New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

MRF450
MRF450A

The RF Line

50 W – 30 MHz
RF POWER
TRANSISTORS
NPN SILICON

NPN SILICON RF POWER TRANSISTORS

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

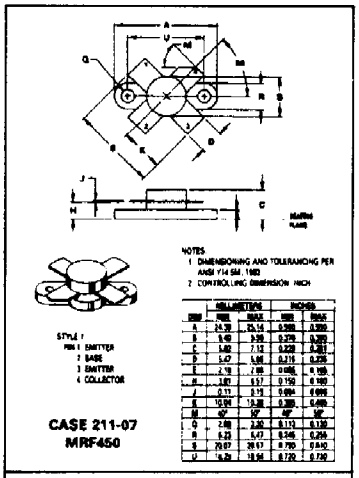
- Specified 12.5 Volt, 30 MHz Characteristics –
  Output Power = 50 Watts
  Minimum Gain = 11 dB
  Efficiency = 50%

MAXIMUM RATINGS

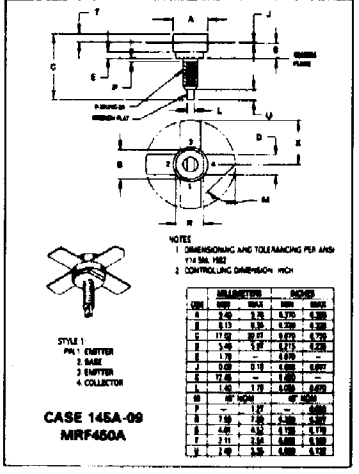
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	20	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	– Vdc
Collector Current – Continuous	I_C	7.5	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	115 0.66	Watts W/°C
Storage Temperature Range	T_{stg}	–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

THERMAL CHARACTERISTICS

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

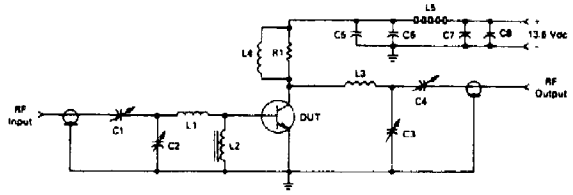


CASE 211-07
MRF450



CASE 145A-09
MRF450A

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, 2.0 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

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 = 20 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	40	–	–	Vdc
Collector-Base Breakdown Voltage (I_C = 20 mAdc, I_E = 0)	$V_{(BR)CBO}$	40	–	–	Vdc
Emitter Base Breakdown Voltage (I_E = 10 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} = 15 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	–	–	200	pF
FUNCTIONAL TESTS (Figure 1)					
Common-Emitter Amplifier Power Gain (V_{CC} = 13.6 Vdc, P_{out} = 50 W, I_C(max) = 6.13 Adc, f = 30 MHz)	G_{PE}	11	15	–	dB
Collector Efficiency (V_{CC} = 13.6 Vdc, P_{out} = 50 W, I_C(max) = 6.13 Adc, f = 30 MHz)	η	50	–	–	%
Series Equivalent Input Impedance (V_{CC} = 13.6 Vdc, P_{out} = 50 W, f = 30 MHz)	Z_{in}	–	1.56-j.89	–	Ohms
Series Equivalent Output Impedance (V_{CC} = 13.6 Vdc, P_{out} = 50 W, f = 30 MHz)	Z_{out}	–	174-j 50	–	Ohms

FIGURE 2 – INPUT POWER versus OUTPUT POWER

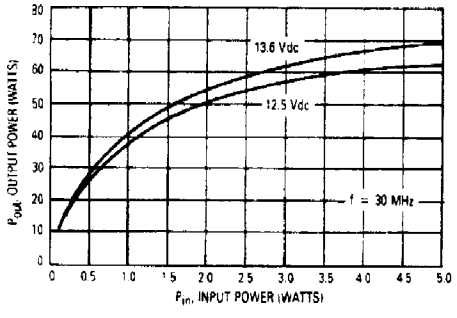


FIGURE 3 – OUTPUT POWER versus SUPPLY VOLTAGE