



Island Labs

**MRF237**

**The RF Line**

**NPN SILICON RF POWER TRANSISTOR**

... designed for 12.5 Volt large-signal power amplifier applications in communication equipment operating to 225 MHz.

- Specified 12.5 Volt, 175 MHz Characteristics –  
Output Power = 4.0 Watts  
Minimum Gain = 12 dB  
Efficiency = 50%
- Characterized With Series Equivalent Large-Signal Impedance Parameters
- Grounded Emitter TO-39 Package for High Gain and Excellent Heat Dissipation
- Replaces Medium Power Stud Mount Devices

**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CE0}$	18	Vdc
Collector-Base Voltage	$V_{CBO}$	36	Vdc
Emitter-Base Voltage	$V_{EBO}$	4.0	Vdc
Collector Current – Continuous	$I_C$	1.0	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	8.0	Watts mW/ $^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +200	$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	22	$^\circ\text{C}/\text{W}$

**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 ( $I_C = 10 \text{ mAdc}$ , $I_B = 0$ )	$V_{(BR)CEO}$	18	–	–	Vdc
Collector-Emitter Breakdown Voltage ( $I_C = 5.0 \text{ mAdc}$ , $V_{BE} = 0$ )	$V_{(BR)CES}$	36	–	–	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 1.0 \text{ mAdc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	4.0	–	–	Vdc
Collector Cutoff Current ( $V_{CB} = 15 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	–	–	0.25	mAdc

**ON CHARACTERISTICS**

DC Current Gain ( $I_C = 250 \text{ mAdc}$ , $V_{CE} = 5.0 \text{ Vdc}$ )	$h_{FE}$	5.0	–	–	–
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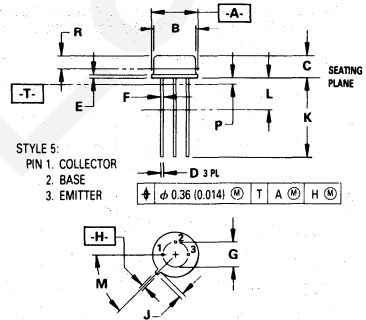
**DYNAMIC CHARACTERISTICS**

Output Capacitance ( $V_{CB} = 15 \text{ Vdc}$ , $I_E = 0$ , $f = 0.1 \text{ MHz}$ )	$C_{ob}$	–	15	20	pF
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**FUNCTIONAL TESTS**

Common-Emitter Amplifier Power Gain ( $P_{out} = 4.0 \text{ W}$ , $V_{CC} = 12.5 \text{ Vdc}$ , $f = 175 \text{ MHz}$ )	$G_{pE}$	12	14	–	dB
Collector Efficiency ( $P_{out} = 4.0 \text{ W}$ , $V_{CC} = 12.5 \text{ Vdc}$ , $f = 175 \text{ MHz}$ )	$\eta$	50	62	–	%

**4 W – 175 MHz**  
**RF POWER**  
**TRANSISTOR**  
**NPN SILICON**



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION J MEASURED FROM DIMENSION A MAXIMUM.
  4. DIMENSION B SHALL NOT VARY MORE THAN 0.25 (0.010) IN ZONE R. THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING.
  5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L. DIMENSION D APPLIES BETWEEN DIMENSION L AND K MINIMUM. LEAD DIAMETER IS UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.02	9.29	0.355	0.366
B	8.01	8.50	0.315	0.335
C	4.20	4.57	0.165	0.180
D	0.44	0.53	0.017	0.021
E	0.44	0.88	0.017	0.035
F	0.41	0.48	0.016	0.019
G	5.08 BSC		0.200 BSC	
H	0.72	0.86	0.028	0.034
J	0.74	1.01	0.029	0.040
K	12.70	19.05	0.500	0.750
L	6.35		0.250	
M	45° BSC		45° BSC	
P	–	1.27	–	0.050
R	2.54	–	0.100	–

