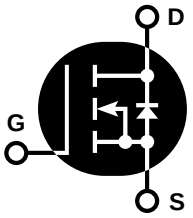

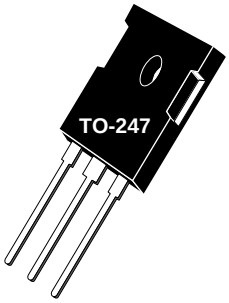

ADVANCED POWER TECHNOLOGY®

ARF444 300W 300V 13.56MHz
ARF445 300W 300V 13.56MHz

THE ARF444 PIN-OUTS ARE MIRROR IMAGE OF THE ARF445.

RF OPERATION (1-15MHz)

POWER MOS IV®

N-CHANNEL ENHANCEMENT MODE RF POWER MOSFET

The ARF444 and ARF445 comprise a symmetric pair of RF power transistors designed for push-pull scientific, commercial, medical and industrial RF power amplifier applications.

- **Specified 300 Volt, 13.56 MHz Characteristics:**
- **Output Power = 300 Watts.**
- **Gain = 18.7dB (Typ.)**
- **Efficiency = 83% (Typ.)**
- **Low Cost Common Source RF Package.**
- **Very High Breakdown for Improved Ruggedness.**
- **Low Thermal Resistance.**
- **Nitride Passivated Die for Improved Reliability.**

MAXIMUM RATINGS All Ratings: T_C = 25°C unless otherwise specified.

Symbol	Parameter	ARF444/445	UNIT
V_{DSS}	Drain-Source Voltage	900	Volts
V_{DGO}	Drain-Gate Voltage	900	
I_D	Continuous Drain Current @ T_C = 25°C	6.5	Amps
V_{GS}	Gate-Source Voltage	±30	Volts
P_D	Total Power Dissipation @ T_C = 25°C	208	Watts
$R_{\theta JC}$	Junction to Case	0.60	°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)	900			Volts
V_{DS}(ON)	On State Drain Voltage ① (I_D(ON) = 3.5A, V_{GS} = 10V)			7	
I_{DSS}	Zero Gate Voltage Drain Current (V_{DS} = V_{DSS}, V_{GS} = 0V)			250	μA
	Zero Gate Voltage Drain Current (V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125°C)			1000	
I_{GSS}	Gate-Source Leakage Current (V_{GS} = ±30V, V_{DS} = 0V)			±100	nA
g_{fs}	Forward Transconductance (V_{DS} = 25V, I_D = 3.5A)	4	5.7		mhos
V_{GS}(TH)	Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 50mA)	2		5	Volts

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

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

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405 S.W. Columbia Street **Bend, Oregon 97702-1035** **Phone: (541) 382-8028** **FAX: (541) 388-0364**
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DYNAMIC CHARACTERISTICS

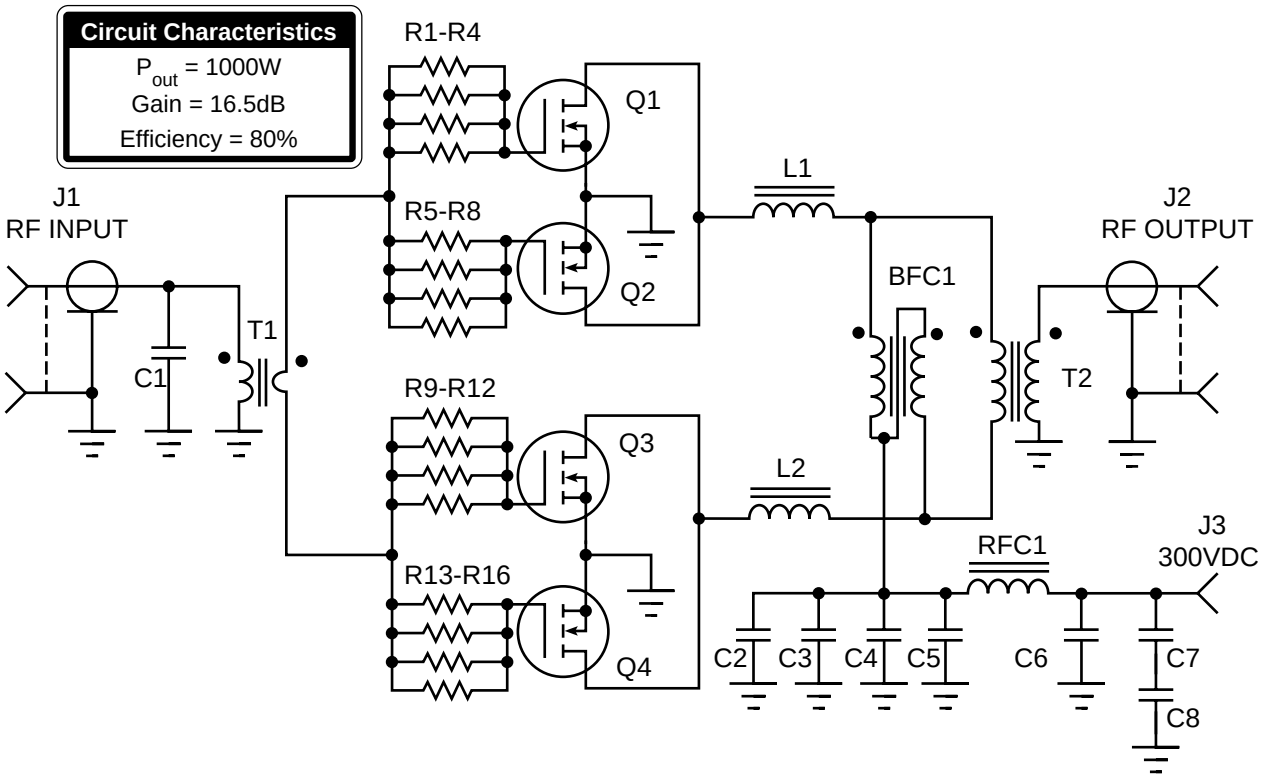
Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 300V f = 1 MHz		1500	1800	pF
C_{oss}	Output Capacitance			90	130	
C_{rss}	Reverse Transfer Capacitance			28	50	

