

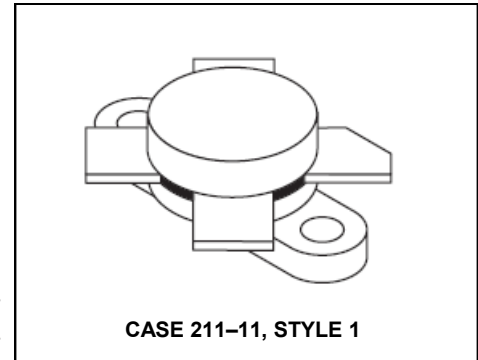
The RF Line NPN Silicon Power Transistor 80W, 30MHz, 12.5V

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°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 |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

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 | — |
|------------------------------------------------------------------------|----------|----|---|-----|---|

DYNAMIC CHARACTERISTICS

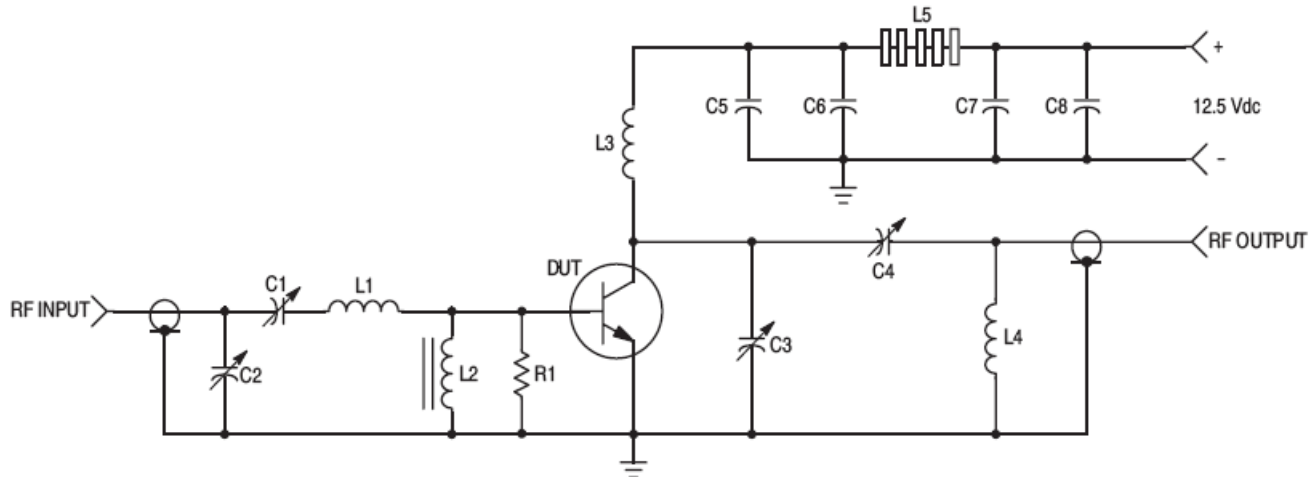
| | | | | | |
|------------------------------------------------------------------------------------|----------|---|---|-----|----|
| Output Capacitance ($V_{CB} = 15\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$) | C_{ob} | — | — | 250 | pF |
|------------------------------------------------------------------------------------|----------|---|---|-----|----|

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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 $\mu\text{F}/15 \text{ V}$ 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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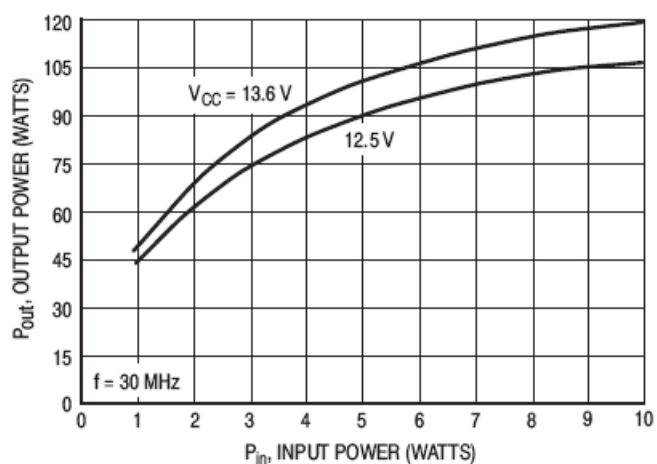


