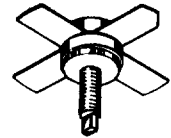


TP2317

The RF Line
VHF Power Transistor

20 W — 175 MHz
VHF POWER
TRANSISTOR
NPN SILICON



CASE 145D-01, STYLE 1
(.380 SOE)

The TP2317 is designed for use in 12.5 V VHF amplifiers operating under Class A, B or C conditions.

Its construction, which incorporates gold metallization and diffused ballast resistors, enables the part to be used at its maximum ratings and be able to withstand an infinite VSWR at all phase angles.

- 175 MHz
- 20 W — P_{out}
- 12.5 V — V_{CC}
- Gold Metallization for Reliability

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--------------------------------|-----------|-------------|------|
| Collector-Emitter Voltage | V_{CEO} | 16 | Vdc |
| Collector-Base Voltage | V_{CBO} | 36 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 4 | Vdc |
| Collector Current — Continuous | I_C | 8 | Adc |
| Operating Junction Temperature | T_J | 200 | °C |
| Storage Temperature Range | T_{stg} | -65 to +200 | °C |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--------------------------------------|-----------------|-----|------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 2.2 | °C/W |

ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|---|---------------|----|---|----|------|
| Collector-Emitter Breakdown Voltage ($I_C = 50$ mA, $I_B = 0$) | $V_{(BR)CEO}$ | 16 | — | — | Vdc |
| Collector-Base Breakdown Voltage ($I_C = 50$ mA, $I_E = 0$) | $V_{(BR)CBO}$ | 36 | — | — | Vdc |
| Emitter-Base Breakdown Voltage ($I_E = 5$ mA, $I_C = 0$) | $V_{(BR)EBO}$ | 4 | — | — | Vdc |
| Collector-Emitter Breakdown Voltage ($I_C = 50$ mA, $R_{BE} = 10 \Omega$) | $V_{(BR)CER}$ | 35 | — | — | Vdc |
| Collector Cutoff Current ($V_{CB} = 15$ V, $I_E = 0$) | I_{CBO} | — | — | 25 | mAdc |

ON CHARACTERISTICS

| | | | | | |
|--|----------|----|---|---|---|
| DC Current Gain ($I_C = 1$ A, $V_{CE} = 5$ V) | h_{FE} | 10 | — | — | — |
|--|----------|----|---|---|---|

FUNCTIONAL TESTS

| | | | | | |
|--|----------|--------------------------------|---|---|----|
| Common-Emitter Amplifier Power Gain ($V_{CE} = 12.5$ V, $P_{out} = 20$ W, $f = 175$ MHz) | G_{PE} | 7 | — | — | dB |
| Collector Efficiency ($V_{CE} = 12.5$ V, $P_{out} = 20$ W, $f = 175$ MHz) | η_c | 55 | — | — | % |
| Load Mismatch ($V_{CE} = 12.5$ V, $P_{out} = 20$ W, $f = 175$ MHz, Load VSWR = $\infty:1$, All Phase Angles) | ψ | No Degradation in Output Power | | | |