**CASE 79-05**  
**TO-206AF**  
**(TO-39)**

FIGURE 1 - 175 MHz TEST CIRCUIT SCHEMATIC

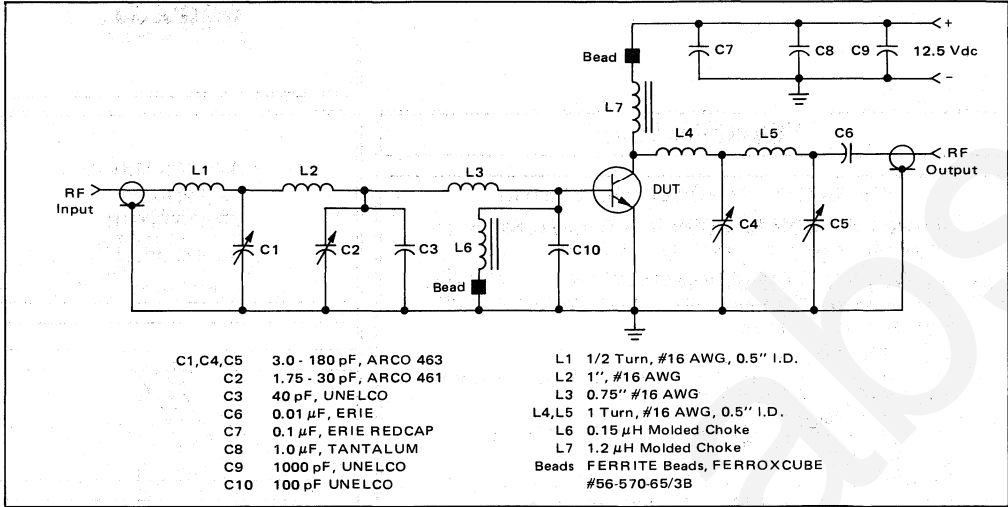


FIGURE 2 - OUTPUT POWER versus INPUT POWER

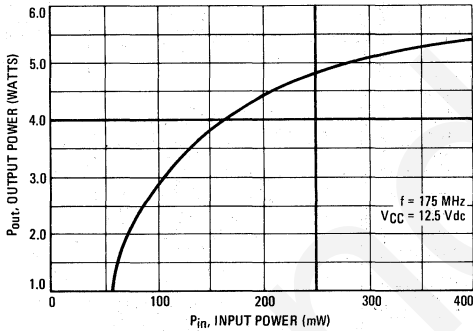


FIGURE 3 - OUTPUT POWER versus FREQUENCY

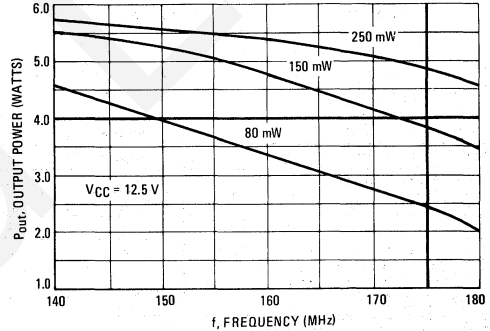


FIGURE 4 - OUTPUT POWER versus SUPPLY VOLTAGE

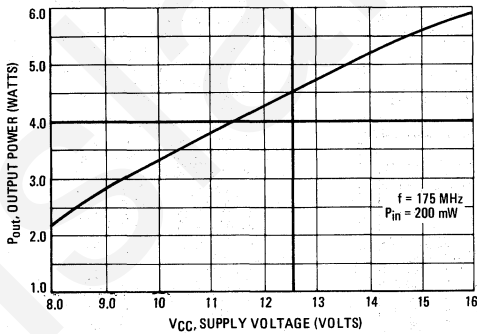
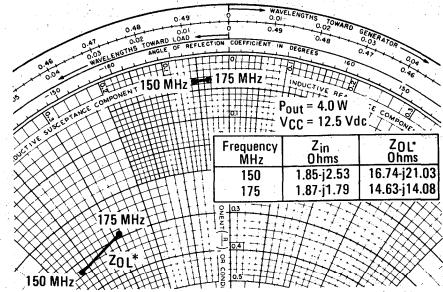


FIGURE 5 - SERIES EQUIVALENT IMPEDANCE



ZOL\* = Conjugate of the optimum load impedance into which the device output operates at a given output power, voltage and frequency.