

The RF Line

NPN Silicon

RF Power Transistor

... designed for 12.5 Volt VHF large-signal power amplifier applications required in commercial and industrial equipment operating to VHF frequencies.

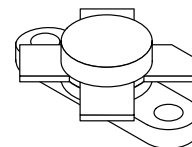
- Specified 12.5 Volt, 175 MHz Characteristics —
 - Output Power = 40 W
 - Power Gain = 4.5 dB Min
 - Efficiency = 70% Min

MRF224

**40 W, 175 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	7.0	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (2) Derate above 25°C	P_D	80 0.46	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +200	$^\circ\text{C}$
Stud Torque (1)	—	6.5	in. lb.



CASE 211-07, STYLE 1

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 ($I_C = 100 \text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	18	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 20 \text{ mAdc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \text{ mAdc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 15 \text{ Vdc}$, $V_{BE} = 0$, $T_C = +55^\circ\text{C}$)	I_{CES}	—	—	10	mAdc
Collector Cutoff Current ($V_{CB} = 15 \text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	—	2.5	mAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 1.0 \text{ Adc}$, $V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	5.0	—	—	—
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DYNAMIC CHARACTERISTICS

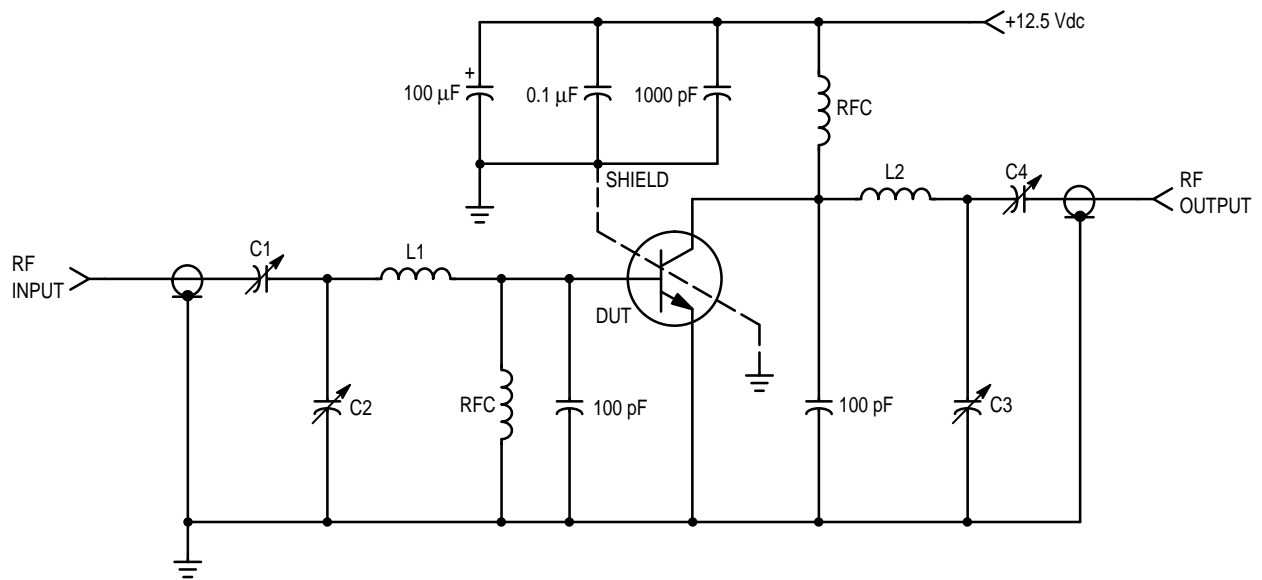
Output Capacitance ($V_{CB} = 15 \text{ Vdc}$, $I_E = 0$, $f = 0.1 \text{ MHz}$)	C_{ob}	—	170	200	pF
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FUNCTIONAL TESTS

Common-Emitter Amplifier Power Gain ($P_{out} = 40 \text{ W}$, $V_{CC} = 12.5 \text{ Vdc}$, $f = 175 \text{ MHz}$)	G_{PE}	4.5	—	—	dB
Collector Efficiency ($P_{out} = 40 \text{ W}$, $V_{CC} = 12.5 \text{ Vdc}$, $f = 175 \text{ MHz}$)	η	70	—	—	%

NOTES:

- For repeated assembly use 5 in. lb.
- These devices are designed for RF operation. The total device dissipation rating applies only when the devices are operated as RF amplifiers.



