

MRF454



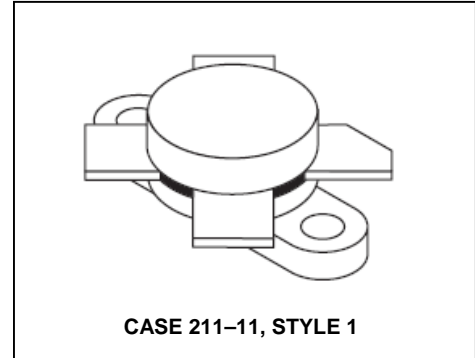
The RF Line NPN Silicon Power Transistor 80W, 30MHz, 12.5V

M/A-COM Products
Released - Rev. 07.07

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

- Specified 12.5 V, 30 MHz characteristics
- Output power = 80 W
- Minimum gain = 12 dB
- Efficiency = 50%

Product Image



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}	40	—	150	—
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DYNAMIC CHARACTERISTICS

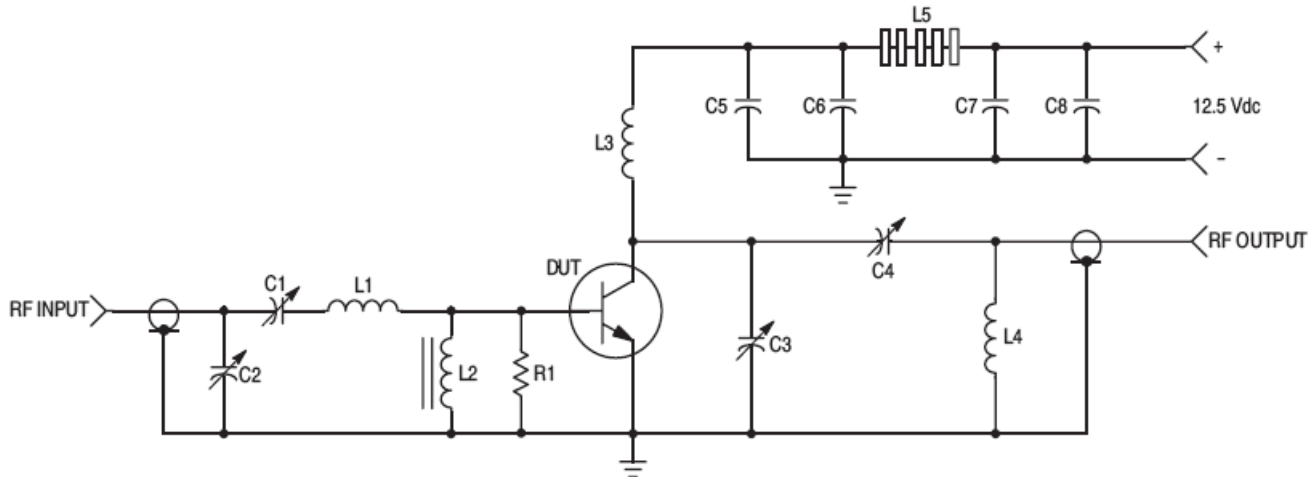
Output Capacitance ($V_{CB} = 15 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{ob}	—	—	250	pF
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FUNCTIONAL TESTS (Figure 1)

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.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	—	—



C1, C2, C4 — ARCO 469
C3 — ARCO 466
C5 — 1000 pF, UNELCO
C6, C7 — 0.1 μF Disc Ceramic
C8 — 1000 μF /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

