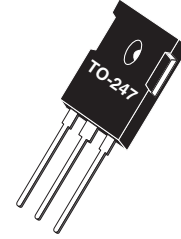
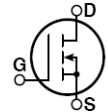



**RF POWER MOSFET**  
 N-CHANNEL ENHANCEMENT MODE

The ARF460A and ARF460B 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 65MHz. They have been optimized for both linear and high efficiency classes of operation.



Common Source



- Specified 125 Volt, 40.68MHz Characteristics:
  - Output Power = 150 Watts.
  - Gain = 13dB (Class AB)
  - Efficiency = 75% (Class C)
- Low Cost Common Source RF Package.
- Low  $V_{th}$  thermal coefficient.
- Low Thermal Resistance.
- Optimized SOA for Superior Ruggedness
- RoHS Compliant 

**Maximum Ratings**

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

Symbol	Parameter	ARF460AG/BG	Unit
$V_{DSS}$	Drain-Source Voltage	500	V
$V_{DGO}$	Drain-Gate Voltage	500	
$I_D$	Continuous Drain Current @ $T_c = 25^\circ\text{C}$	14	A
$V_{GS}$	Gate-Source Voltage	$\pm 30$	V
$P_D$	Total Power Dissipation @ $T_c = 25^\circ\text{C}$	250	W
$R_{\theta JC}$	Junction to Case	0.50	$^\circ\text{C}/\text{W}$
$T_J, T_{STG}$	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	Parameter	Min	Typ	Max	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage ( $V_{GS} = 0\text{V}, I_D = 250 \mu\text{A}$ )	500			V
$V_{DS(ON)}$	On State Drain Voltage <sup>1</sup> ( $I_{D(ON)} = 7\text{A}, V_{GS} = 10\text{V}$ )			4	
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{DS} = V_{DSS}, V_{GS} = 0\text{V}$ )			25	$\mu\text{A}$
	Zero Gate Voltage Drain Current ( $V_{DS} = 0.8V_{DSS}, V_{GS} = 0, T_c = 125^\circ\text{C}$ )			250	
$I_{GSS}$	Gate-Source Leakage Current ( $V_{DS} = \pm 30\text{V}, V_{GS} = 0\text{V}$ )			$\pm 100$	nA
$g_{fs}$	Forward Transconductance ( $V_{DS} = 25\text{V}, I_D = 7\text{A}$ )	3.3	5.5	8	mhos
$V_{GS(TH)}$	Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 50\text{mA}$ )	3		5	Volts

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

## Dynamic Characteristics

ARF460AG/BG

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$C_{ISS}$	Input Capacitance	$V_{GS} = 0V$		1200	1400	pF
$C_{OSS}$	Output Capacitance	$V_{DS} = 150V$		150	180	
$C_{RSS}$	Reverse Transfer Capacitance	$f = 1MHz$		60	75	
$t_{d(ON)}$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5V_{DSS}$ $I_D = I_{D[Cont.]} @ 25^\circ C$ $R_G = 1.6\Omega$		7		ns
$t_r$	Rise Time			6		
$t_{d(off)}$	Turn-off Delay Time			20		
$t_f$	Fall Time			4.0	7	

## Functional Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$G_{PS}$	Common Source Amplifier Power Gain	$f = 40.68MHz$	13	15		dB
$\eta$	Drain Efficiency	$I_{dq} = 50mA$ $V_{DD} = 125V$	70	75		%
$\Psi$	Electrical Ruggedness VSWR 10:1	$P_{OUT} = 150W$	No Degradation in Output Power			

