

T-33-11

MOTOROLA SEMICONDUCTOR TECHNICAL DATA

MRF450 MRF450A

The RF Line

NPN SILICON RF POWER TRANSISTORS

... designed for power amplifier applications in industrial, commercial and amateur radio equipment to 30 MHz.

- Specified 12.5 Volt, 30 MHz Characteristics —
Output Power = 50 Watts
Minimum Gain = 11 dB
Efficiency = 50%

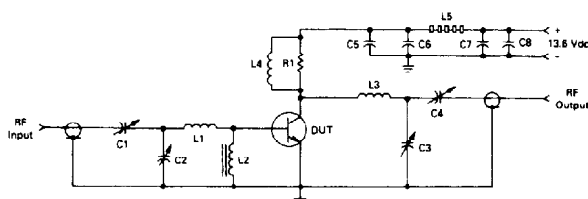
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE0}	20	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	- Vdc
Collector Current — Continuous	I_C	7.5	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	115 0.66	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

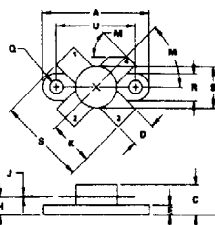
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.53	$^\circ\text{C/W}$

FIGURE 1 — 30 MHz TEST CIRCUIT SCHEMATIC



C1 — 14-150 pF, ARCO 424
C2, C3, C4 — 170-780 pF, ARCO 469
C5, C6 — ERIE 0.1 μF @ 100 V RED CAPS
C6 — 1000 pF UNELCO, 350 Vdc
C7 — 10 μF , 35 Vdc
L1 — 100 Ω , 2.0 W Carbon
L2 — 0.15 μH Molded Choke MILLER
L3 — 3 Turns, #14 Bare Tinned Wire, 0.3" (0.79) I.D. x 0.38" (0.97) Long
L4 — 9 Turns, #20 Enamel Wire, Close Wound on R1
L5 — FERROXCUBE #56-570-65/3B, 5 Ferrite Beads, on 1" Long #20 Wire
Input/Output Connectors — Type N
Board — Glass Teflon Mounted on a 4" x 4" x 2" SEEZAK Box

50 W — 30 MHz
RF POWER
TRANSISTORS
NPN SILICON



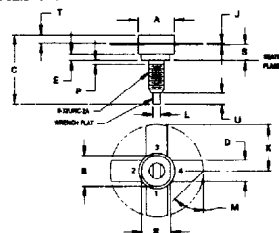
NOTES
1. DIMENSIONING AND TOLERANCING PER
ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.



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

CASE 211-07
MRF450

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	25.20	25.14	0.992	0.990
B	8.40	8.30	0.330	0.330
C	8.82	7.13	0.348	0.281
D	5.42	5.96	0.213	0.235
E	1.18	1.00	0.046	0.039
F	1.81	1.57	0.071	0.062
G	0.11	0.15	0.004	0.006
H	10.04	10.20	0.395	0.401
I	40°	50°	40°	50°
J	2.88	1.30	0.113	0.051
K	4.23	4.47	0.166	0.176
L	20.07	20.57	0.790	0.812
M	18.29	18.54	0.720	0.733



NOTES
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STYLE 1
PIN 1: EMITTER
2: BASE
3: EMITTER
4: COLLECTOR

CASE 145A-09
MRF450A

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.40	8.30	0.330	0.330
B	8.13	8.38	0.320	0.330
C	17.02	20.07	0.670	0.790
D	1.46	1.67	0.057	0.066
E	1.78	—	0.070	—
F	0.08	0.18	0.003	0.007
G	12.45	—	0.490	—
H	1.40	1.79	0.055	0.070
I	—	1.27	—	0.050
J	7.59	7.90	0.299	0.311
K	4.01	4.52	0.158	0.178
L	2.11	2.54	0.083	0.100
M	2.48	2.58	0.098	0.102

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I _C = 100 mA dc, I _B = 0)	V(BR)CEO	20	—	—	V _{dc}
Collector-Emitter Breakdown Voltage (I _C = 20 mA dc, V _{BE} = 0)	V(BR)CES	40	—	—	V _{dc}
Collector-Base Breakdown Voltage (I _C = 20 mA dc, I _E = 0)	V(BR)CBO	40	—	—	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 10 mA dc, I _C = 0)	V(BR)EBO	4.0	—	—	V _{dc}
ON CHARACTERISTICS					
DC Current Gain (I _C = 1.0 A dc, V _{CE} = 5.0 V dc)	h _{FE}	10	—	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V _{CB} = 15 V dc, I _E = 0, f = 1.0 MHz)	C _{ob}	—	—	200	pF
FUNCTIONAL TESTS (Figure 1)					
Common-Emitter Amplifier Power Gain (V _{CC} = 13.6 V dc, P _{out} = 50 W, I _{C(max)} = 6.13 A dc, f = 30 MHz)	G _{PE}	11	15	—	dB
Collector Efficiency (V _{CC} = 13.6 V dc, P _{out} = 50 W, I _{C(max)} = 6.13 A dc, f = 30 MHz)	η	50	—	—	%
Series Equivalent Input Impedance (V _{CC} = 13.6 V dc, P _{out} = 50 W, f = 30 MHz)	Z _{in}	—	1.56-j.89	—	Ohms
Series Equivalent Output Impedance (V _{CC} = 13.6 V dc, P _{out} = 50 W, f = 30 MHz)	Z _{out}	—	174-j.50	—	Ohms

FIGURE 2 — INPUT POWER versus OUTPUT POWER

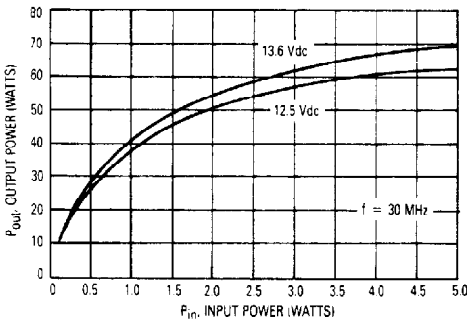


FIGURE 3 — OUTPUT POWER versus SUPPLY VOLTAGE

