

Common Source

**ARF469AG**  
**ARF469BG**

# RF POWER MOSFETS

## N-CHANNEL ENHANCEMENT MODE

**150V 350W 45MHz**

The ARF469A and ARF469B comprise a symmetric pair of common source RF power transistors designed for push-pull scientific, commercial, medical and industrial RF power amplifier applications up to 45 MHz. They have been optimized for both linear and high efficiency classes of operation.

- Specified 150 Volt, 40.68 MHz Characteristics:
  - Output Power = 350 Watts.
  - Gain = 16dB (Class AB)
  - Efficiency = 75% (Class C)
- Low Cost Common Source RF Package.
- Low V<sub>th</sub> thermal coefficient.
- Low Thermal Resistance.
- Optimized SOA for Superior Ruggedness.

### MAXIMUM RATINGS

All Ratings: T<sub>C</sub> = 25°C unless otherwise specified.

Symbol	Parameter	Ratings	UNIT
V <sub>DSS</sub>	Drain-Source Voltage	500	Volts
V <sub>DGO</sub>	Drain-Gate Voltage	500	
I <sub>D</sub>	Continuous Drain Current @ T <sub>C</sub> = 25°C	30	Amps
V <sub>GS</sub>	Gate-Source Voltage	±30	Volts
P <sub>D</sub>	Total Power Dissipation @ T <sub>C</sub> = 25°C	445	Watts
R <sub>θJC</sub>	Junction to Case	0.28	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Junction Temperature Range	-55 to 150	°C
T <sub>L</sub>	Lead Temperature: 0.063" from Case for 10 Sec.	300	

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage (V <sub>GS</sub> = 0V, I <sub>D</sub> = 250 μA)	500			Volts
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance <sup>①</sup> (V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A)		0.25	0.28	ohms
I <sub>DSS</sub>	Zero Gate Voltage Drain Current (V <sub>DS</sub> = 500V, V <sub>GS</sub> = 0V)			25	μA
	Zero Gate Voltage Drain Current (V <sub>DS</sub> = 400V, V <sub>GS</sub> = 0V, T <sub>C</sub> = 125°C)			250	
I <sub>GSS</sub>	Gate-Source Leakage Current (V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V)			±100	nA
g <sub>fs</sub>	Forward Transconductance (V <sub>DS</sub> = 25V, I <sub>D</sub> = 6.5A)		8		mhos
V <sub>GS(TH)</sub>	Gate Threshold Voltage (V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1mA)	2		4	Volts

**CAUTION:** These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

Microsemi Website - <http://www.microsemi.com>

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 150V$ $f = 1\text{ MHz}$		2300		
$C_{oss}$	Output Capacitance			250		pF
$C_{rss}$	Reverse Transfer Capacitance			125		

FUNCTIONAL CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
$G_{PS}$	Common Source Amplifier Power Gain	$f = 40.68\text{ MHz}$	14	16		dB
$\eta$	Drain Efficiency	$V_{GS} = 2.5V$ $V_{DD} = 150V$	70	75		%
$\Psi$	Electrical Ruggedness VSWR 10:1	$P_{out} = 350W$	No Degradation in Output Power			

① Pulse Test: Pulse width < 380μS, Duty Cycle < 2%

Microsemi Reserves the right to change, without notice, the specifications and information contained herein.

