MRF454

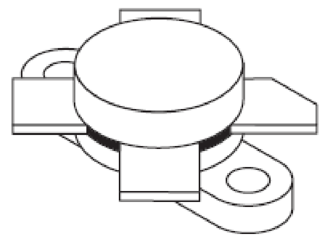
The RF Line NPN Silicon Power Transistor
80W, 30MHz, 12.5V

Rev. V1

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



CASE 211–11, STYLE 1

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	$R_{\theta JC}$	0.7	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 100 mAdc, I_B = 0)	$V_{(BR)CEO}$	18	—	—	Vdc
Collector–Emitter Breakdown Voltage (I_C = 50 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 mAdc, 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	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 15 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	—	—	250	pF

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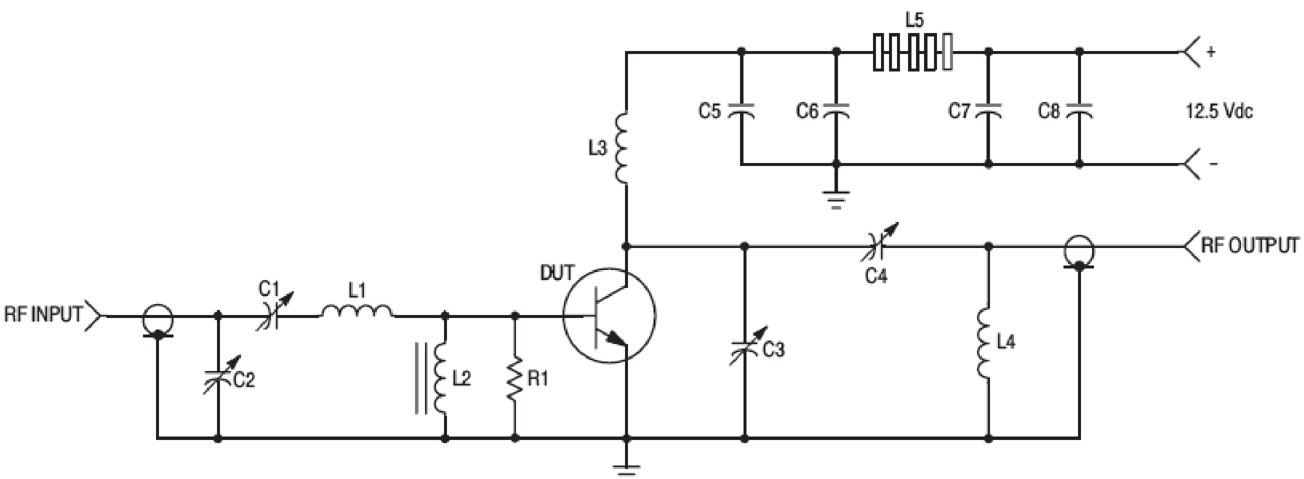
FUNCTIONAL TESTS (Figure 1)

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.341	—	Ohms
Series Equivalent Output Impedance (V_{CC} = 12.5 Vdc, P_{out} = 80 W, f = 30 MHz)	Z_{out}	—	1.16–j.201	—	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	—	—



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

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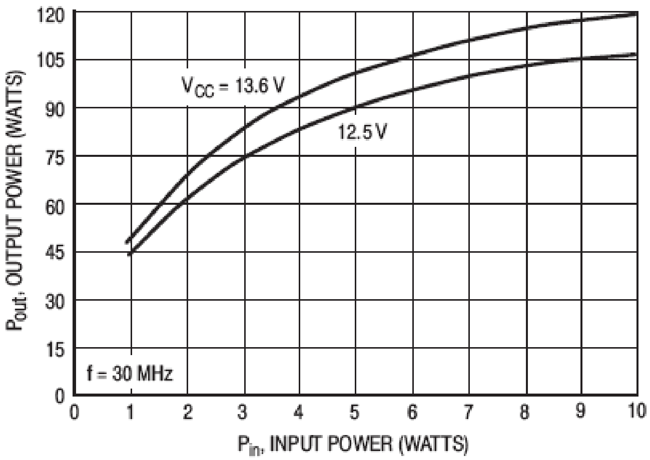

