

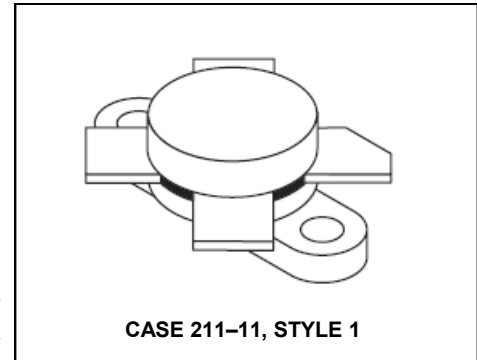
## The RF Line NPN Silicon Power Transistor 80W, 30MHz, 12.5V

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



### 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 $25^\circ\text{C}$	$P_D$	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	$^\circ\text{C}/\text{W}$

### 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

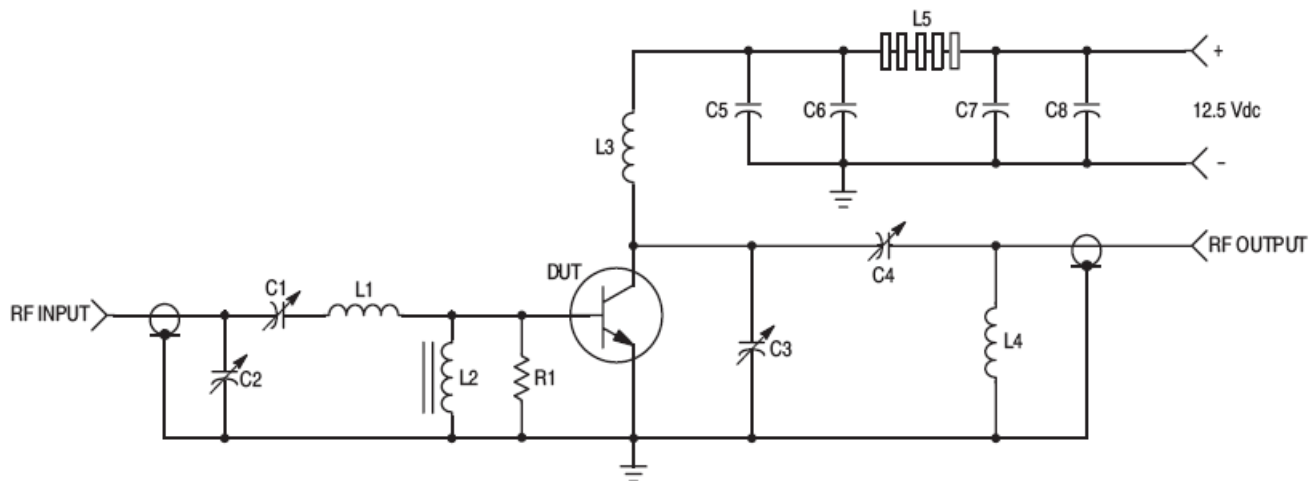
Output Capacitance ( $V_{CB} = 15 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{ob}$	—	—	250	pF
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### FUNCTIONAL TESTS (Figure 1)

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 ( $V_{CC} = 12.5 \text{ Vdc}$ , $P_{out} = 80 \text{ W}$ , $f = 30 \text{ MHz}$ )	$\eta$	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 $\Omega$ 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	—	—



C1, C2, C4 — ARCO 469  
 C3 — ARCO 466  
 C5 — 1000 pF, UNELCO  
 C6, C7 — 0.1  $\mu\text{F}$  Disc Ceramic  
 C8 — 1000  $\mu\text{F}/15 \text{ V}$  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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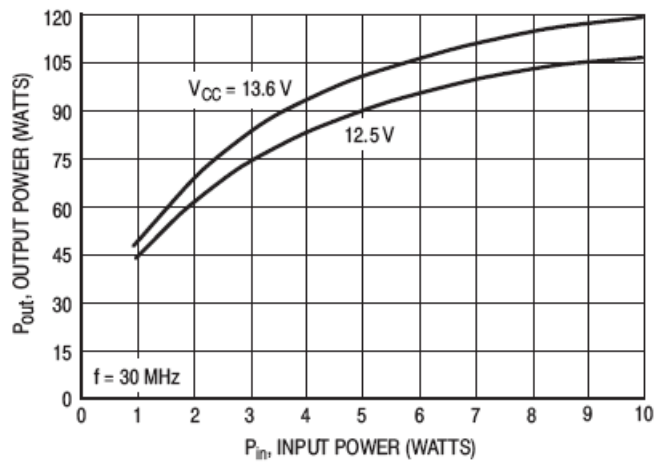


