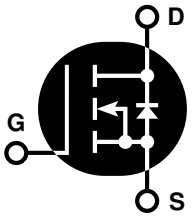
Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

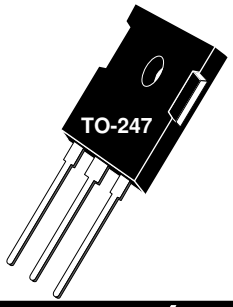
With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





ADVANCED POWER TECHNOLOGY®

ARF440 125W 50V 13.56MHz
ARF441 125W 50V 13.56MHz

THE ARF440 PIN-OUTS ARE MIRROR IMAGE OF THE ARF441.

RF OPERATION (1-15MHz)

POWER MOS IV®

N-CHANNEL ENHANCEMENT MODE RF POWER MOSFET

The ARF440 and ARF441 comprise a symmetric pair of RF power transistors designed for narrow-band push-pull commercial, medical and industrial RF power amplifier applications.

- **Specified 50 Volt, 13.56 MHz Characteristics:**
- **Output Power = 125 Watts.**
- **Gain = 21dB (Typ.)**
- **Efficiency = 63% (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	ARF440/441	UNIT
V_{DSS}	Drain-Source Voltage	150	Volts
V_{DGO}	Drain-Gate Voltage	150	
I_D	Continuous Drain Current @ T_C = 25°C	11	Amps
V_{GS}	Gate-Source Voltage	±30	Volts
P_D	Total Power Dissipation @ T_C = 25°C	167	Watts
$R_{\theta JC}$	Junction to Case	0.75	°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)	150			Volts
V_{DS}(ON)	On State Drain Voltage ① (I_D(ON) = 10A, V_{GS} = 10V)			6	
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} = 10V, I_D = 5.5A)	4	5		mhos
V_{GS}(TH)	Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 200mA)	2		5	Volts

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

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

USA
405 S.W. Columbia Street **Bend, Oregon 97702-1035** **Phone: (541) 382-8028** **FAX: (541) 388-0364**
EUROPE
Avenue J.F. Kennedy Bât B4 Parc Cadéra Nord **F-33700 Merignac - France** **Phone: (33) 5 57 92 15 15** **FAX: (33) 5 56 47 97 61**

050-4406 Rev C

DYNAMIC CHARACTERISTICS

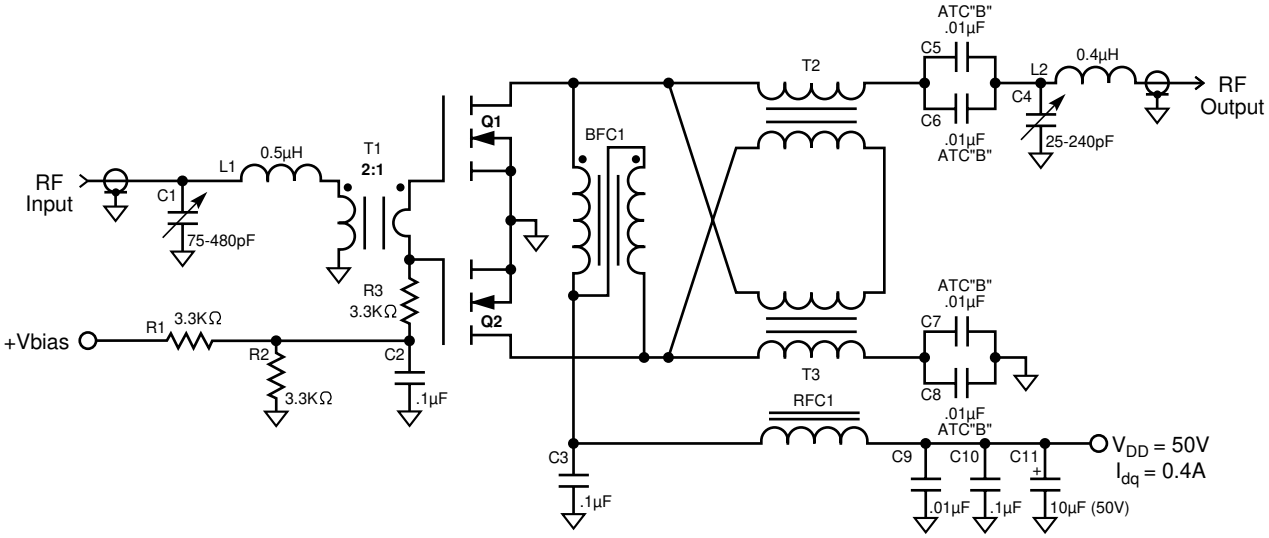
Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 50V f = 1 MHz		755	900	pF
C_{oss}	Output Capacitance			155	215	
C_{rss}	Reverse Transfer Capacitance			55	90	

