

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 Vth thermal coefficient.**
- **Low Thermal Resistance.**
- **Optimized SOA for Superior Ruggedness.**

MAXIMUM RATINGS

 All Ratings: $T_C = 25^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	Ratings	UNIT
V_{DSS}	Drain-Source Voltage	500	Volts
V_{DGO}	Drain-Gate Voltage	500	
I_D	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	30	Amps
V_{GS}	Gate-Source Voltage	± 30	Volts
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	445	Watts
$R_{\theta JC}$	Junction to Case	0.28	$^\circ\text{C/W}$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_L	Lead Temperature: 0.063" from Case for 10 Sec.	300	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0V, I_D = 250 \mu\text{A}$)	500			Volts
$R_{DS(ON)}$	Drain-Source On-State Resistance ^① ($V_{GS} = 10V, I_D = 15A$)		0.25	0.28	ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = 500V, V_{GS} = 0V$)			25	μA
	Zero Gate Voltage Drain Current ($V_{DS} = 400V, V_{GS} = 0V, T_C = 125^\circ\text{C}$)			250	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 30V, V_{DS} = 0V$)			± 100	nA
g_{fs}	Forward Transconductance ($V_{DS} = 25V, I_D = 6.5A$)		8		mhos
$V_{GS(TH)}$	Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 1mA$)	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
η	Drain Efficiency	$V_{GS} = 2.5V$ $V_{DD} = 150V$	70	75		%
Ψ	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

