

Common Source

**ARF468AG**  
**ARF468BG**

# RF POWER MOSFETS

## N-CHANNEL ENHANCEMENT MODE

**150V 300W 45MHz**

The ARF468A and ARF468B 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 = 300 Watts.**
  - Gain = 15dB (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 @ $T_C = 25^\circ\text{C}$	22	Amps
$V_{GS}$	Gate-Source Voltage	$\pm 30$	Volts
$P_D$	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	300	Watts
$R_{\theta JC}$	Junction to Case	0.35	$^\circ\text{C/W}$
$T_J, T_{STG}$	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 <sup>(1)</sup> ( $V_{GS} = 10V, I_D = 11A$ )			0.3	ohms
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{DS} = 500V, V_{GS} = 0V$ )			25	$\mu\text{A}$
	Zero Gate Voltage Drain Current ( $V_{DS} = 400V, V_{GS} = 0V, T_C = 125^\circ\text{C}$ )			250	
$I_{GSS}$	Gate-Source Leakage Current ( $V_{GS} = \pm 30V, V_{DS} = 0V$ )			$\pm 100$	nA
$g_{fs}$	Forward Transconductance ( $V_{DS} = 25V, I_D = 11A$ )	5	8	9	mhos
$V_{GS(TH)}$	Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 1mA$ )	2.5	4	5	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	$V_{GS} = 0V$ $V_{DS} = 150V$ $f = 1\text{ MHz}$		2230		
$C_{oss}$	Output Capacitance			230		pF
$C_{rss}$	Reverse Transfer Capacitance			105		

FUNCTIONAL CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
$G_{PS}$	Common Source Amplifier Power Gain	$f = 40.68\text{ MHz}$	14	15		dB
$\eta$	Drain Efficiency	$V_{GS} = 2.5V$ $V_{DD} = 150V$	70	75		%
$\Psi$	Electrical Ruggedness VSWR 10:1	$P_{out} = 300W$	No Degradation in Output Power			

