

**MRF5177**  
**MRF5177A**

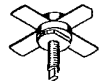
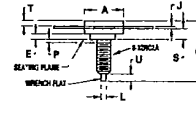
**The RF Line**

**NPN SILICON RF POWER TRANSISTOR**

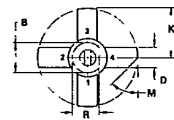
... designed for VHF/UHF power amplifier applications. This device is optimized for rugged performance in 225-400 MHz communications equipment.

- Performance @ 400 MHz, 28 Vdc –  
 Power Output = 30 W (Min)  
 Gain = 6.0 dB (Min)
- Isothermal Design for Rugged Performance –  
 Tested at 30:1 VSWR through all phase angles

**30 W, 400 MHz**  
**RF POWER TRANSISTOR**  
**NPN SILICON**



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



MILLIMETERS		INCHES		
DIM	MIN	MAX	MIN	MAX
A	9.40	9.78	0.372	0.385
B	8.15	8.38	0.320	0.330
C	12.02	20.97	0.475	0.829
D	5.48	5.97	0.215	0.235
E	1.78	—	0.070	—
J	0.08	0.18	0.003	0.007
K	12.45	—	0.490	—
L	1.40	1.78	0.055	0.070
M	—	—	—	45° HOLES
P	—	1.27	—	0.050
R	7.68	7.60	0.299	0.297
S	4.01	4.52	0.158	0.178
T	2.11	2.54	0.083	0.100
U	2.43	2.54	0.298	0.100

CASE 145A-09  
 MRF5177A

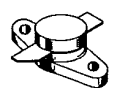
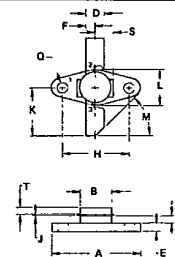
**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	35	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	60	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	4.0	Vdc
Collector Current – Continuous	I <sub>C</sub>	4.0	Adc
Base Current	I <sub>B</sub>	1.0	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C (1)	P <sub>D</sub>	58	Watts
Derate Above 25°C	—	0.33	W/°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +200	°C

(1) This device is designed for RF Power operation. The total device dissipation rating applies only when the device is operated as a Class C RF Amplifier.

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	3.0	°C/W



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

MILLIMETERS		INCHES		
DIM	MIN	MAX	MIN	MAX
A	21.08	21.59	0.830	0.850
B	8.27	9.78	0.325	0.385
D	5.58	5.84	0.220	0.230
E	2.03	2.41	0.080	0.095
F	2.78	2.92	0.110	0.115
H	15.11	15.27	0.595	0.605
J	0.10	0.15	0.004	0.006
K	13.68	13.59	0.515	0.535
L	9.51	10.41	0.369	0.410
M	4.00	NO L	4.00	NO L
Q	2.52	3.18	0.115	0.125
H	1.52	2.03	0.060	0.080
S	—	5.36	—	0.212
T	2.03	2.54	0.080	0.100

CASE 215  
 MRF5177

ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 50 mA, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	35	—	Vdc
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 50 mA, V <sub>BE</sub> = 0)	V <sub>(BR)CES</sub>	60	—	Vdc
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 2.0 mA, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	4.0	—	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 30 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	—	2.0	mA
<b>ON CHARACTERISTICS</b>				
DC Current Gain (I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 5.0 Vdc) (I <sub>C</sub> = 4.0 A, V <sub>CE</sub> = 5.0 Vdc)	h <sub>FE</sub>	10 10	100 —	—
<b>DYNAMIC CHARACTERISTICS</b>				
Output Capacitance (V <sub>CB</sub> = 28 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>ob</sub>	—	50	pF
<b>FUNCTIONAL TESTS (Figures 1 and 9)</b>				
Common-Emitter Amplifier Power Gain (P <sub>out</sub> = 30 W, V <sub>CC</sub> = 28 Vdc, f = 400 MHz)	G <sub>PE</sub>	6.0	—	dB
Collector Efficiency (P <sub>out</sub> = 30 W, V <sub>CC</sub> = 28 Vdc, f = 400 MHz)	η	60	—	%
Saturated Power (P <sub>in</sub> = 11 W, V <sub>CC</sub> = 28 Vdc, f = 400 MHz)	P <sub>sat</sub>	36	—	Watts
Electrical Ruggedness (P <sub>out</sub> = 30 W, V <sub>CC</sub> = 28 Vdc, f = 400 MHz, T <sub>C</sub> ≈ 60°C)	VSWR > 30:1 through all phase angles in a 3 second time interval, After which, devices will meet G <sub>PE</sub> test limits.			

