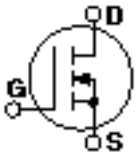
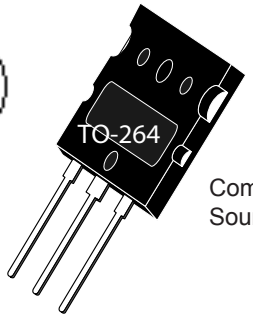
Microsemi





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°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°C	22	Amps
V_{GS}	Gate-Source Voltage	±30	Volts
P_D	Total Power Dissipation @ T_C = 25°C	300	Watts
$R_{\theta JC}$	Junction to Case	0.35	°C/W
T_J,T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	°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 µA)	500			Volts
$R_{DS(ON)}$	Drain-Source On-State Resistance ① (V_{GS} = 10V, I_D = 11A)			0.3	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°C)			250	
I_{GSS}	Gate-Source Leakage Current (V_{GS} = ±30V, V_{DS} = 0V)			±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

050-4982 Rev A 7-2014

DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 150V f = 1 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 MHz	14	15		dB
η	Drain Efficiency	V_{GS} = 2.5V V_{DD} = 150V	70	75		%
Ψ	Electrical Ruggedness VSWR 10:1	P_{out} = 300W	No Degradation in Output Power			

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

TYPICAL PERFORMANCE CURVES

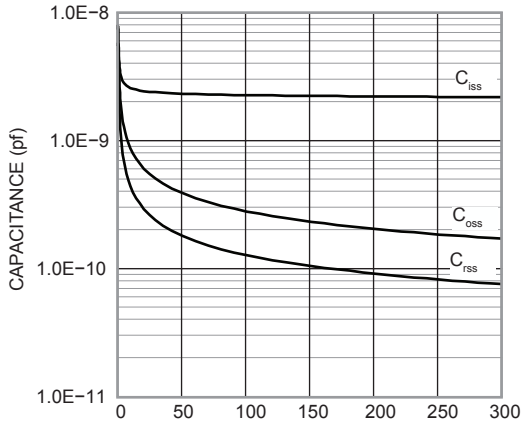


Figure 1, Typical Capacitance vs. Drain-to-Source Voltage

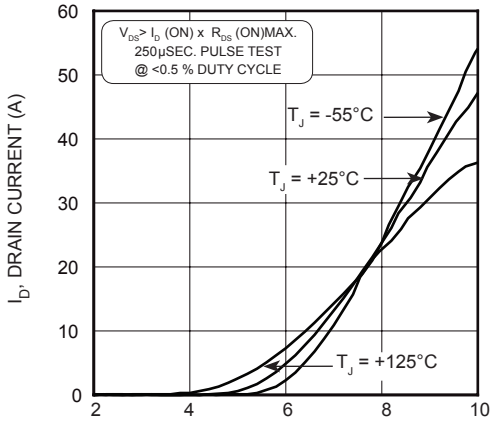


Figure 2, Typical Transfer Characteristics

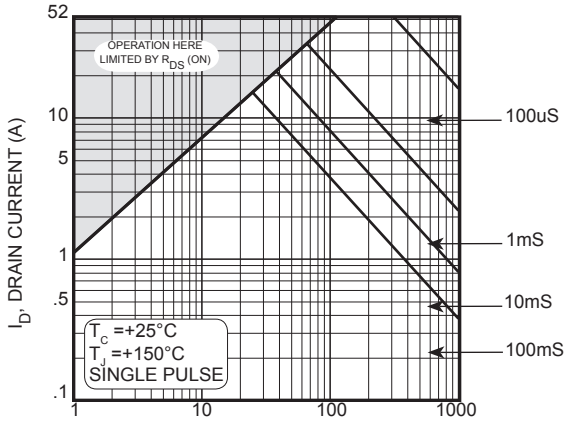


Figure 3, Typical Maximum Safe Operating Area

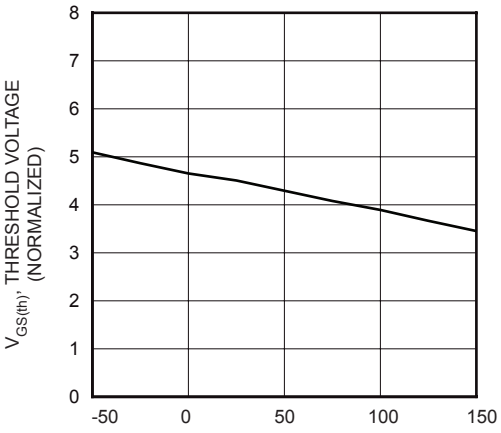


Figure 4, Typical Threshold Voltage vs Temperature

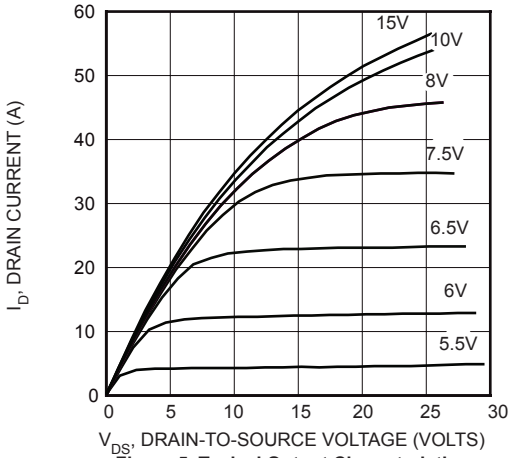


Figure 5, Typical Output Characteristics

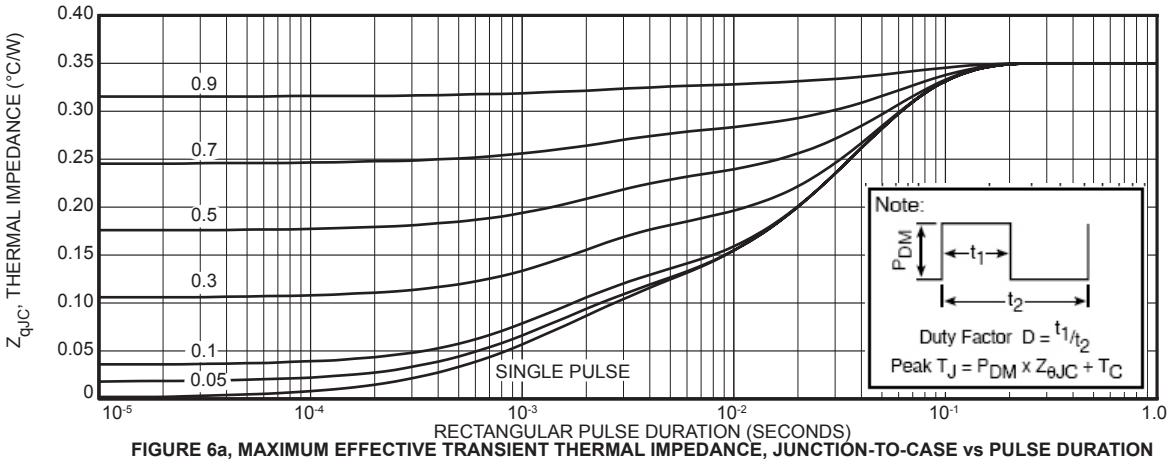