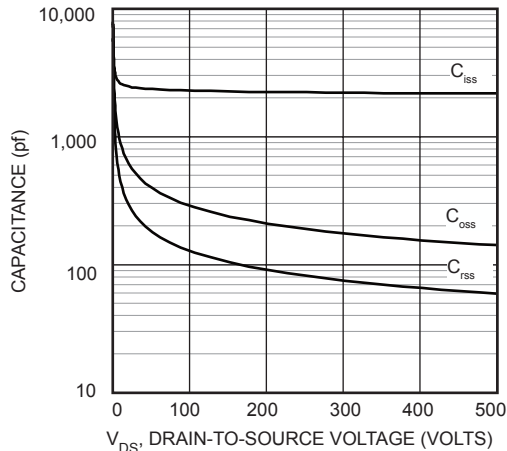


Figure 1, Typical Capacitance vs. Drain-to-Source Voltage

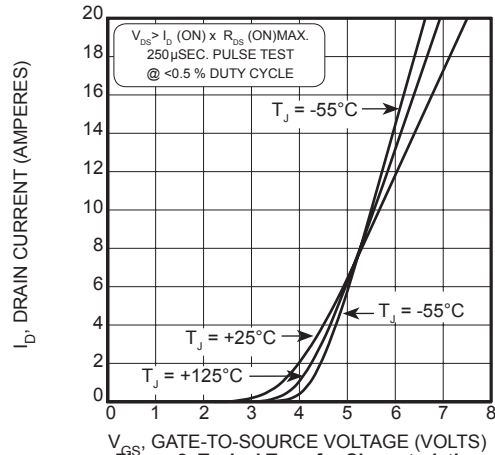


Figure 2, Typical Transfer Characteristics

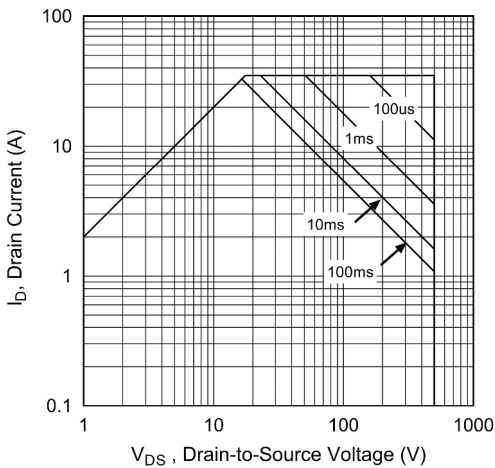


Figure 3, Typical Maximum Safe Operating Area

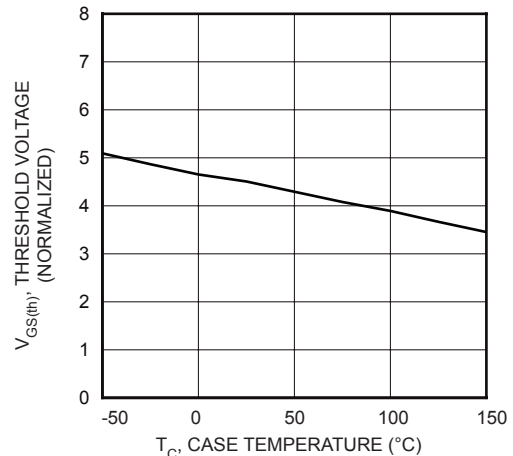


Figure 4, Typical Threshold Voltage vs Temperature

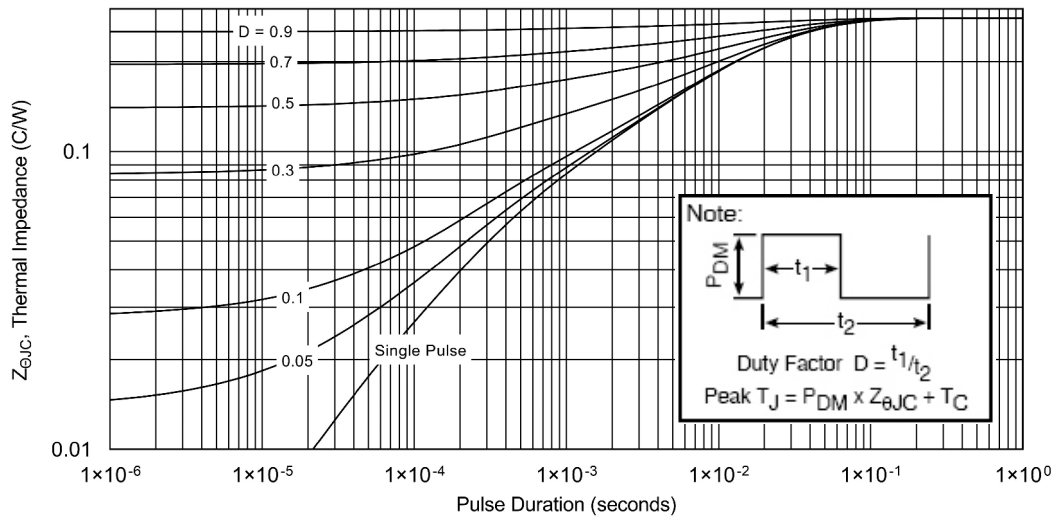
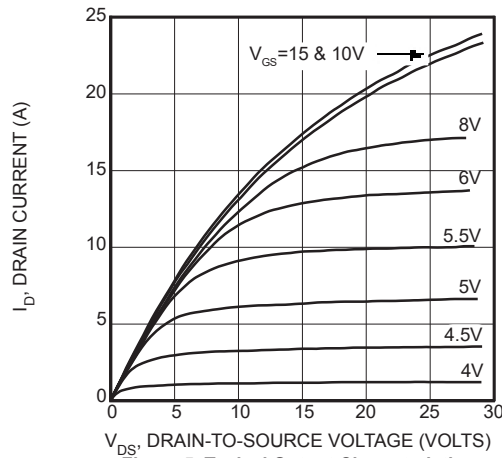
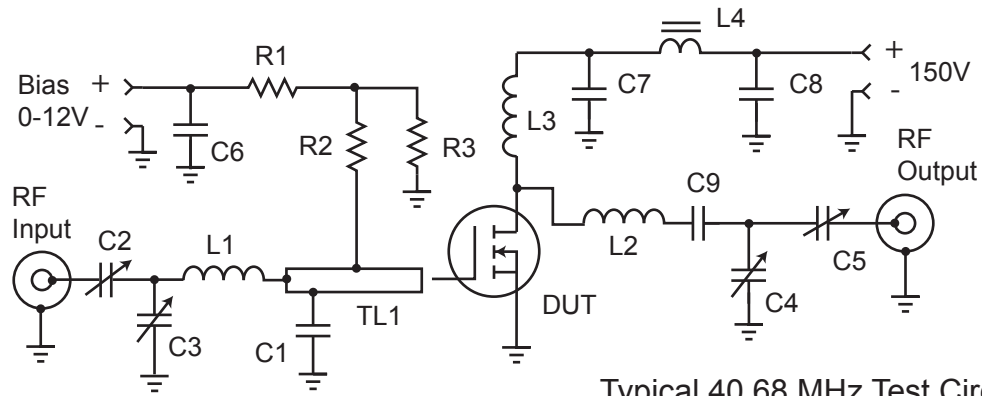


Table 1 - Typical Class AB Large Signal Input - Output Impedance

Freq. (MHz)	Z _{in} (Ω)	Z _{OL} (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_{IN} - Gate shunted with 25Ω I_{dg} = 100mA
 Z_{OL} - Conjugate of optimum load for 300 Watts output at V_{dd}=150V



Typical 40.68 MHz Test Circuit

C1 -- 2200pF ATC 700B

C2-C5 -- Arco 465 Mica trimmer

C6-C8 -- .1 μ 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 μ H

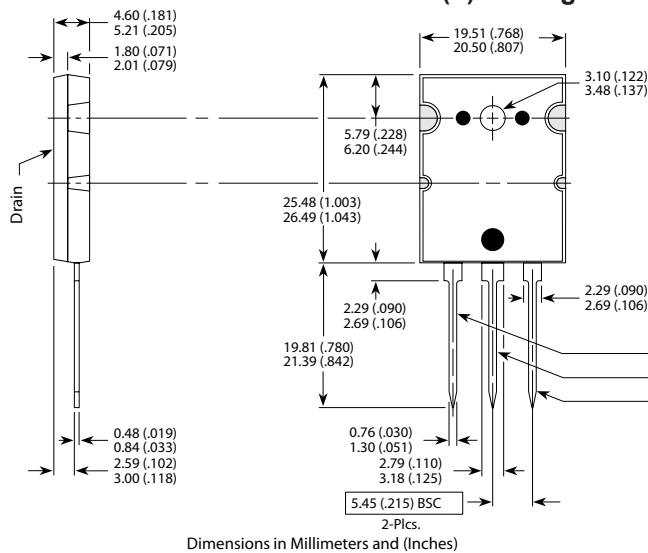
L4 -- VK200-4B ferrite choke 3 μ H

R1- R3 -- 1k Ω 0.5 Ω Carbon

TL1 -- 34 Ω 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