

234-2625

MOTOROLA
SEMICONDUCTOR TECHNICAL DATA

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The RF Line
NPN Silicon
RF Power Transistor

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

- Specified 12.5 Volt, 30 MHz Characteristics—
 - Output Power = 80 Watts
 - Minimum Gain = 12 dB
 - Efficiency = 50%

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	25	Vdc
Collector-Base Voltage	V_{CBO}	45	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current -- Continuous	I_C	20	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	250 1.43	Watts W/°C
Storage Temperature Range	T_{stg}	-65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.7	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 100\text{ mA dc}$, $I_B = 0$)	$V_{(BR)CEO}$	18	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 50\text{ mA dc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	35	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10\text{ mA dc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 5.0\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	40	—	150	—
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DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 15\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	—	250	pF
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FUNCTIONAL TESTS (Figure 1)

Common-Emitter Amplifier Power Gain ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	G_{pe}	12	—	—	dB
Collector Efficiency ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	η	50	—	—	%
Series Equivalent Input Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	Z_{in}	—	$938-j.34^*$	—	Ohms
Series Equivalent Output Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	Z_{out}	—	$1.16-j.20^*$	—	Ohms
Parallel Equivalent Input Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	—	—	$1.06\ \Omega$ 1817 pF	—	—
Parallel Equivalent Output Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	—	—	$1.19\ \Omega$ 777 pF	—	—

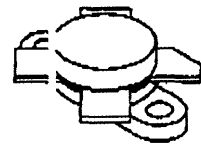
REV 1

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MRF454

80 W, 30 MHz
RF POWER
TRANSISTOR
IPN SILICON



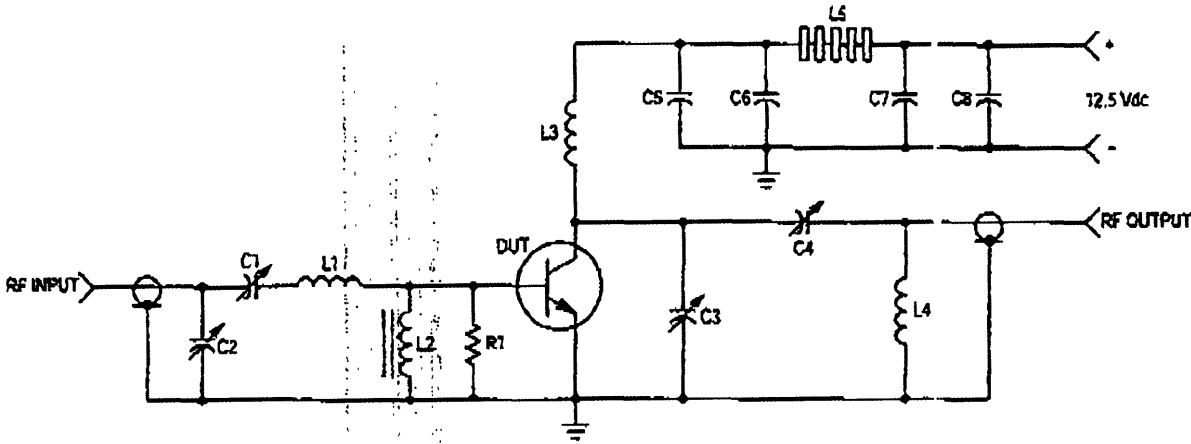
CASE 211-11, STYLE 1

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- C1, C2, C4 — ARCO 469
- C3 — ARCO 465
- C5 — 1000 pF, UNELCO
- C6, C7 — 0.1 μ F Disc Ceramic
- C8 — 1000 μ F/15 V Electrolytic
- R1 — 10 Ohm/1.0 Watt, Carbon
- L1 — 3 Turns, #18 AWG, 5/16" I.D., 5/16" Long
- L2 — VK200-20/4B, FERROXCUBE
- L3 — 12 Turns, #18 AWG Enameled Wire, 1/4" I.D., Close Wound
- L4 — 3 Turns 1/8" O.D. Copper Tubing, 3/8" I.D., 3/4" Long
- L5 — 7 FERRITE Beads, FERROXCUBE #56-69X-65/3B

