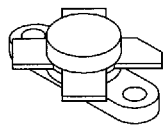
The RF Line
NPN Silicon RF Power Transistor

. . . 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



CASE 211–07, STYLE 1

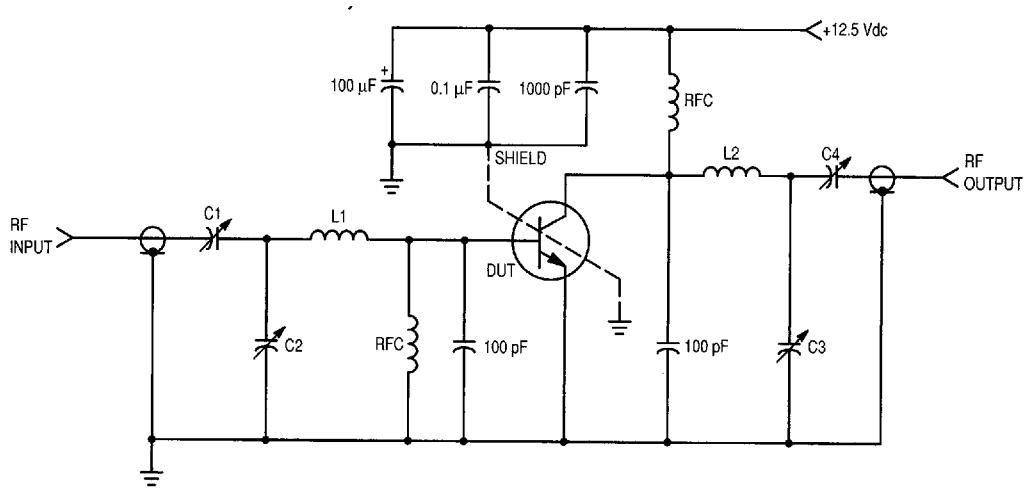
MAXIMUM RATINGS

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°C (2) Derate above 25°C	P_D	80 0.46	Watts W/°C
Storage Temperature Range	T_{stg}	−65 to +200	°C
Stud Torque (1)	—	6.5	in. lb.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 100 mAdc, I_B = 0)	$V_{(BR)CEO}$	18	—	—	Vdc
Collector–Emitter Breakdown Voltage (I_C = 20 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} = 15 Vdc, V_{BE} = 0, T_C = +55°C)	I_{CES}	—	—	10	mAdc
Collector Cutoff Current (V_{CB} = 15 Vdc, I_E = 0)	I_{CBO}	—	—	2.5	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1.0 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	5.0	—	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 15 Vdc, I_E = 0, f = 0.1 MHz)	C_{ob}	—	170	200	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (P_{out} = 40 W, V_{CC} = 12.5 Vdc, f = 175 MHz)	G_{PE}	4.5	—	—	dB
Collector Efficiency (P_{out} = 40 W, V_{CC} = 12.5 Vdc, f = 175 MHz)	η	70	—	—	%

NOTES:
1. For repeated assembly use 5 in. lb.
2. 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

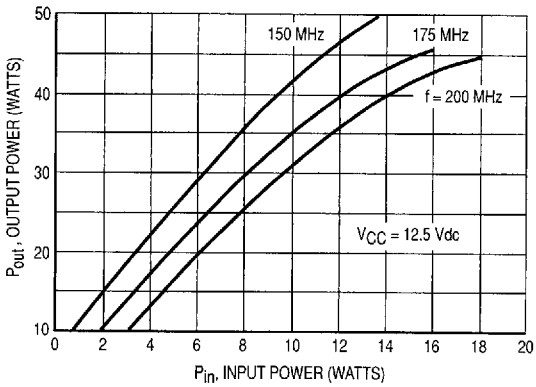


Figure 2. Output Power versus Input Power

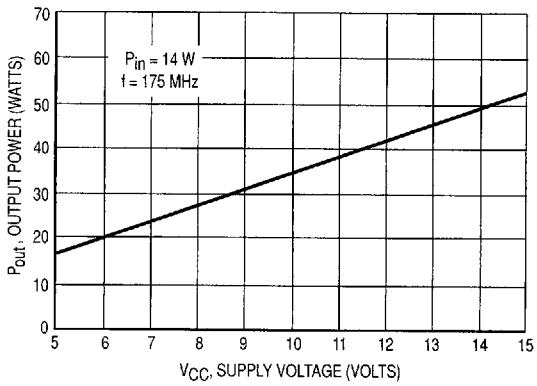
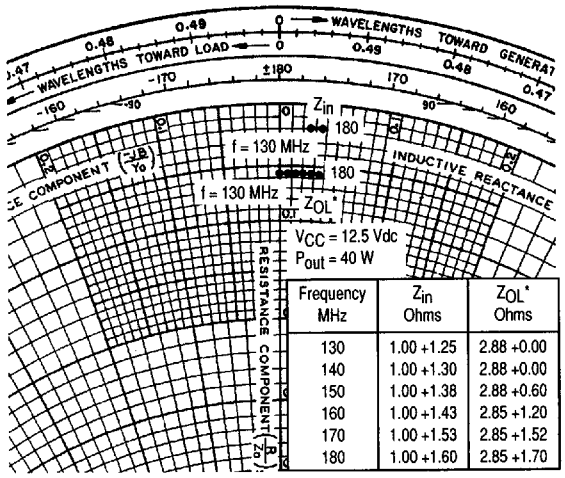


Figure 3. Output Power versus Supply Voltage



Frequency MHz	Z_{in} Ohms	Z_{OL}^* Ohms
130	1.00 +1.25	2.88 +0.00
140	1.00 +1.30	2.88 +0.00
150	1.00 +1.38	2.88 +0.60
160	1.00 +1.43	2.85 +1.20
170	1.00 +1.53	2.85 +1.52
180	1.00 +1.60	2.85 +1.70

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