FUNCTIONAL CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
G_{PS}	Common Source Amplifier Power Gain	V_{DD} = 50V P_{out} = 125W I_{DQ} = 200mA f = 13.56MHz	18	21		dB
η	Drain Efficiency			63		%
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, 250 WATT PUSH-PULL POWER AMPLIFIER CIRCUIT



Parts List

C1 = 75-480pF Compression Mica
C2, C3 & C10 = .1μF @ 50V, Novacap #1210B104K500N
C4 = 25-240pF Compression Mica
C5, C6, C7, C8 & C9 = .01μF @ 50V, Novacap #1210B103K500N
C11 = 10μF @ 50V Electrolytic
R1, R2 & R3 = 1KΩ, 5%, 1/4W, Carbon
Q1 = ARF440
Q2 = ARF441

L1 = 7.5 T of #18AWG, ID = .438", L = 0.5μH
L2 = 6.5 T of #18AWG, ID = .438", L = 0.4μH

BFC1 = Balanced DC Feed Choke; 7 T of #18 stranded PTFE twisted pair on an Indiana General #F624-19-Q1 toroid. μi = 125
RFC1 = 2 T of #18 stranded PTFE on a Fair-Rite #2677006301 shield bead. μi = 2000

T1 = 4:1 Z Conventional Transformer; 2:1 T of #22 stranded PTFE on a Fair-Rite #2843000202 Balun Core. μi = 850
T2 & 3 = 1:4 Z Transmission Line Transformer; 6 T of mini 25Ω PTFE coax on a Fair-Rite #2643102002 shield bead. μi = 2000

PCB = .062" G10 Epoxy Glass.