C1, C2, C3, C4 — 5.0–80 pF ARCO 462
 L1 — Straight Wire, #14 AWG, 1–3/8" Long
 L2 — 1 Turn, #14 AWG, 3/8" ID, Length Plus Leads = 1"
 RFC — VK200–20/4B, FERROXCUBE

Figure 1. 175 MHz Test Circuit

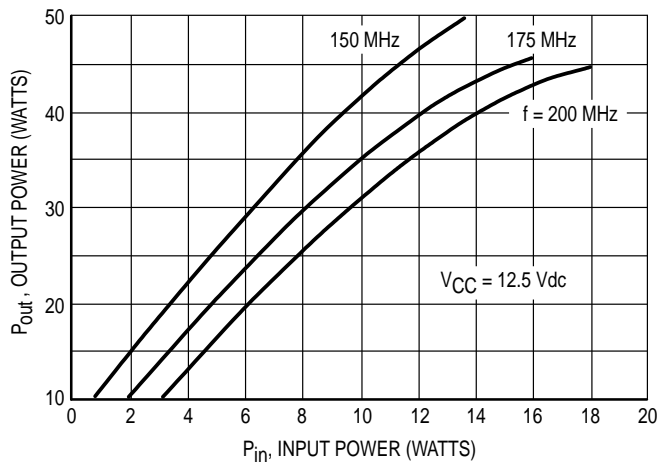


Figure 2. Output Power versus Input Power

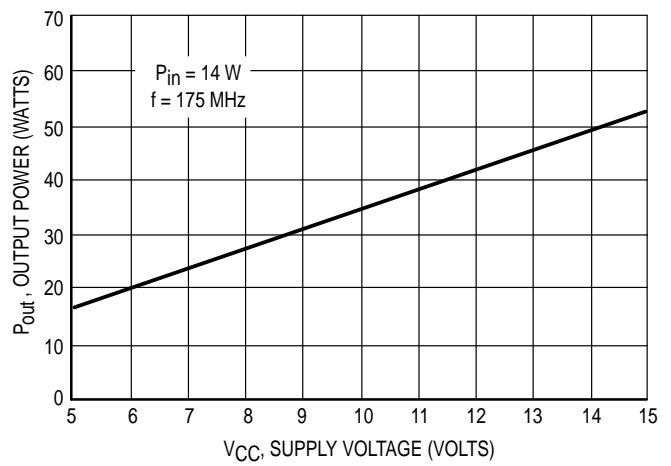
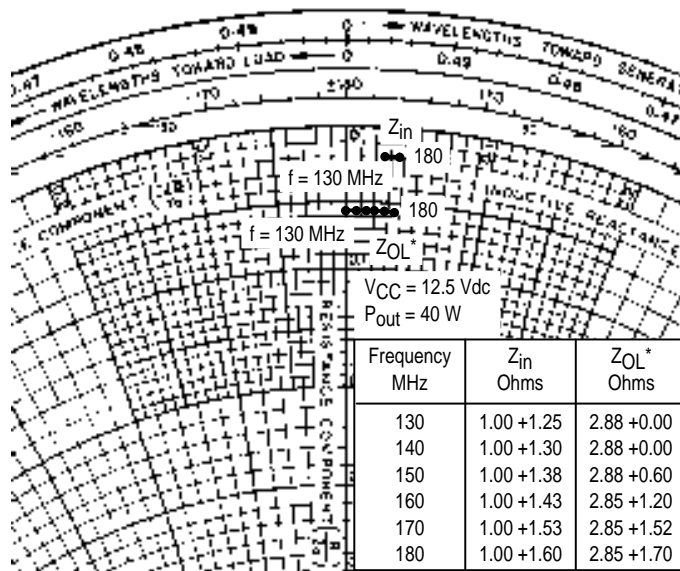


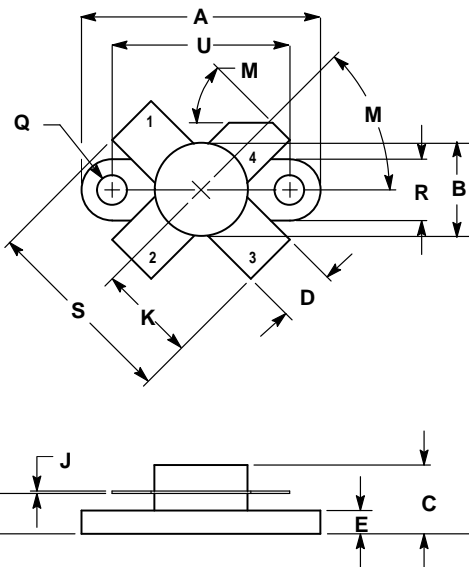
Figure 3. Output Power versus Supply Voltage



Z_{OL}^* = Conjugate of the optimum load impedance into which the device output operates at a given output power, voltage and frequency.

Figure 4. Series Equivalent Impedance

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	0.370	0.390	9.40	9.90
C	0.229	0.281	5.82	7.13
D	0.215	0.235	5.47	5.96
E	0.085	0.105	2.16	2.66
H	0.150	0.108	3.81	4.57
J	0.004	0.006	0.11	0.15
K	0.395	0.405	10.04	10.28
M	40 °	50 °	40 °	50 °
Q	0.113	0.130	2.88	3.30
R	0.245	0.255	6.23	6.47
S	0.790	0.810	20.07	20.57
U	0.720	0.730	18.29	18.54

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

CASE 211-07
ISSUE N

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