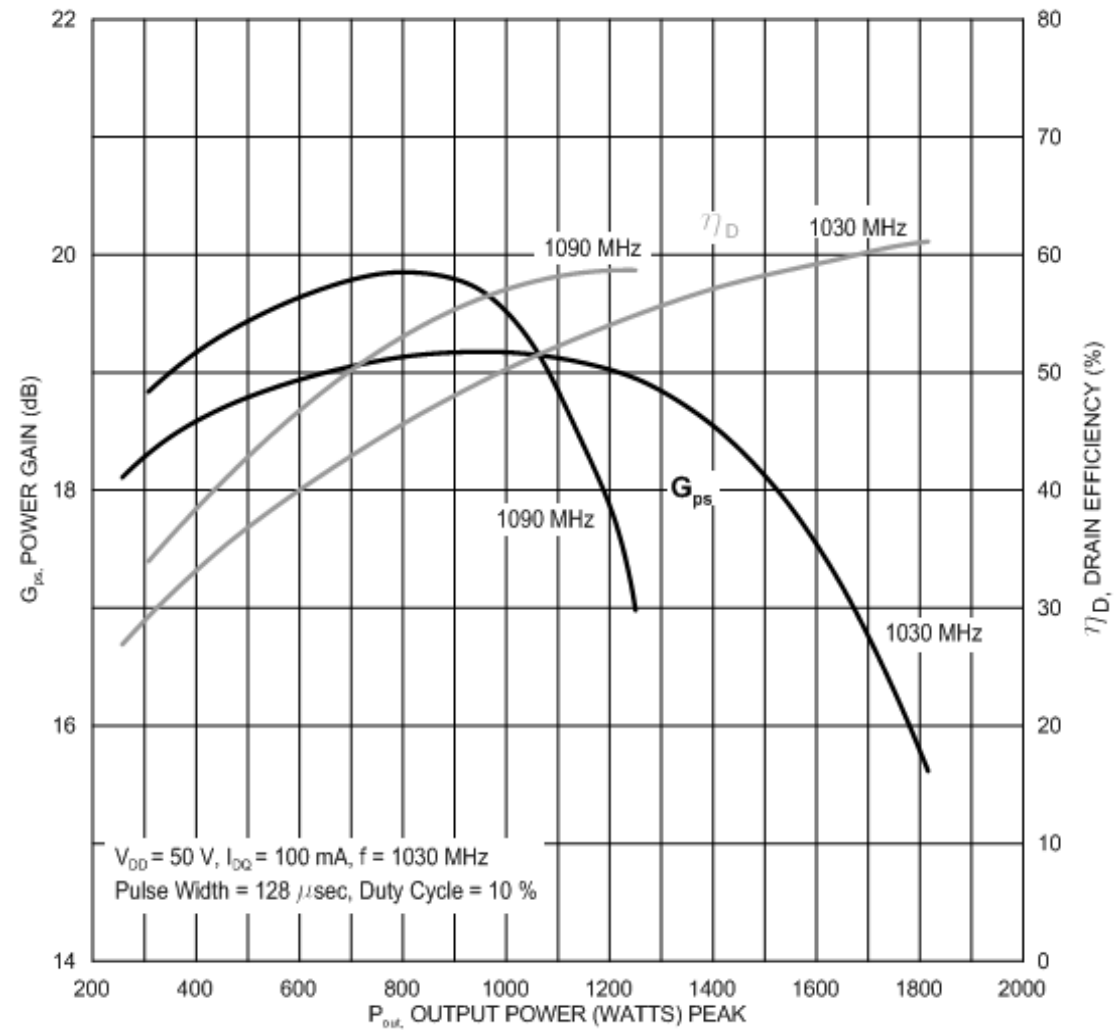
Competitive Advantages

- Device in NXP 15 year Product Longevity Program
- Able to replace multiple RF amplifiers with one wideband PA
- Application circuit support
- Dedicated RF Military team
- Availability: Device is in production as eared, earless and gull winged. Orderable part number is MMRF1317HR5.

MMRF1317H Applications Circuit: 1030 to 1090 MHz



MMRF1317H: Gain and Efficiency versus Power





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