TYPICAL CHARACTERISTICS

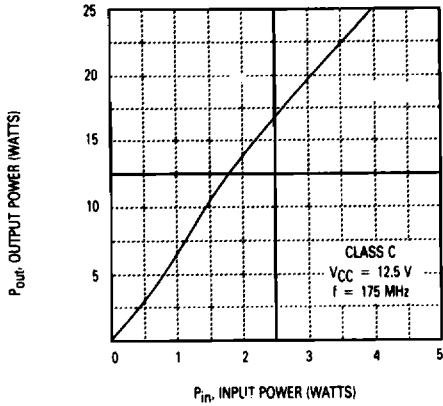


Figure 1. Power Transfer

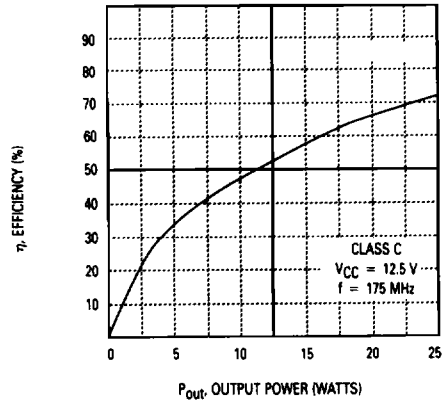


Figure 2. Collector Efficiency

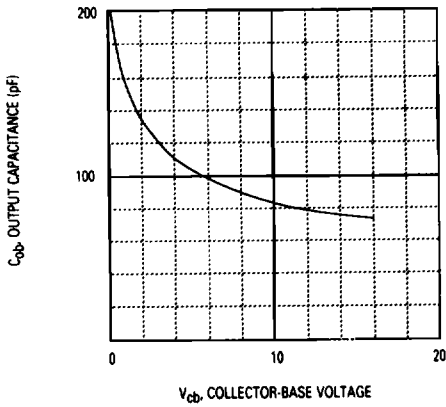


Figure 3. Output Capacitance (Typical)

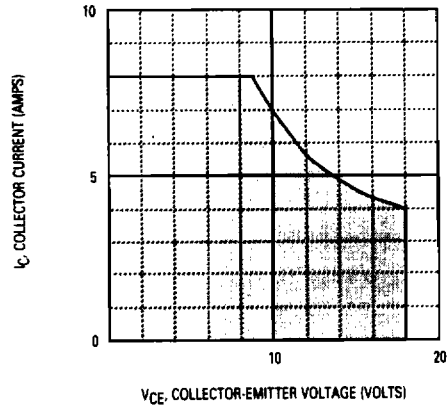


Figure 4. Safe Operating Area

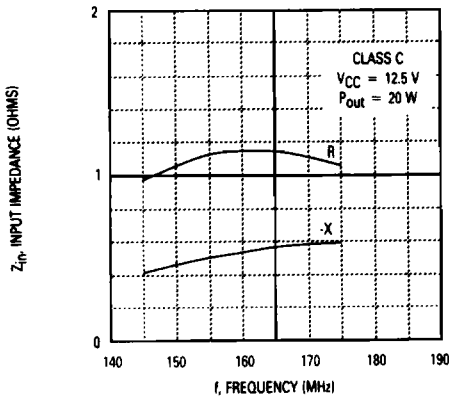


Figure 5. Input Series Impedance

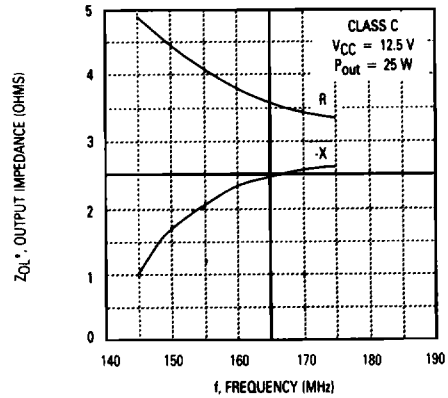
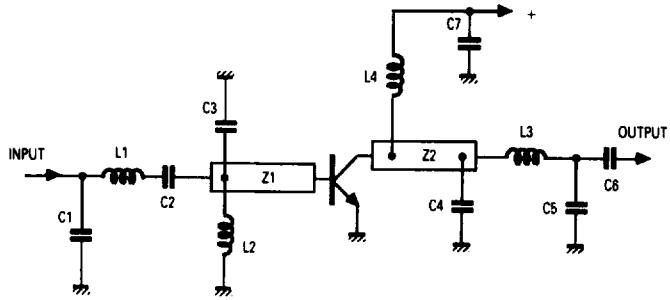


Figure 6. Output Series Impedance

TP2317

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- C1 — ARCO 4-40 pF Trimmer Capacitor
- C2 — ARCO 4-40 pF Trimmer Capacitor
- C3 — UNELCO 200 pF
- C4 — UNELCO 120 pF
- C5 — ARCO 7-120 pF Trimmer Capacitor
- C6 — ARCO 24-200 pF Trimmer Capacitor
- C7 — 1 nF + 0.1 μ F + 47 μ F
- L1 — 3 turns 16 AWG 0.16" I.D.
- L2 — 0.47 μ H Molded Coil
- L3 — 1 turn 16 AWG 0.16" I.D.
- L4 — 8 turns 12 AWG On 380 Ω 2 W Carbon
- Z1 — Base pad 0.06" single sided PC board 0.55" Lx0.28" W
- Z2 — Collector pad 0.06" single sided PC board 0.58" Lx0.28" W
PC Board: Double Sided PC Board 0.06"

Figure 7. 175 MHz Test Circuit