Figure 1. 30 MHz Test Circuit Schematic

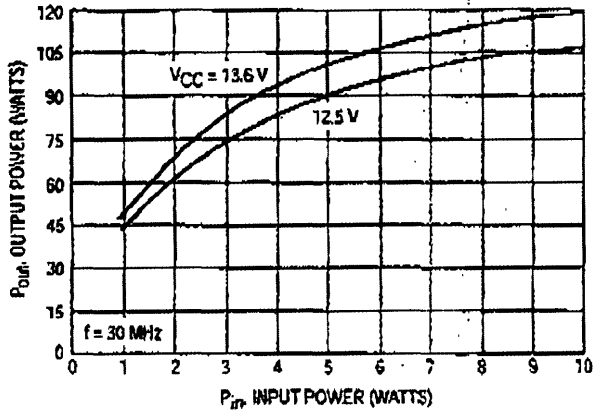


Figure 2. Output Power versus Input Power

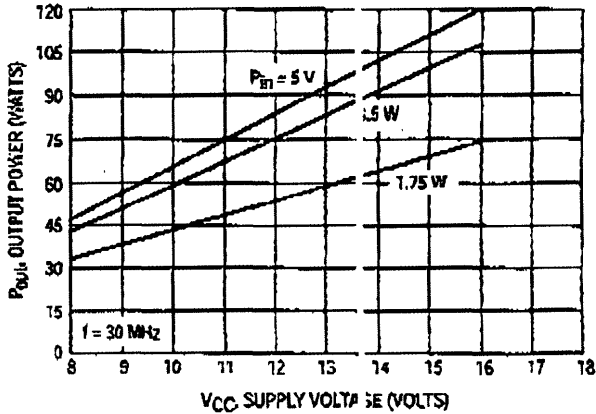
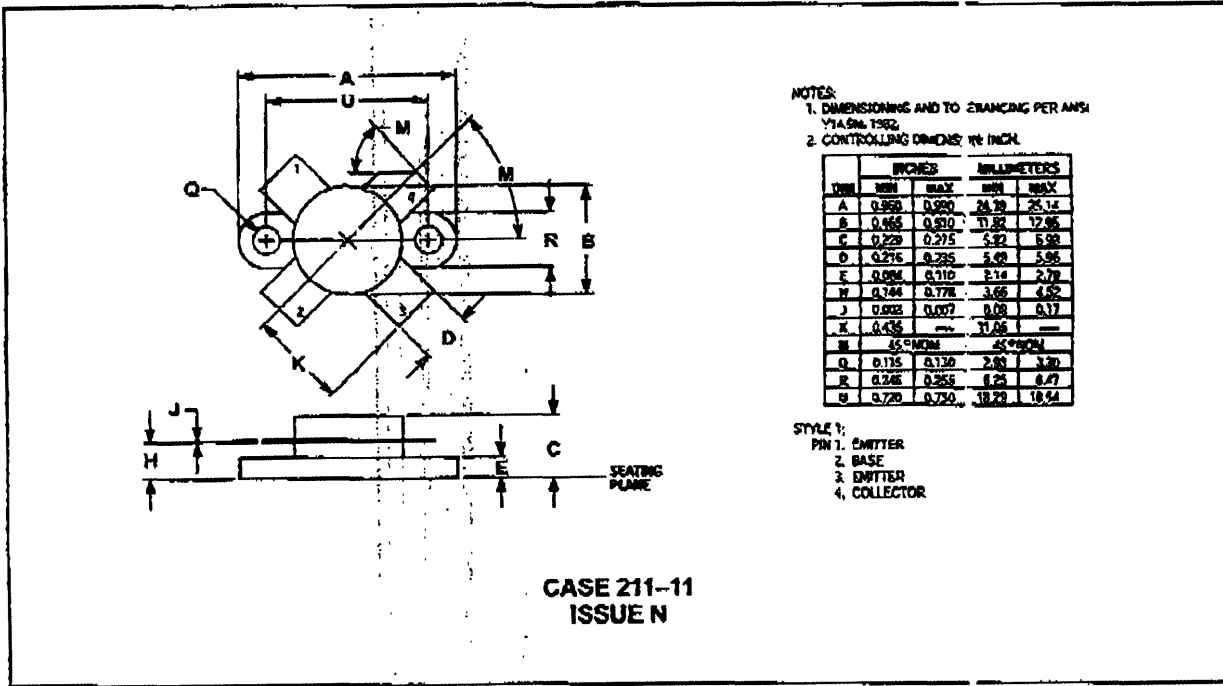


Figure 3. Output Power versus Supply Voltage

PACKAGE DIMENSIONS


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