
 Common
Source

RF POWER MOSFETS

N-CHANNEL ENHANCEMENT MODE

65V 150W 65MHz

The ARF462A and ARF462B 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 65 MHz. They have been optimized for both linear and high efficiency classes of operation.

- Specified 65 Volt, 40.68 MHz Characteristics:
- Low Cost Common Source RF Package.
- Output Power = 150 Watts.
- Low V_{th} thermal coefficient.
- Gain = 15dB (Class AB)
- Low Thermal Resistance.
- Efficiency = 75% (Class C)
- Optimized SOA for Superior Ruggedness.

MAXIMUM RATINGS

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

Symbol	Parameter	ARF462A/B	UNIT
V_{DSS}	Drain-Source Voltage	200	Volts
V_{DGO}	Drain-Gate Voltage	200	
I_D	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	23	Amps
V_{GS}	Gate-Source Voltage	± 30	Volts
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	250	Watts
$R_{\theta JC}$	Junction to Case	0.50	$^\circ\text{C/W}$
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 ($V_{GS} = 0V, I_D = 250 \mu\text{A}$)	200			Volts
$V_{DS(ON)}$	On State Drain Voltage ^① ($I_D(ON) = 11.5A, V_{GS} = 10V$)			2.5	
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}, V_{GS} = 0V$)			25	μA
	Zero Gate Voltage Drain Current ($V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125^\circ\text{C}$)			250	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 30V, V_{DS} = 0V$)			± 100	nA
g_{fs}	Forward Transconductance ($V_{DS} = 25V, I_D = 7A$)	4	6.5	8	mhos
$V_{GS(TH)}$	Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 50mA$)	3		5	Volts

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

APT Website - <http://www.advancedpower.com>

DYNAMIC CHARACTERISTICS

ARF462A/B

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 50V$ $f = 1 \text{ MHz}$		1350		pF
C_{oss}	Output Capacitance			435		
C_{rss}	Reverse Transfer Capacitance			200		
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_{D[Cont.]} @ 25^\circ C$ $R_G = 1.6\Omega$		7	15	ns
t_r	Rise Time			5	10	
$t_{d(off)}$	Turn-off Delay Time			23	40	
t_f	Fall Time			12	25	

FUNCTIONAL CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
G_{PS}	Common Source Amplifier Power Gain	$f = 40.68 \text{ MHz}$	13	15		dB
η	Drain Efficiency	$I_{DQ} = 100 \text{ mA}$ $V_{DD} = 65V$	50	55		%
ψ	Electrical Ruggedness VSWR 10:1	$P_{out} = 150W$	No Degradation in Output Power			

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

APT Reserves the right to change, without notice, the specifications and information contained herein.