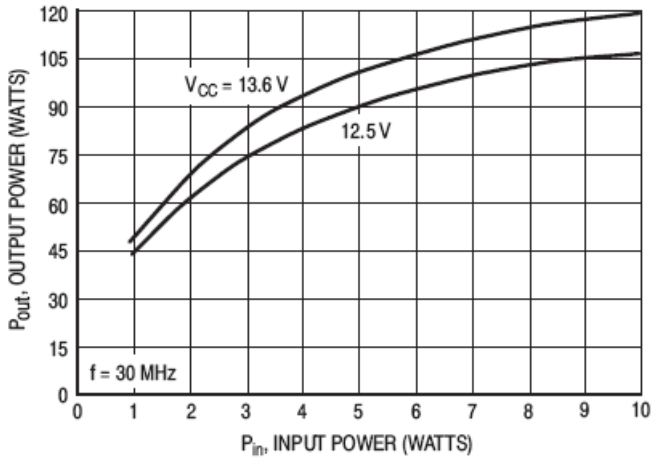


Figure 2. Output Power versus Input Power

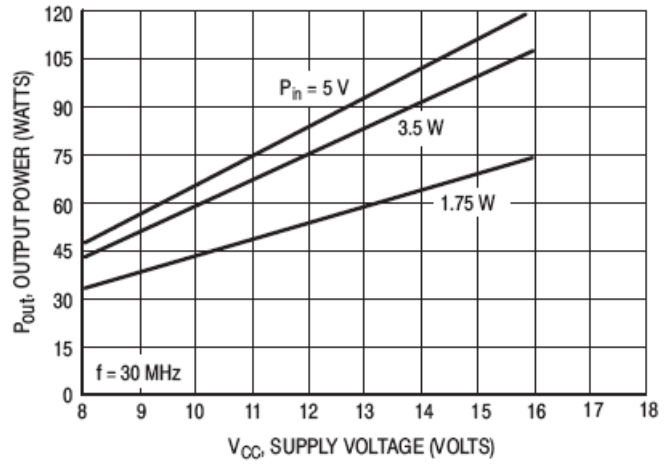


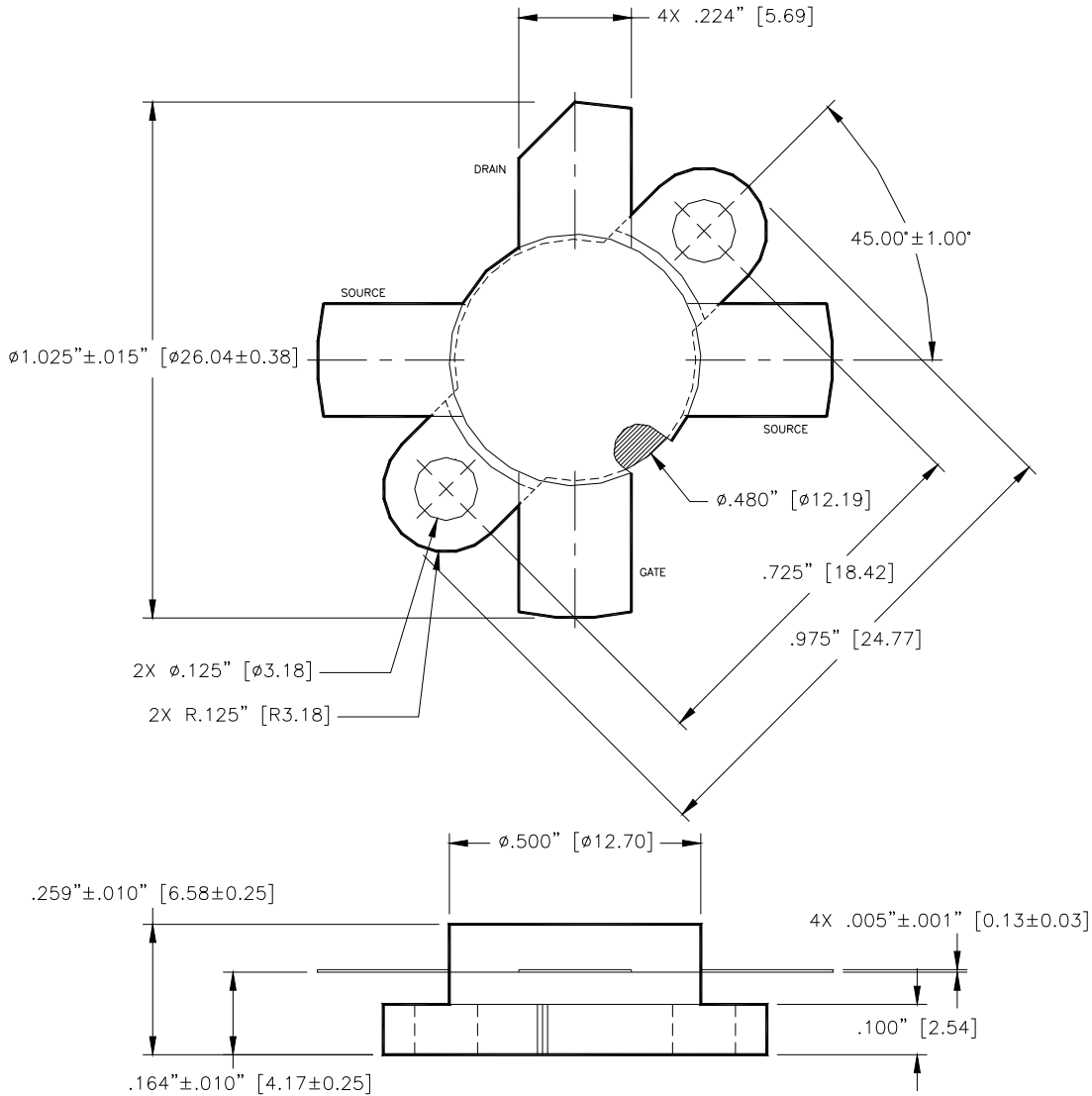
Figure 3. Output Power versus Supply Voltage

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Unless otherwise noted, tolerances are inches $\pm .005$ " [millimeters ± 0.13 mm]