FUNCTIONAL CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
G_{PS}	Common Source Amplifier Power Gain	V_{DD} = 300V V_{GS} = 0V P_{out} = 300W f = 13.56MHz	17	18.7		dB
η	Drain Efficiency			83		%
Ψ	Electrical Ruggedness VSWR 30:1		No Degradation in Output Power			

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

TYPICAL 13.56 MHz, 1000 WATT PUSH-PULL CLASS 'C' POWER AMPLIFIER CIRCUIT



Parts List

R1-R16 = 4.7Ω 1W
C2-C6 = 0.1μF Disk Ceramic
Q1, Q3 = ARF444
L1, L2 = 0.37μH: 6T, #18AWG, ID=0.438
C1 = 200pF Chip Capacitor
C7, C8 = 0.01 Disk Ceramic
Q2, Q4 = ARF445
RFC1 = 2T, #14 PTFE coated twisted pair on a Fair-Rite #2643665702 shield bead, μ_i=850
T1 = 9:1 (Z) conventional transformer; 3:1 (T), #18 stranded PTFE coated wire on two Fair-Rite #2643540002, μ_i=850
T2 = 1:1 (Z) conventional transformer; 2:2 (T), #14 stranded PTFE coated wire on two stacks of three Fair-Rite #2643102002 shielded bead, μ_i=850
BFC1 = 6T, #18 Twisted pair stranded PTFE coated wire on three stacked Indiana General Toroid #F624-19-Q1 μi=125

