

MRF1K50 FAMILY INTRODUCTION

NOV 2016



SECURE CONNECTIONS
FOR A SMARTER WORLD

Introducing the new MRF1K50H and MRF1K50N

- Industry's **highest power** RF transistor: **1500W CW**
- Available in both ceramic and **low-thermals** plastic packaging (-40% Rjc)
- Extremely rugged, with best **energy absorption** on the market: capable of 35% more energy absorption than closest competing device. Ideal for ISM applications
- **Pin-compatible** with existing solutions: same footprint, same PCB, only light retuning needed (similar output capacitance), enabling fast time-to-market



The MRF1K50 transistors complement the NXP Series of Extremely Rugged 50V LDMOS Transistors

Rugged Ceramic	Rugged Plastic
MRF1K50H 1500 W 2016	MRF1K50N 1500 W 2016
MRFE6VP61K25H 1250 W 2010	MRFE6VP61K25N 1250 W 2015
MRFE6VP5600H 600 W 2010	MRFE6VP6600N 600 W 2015
MRFE6VP6300H 300 W 2009	MRFE6VP5300N 300 W 2014
MRFE6VP100H 100 W 2012	MRFE6VP5150N 150 W 2014
MRFE6VS25L 25 W 2012	MRFE6VS25N 25 W 2013

Target Markets

- **Industrial, Scientific, Medical (ISM)**
 - Laser generation
 - Plasma etching
 - Particle accelerators
 - Medical: MRI, diathermy, skin laser, ablation
 - Industrial heating, welding and drying systems
- **Broadcast**
 - Radio broadcast (FM/DAB)
 - VHF TV broadcast
- **Aerospace**
 - VHF omnidirectional range (VOR)
 - HF and VHF communications
 - Weather radar
- **Mobile Radio**
 - VHF and UHF base stations



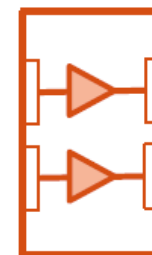
MRF1K50H (ceramic package) Overview

1500 W LDMOS Transistor

- Unmatched Input and Output
- Push-Pull
- Housed in an NI-1230 air-cavity ceramic package
- Extreme Ruggedness: handles 65:1 VSWR
- Product Longevity Program: warranted availability until 2031
- Recommended Driver: MRFE6VS25N (25W)

Available Reference Circuits:

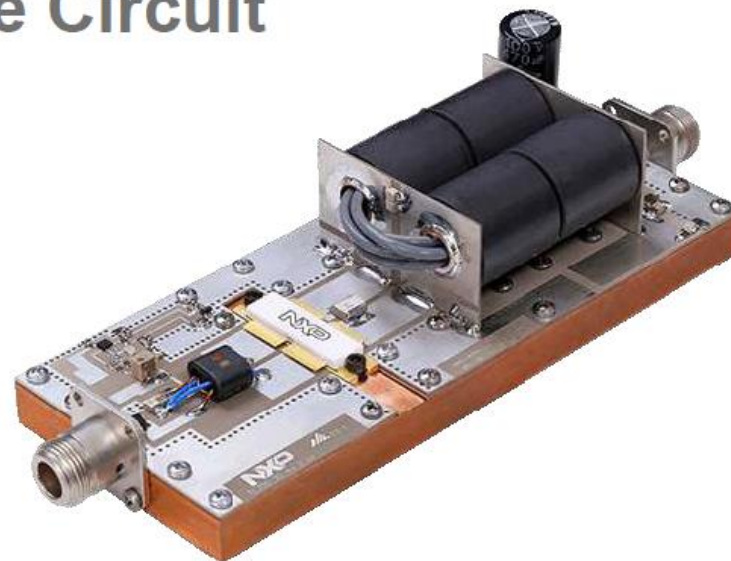
Board Frequency (MHz)	Example of application	Power (W)	Gain (dB)	Drain Eff. (%)	Size (inch)
27 MHz	Industrial heating	1550 CW	25.9	78	2.9 x 6.9
81.36 MHz	Laser	1400 CW	23.0	75	2.9 x 6.4
87.5-108 MHz	FM broadcast	1475 CW	23.3	83	2.9 x 5.1
230 MHz	Misc.	1500 Pulse	23.7	74	4 x 6



