

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/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

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 ($I_C = 100\text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	18	—	—	Vdc
Collector–Emitter Breakdown Voltage ($I_C = 50\text{ mAdc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10\text{ mAdc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 5.0\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	10	—	150	—
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DYNAMIC CHARACTERISTICS

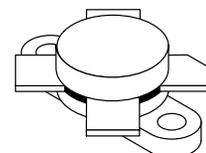
Output Capacitance ($V_{CB} = 15\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	—	250	pF
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FUNCTIONAL TESTS (Figure 1)

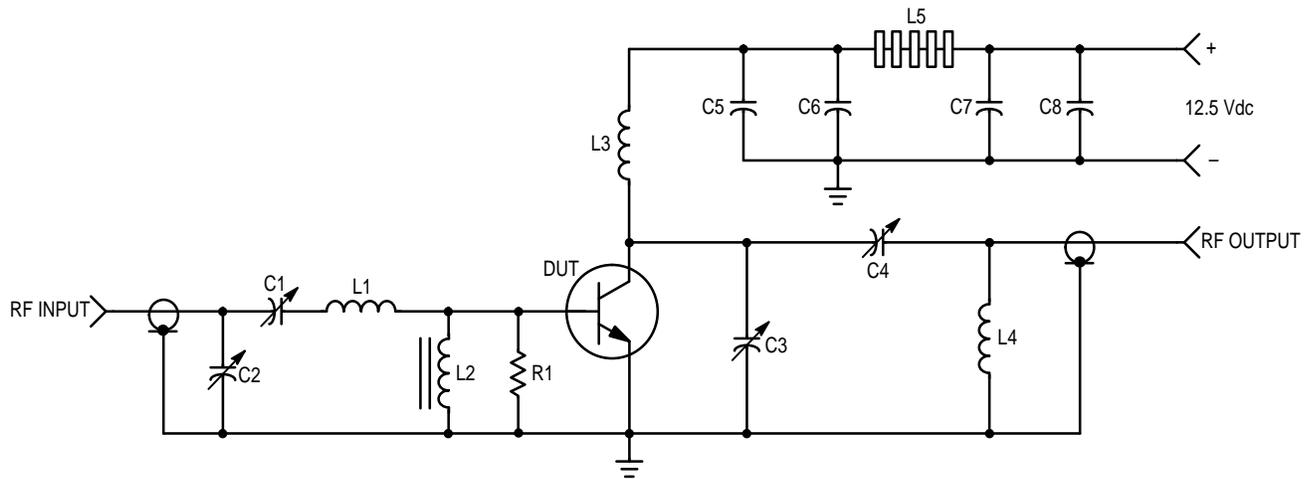
Common–Emitter Amplifier Power Gain ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	G_{pe}	12	—	—	dB
Collector Efficiency ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	η	50	—	—	%
Series Equivalent Input Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	Z_{in}	—	.938-j.341	—	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.201	—	Ohms
Parallel Equivalent Input Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	—	—	1.06 Ω 1817 pF	—	—
Parallel Equivalent Output Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 80\text{ W}$, $f = 30\text{ MHz}$)	—	—	1.19 Ω 777 pF	—	—

MRF454

80 W, 30 MHz
RF POWER
TRANSISTOR
NPN SILICON



CASE 211-11, STYLE 1



C1, C2, C4 — ARCO 469
 C3 — ARCO 466
 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 #56-590-65/3B

Figure 1. 30 MHz Test Circuit Schematic

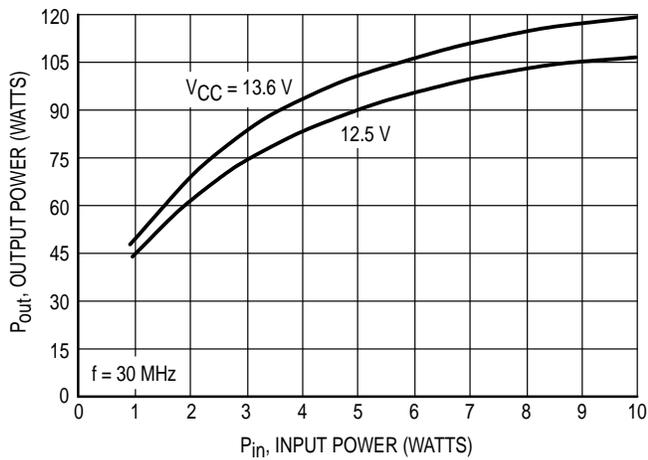


Figure 2. Output Power versus Input Power

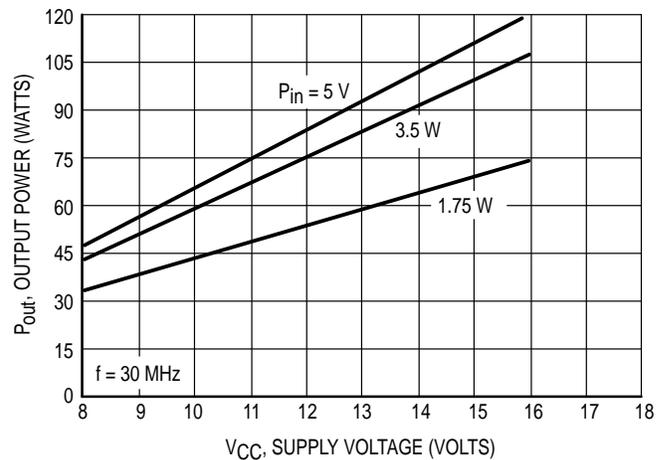
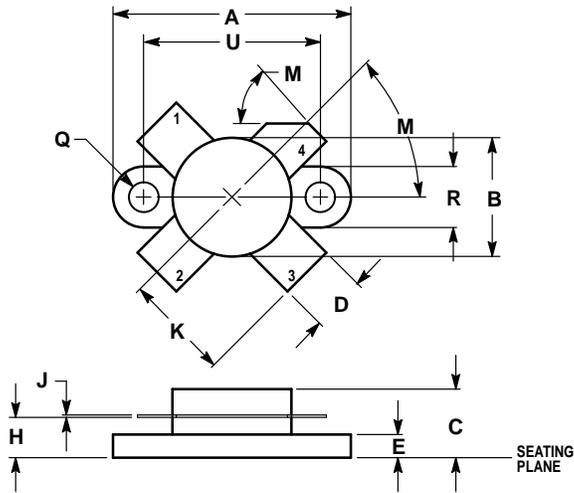


Figure 3. Output Power versus Supply Voltage

PACKAGE DIMENSIONS



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.960	0.990	24.39	25.14
B	0.465	0.510	11.82	12.95
C	0.229	0.275	5.82	6.98
D	0.216	0.235	5.49	5.96
E	0.084	0.110	2.14	2.79
H	0.144	0.178	3.66	4.52
J	0.003	0.007	0.08	0.17
K	0.435	—	11.05	—
M	45°NOM		45°NOM	
Q	0.115	0.130	2.93	3.30
R	0.246	0.255	6.25	6.47
U	0.720	0.730	18.29	18.54

- STYLE 1:
 PIN 1. EMITTER
 2. BASE
 3. EMITTER
 4. COLLECTOR

**CASE 211-11
 ISSUE N**

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MRF454/D

