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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%

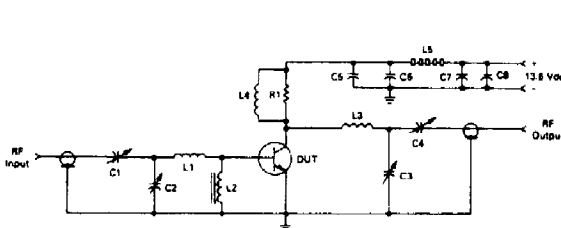
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE0}	20	Vdc
Collector-Base Voltage	V_{CB0}	40	Vdc
Emitter-Base Voltage	V_{EB0}	4.0	- Vdc
Collector Current - Continuous	I_C	7.5	Adc
Total Device Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	P_D	115	Watts W/C
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ C$

THERMAL CHARACTERISTICS

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

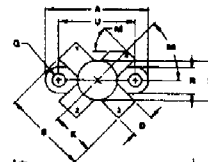
FIGURE 1 - 30 MHz TEST CIRCUIT SCHEMATIC



- 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 #56-570-653B, 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

MRF450 MRF450A

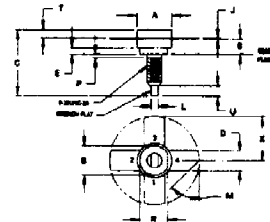
50 W - 30 MHz
RF POWER
TRANSISTORS
NPN SILICON



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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	25.20	25.25	0.992	0.994
B	1.60	1.60	0.063	0.063
C	1.60	1.62	0.063	0.064
D	1.60	1.60	0.063	0.063
E	1.78	1.78	0.070	0.070
F	1.60	1.62	0.063	0.064
G	1.60	1.62	0.063	0.064
H	1.60	1.62	0.063	0.064
I	1.60	1.62	0.063	0.064
J	1.60	1.62	0.063	0.064
K	1.60	1.62	0.063	0.064
L	1.60	1.62	0.063	0.064
M	1.60	1.62	0.063	0.064
N	1.60	1.62	0.063	0.064
O	1.60	1.62	0.063	0.064
P	1.60	1.62	0.063	0.064
Q	1.60	1.62	0.063	0.064
R	1.60	1.62	0.063	0.064
S	1.60	1.62	0.063	0.064
T	1.60	1.62	0.063	0.064
U	1.60	1.62	0.063	0.064
V	1.60	1.62	0.063	0.064
W	1.60	1.62	0.063	0.064
X	1.60	1.62	0.063	0.064
Y	1.60	1.62	0.063	0.064
Z	1.60	1.62	0.063	0.064

CASE 211-07
MRF450



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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.60	1.62	0.063	0.064
B	1.60	1.62	0.063	0.064
C	1.60	1.62	0.063	0.064
D	1.60	1.62	0.063	0.064
E	1.60	1.62	0.063	0.064
F	1.60	1.62	0.063	0.064
G	1.60	1.62	0.063	0.064
H	1.60	1.62	0.063	0.064
I	1.60	1.62	0.063	0.064
J	1.60	1.62	0.063	0.064
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R	1.60	1.62	0.063	0.064
S	1.60	1.62	0.063	0.064
T	1.60	1.62	0.063	0.064
U	1.60	1.62	0.063	0.064
V	1.60	1.62	0.063	0.064
W	1.60	1.62	0.063	0.064
X	1.60	1.62	0.063	0.064
Y	1.60	1.62	0.063	0.064
Z	1.60	1.62	0.063	0.064

CASE 145A-09
MRF450A

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

MRF450, MRF450A

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 100\text{ mA dc}, I_B = 0$)	$V_{(BR)CEO}$	20	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 20\text{ mA dc}, V_{BE} = 0$)	$V_{(BR)CES}$	40	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 20\text{ mA dc}, I_E = 0$)	$V_{(BR)CBO}$	40	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10\text{ mA dc}, I_C = 0$)	$V_{(BR)EB0}$	4.0	—	—	Vdc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 1.0\text{ A dc}, V_{CE} = 5.0\text{ V dc}$)	h_{FE}	10	—	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance ($V_{CB} = 15\text{ V dc}, I_E = 0, f = 1.0\text{ MHz}$)	C_{ob}	—	—	200	pF
FUNCTIONAL TESTS (Figure 1)					
Common-Emitter Amplifier Power Gain ($V_{CC} = 13.6\text{ V dc}, P_{out} = 50\text{ W}, I_C(\text{max}) = 6.13\text{ A dc}, f = 30\text{ MHz}$)	G_{PE}	11	15	—	dB
Collector Efficiency ($V_{CC} = 13.6\text{ V dc}, P_{out} = 50\text{ W}, I_C(\text{max}) = 6.13\text{ A dc}, f = 30\text{ MHz}$)	η	50	—	—	%
Series Equivalent Input Impedance ($V_{CC} = 13.6\text{ V dc}, P_{out} = 50\text{ W}, f = 30\text{ MHz}$)	Z_{in}	—	$1.56 - j.89$	—	Ohms
Series Equivalent Output Impedance ($V_{CC} = 13.6\text{ V dc}, P_{out} = 50\text{ W}, f = 30\text{ MHz}$)	Z_{out}	—	$174 - j.50$	—	Ohms

FIGURE 2 — INPUT POWER versus OUTPUT POWER

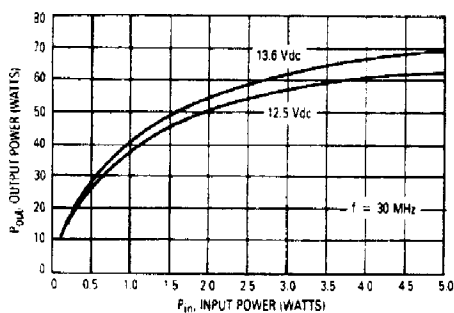


FIGURE 3 — OUTPUT POWER versus SUPPLY VOLTAGE