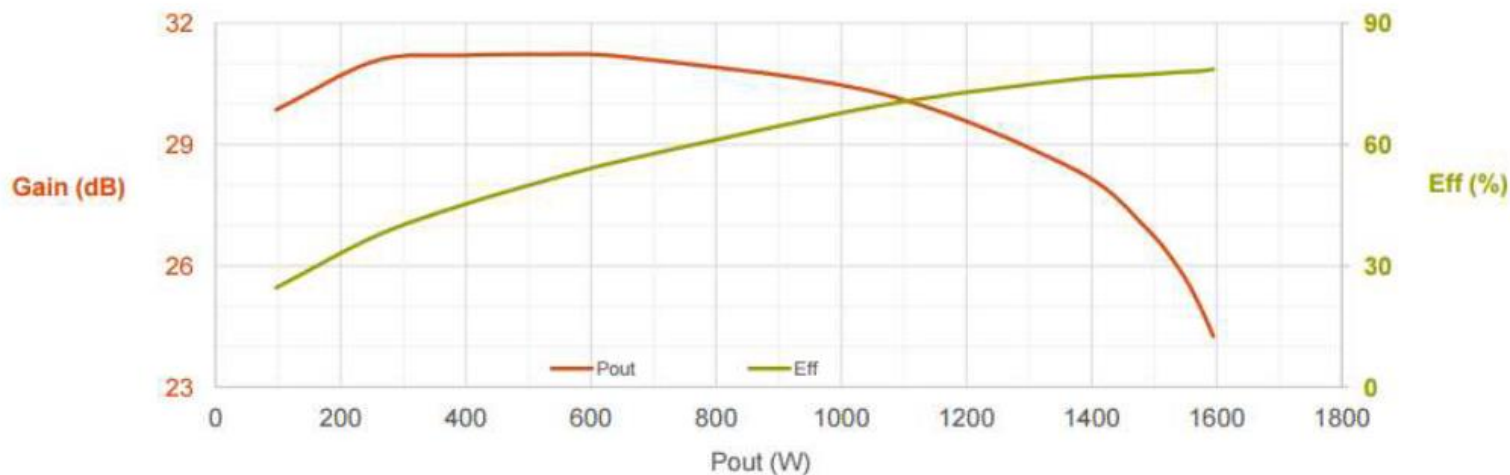
MRF1K50H 27 MHz Reference Circuit

- Typical performance @ 50 V:

Frequency (MHz)	Power (W)	Gain (dB)	Drain Eff. (%)
27 MHz	1550 CW	25.9	78.3



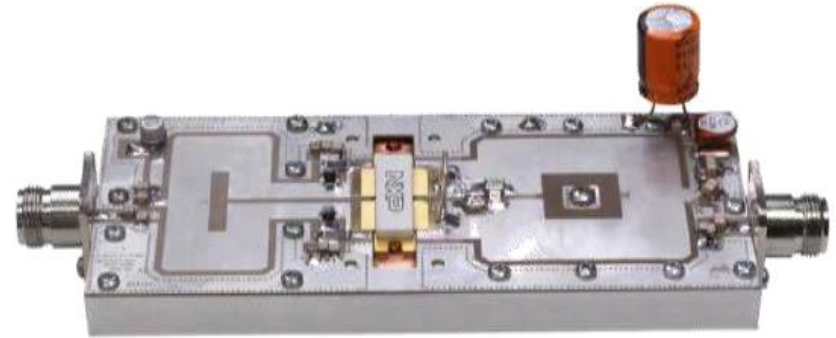
Size: 2.9x6.9" (7.4x17.5cm)