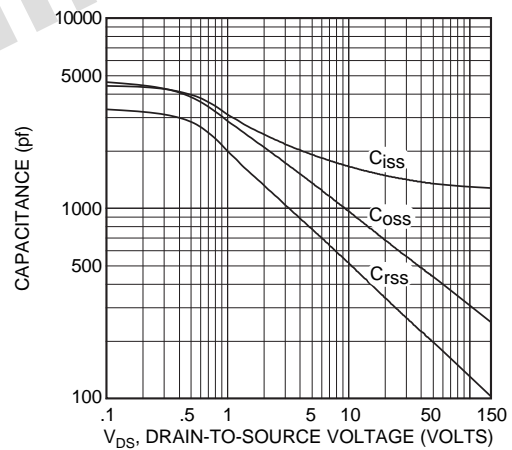


Figure 2, Typical Capacitance vs. Drain-to-Source Voltage

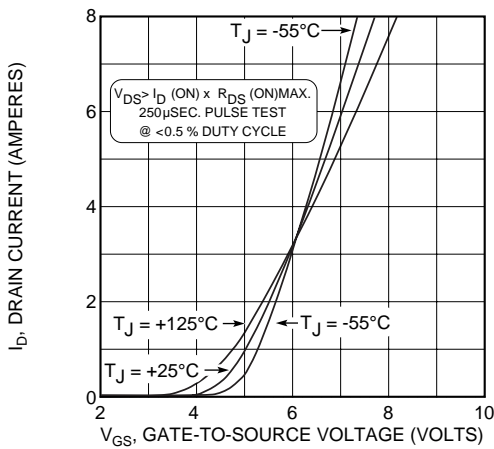


Figure 3, Typical Transfer Characteristics

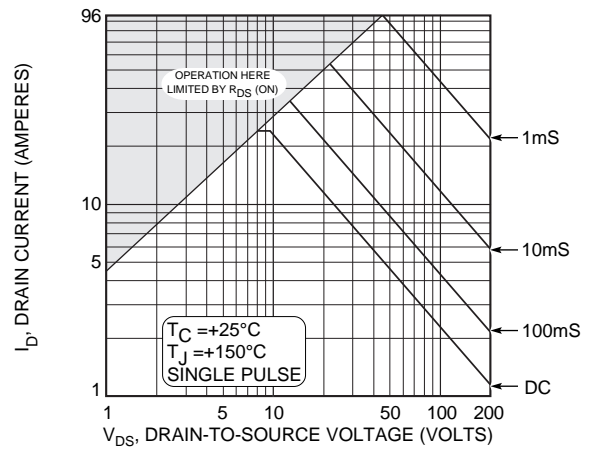


Figure 4, Typical Maximum Safe Operating Area

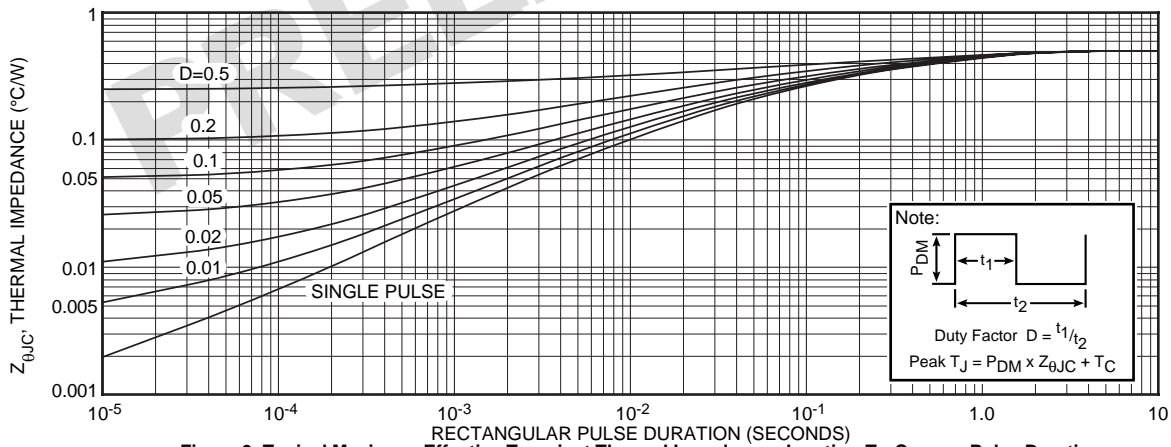
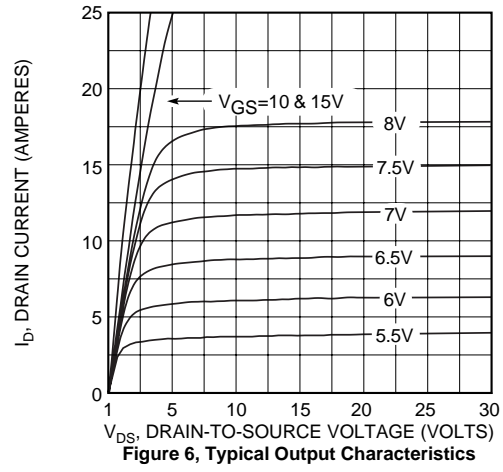
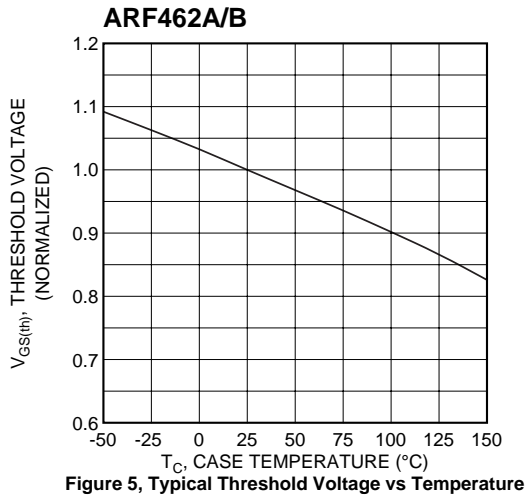
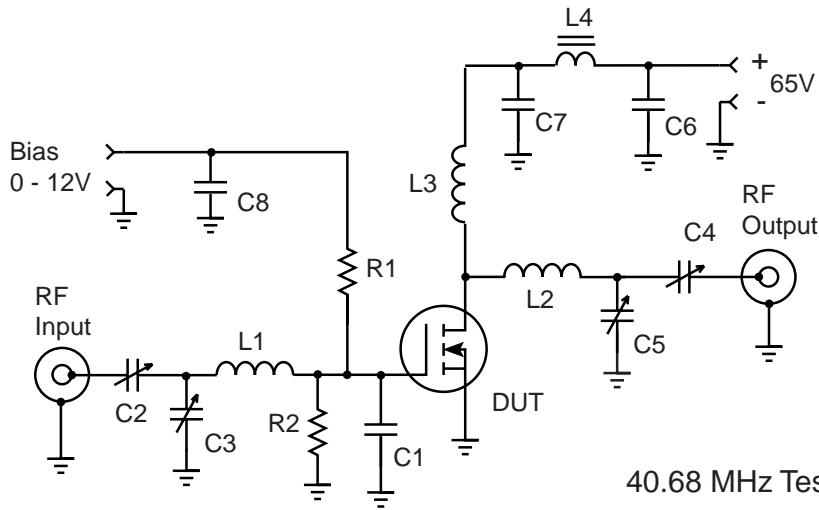


