

# The RF Line

## NPN Silicon

### RF Power Transistor

Designed for 12.5 volt low band VHF large-signal power amplifier applications in commercial and industrial FM equipment.

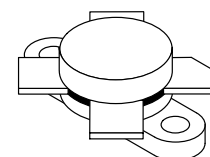
- Specified 12.5 V, 50 MHz Characteristics —
  - Output Power = 70 W
  - Minimum Gain = 11 dB
  - Efficiency = 50%
- Load Mismatch Capability at High Line and RF Overdrive

**MRF492**

**70 W, 50 MHz  
RF POWER  
TRANSISTOR  
NPN SILICON**

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	18	Vdc
Collector-Base Voltage	$V_{CBO}$	36	Vdc
Emitter-Base Voltage	$V_{EBO}$	4.0	Vdc
Collector Current — Continuous	$I_C$	20	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (1) Derate above $25^\circ\text{C}$	$P_D$	250 1.43	Watts W/ $^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$



CASE 211-11, STYLE 1

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (2)	$R_{\theta JC}$	0.7	$^\circ\text{C}/\text{W}$

#### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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#### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ( $I_C = 100$ mAdc, $I_B = 0$ )	$V_{(BR)CEO}$	18	—	—	Vdc
Collector-Emitter Breakdown Voltage ( $I_C = 50$ mAdc, $V_{BE} = 0$ )	$V_{(BR)CES}$	36	—	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 10$ mAdc, $I_C = 0$ )	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ( $V_{CE} = 13.6$ Vdc, $V_{BE} = 0$ )	$I_{CES}$	—	—	20	mAdc

#### ON CHARACTERISTICS

DC Current Gain ( $I_C = 5.0$ Adc, $V_{CE} = 5.0$ Vdc)	$h_{FE}$	10	—	150	—
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#### DYNAMIC CHARACTERISTICS

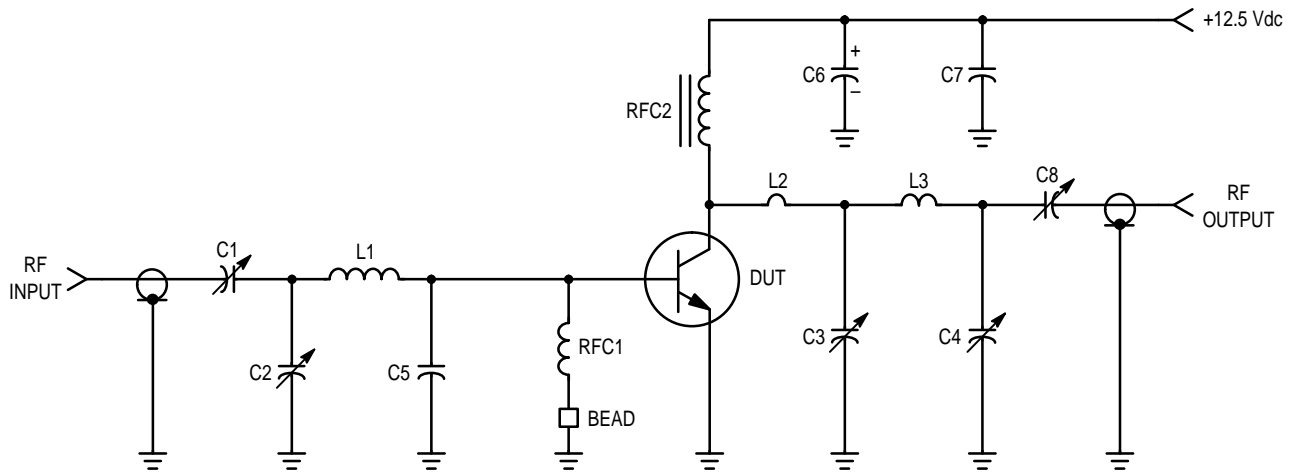
Output Capacitance ( $V_{CB} = 15$ Vdc, $I_E = 0$ , $f = 1.0$ MHz)	$C_{ob}$	—	275	450	pF
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#### FUNCTIONAL TESTS

Common-Emitter Amplifier Power Gain ( $V_{CC} = 12.5$ Vdc, $P_{out} = 70$ W, $f = 50$ MHz)	$G_{PE}$	11	13	—	dB
Collector Efficiency ( $V_{CC} = 12.5$ Vdc, $P_{out} = 70$ W, $f = 50$ MHz)	$\eta$	50	—	—	%