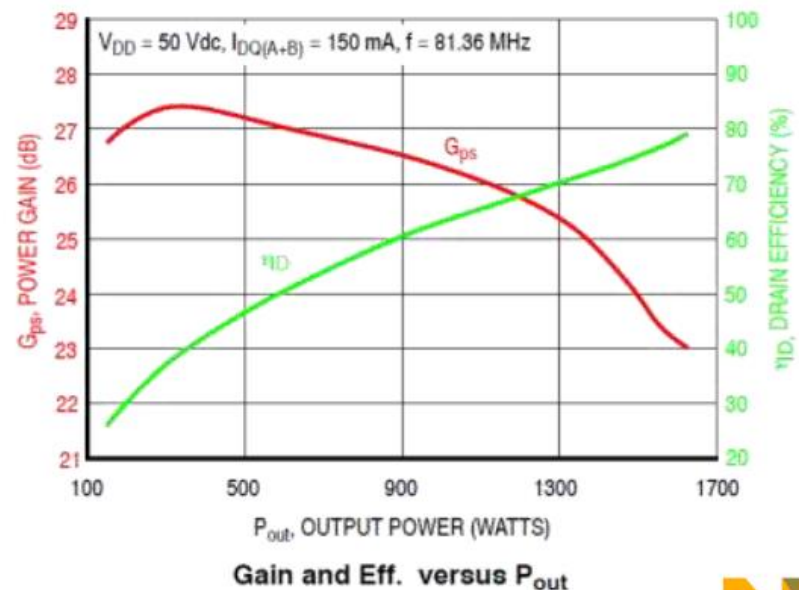
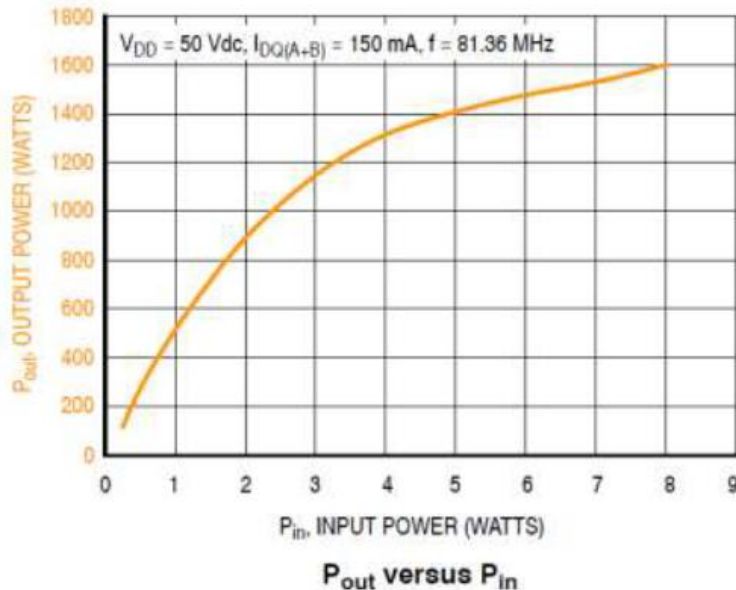
MRF1K50H 81.36 MHz Reference Circuit

- Typical performance @ 50 V:

Frequency (MHz)	Power (W)	Gain (dB)	Drain Eff. (%)
81.36 MHz	1400 CW	23.0	75.0



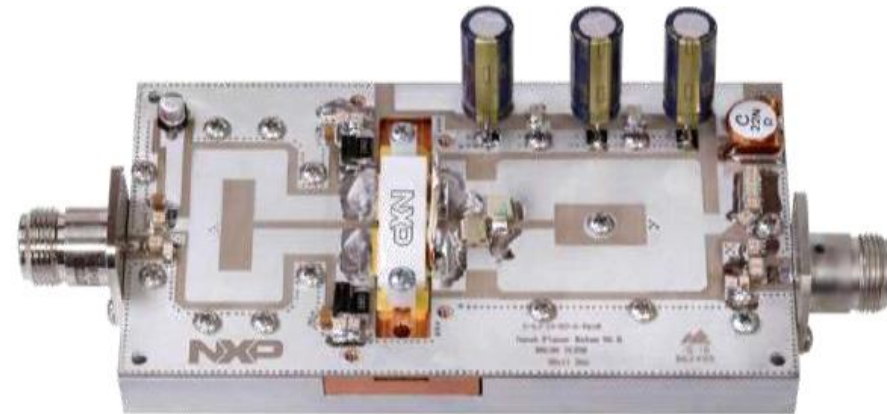
Size: 2.88" × 6.38" (7.3 × 16.2mm)