TYPICAL PERFORMANCE CURVES

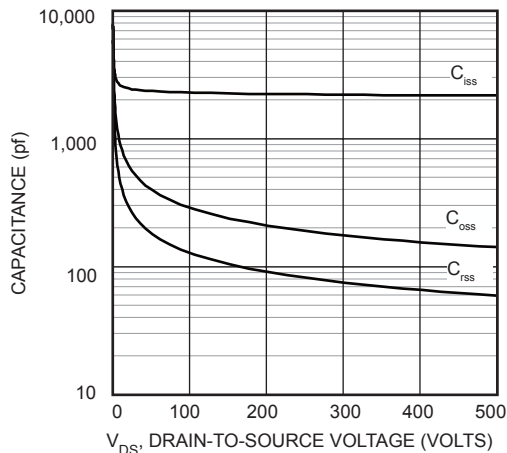


Figure 1, Typical Capacitance vs. Drain-to-Source Voltage

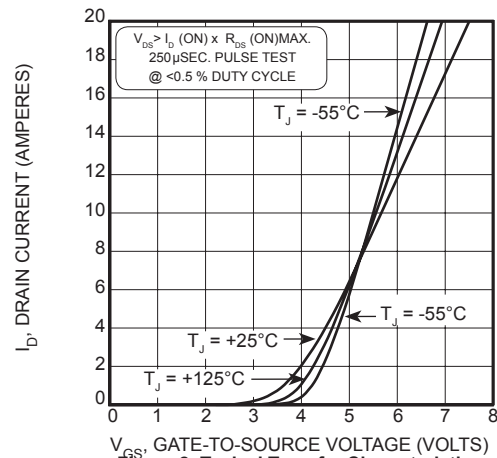


Figure 2, Typical Transfer Characteristics

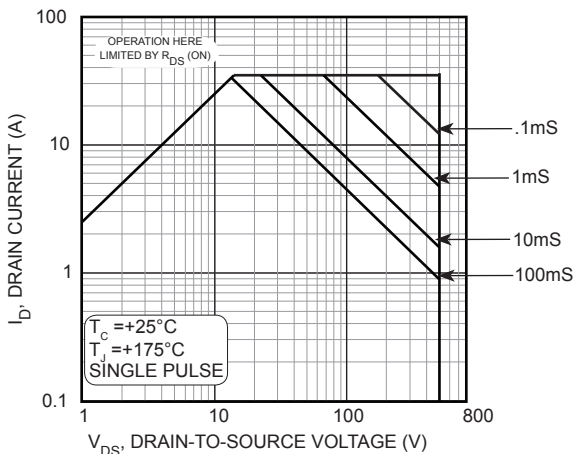


Figure 3, Typical Maximum Safe Operating Area

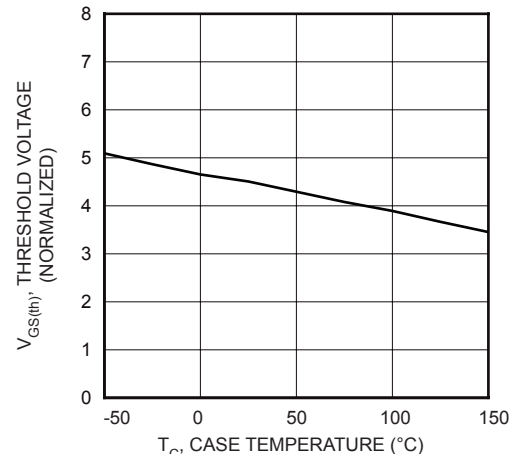


Figure 4, Typical Threshold Voltage vs Temperature