#### NOTES:

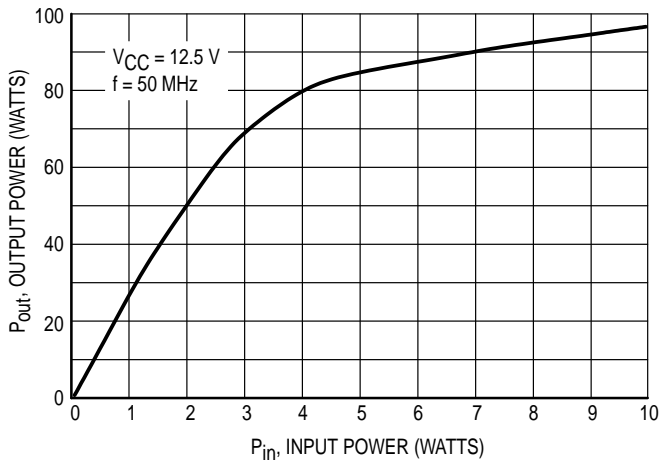
- These devices are designed for RF operation. The total device dissipation rating applies only when the devices are operated as RF amplifiers.
- Thermal Resistance is determined under specified RF operating conditions by infrared measurement techniques.



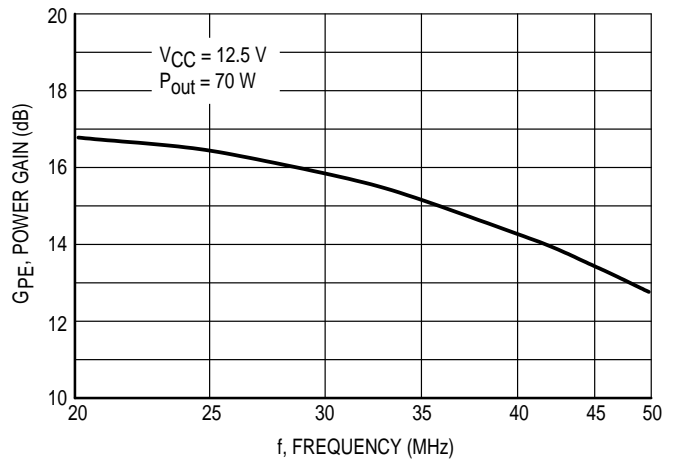
C1, C8 — 9.0–180 pF, Arco 463  
 C2, C3, C4 — 80–480 pF, Arco 466  
 C5 — 1000 pF, 350 V, Unelco  
 C6 — 10  $\mu$ F, 25 Vdc  
 C7 — 0.01  $\mu$ F, Ceramic  
 RFC1 — 10  $\mu$ H Molded Choke

RFC2 — 12 Turns, #16 AWG, Enameled Wire Closewound  
 on a 2.0 W Carbon Resistor  
 L1 — 2 Turns, #18 AWG Enameled Wire, 0.4" ID, 0.15" Long  
 L2 — Loop, #12 AWG Wire, 0.6" High, 0.4" Wide  
 L3 — 2 Turns, #12 AWG Wire, ID 0.4", 0.25" Long  
 Bead — Ferrite Bead Ferroxcube #56–590–65/3B