1. Pulse Test: Pulse width < 380  $\mu S$ , Duty Cycle < 2%.

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

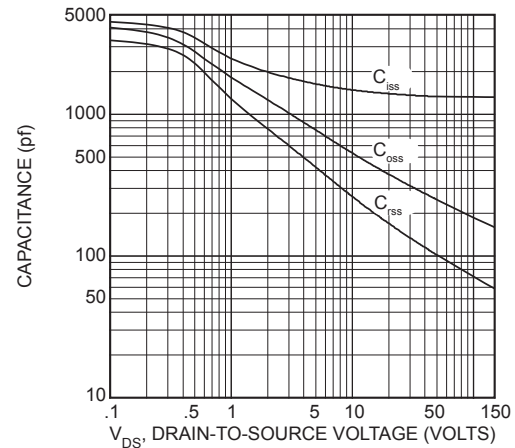


Figure 2, Typical Capacitance vs. Drain-to-Source Voltage

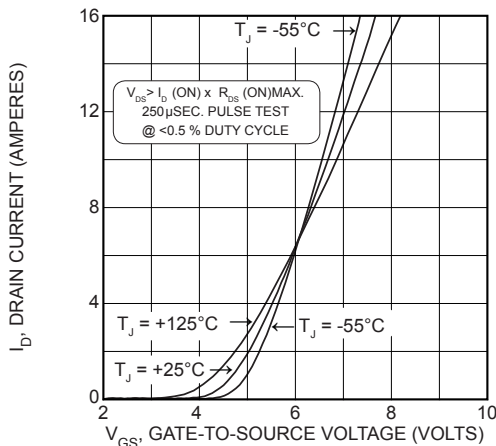


Figure 3, Typical Transfer Characteristics

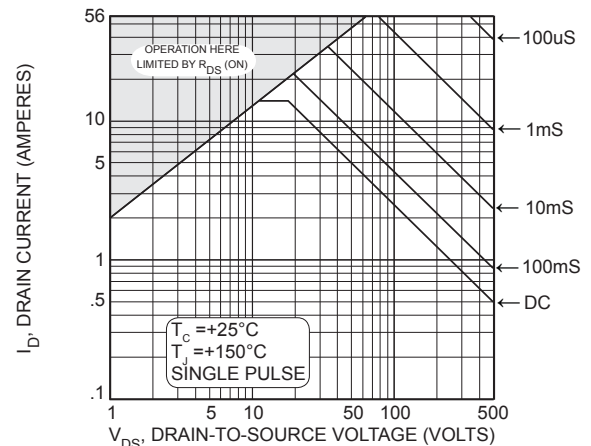


Figure 4, Typical Maximum Safe Operating Area

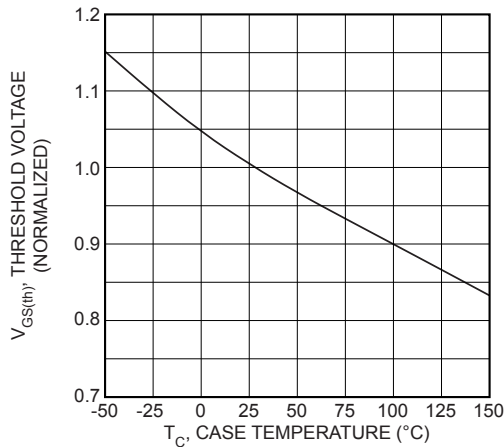


Figure 5, Typical Threshold Voltage vs Temperature

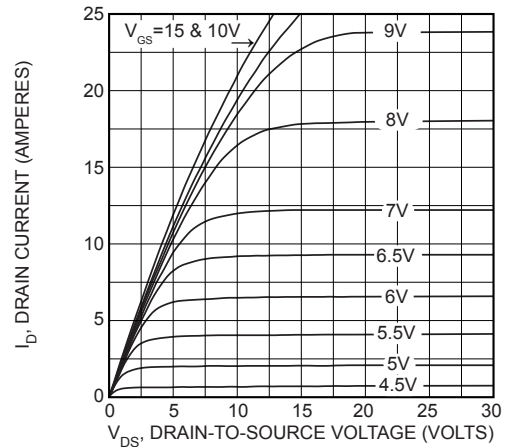


Figure 6, Typical Output Characteristics

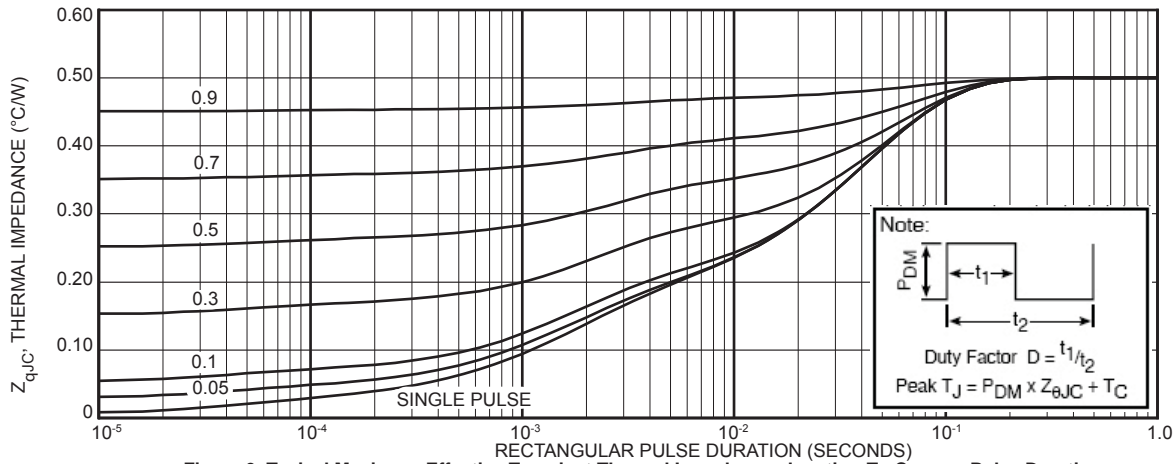


Figure 9, Typical Maximum Effective Transient Thermal Impedance, Junction-To-Case vs Pulse Duration

