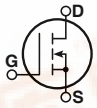
ADVANCED POWER TECHNOLOGY®

ARF463AP1 ARF463BP1

ARF463AP1G* ARF463BP1G*

***G Denotes RoHS Compliant, Pb Free Terminal Finish.**



Common Source

RF POWER MOSFETs

N-CHANNEL ENHANCEMENT MODE

125V 100A 100MHz

The ARF463AP1 and ARF463BP1 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 100MHz. They have been optimized for both linear and high efficiency classes of operation.

- **Specified 125 Volt, 81.36MHz Characteristics:**
  - **Output Power = 100 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	ARF463A_BP1(G)	UNIT
V_{DSS}	Drain-Source Voltage	500	Volts
V_{DGO}	Drain-Gate Voltage	500	
I_D	Continuous Drain Current @ T_C = 25°C	9	Amps
V_{GS}	Gate-Source Voltage	±30	Volts
P_D	Total Power Dissipation @ T_C = 25°C	180	Watts
$R_{\theta JC}$	Junction to Case	0.70	°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
V_{DS}(ON)	On State Drain Voltage ① (I_D(ON) = 4.5A, V_{GS} = 10V)			5.0	
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°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 = 4.5A)	2	3	4	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.

APT4924 Rev B 3-2006

DYNAMIC CHARACTERISTICS

ARF463A_BP1(G)

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 50V f = 1 MHz		670		pF
C_{oss}	Output Capacitance			120		
C_{rss}	Reverse Transfer Capacitance			50		
$t_{d(on)}$	Turn-on Delay Time	V_{GS} = 15V V_{DD} = 0.5 V_{DSS} I_D = $I_{D[Cont.]}$ @ 25°C R_G = 1.6Ω		5.6		ns
t_r	Rise Time			4.3		
$t_{d(off)}$	Turn-off Delay Time			13.5		
t_f	Fall Time			4.2		

FUNCTIONAL CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
G_{PS}	Common Source Amplifier Power Gain	f = 81.36 MHz V_{GS} = 0V V_{DD} = 125V P_{out} = 100W	13	15		dB
η	Drain Efficiency		70	75		%
ψ	Electrical Ruggedness VSWR 10:1		No Degradation in Output Power			

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

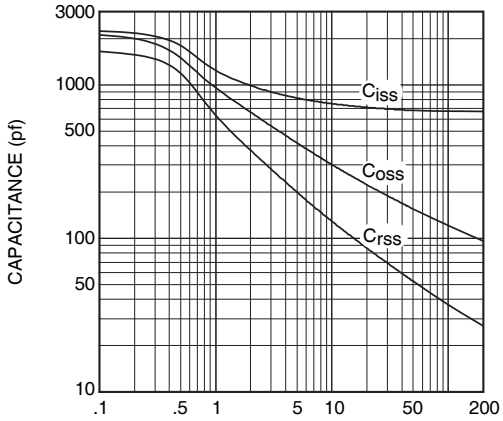
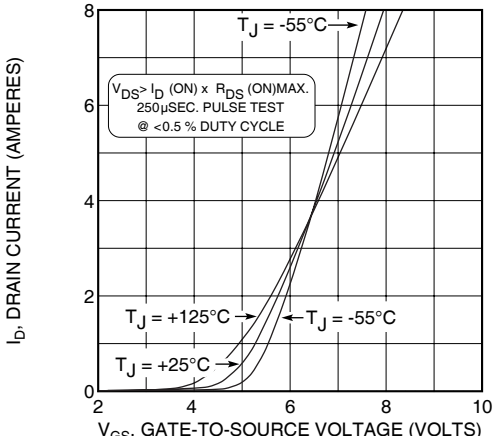
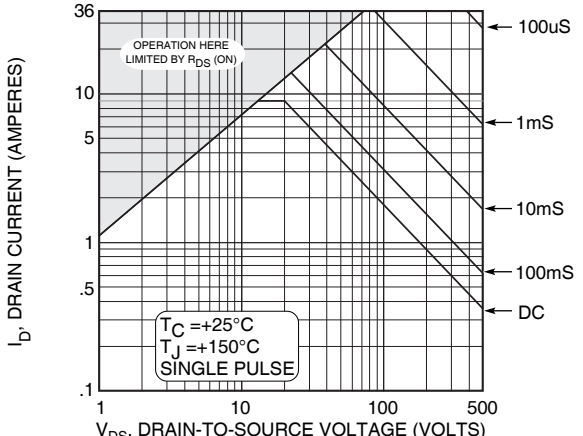