FIGURE 1 — 400 MHz TEST CIRCUIT  
(Typical Performance Data for 300-500 MHz Operation)

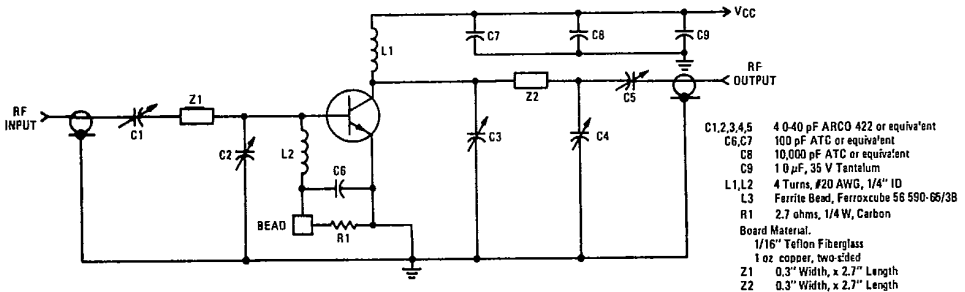


FIGURE 2 — 200-300 MHz TEST CIRCUIT  
(Typical Performance Data)

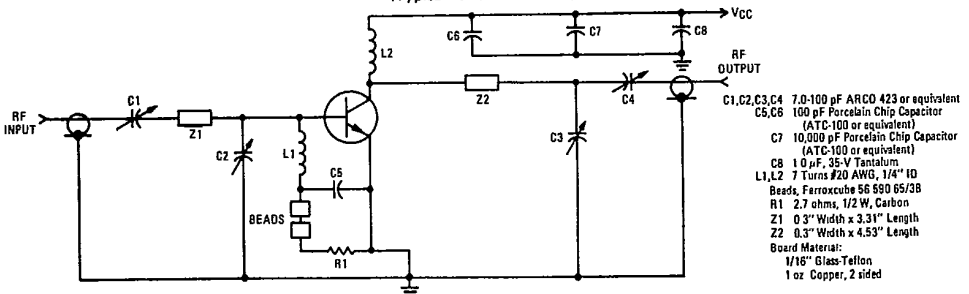


FIGURE 3 – OUTPUT POWER versus FREQUENCY

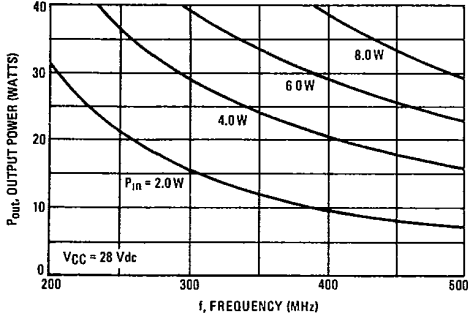


FIGURE 4 – OUTPUT POWER versus INPUT POWER

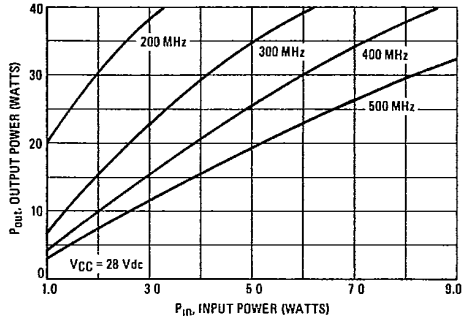


FIGURE 5 – OUTPUT POWER versus SUPPLY VOLTAGE

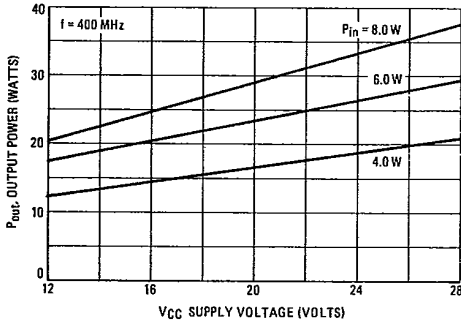


FIGURE 6 – OUTPUT POWER versus SUPPLY VOLTAGE

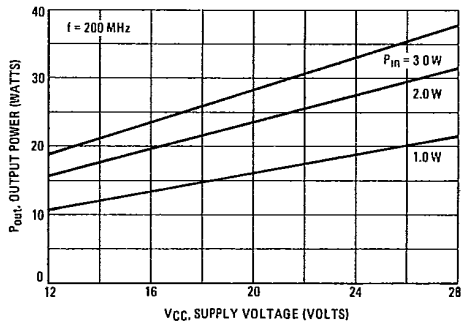


FIGURE 7 – RF POWER DERATING

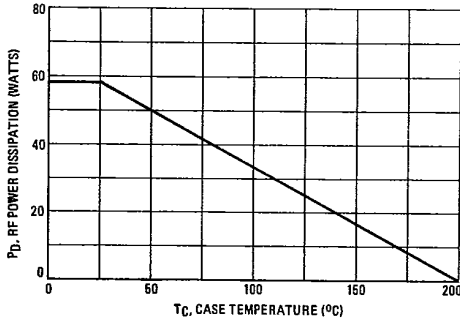


FIGURE 8 – SERIES EQUIVALENT IMPEDANCE

