

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°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 _{θJC}	0.7	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage (I _C = 100 mA _{dc} , I _B = 0)	V _{(BR)CEO}	18	—	—	Vdc
Collector-Emitter Breakdown Voltage (I _C = 50 mA _{dc} , V _{BE} = 0)	V _{(BR)CES}	35	—	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 10 mA _{dc} , I _C = 0)	V _{(BR)EBO}	4.0	—	—	Vdc

ON CHARACTERISTICS

DC Current Gain (I _C = 5.0 Adc, V _{CE} = 5.0 Vdc)	h _{FE}	40	—	150	—
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DYNAMIC CHARACTERISTICS

Output Capacitance (V _{CB} = 15 Vdc, I _E = 0, f = 1.0 MHz)	C _{ob}	—	—	250	pF
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FUNCTIONAL TESTS (Figure 1)

Common-Emitter Amplifier Power Gain (V _{CC} = 12.5 Vdc, P _{out} = 80 W, f = 30 MHz)	G _{pe}	12	—	—	dB
Collector Efficiency (V _{CC} = 12.5 Vdc, P _{out} = 80 W, f = 30 MHz)	η	50	—	—	%
Series Equivalent Input Impedance (V _{CC} = 12.5 Vdc, P _{out} = 80 W, f = 30 MHz)	Z _{in}	—	938-j.34*	—	Ohms
Series Equivalent Output Impedance (V _{CC} = 12.5 Vdc, P _{out} = 80 W, f = 30 MHz)	Z _{out}	—	1.16-j.20*	—	Ohms
Parallel Equivalent Input Impedance (V _{CC} = 12.5 Vdc, P _{out} = 80 W, f = 30 MHz)	—	—	1.06 Ω 1817 pF	—	—
Parallel Equivalent Output Impedance (V _{CC} = 12.5 Vdc, P _{out} = 80 W, f = 30 MHz)	—	—	1.19 Ω 777 pF	—	—

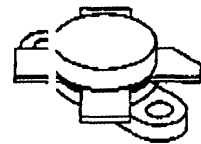
REV 1

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MRF454

80 W, 30 MHz
RF POWER
TRANSISTOR
IPN SILICON



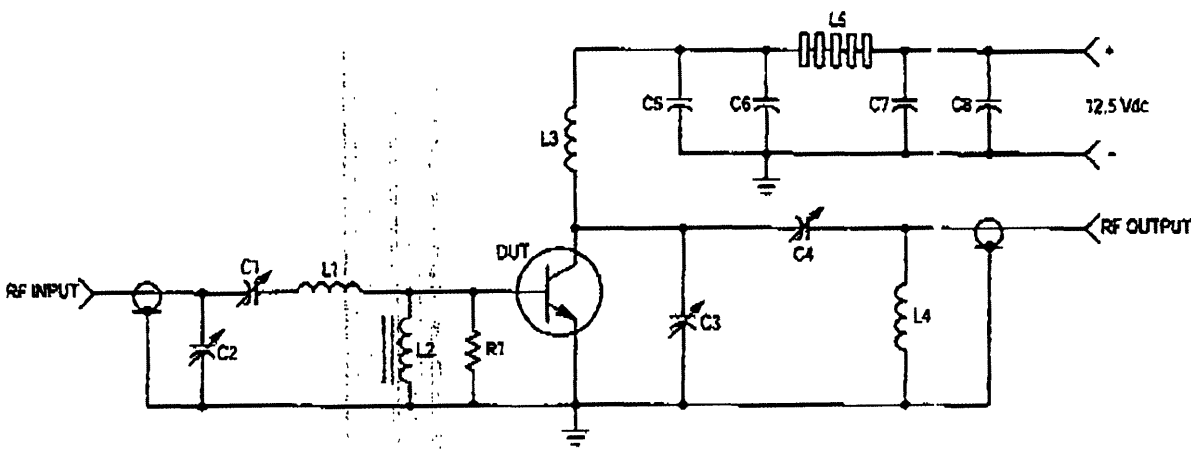
CASE 211-11, STYLE 1

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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

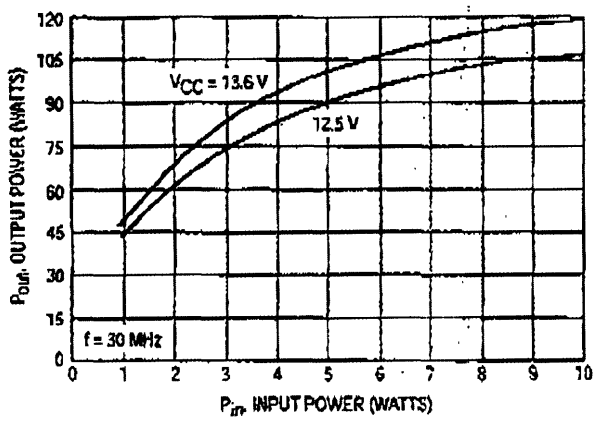


Figure 2. Output Power versus Input Power

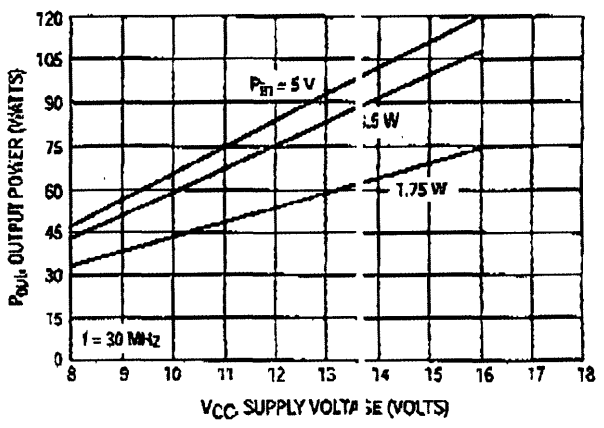
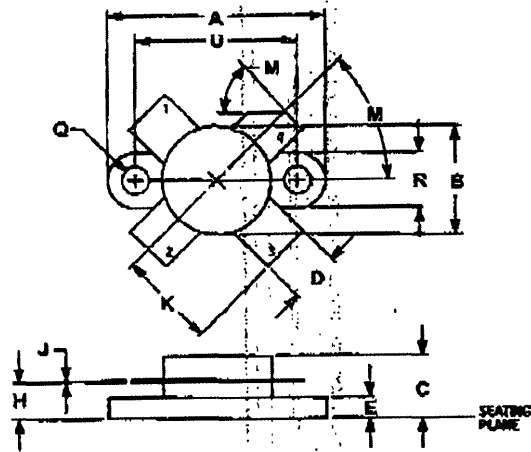


Figure 3. Output Power versus Supply Voltage

PACKAGE DIMENSIONS

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NOTES:
 1. DIMENSIONING AND TO DIMANCING PER ANSI Y14.5M-1982
 2. CONTROLLING DIMENS: 1/16 INCH


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.950	0.920	24.13	23.14
B	0.465	0.910	11.82	22.95
C	0.229	0.275	5.82	6.98
D	0.215	0.235	5.48	5.96
E	0.094	0.110	2.41	2.79
F	0.264	0.278	6.65	7.07
J	0.002	0.007	0.05	0.17
K	0.435	---	11.04	---
M	AS SHOWN	AS SHOWN		
Q	0.135	0.130	3.43	3.30
R	0.248	0.255	6.25	6.47
U	0.720	0.720	18.29	18.54

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

CASE 211-11
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