Figure 2. Output Power versus Input Power

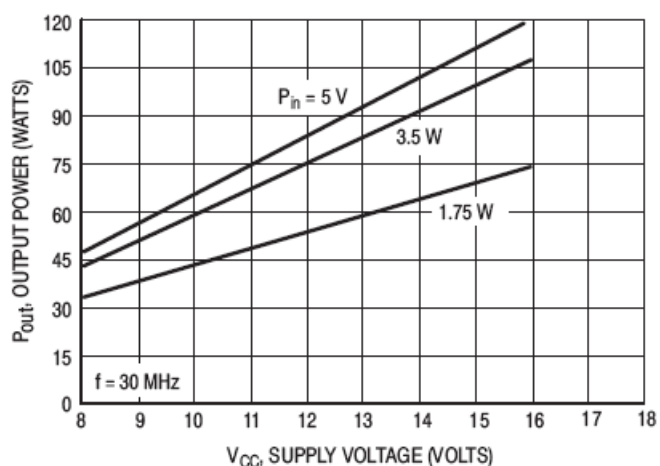
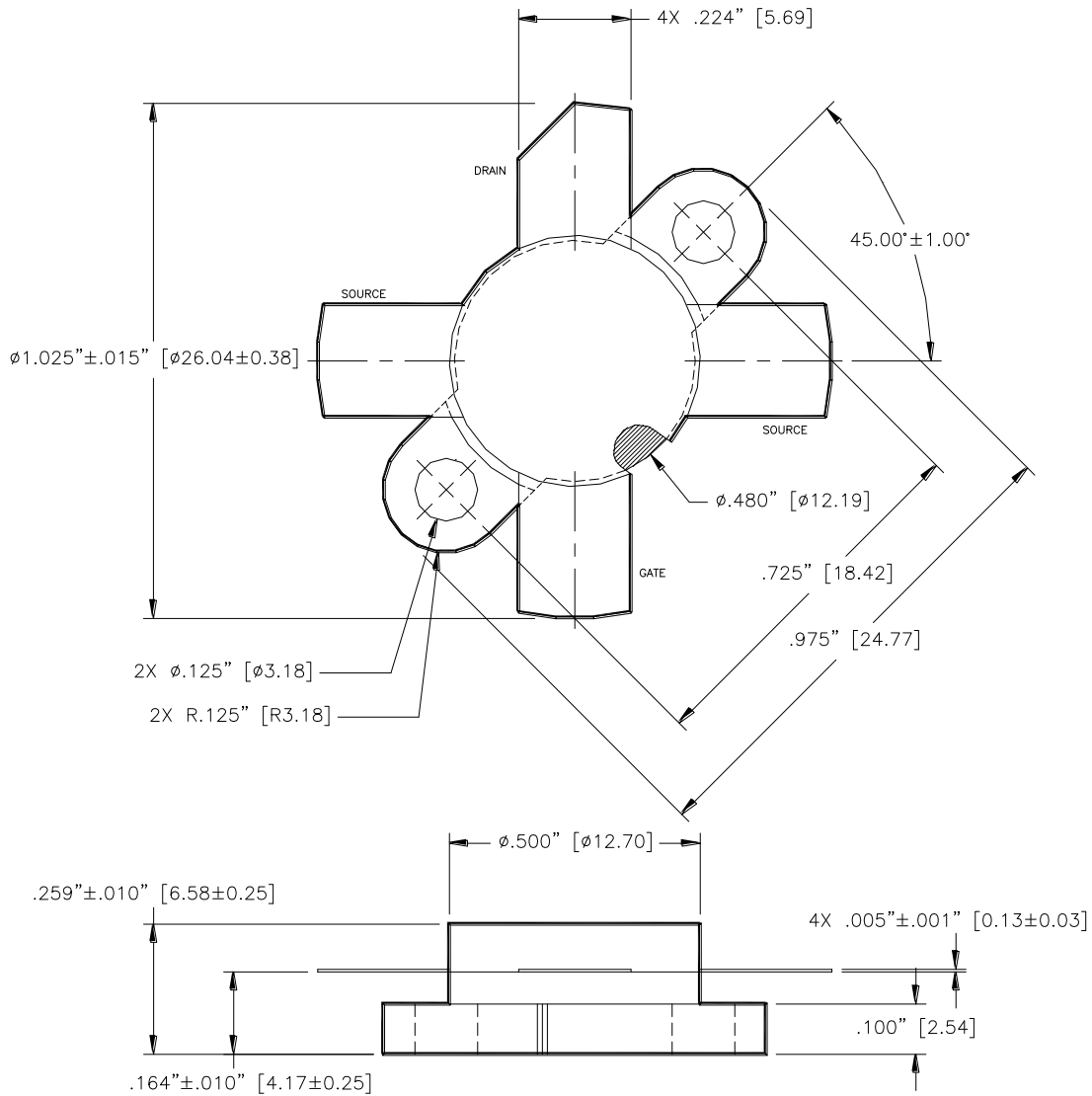


Figure 3. Output Power versus Supply Voltage

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

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