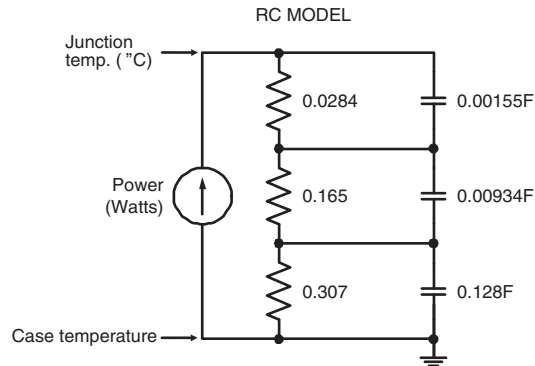
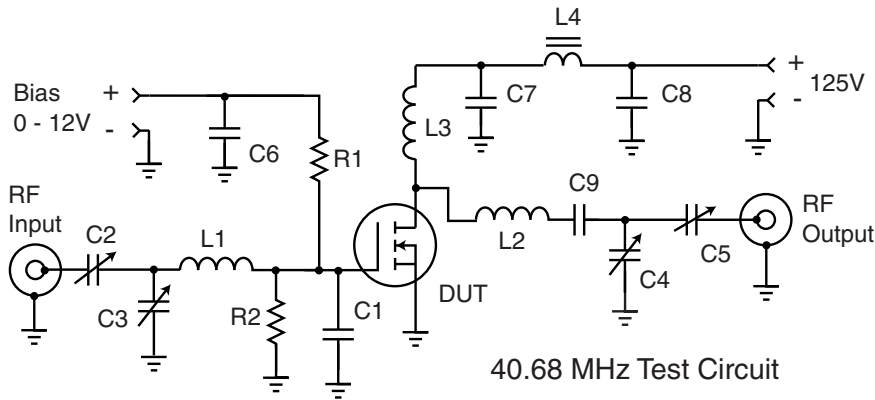


Figure 9a, TRANSIENT THERMAL IMPEDANCE MODEL

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

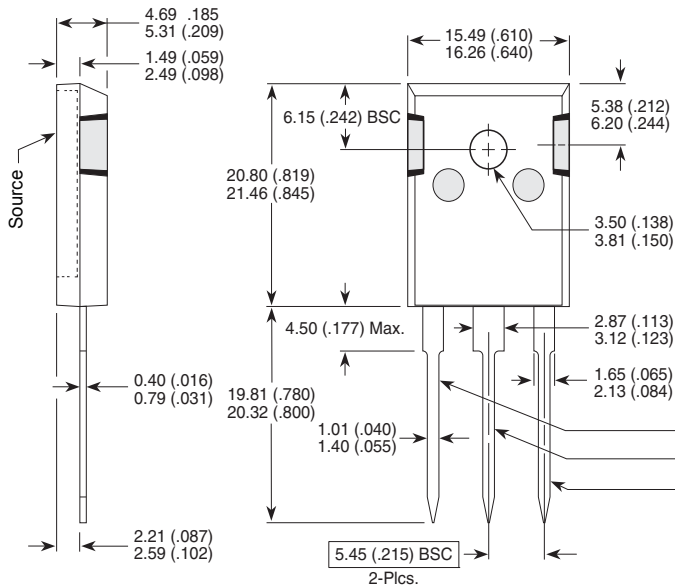
Freq. (MHz)	Z <sub>in</sub> (Ω)	Z <sub>OL</sub> (Ω)
2.0	20.9 - j 9.2	38 - j 2.6
13.5	2.4 - j 6.8	31 - j 14
27	.57 - j 2.6	19.6 - j 17.6
40	.31 - j 0.5	12.5 - j 15.8
65	.44 - j 1.9	6.0 - j 10.5

Z<sub>IN</sub> - Gate shunted with 25Ω I<sub>dq</sub> = 100mA  
 Z<sub>OL</sub> - Conjugate of optimum load for 150 Watts output at V<sub>dd</sub>=125V



- C1 -- 2000 pF 100V NPO chip mounted at gate lead
- C2-C5 -- Arco 463 Mica trimmer
- C6-C8 -- .1  $\mu$ F 500V ceramic chip
- C9 -- 2200 pF 500V chip
- L1 -- 4t #20 AWG .25"ID .3"L ~80nH
- L2 -- 6t #16 AWG .312" ID .4"L ~185nH
- L3 -- 15t #24 AWG .25"ID ~.85uH
- L4 -- VK200-4B ferrite choke 3uH
- R1-R2 -- 51 Ohm 0.5W Carbon
- DUT = ARF460A/B

TO-247 Package Outline



**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)