Table 1 - Typical Class AB Large Signal Input - Output Impedance

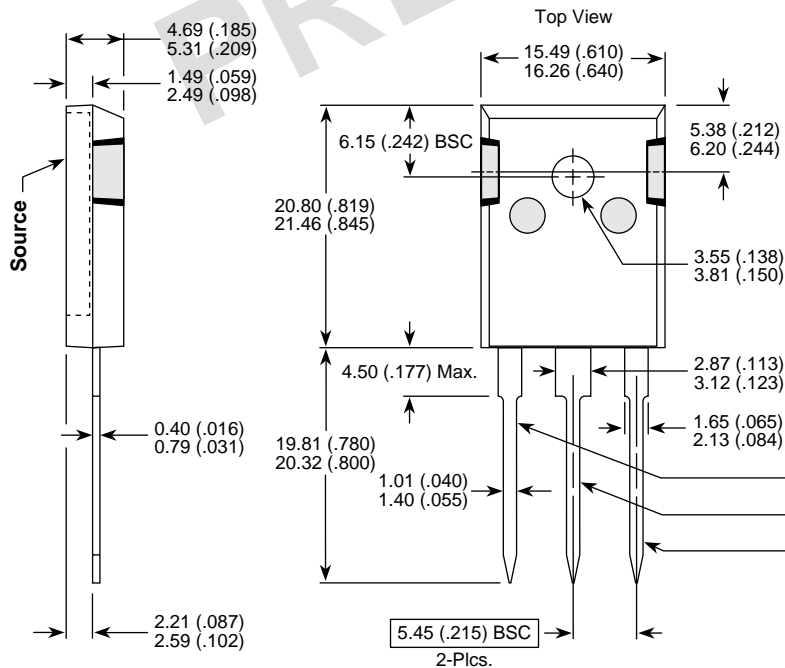
Freq. (MHz)	Z _{in} (Ω)	Z _{OL} (Ω)
2.0	20.4 - j 9.6	10.1 - j 0.5
13.5	2.0 - j 6.5	9.0 - j 2.6
27	.42 - j 2.3	6.5 - j 3.5
40	.20 - j .38	4.5 - j 3.0
65	.36 + j 2.0	2.4 - j 1.0

Z_{in} - Gate shunted with 25Ω I_{DQ} = 100mA
 Z_{OL} - Conjugate of optimum load for 150 Watts output at V_{dd} = 65V



- C1 -- 2200 pF 50V NPO
mounted at device gate lead.
- C2-C5 -- Arco 463 Mica trimmer
- C6-C8 -- 10nF 500V COG chip
- L1 -- 3t #20 AWG .312" ID ~74nH
- L2 -- 4t #18 AWG .25" ID .25L ~86 nH
- L3 -- 10t #20 AWG .25 ID ~470nH
- L4 -- VK200-4B ferrite choke ~3uH
- R1-R2 -- 50 Ohm 1/2W Carbon
- DUT = ARF462A/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