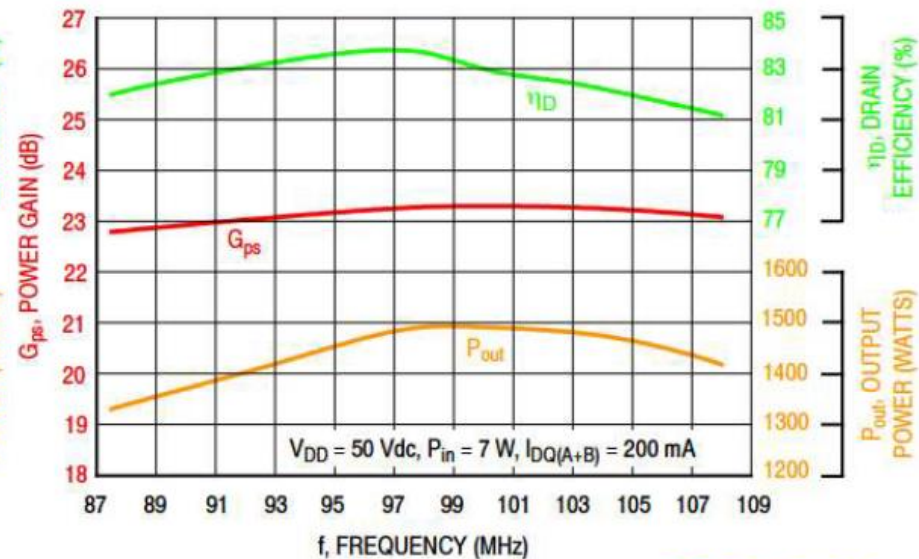
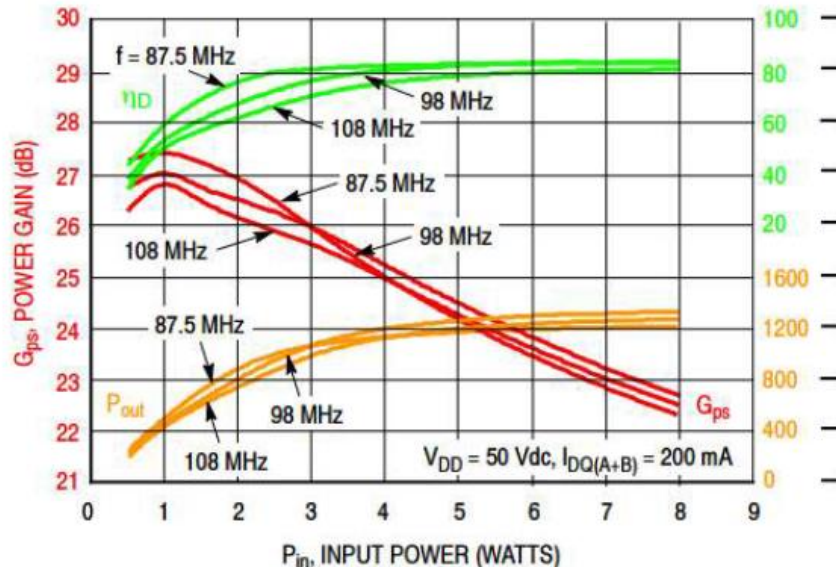
MRF1K50H 87.5-108 MHz Reference Circuit 1/2

- Typical wideband performance @ 50 V:

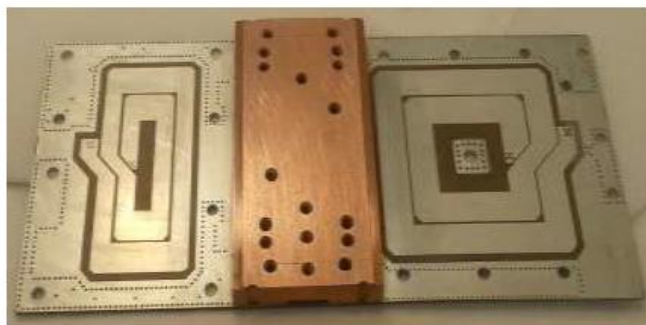
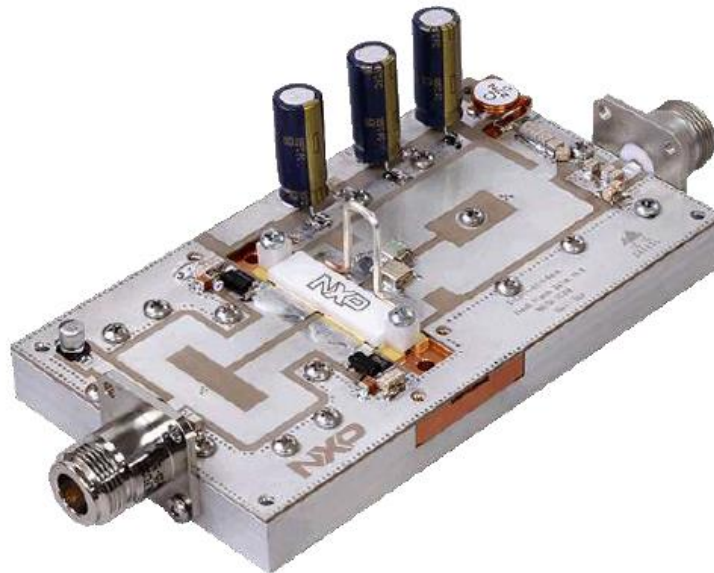
Frequency (MHz)	Power (W)	Gain (dB)	Drain Eff. (%)
87.5	1325 CW	22.8	81.8
98	1475 CW	23.3	83.4
108	1410 CW	23.0	81.2