Figure 2. Output Power versus Input Power

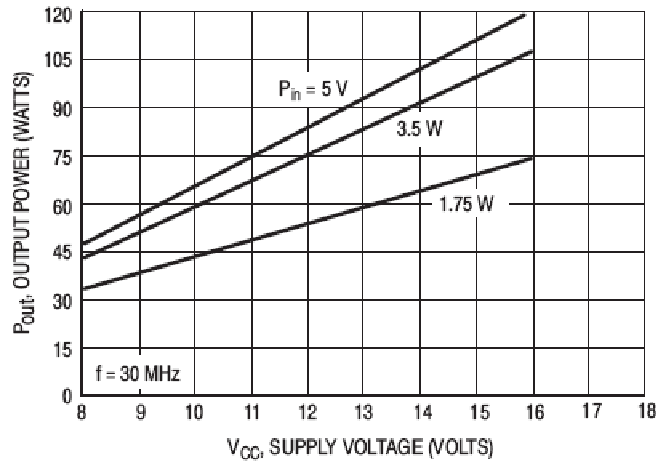

Figure 3. Output Power versus Supply Voltage

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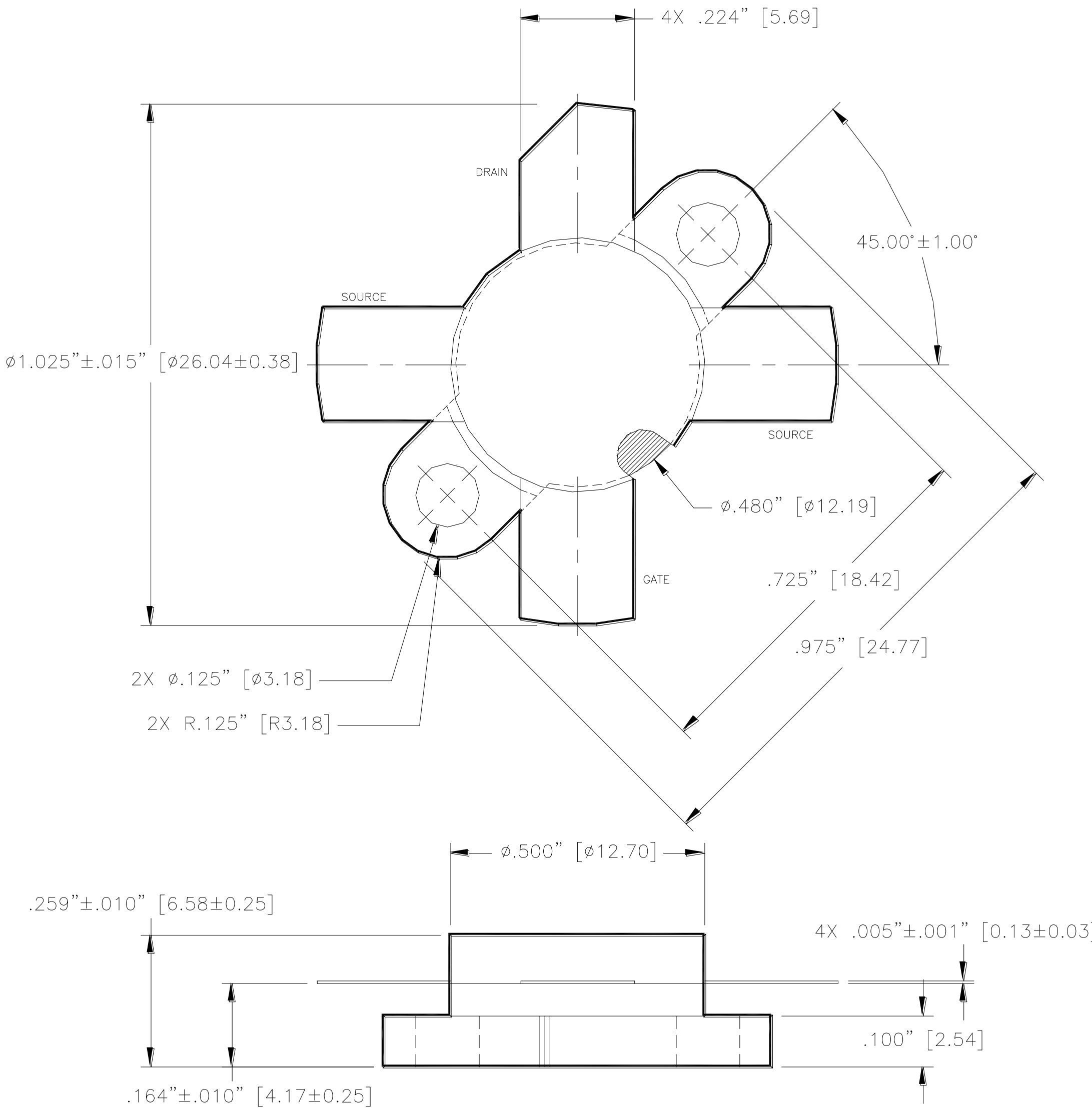

Unless otherwise noted, tolerances are inches ±.005" [millimeters ±0.13mm]