

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.

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

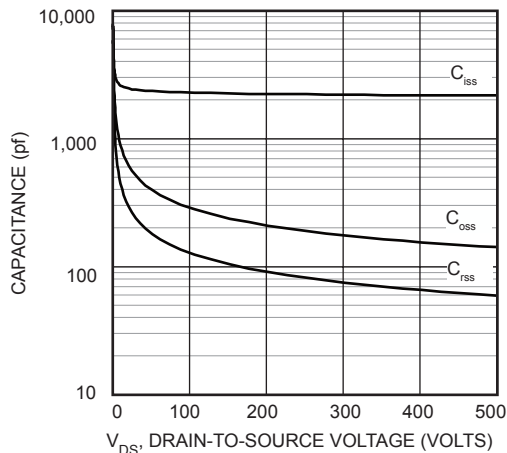


Figure 1, Typical Capacitance vs. Drain-to-Source Voltage

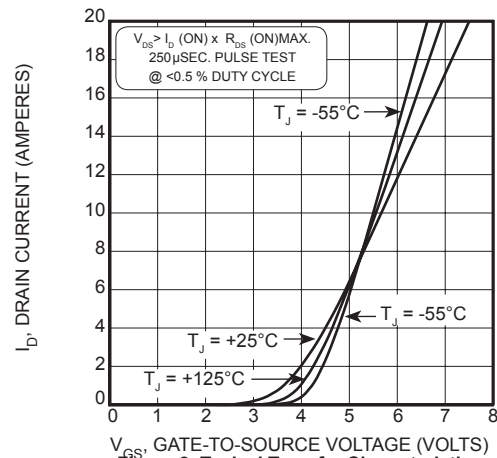


Figure 2, Typical Transfer Characteristics

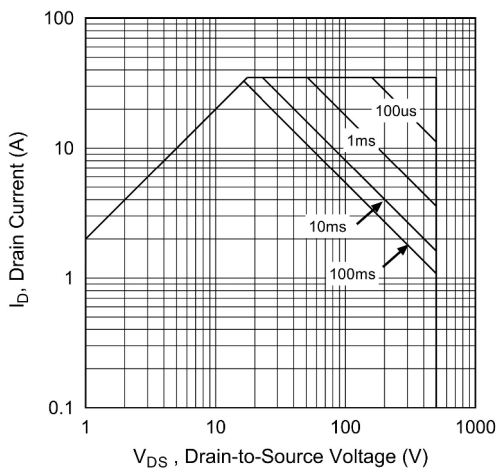


Figure 3, Typical Maximum Safe Operating Area

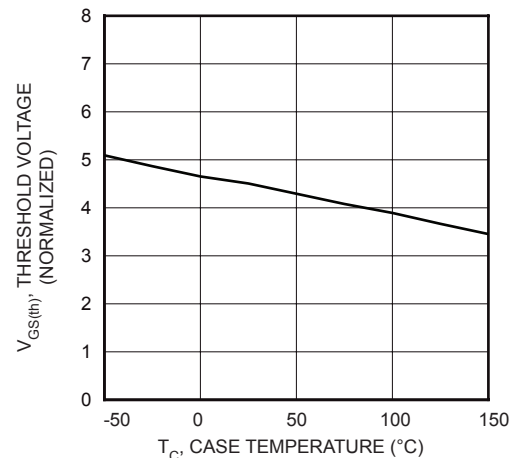


Figure 4, Typical Threshold Voltage vs Temperature

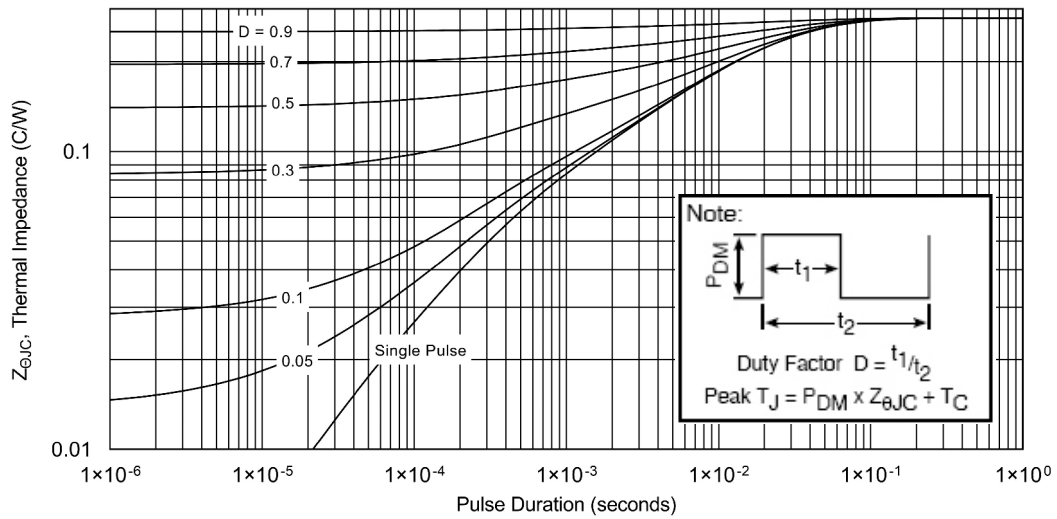
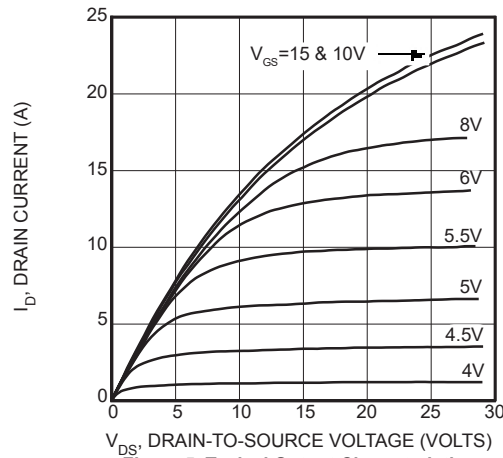
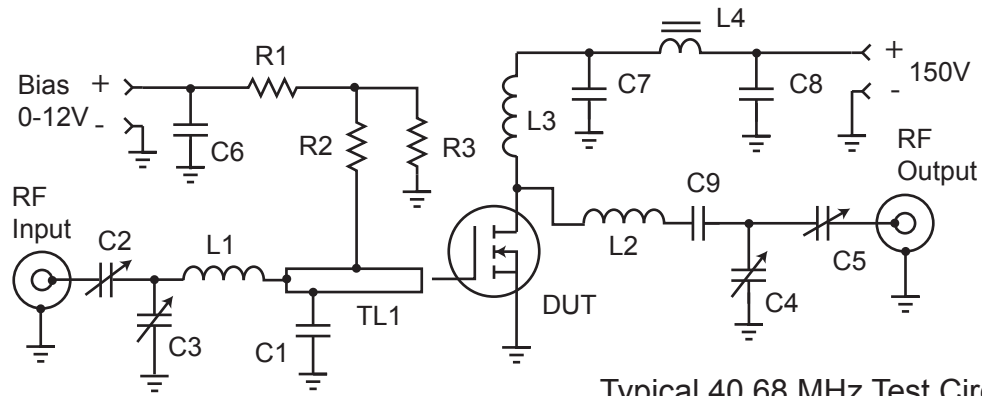