**Figure 1. 50 MHz Test Circuit**



**Figure 2. Output Power versus Input Power**



**Figure 3. Power Gain versus Frequency**

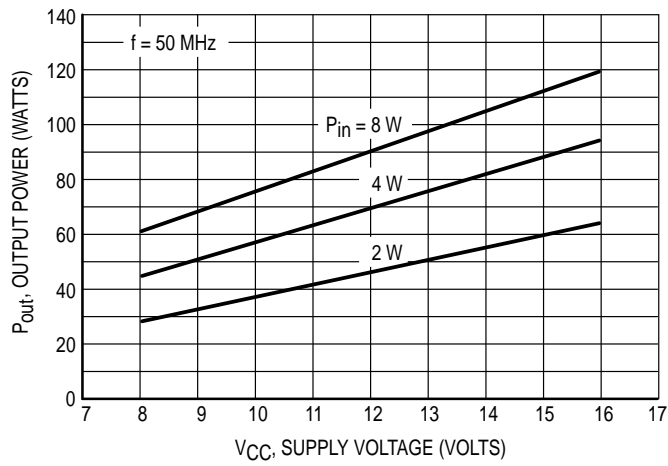


Figure 4. Output Power versus Supply Voltage

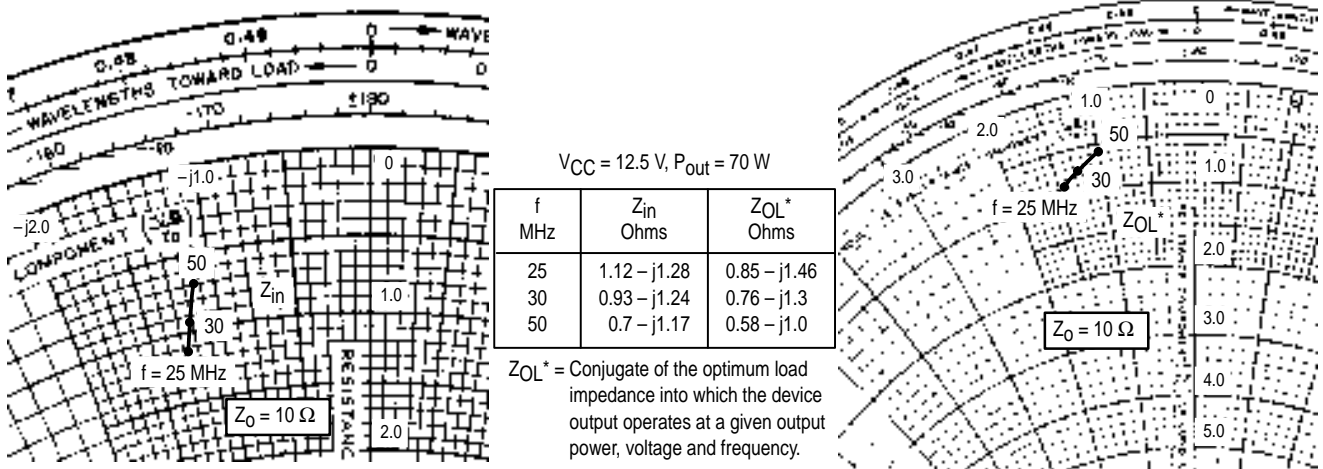
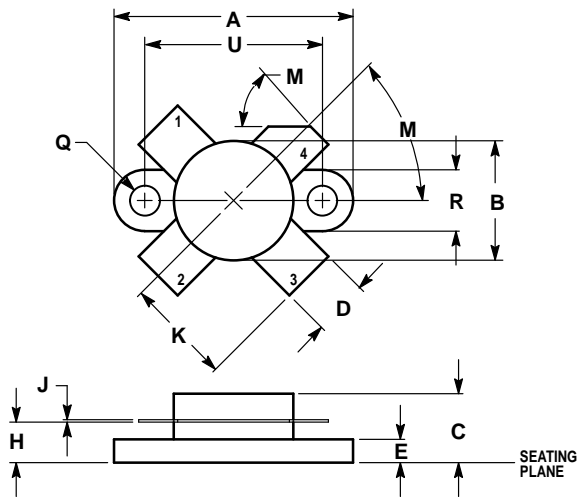


Figure 5. Series Equivalent Input/Output Impedances

## PACKAGE DIMENSIONS




- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.960	0.990	24.39	25.14
B	0.465	0.510	11.82	12.95
C	0.229	0.275	5.82	6.98
D	0.216	0.235	5.49	5.96
E	0.084	0.110	2.14	2.79
H	0.144	0.178	3.66	4.52
J	0.003	0.007	0.08	0.17
K	0.435	—	11.05	—
M	45°NOM		45°NOM	
Q	0.115	0.130	2.93	3.30
R	0.246	0.255	6.25	6.47
U	0.720	0.730	18.29	18.54

- STYLE 1:  
 PIN 1. EMITTER  
 2. BASE  
 3. EMITTER  
 4. COLLECTOR

**CASE 211-11  
 ISSUE N**

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**How to reach us:**

**USA/EUROPE:** Motorola Literature Distribution;  
 P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,  
 6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

**MFAX:** RMFAX0@email.sps.mot.com - TOUCHTONE (602) 244-6609  
**INTERNET:** http://Design-NET.com

**HONG KONG:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



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