MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

MRF449
MRF449A

The RF Line

30 W – 30 MHz

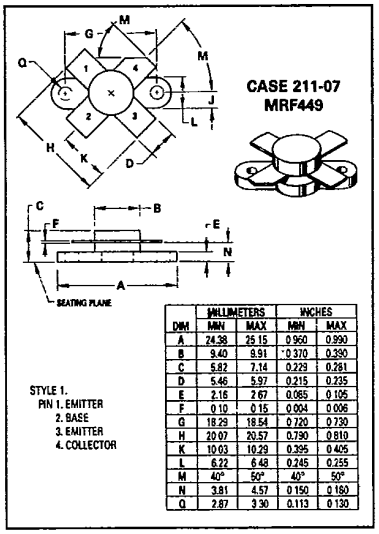
RF POWER TRANSISTORS

NPN SILICON

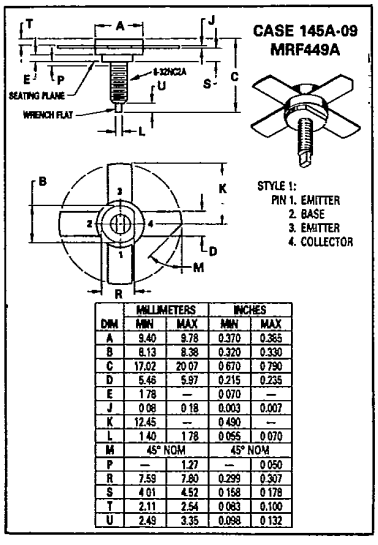
NPN SILICON RF POWER TRANSISTORS

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

- Specified 12.5 Volt, 30 MHz Characteristics –
  Output Power = 30 Watts
  Minimum Gain = 12 dB
  Efficiency = 50%



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	24.38	25.15	0.960	0.990
B	9.40	9.91	0.370	0.390
C	5.82	7.14	0.229	0.281
D	5.46	5.97	0.215	0.235
E	2.16	2.67	0.085	0.105
F	0.10	0.15	0.004	0.006
G	18.29	18.54	0.720	0.730
H	20.07	20.57	0.790	0.810
K	10.03	10.29	0.395	0.405
L	6.22	6.48	0.245	0.255
M	40°	50°	40°	50°
N	3.81	4.57	0.150	0.180
Q	2.87	3.30	0.113	0.130



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	9.40	9.78	0.370	0.385
B	8.13	8.38	0.320	0.330
C	17.02	20.07	0.670	0.790
D	5.46	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° NOM		45° NOM	
P	—	1.27	—	0.050
R	7.59	7.80	0.299	0.307
S	4.01	4.52	0.158	0.178
T	2.11	2.54	0.083	0.100
U	2.49	3.35	0.098	0.132

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}	4.0	Vdc
Total Device Dissipation @ $T_C = 25^oC$ Derate above 25^oC	P_D	60 343	Watts mW/^oC
Storage Temperature Range	T_{stg}	−65 to +150	^oC

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.9	$^oC/W$

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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 mAdc, I_B = 0)	$V_{(BR)CEO}$	20	–	–	Vdc
Collector-Emitter Breakdown Voltage (I_C = 50 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	40	50	–	Vdc
Collector-Base Breakdown Voltage (I_C = 20 mAdc, I_E = 0)	$V_{(BR)CBO}$	40	–	–	Vdc
Emitter-Base Breakdown Voltage (I_E = 5.0 mAdc, I_C = 0)	$V_{(BR)EBO}$	4.0	–	–	Vdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1.0 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	10	–	–	–
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 12.5 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	–	–	140	pF
FUNCTIONAL TESTS (Figure 1)					
Common-Emitter Amplifier Power Gain (V_{CC} = 13.6 Vdc, P_{out} = 30 W, I_C(max) = 4.0 Adc, f = 30 MHz)	G_{PE}	12	14	–	dB
Collector Efficiency (V_{CC} = 13.6 Vdc, P_{out} = 30 W, I_C(max) = 4.0 Adc, f = 30 MHz)	η	50	–	–	%
Series Equivalent Input Impedance (V_{CC} = 12.5 Vdc, P_{out} = 30 W, f = 30 MHz)	Z_{in}	–	2.13-j1.15	–	Ohms
Series Equivalent Output Impedance (V_{CC} = 12.5 Vdc, P_{out} = 30 W, f = 30 MHz)	Z_{out}	–	2.47-j0.37	–	Ohms

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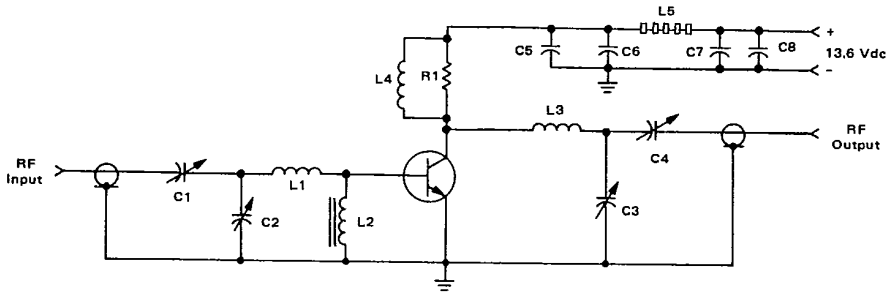
FIGURE 1 – 30 MHz TEST CIRCUIT SCHEMATIC



C1 – 14-150 pF, ARCO 424
C2,C3,C4 – 170-780 pF, ARCO 469
C5,C8 – ERIE 0.1 μF @ 100 V RED CAPS
C6 – 1000 pF UNELCO, 350 Vdc
C7 – 10 μF, 35 Vdc
R1 – 100 Ω, 2 W Carbon
L1 – 0.15 μH Molded Choke MILLER
L2 – FERROXCUBE, VK200-20-4B
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

FIGURE 2 – POWER OUTPUT versus POWER INPUT

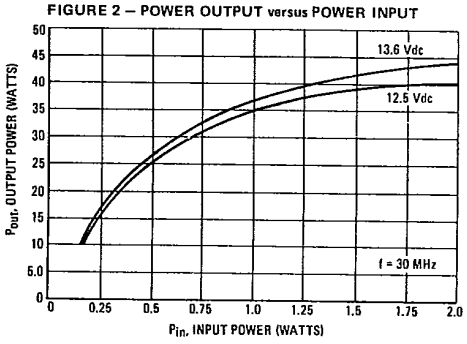
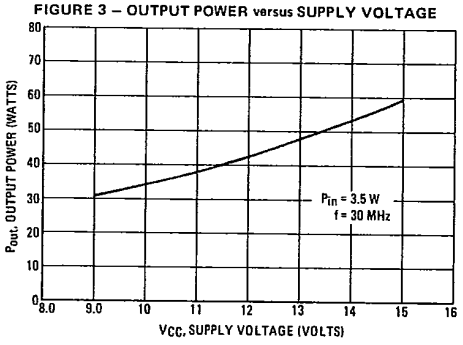


FIGURE 3 – OUTPUT POWER versus SUPPLY VOLTAGE



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