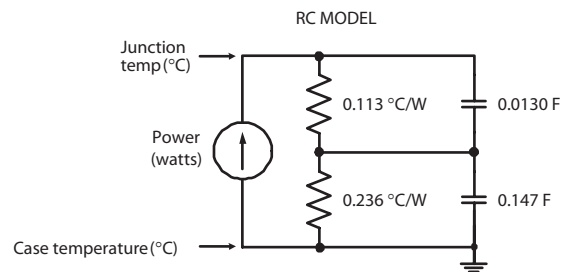
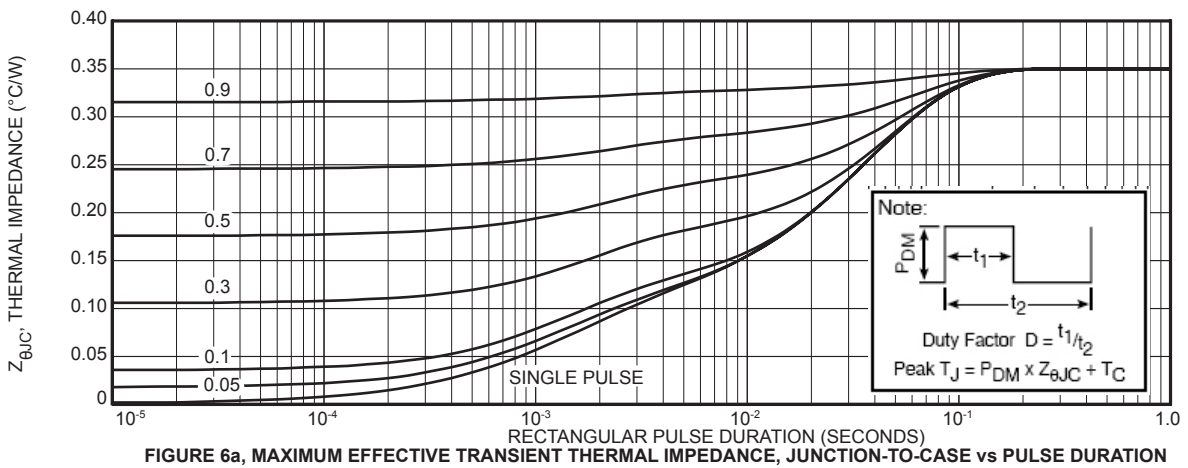
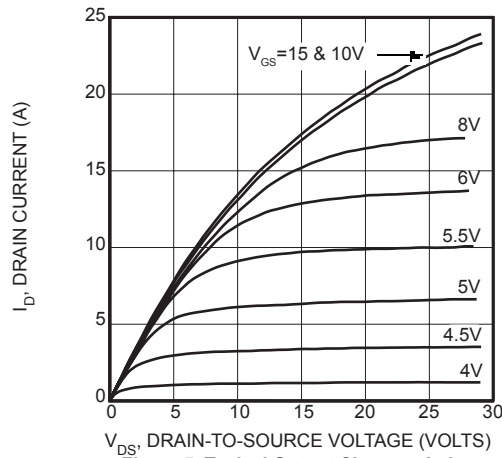
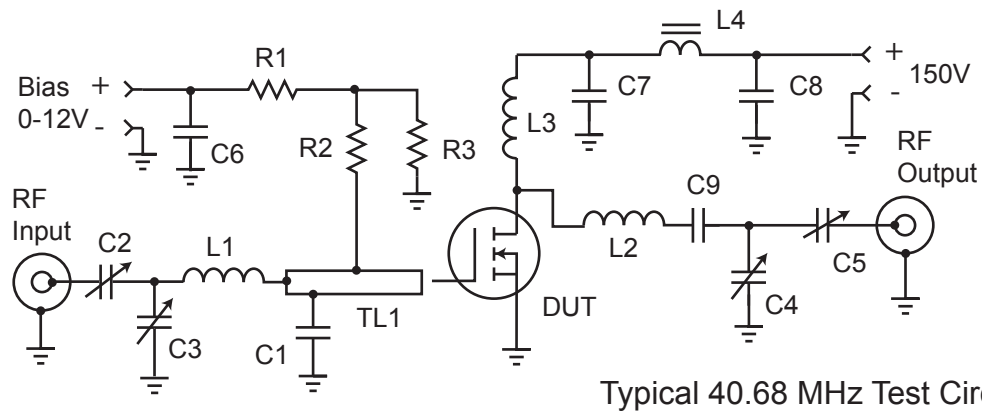


Table 1 - Typical Class AB Large Signal Input - Output Impedance

Freq. (MHz)	Z <sub>in</sub> (Ω)	Z <sub>OL</sub> (Ω)
2.0	18 - j 10.8	30 - j 1.5
13.5	1.3 - j 4.8	26 - j 9.6
27.1	0.4 - j 2.4	18 - j 13.1
40.7	0.2 - j 1.4	12 - j 12.4