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

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TYPICAL PERFORMANCE CURVES

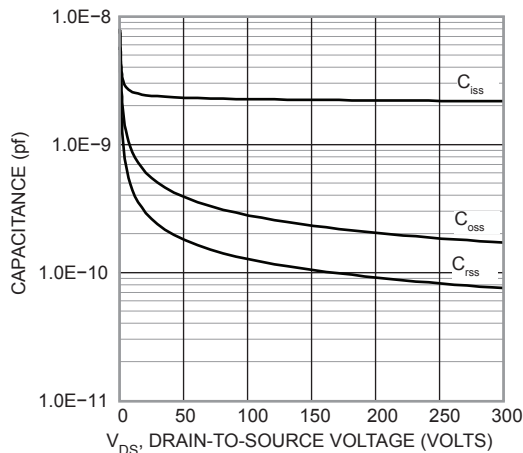


Figure 1, Typical Capacitance vs. Drain-to-Source Voltage

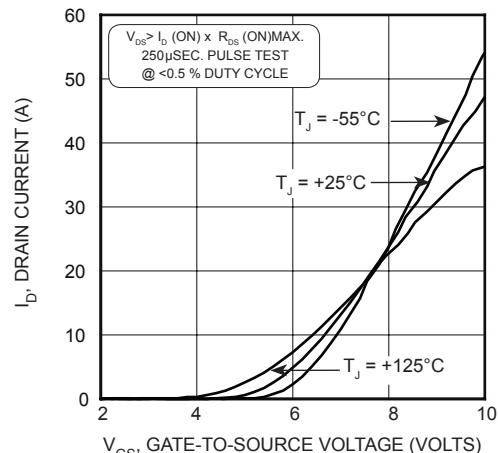


Figure 2, Typical Transfer Characteristics

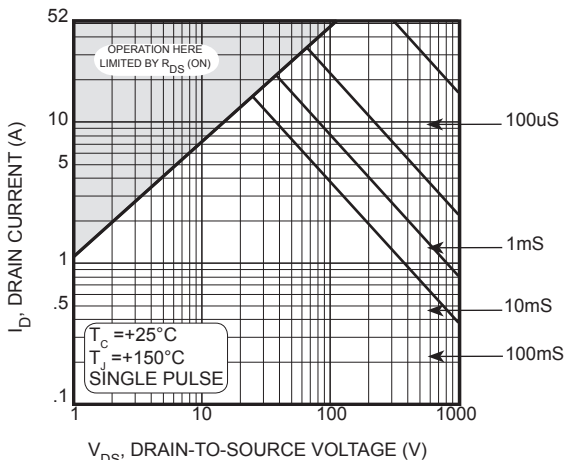


Figure 3, Typical Maximum Safe Operating Area

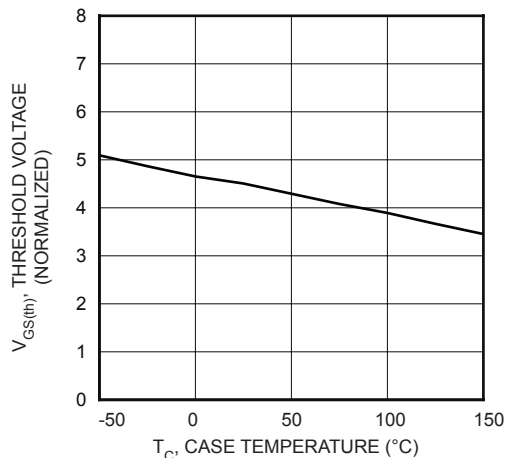


Figure 4, Typical Threshold Voltage vs Temperature

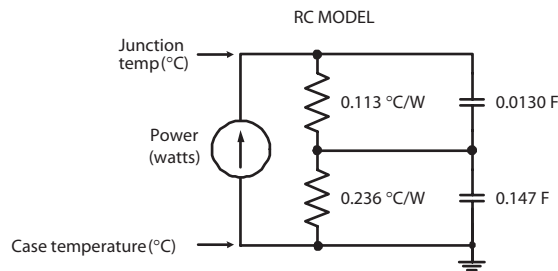
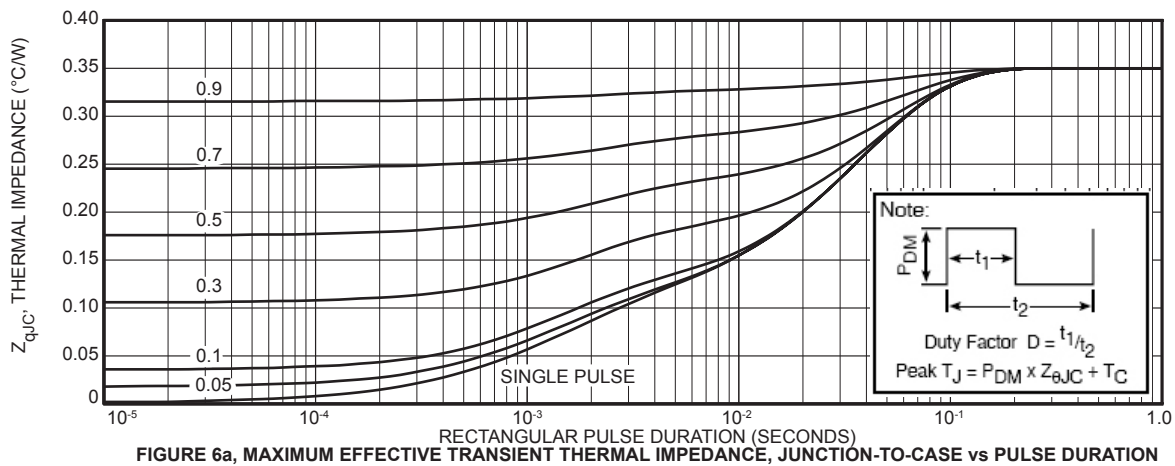
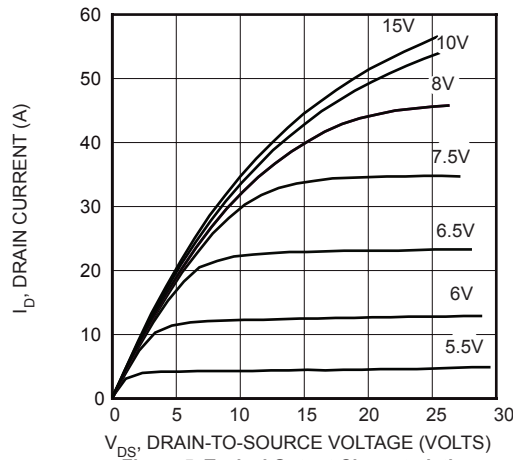
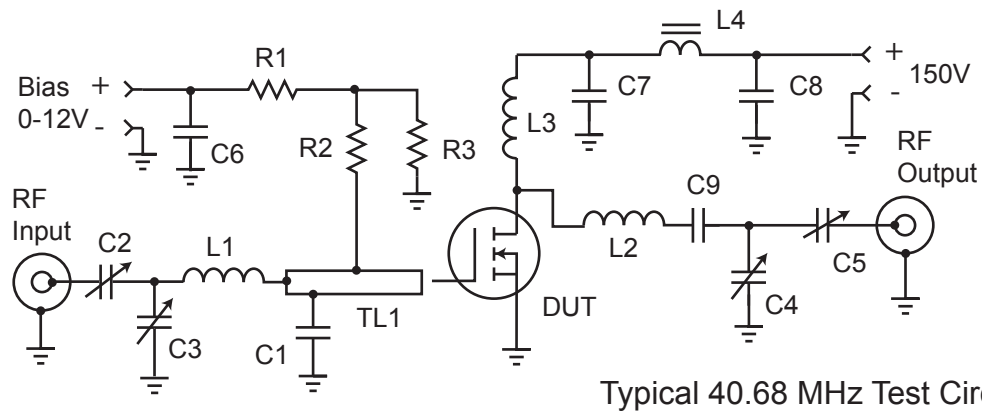