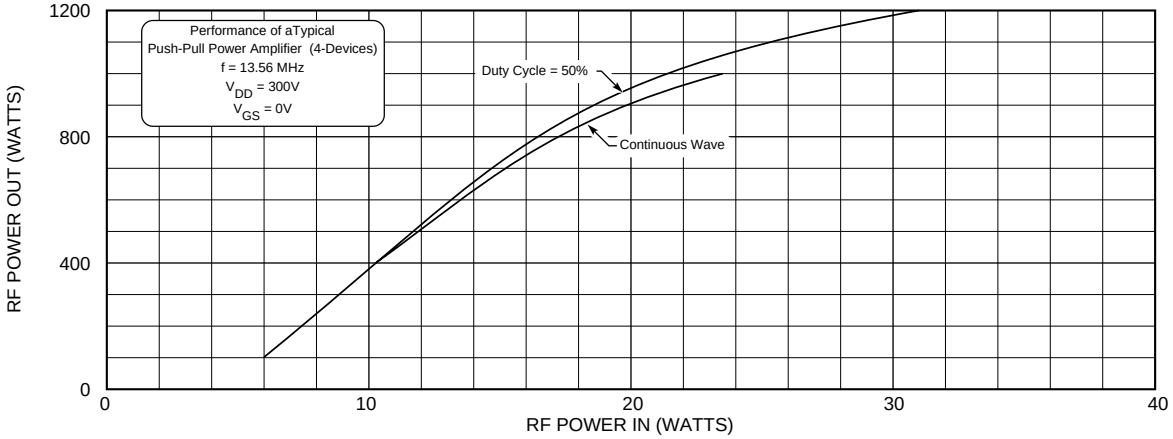


Figure 1, RF Power Out vs RF Power In

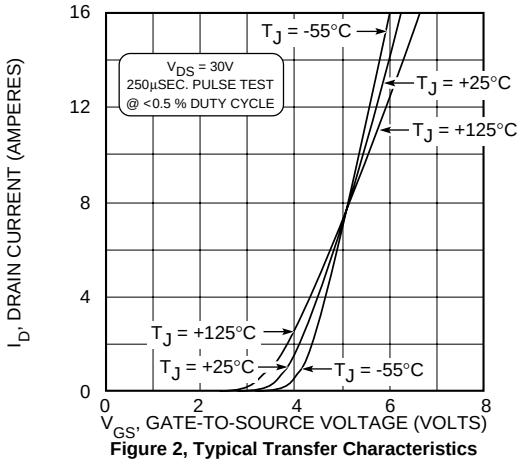


Figure 2, Typical Transfer Characteristics

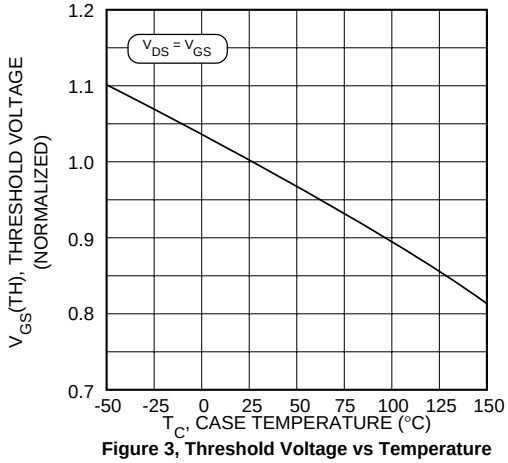


Figure 3, Threshold Voltage vs Temperature

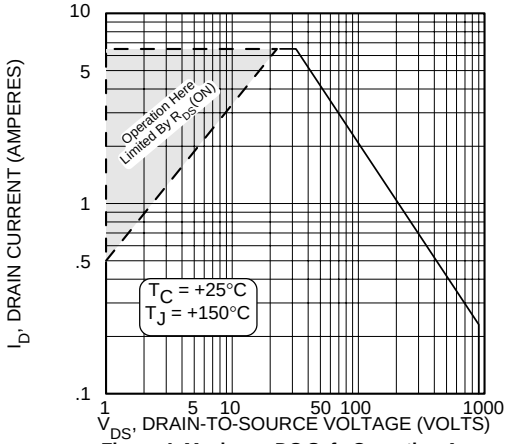


Figure 4, Maximum DC Safe Operating Area

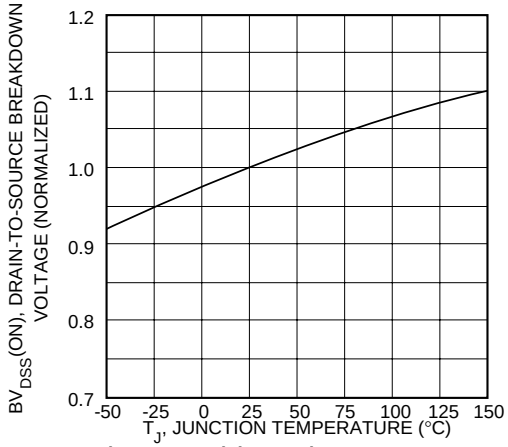


Figure 5, Breakdown Voltage vs Temperature