Figure 2, Typical Capacitance vs. Drain-to-Source Voltage





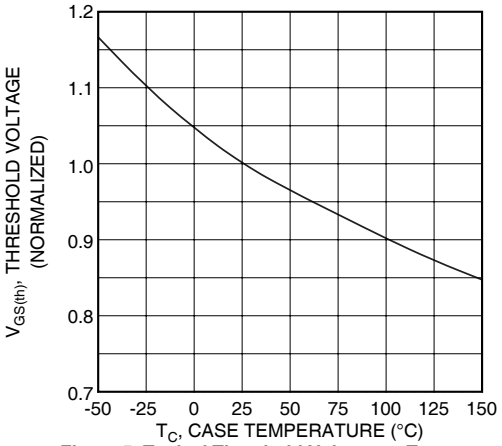


Figure 5, Typical Threshold Voltage vs Temperature

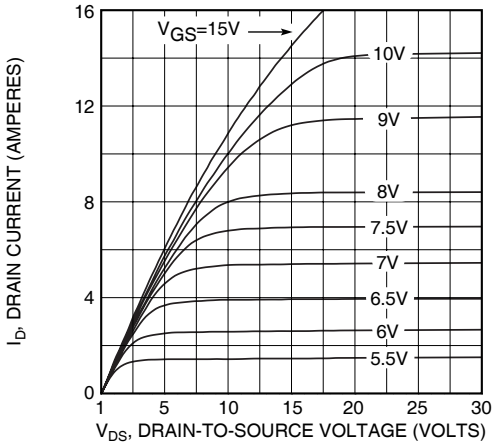


Figure 6, Typical Output Characteristics

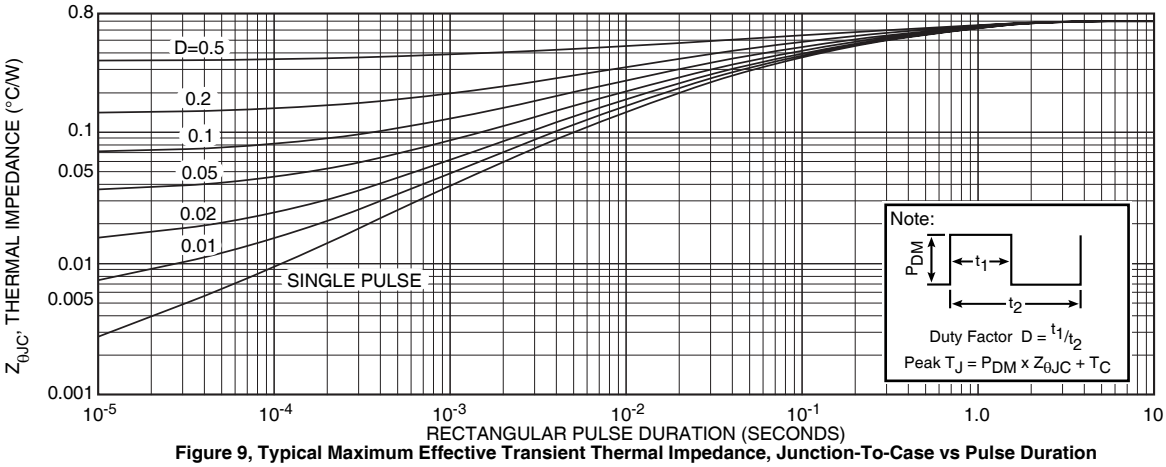
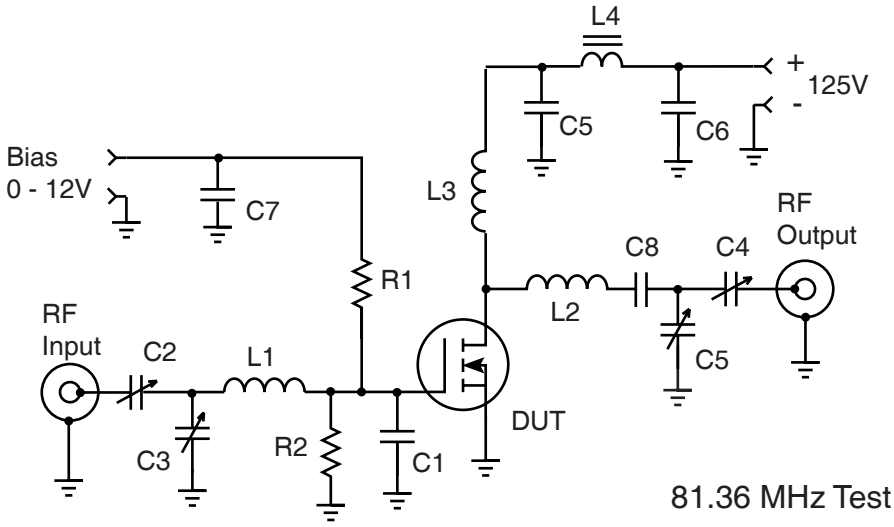