Figure 2. Output Power versus Input Power

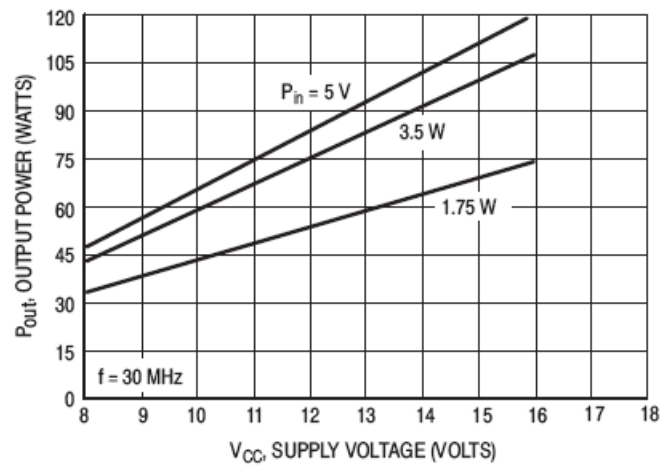
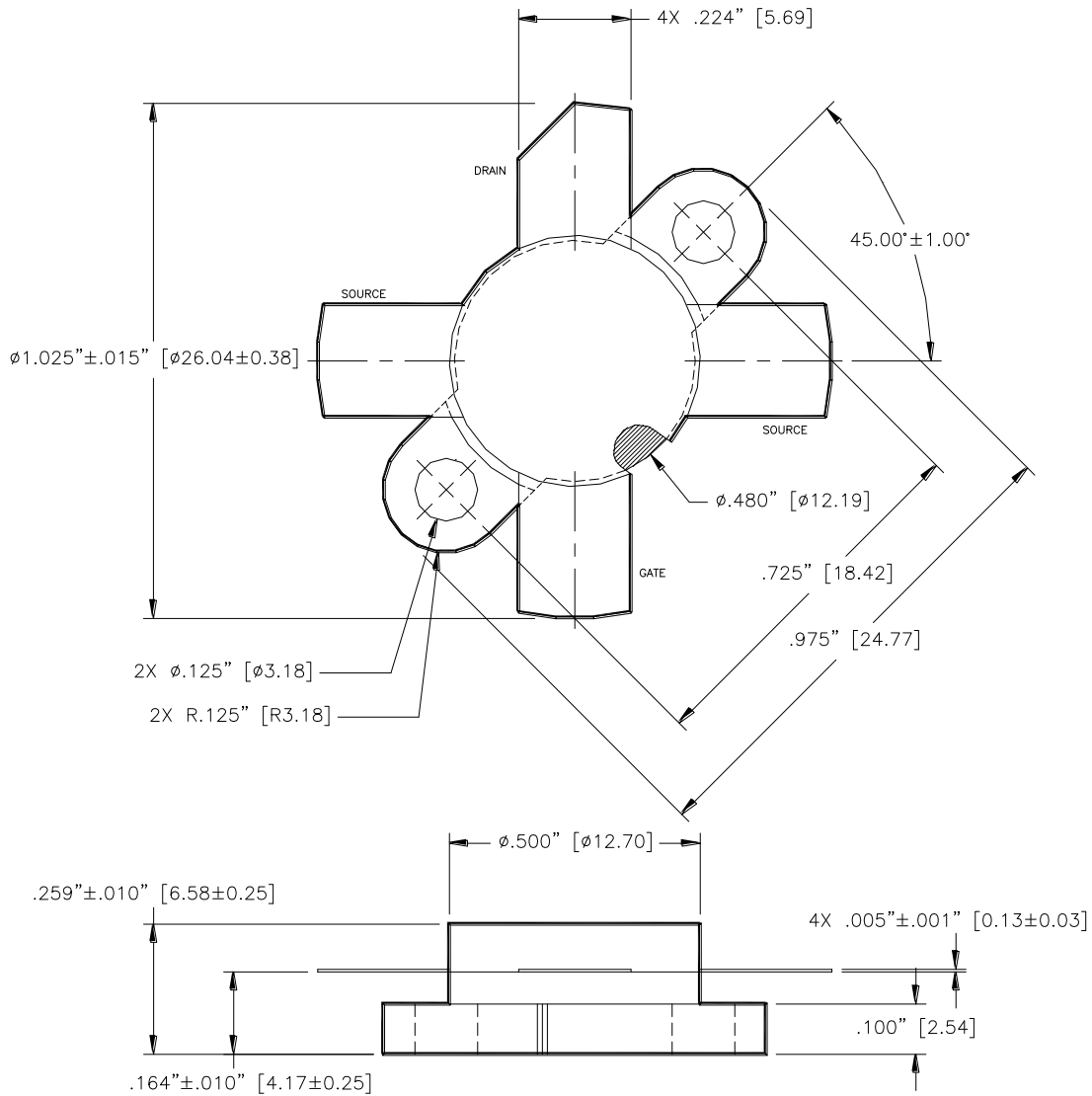


Figure 3. Output Power versus Supply Voltage

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

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