Figure 6b, TRANSIENT THERMAL IMPEDANCE

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

Freq. (MHz)	$Z_{in} (\Omega)$	$Z_{OL} (\Omega)$
2.0	18 - j 10.5	21 - j 1.4
13.5	2.7 - j 4.6	17.5 - j 7.8
27.1	1.8 - j 1.6	11.7 - j 10.4
40.7	1.7 - j 0.2	7.7 - j 10

$Z_{in}$  - Gate shunted with 25 $\Omega$   $I_{dg} = 0$   
 $Z_{OL}$  - Conjugate of optimum load for 300 Watts output at  $V_{dd} = 125V$



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

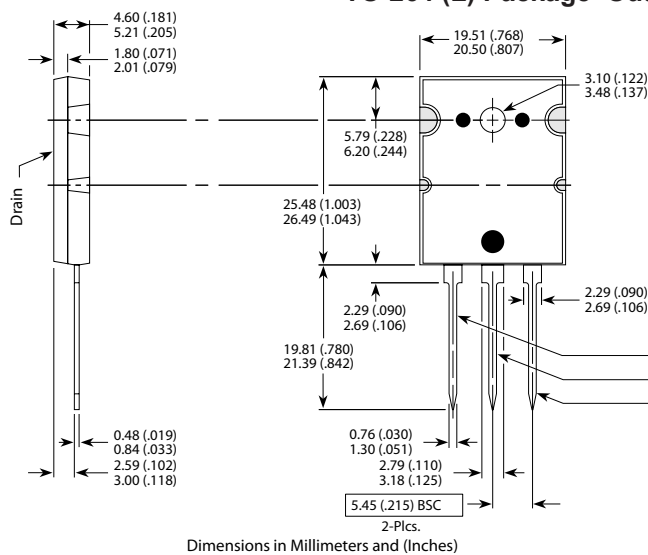
L2 -- 5t #16 AWG .312" ID .35" L ~176nH

L3 -- 10t #24 AWG .25"ID ~.5 $\mu$ HL4 -- VK200-4B ferrite choke 3 $\mu$ HR1- R3 -- 1k $\Omega$  0.5 $\Omega$  CarbonTL1 -- 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

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