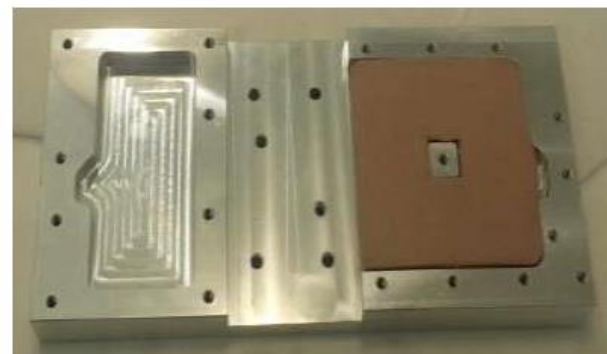
Size: 2.88 x 5.12" (7.3x13 cm)



MRF1K50H 87.5-108 MHz Reference Circuit 2/2



Bottom side of PCB
and copper insert

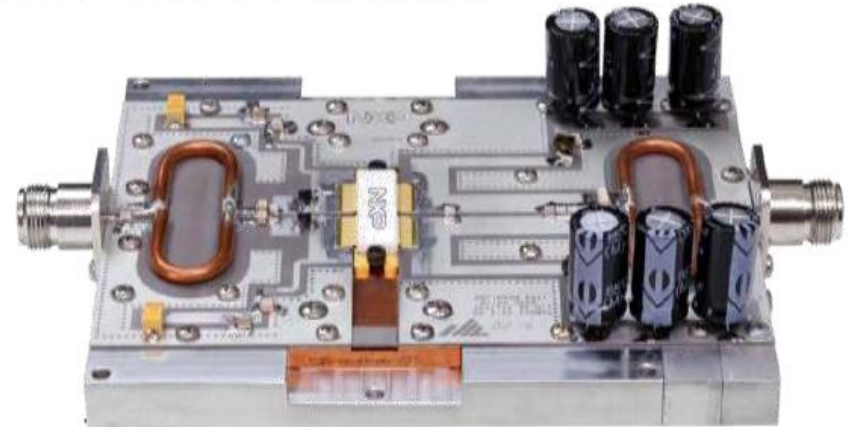


Heat spreader
with thermal paste on output side

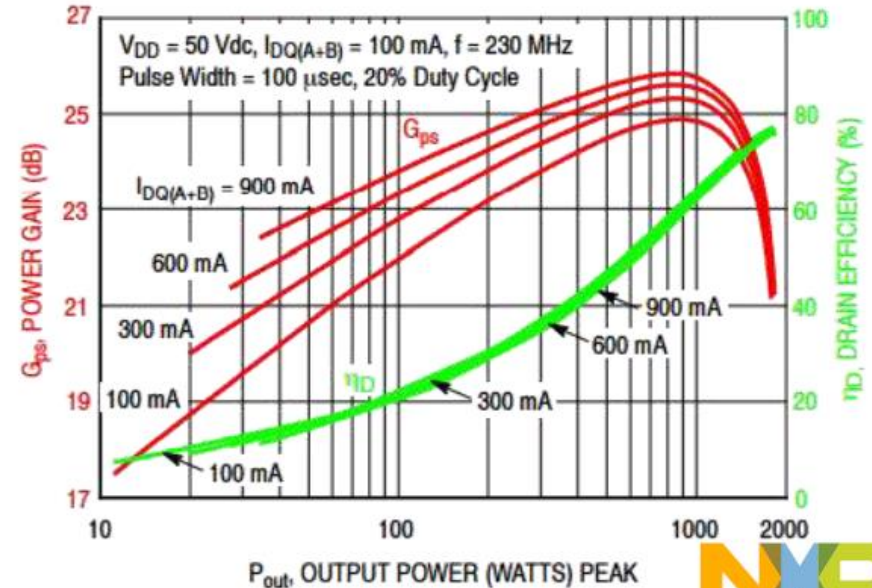
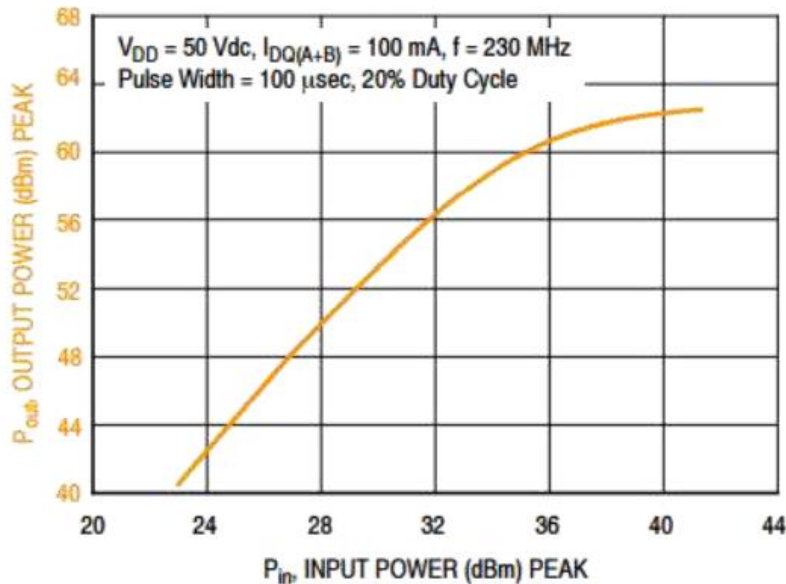
MRF1K50H 230 MHz Production Test Fixture