Table 1 - Typical Class AB Large Signal Input - Output Impedance

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



Typical 40.68 MHz Test Circuit

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

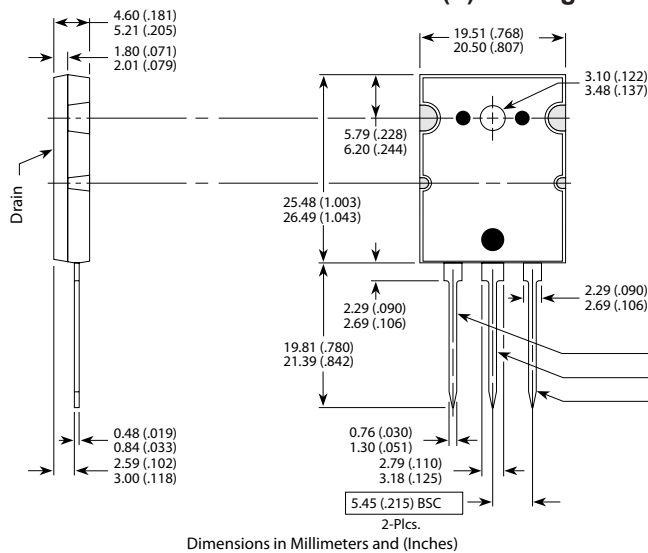
L4 -- VK200-4B ferrite choke 3 $\mu$ H

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



Dimensions in Millimeters and (Inches)

NOTE: These two parts comprise a symmetric pair of RF power transistors and meet the same electrical specifications. The device pin-outs are the mirror image of each other to allow ease of use as a push-pull pair.

Device	
ARF - A	ARF - B
Gate	Drain
Source	Source
Drain	Gate