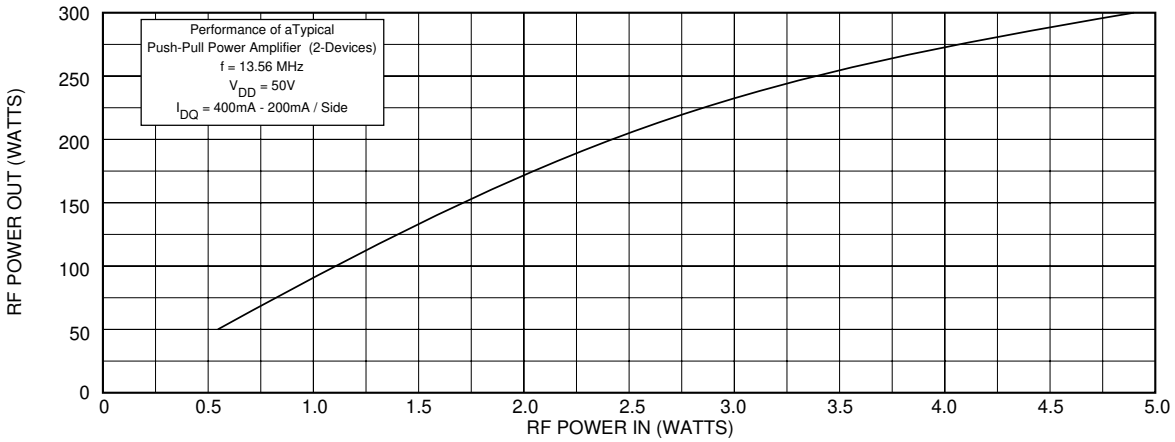


Figure 1, RF Power Out vs RF Power In

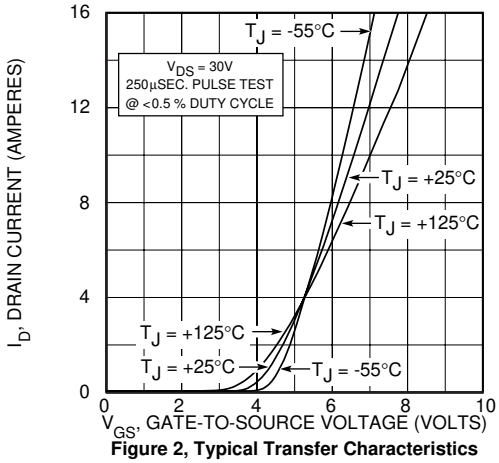


Figure 2, Typical Transfer Characteristics

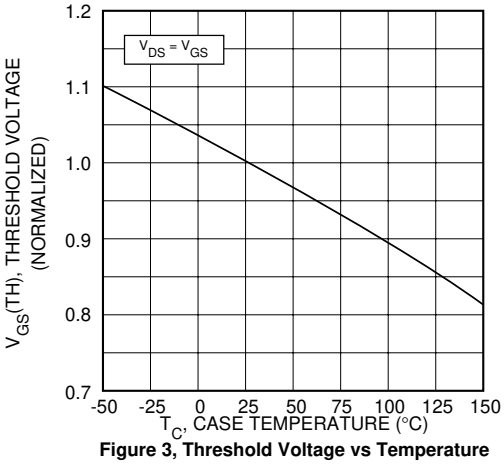


Figure 3, Threshold Voltage vs Temperature

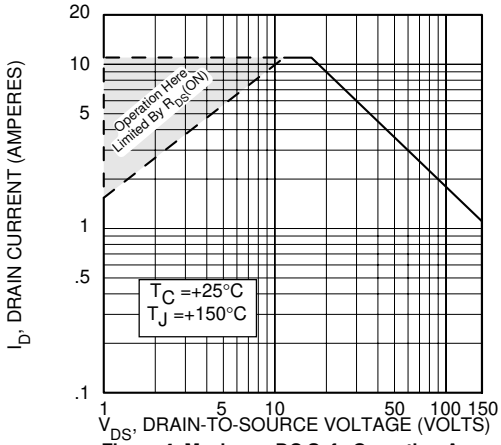


Figure 4, Maximum DC Safe Operating Area

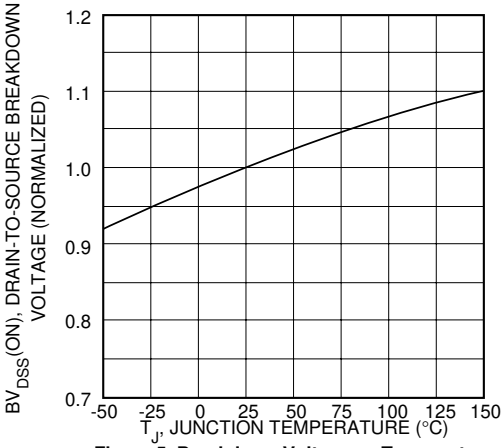


Figure 5, Breakdown Voltage vs Temperature

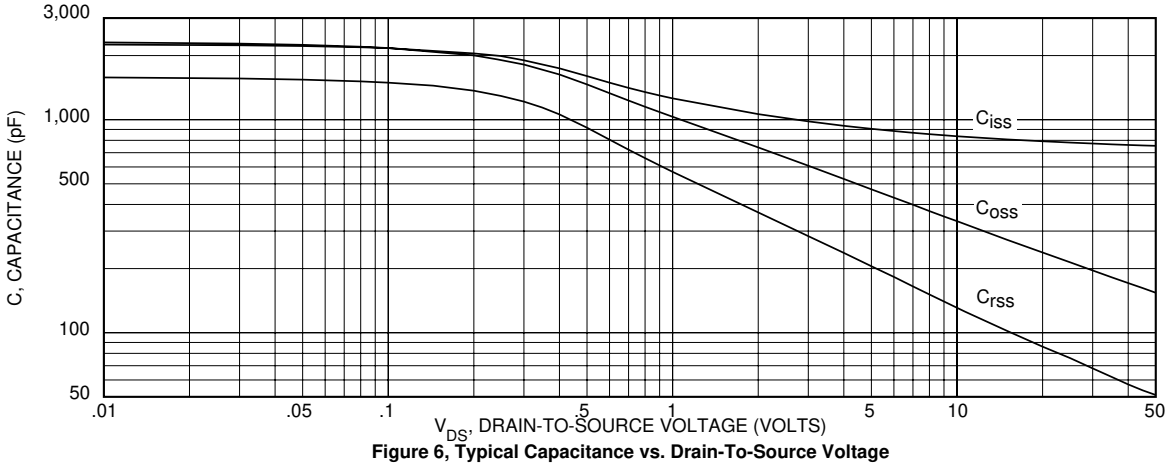
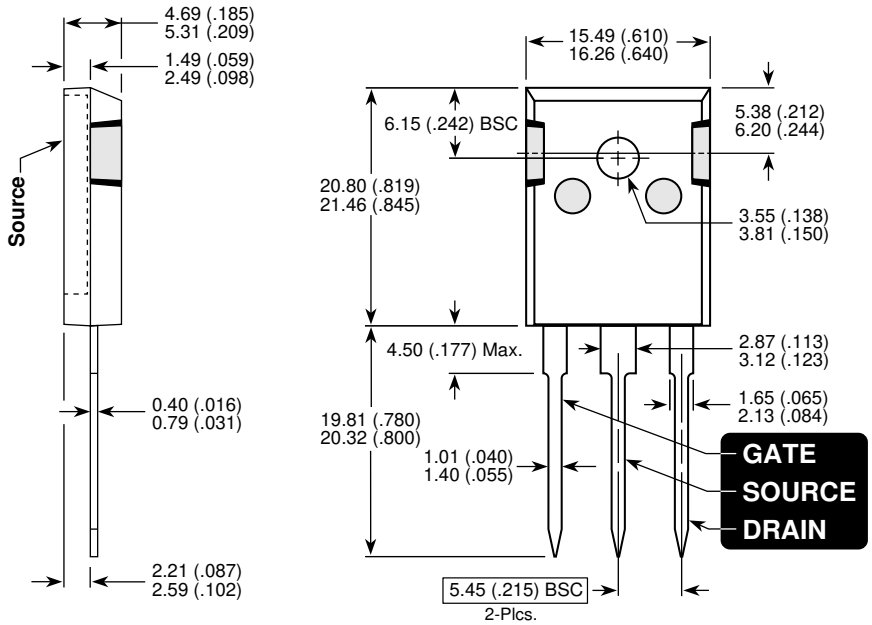


Figure 6, Typical Capacitance vs. Drain-To-Source Voltage