- Typical performance @ 50 V:

Frequency (MHz)	Power (W)	Gain (dB)	Drain Eff. (%)
81.36 MHz	1500 CW	23.7	74.0



Size: 4x6" (10x15 cm)

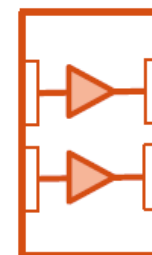


MRF1K50N (plastic package) Overview

- Unmatched Input and Output
- Push-Pull
- Housed in an OM-1230 over molded plastic
 - 40% lower R_{jc} than ceramic version
- Extreme Ruggedness: handles 65:1 VSWR
- Product Longevity Program: warranted availability until 2031
- Recommended Driver: MRFE6VS25N (25W)

Available Reference Circuits:

Board Frequency (MHz)	Example of application	Power (W)	Gain (dB)	Drain Eff. (%)
87.5-108 MHz	FM broadcast	1421 CW	23.1	83
230 MHz	Misc.	1500 Pulse	23.4	75

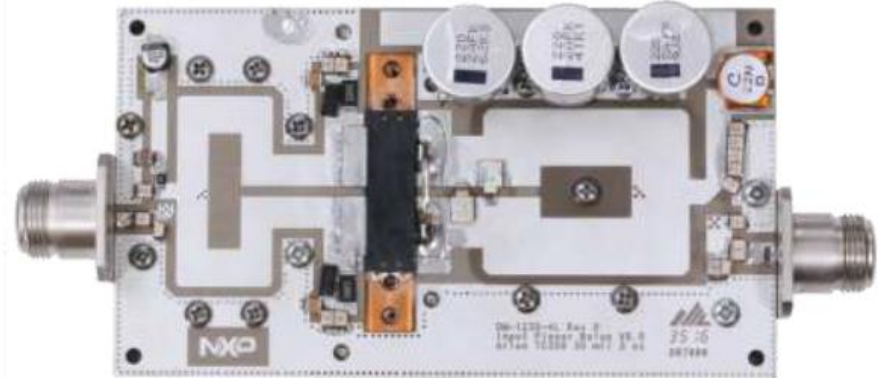


MRF1K50N 87.5-108 MHz Reference Circuit

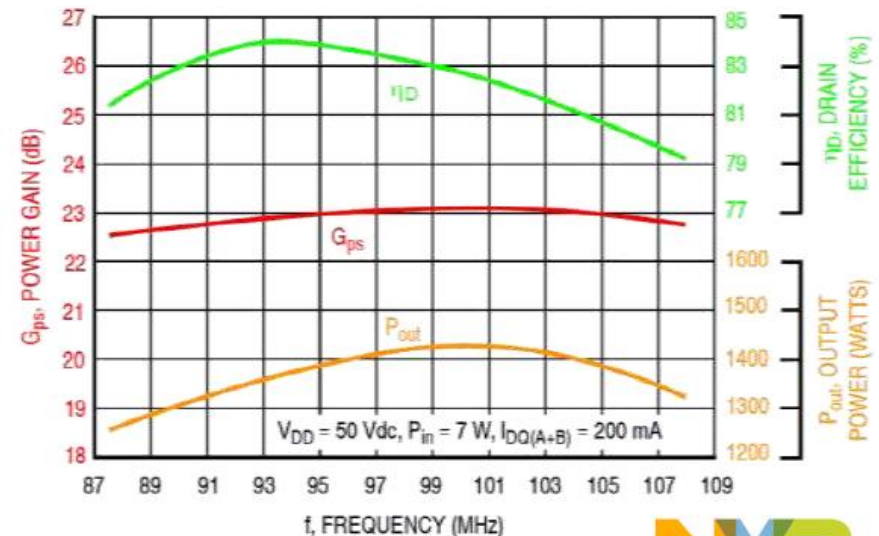
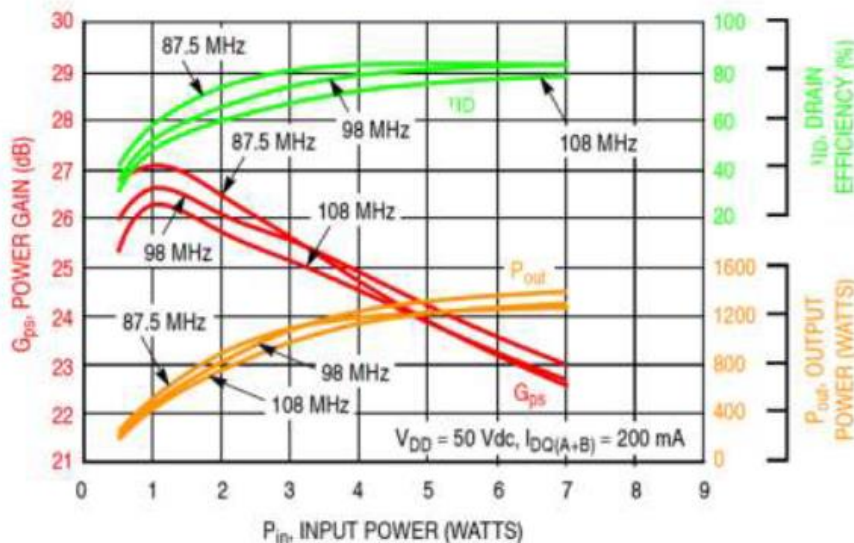
Same PCB, BoM and component placement as MRF1K50H

- **Typical CW performance @ 50 V:**
($P_{in}=7W$, $I_{dq}=200mA$)

Frequency (MHz)	G_{ps} (dB)	η_{ID} (%)	P_{out} (W)
87.5	22.5	81.7	1257
98	23.1	83.2	1421
108	22.8	79.1	1328



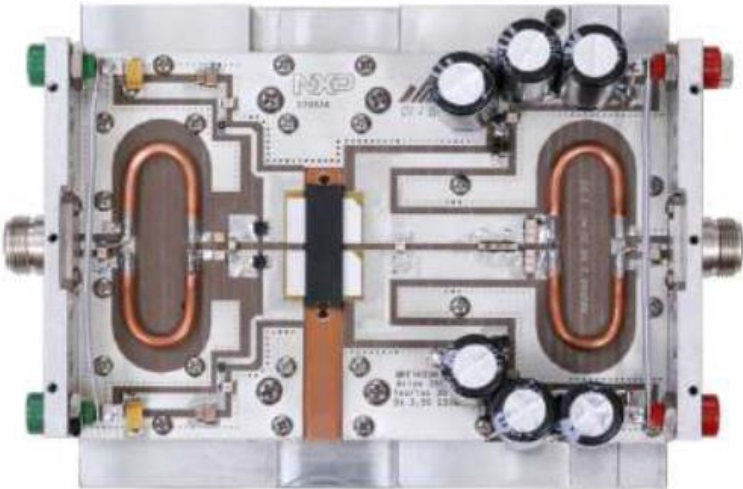
Size 2.88" × 5.12" (73 mm × 130 mm)