FIGURE 6a, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

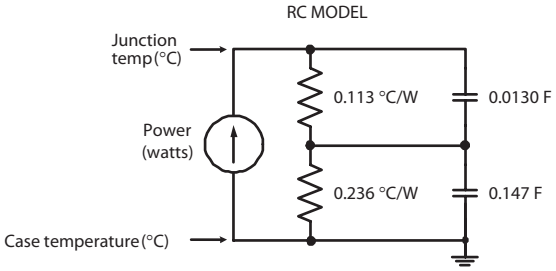
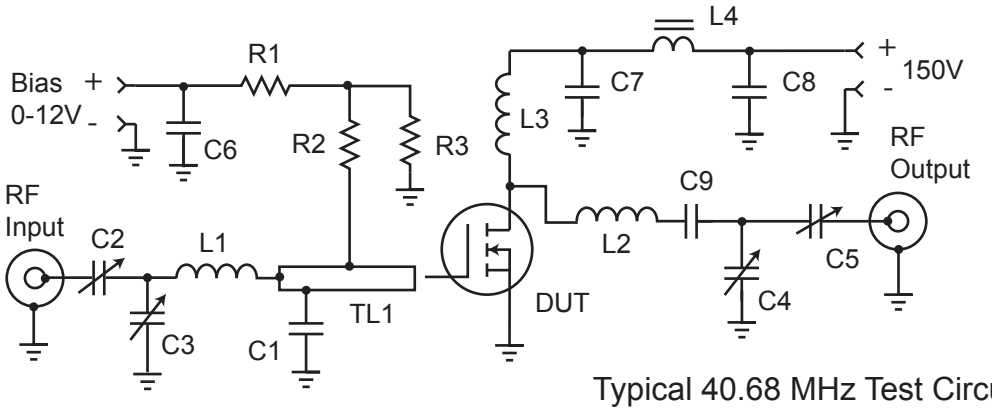


Figure 6b, TRANSIENT THERMAL IMPEDANCE

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

Freq. (MHz)	Z_{in} (Ω)	Z_{OL} (Ω)
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 25Ω I_{dq} = 0
Z_{OL} - Conjugate of optimum load for 300 Watts output at V_{dd}=125V



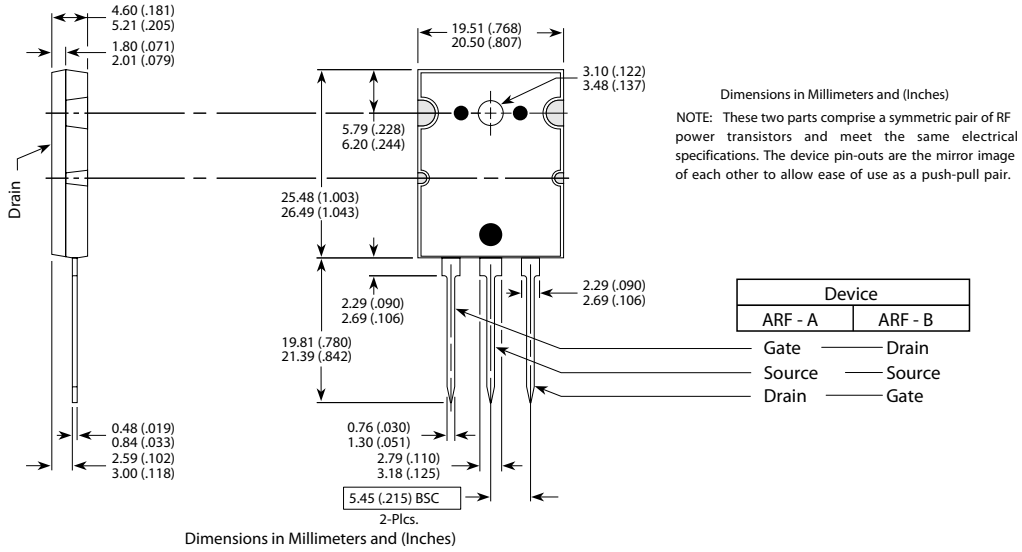
Typical 40.68 MHz Test Circuit

C1 -- 2200pF ATC 700B
C2-C5 -- Arco 465 Mica trimmer
C6-C8 -- .1 µF 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 ~.5µH
L4 -- VK200-4B ferrite choke 3µH

R1- R3 -- 1kΩ 0.5Ω Carbon
TL1 -- 34Ω 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

Dimensions in Millimeters and (Inches)

050-4982 Rev A 7-2014