Figure 9, Typical Maximum Effective Transient Thermal Impedance, Junction-To-Case vs Pulse Duration

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

Freq. (MHz)	Z_{in} (Ω)	Z_{OL} (Ω)
2.0	24 - j 5.0	55 - j 4.8
13.5	7.8 - j 11	41 - j 24
27	2.1 - j 6.4	23 - j 26.2
40	.74 - j 3.3	13.6 - j 22
65	.30 + j .42	6.1 - j 14.2
80	.46 + j 2.0	4.2 - j 10.7
100	.87 + j 3.7	2.7 - j 7.1

Z_{in} - Gate shunted with 25Ω I_{DQ} = 50mA

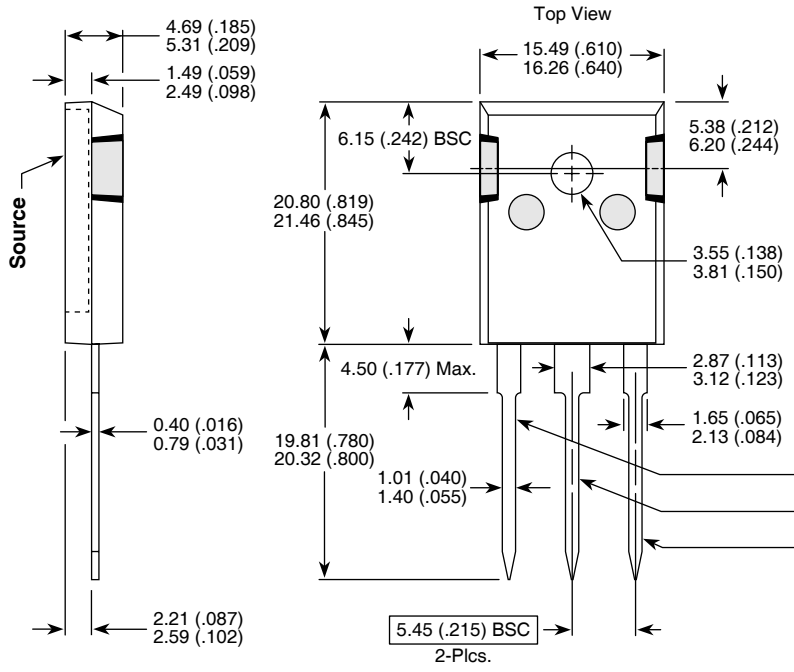


C1 -- 820pF Unelco mounted at gate lead
C2-C5 -- Arco 463 Mica trimmer
C5-C8 -- 10nF 500V COG chip
L1 -- 3t #18 .3" ID .25"L ~50nH
L2 -- 3t #16 AWG .25" ID .3"L ~58nH
L3 -- 10t #18 AWG .25 ID ~470nH
L4 -- VK200-4B ferrite choke ~3uH
R1-R2 -- 50 Ohm 1/2W Carbon
DUT = ARF463A/B

81.36 MHz Test Circuit

TO-247 Package Outline

(e3) 100% Sn Plated



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**P1**	ARF - B**P1**
Gate	Drain
Source	Source
Drain	Gate