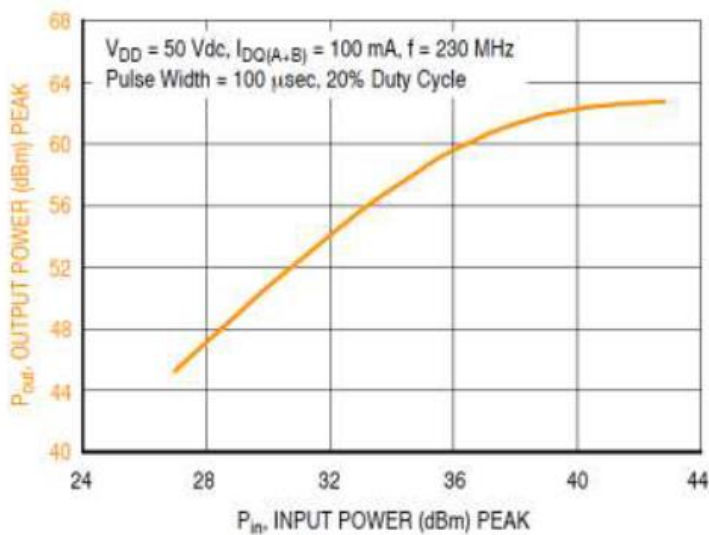
MRF1K50N 230 MHz Production Test Fixture

- Typical CW performance @ 50 V:

Frequency (MHz)	Power (W)	Gain (dB)	Drain Eff. (%)
230 MHz	1500 CW	23.4	75.1



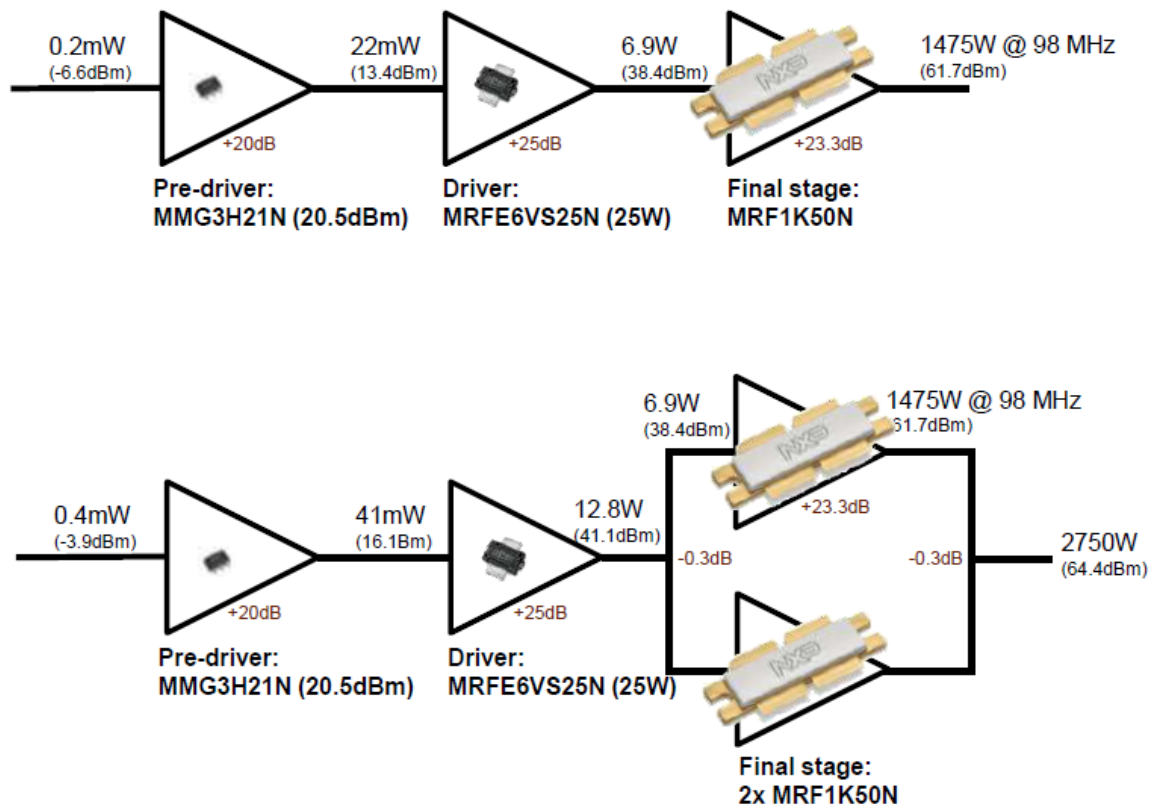
Size 6.0" × 4.0" (152 mm × 102 mm)



f (MHz)	P1dB (W)	P3dB (W)
230	1629	1857



MRF1K50 line-up recommendations



For 4x MRF1K50H, the recommended driver is **MRFE6VP5150N**