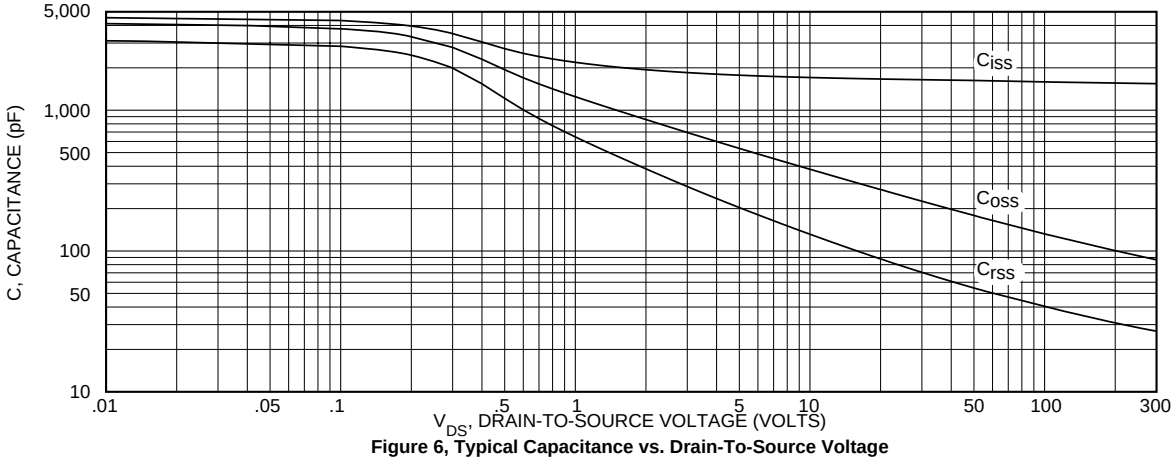
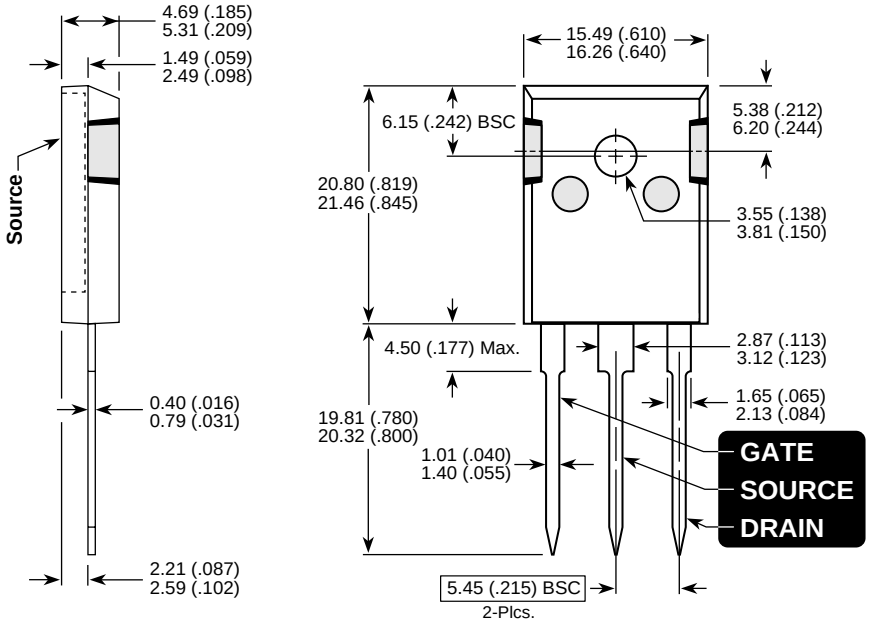


Figure 6, Typical Capacitance vs. Drain-To-Source Voltage

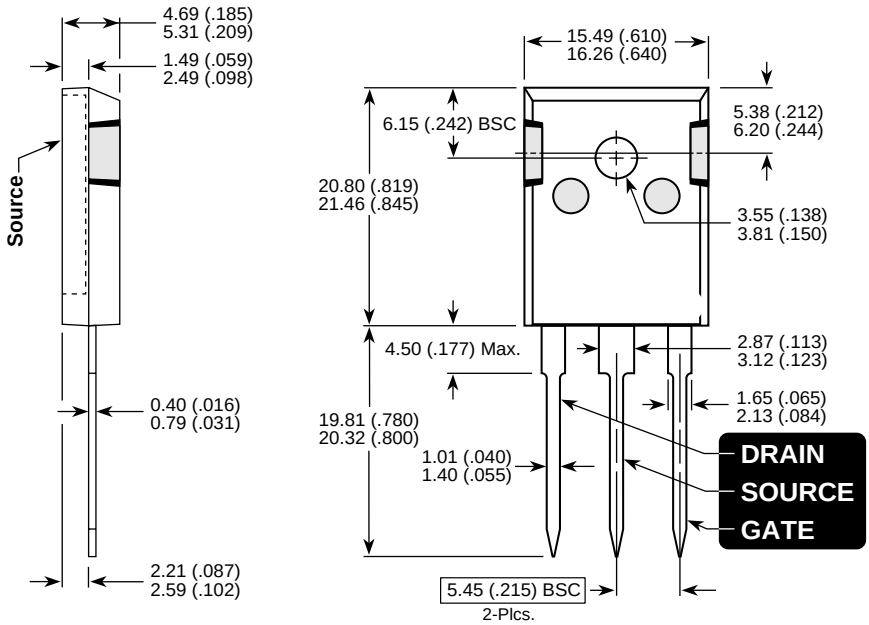
TO-247AD Package Outline

ARF444



Dimensions in Millimeters and (Inches)

ARF445



Dimensions in Millimeters and (Inches)

NOTE: The ARF444 and ARF445 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.

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