

MRF604

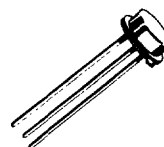
The RF Line

NPN SILICON RF POWER TRANSISTOR

... designed for 12.5 Volt VHF large-signal amplifier applications in industrial equipment with restricted available space.

- Specified 12.5 Volt, 175 MHz Characteristics —
Output Power = 1.0 Watt
Minimum Gain = 10 dB
Efficiency = 50%

1.0 W — 175 MHz
RF POWER
TRANSISTOR
NPN SILICON



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	20	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	2.0	Vdc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	2.0 11.0	Watts mW/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +200	$^\circ\text{C}$

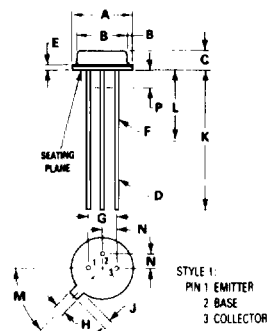
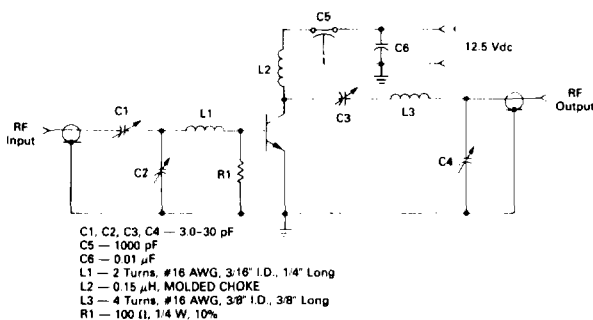


FIGURE 1 — 175 MHz TEST CIRCUIT SCHEMATIC



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	1.65	2.16	0.065	0.085
D	0.406	0.533	0.016	0.021
E	—	1.02	—	0.040
F	0.305	0.483	0.012	0.019
G	2.54 BSC		0.100 BSC	
H	0.914	1.17	0.036	0.046
J	0.711	1.22	0.028	0.048
K	12.70	—	0.500	—
L	6.35	—	0.250	—
M	45° BSC		45° BSC	
N	1.27 BSC		0.050 BSC	
P	—	1.27	—	0.050

CASE 26-03
TO-206AB
(TO-46)

MRF604

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 5.0\text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	20	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{Adc}$, $I_E = 0$)	$V_{(BR)CBO}$	40	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 12\text{ Vdc}$, $I_B = 0$)	I_{CEO}	—	—	1.0	mAdc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 50\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	20	80	200	—
DYNAMIC CHARACTERISTICS					
Current Gain — Bandwidth Product ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 200\text{ MHz}$)	f_T	800	—	—	MHz
Output Capacitance ($V_{CB} = 12.5\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	—	3.5	pF
FUNCTIONAL TESTS (Figure 1)					
Common-Emitter Amplifier Power Gain ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 1.0\text{ W}$, $f = 175\text{ MHz}$)	G_{pE}	10	—	—	dB
Collector Efficiency ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 1.0\text{ W}$, $f = 175\text{ MHz}$)	η	50	—	—	%
Series Equivalent Input Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 1.0\text{ W}$, $f = 175\text{ MHz}$)	Z_{in}	—	7.5-j 14	—	Ohms
Series Equivalent Output Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 1.0\text{ W}$, $f = 175\text{ MHz}$)	Z_{out}	—	47-j 60	—	Ohms

FIGURE 2 — OUTPUT POWER versus INPUT POWER

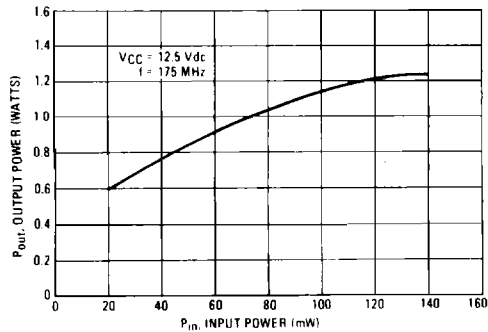


FIGURE 3 — CURRENT-GAIN BANDWIDTH PRODUCT

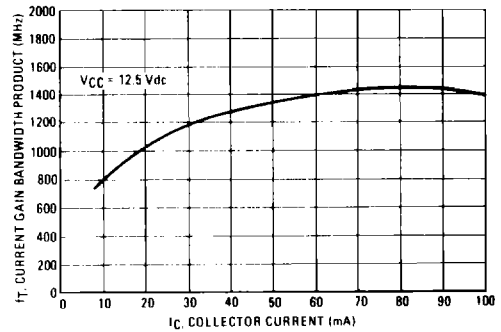


FIGURE 4 — OUTPUT CAPACITANCE versus COLLECTOR BASE VOLTAGE