Z<sub>IN</sub> - Gate shunted with 25Ω I<sub>dg</sub> = 100mA  
 Z<sub>OL</sub> - Conjugate of optimum load for 300 Watts output at V<sub>dd</sub>=150V



C1 -- 2200pF ATC 700B

C2-C5 -- Arco 465 Mica trimmer

C6-C8 -- .1  $\mu$ F 500V ceramic chip

C9 -- 3x 2200 pF 500V chips COG

L1 -- 4t #22 AWG .25"ID .25" L ~87nH

L2 -- 5t #16 AWG .312" ID .35" L ~176nH

L3 -- 10t #24 AWG .25"ID ~.5 $\mu$ H

L4 -- VK200-4B ferrite choke 3 $\mu$ H

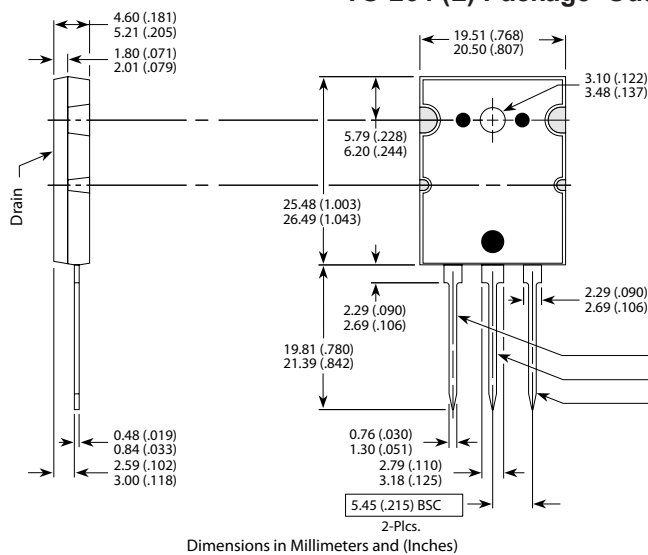
R1- R3 -- 1k $\Omega$  0.5 $\Omega$  Carbon

TL1 -- 34 $\Omega$  t-line 0.175" x 1"

C1 .45" from gate pin.

PCB -- 0.062" FR4, Er=4.7

### TO-264 (L) Package Outline



**Disclaimer:**

The information contained in the document (unless it is publicly available on the Web without access restrictions) is PROPRIETARY AND CONFIDENTIAL information of Microsemi and cannot be copied, published, uploaded, posted, transmitted, distributed or disclosed or used without the express duly signed written consent of Microsemi. If the recipient of this document has entered into a disclosure agreement with Microsemi, then the terms of such Agreement will also apply. This document and the information contained herein may not be modified, by any person other than authorized personnel of Microsemi. No license under any patent, copyright, trade secret or other intellectual property right is granted to or conferred upon you by disclosure or delivery of the information, either expressly, by implication, inducement, estoppels or otherwise. Any license under such intellectual property rights must be approved by Microsemi in writing signed by an officer of Microsemi.

Microsemi reserves the right to change the configuration, functionality and performance of its products at anytime without any notice. This product has been subject to limited testing and should not be used in conjunction with life-support or other mission-critical equipment or applications. Microsemi assumes no liability whatsoever, and Microsemi disclaims any express or implied warranty, relating to sale and/or use of Microsemi products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Any performance specifications believed to be reliable but are not verified and customer or user must conduct and complete all performance and other testing of this product as well as any user or customers final application. User or customer shall not rely on any data and performance specifications or parameters provided by Microsemi. It is the customer's and user's responsibility to independently determine suitability of any Microsemi product and to test and verify the same. The information contained herein is provided "AS IS, WHERE IS" and with all faults, and the entire risk associated with such information is entirely with the User. Microsemi specifically disclaims any liability of any kind including for consequential, incidental and punitive damages as well as lost profit. The product is subject to other terms and conditions which can be located on the web at <http://www.microsemi.com/terms-a-conditions>.