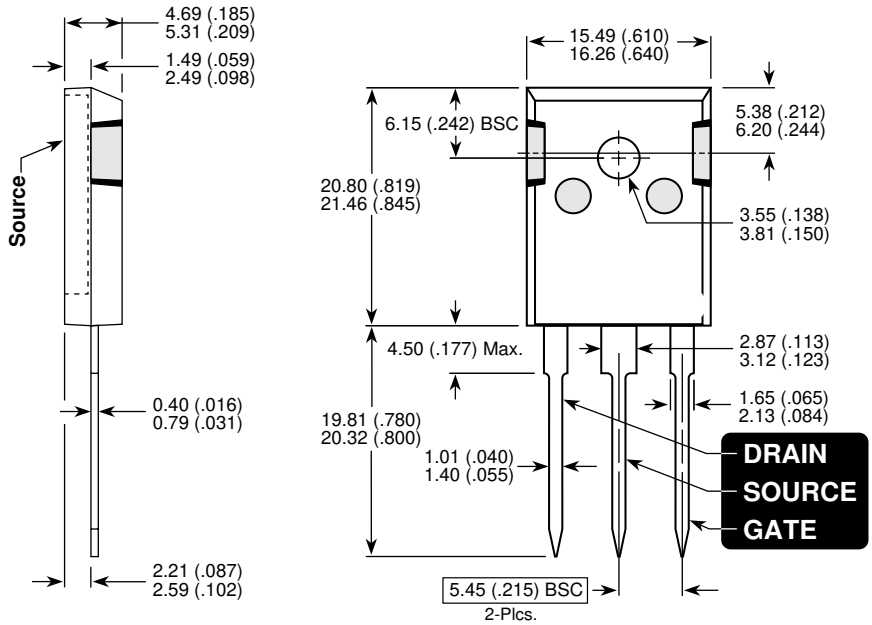
TO-247AD Package Outline

ARF440



Dimensions in Millimeters and (Inches)

ARF441



Dimensions in Millimeters and (Inches)

NOTE: The ARF440 and ARF441 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.

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

USA
405 S.W. Columbia Street Bend, Oregon 97702-1035 Phone: (541) 382-8028 FAX: (541) 388-0364
EUROPE
Avenue J.F. Kennedy Bât B4 Parc Cadéra Nord F-33700 Merignac - France Phone: (33) 5 57 92 15 15 FAX: (33) 5 56 47 97 61

050-4406 Rev C