

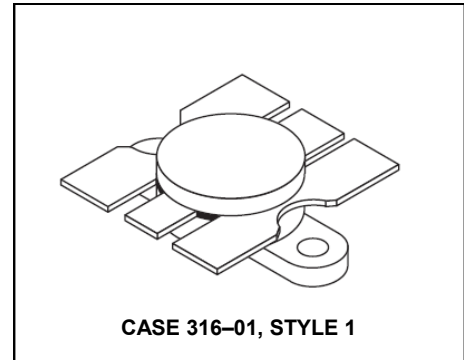
The RF Line Controlled “Q” Broadband Power Transistor 80W, 100 to 500MHz, 28V

Rev. V1

Designed primarily for wideband large-signal output amplifier stages in the 100 to 500 MHz frequency range.

- Guaranteed performance @ 400 MHz, 28 Vdc
Output power = 80 W over 225 to 400 MHz Band
Minimum gain = 7.3 dB @ 400 MHz
- Built-in matching network for broadband operation using double match technique
- 100% tested for load mismatch at all phase angles with 30:1 VSWR
- Gold metallization system for high reliability applications
- Characterized for 100 – 500 MHz

Product Image



MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|-----------|-------------|------------------------------|
| Collector–Emitter Voltage | V_{CEO} | 33 | Vdc |
| Collector–Base Voltage | V_{CBO} | 60 | Vdc |
| Emitter–Base Voltage | V_{EBO} | 4.0 | Vdc |
| Collector Current — Continuous — Peak | I_C | 9.0 12 | Adc |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (1) 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 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

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

OFF CHARACTERISTICS

| | | | | | |
|---|---------------|-----|---|-----|------|
| Collector–Emitter Breakdown Voltage ($I_C = 80 \text{ mAdc}$, $I_B = 0$) | $V_{(BR)CEO}$ | 33 | — | — | Vdc |
| Collector–Emitter Breakdown Voltage ($I_C = 80 \text{ mAdc}$, $V_{BE} = 0$) | $V_{(BR)CES}$ | 60 | — | — | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = 8.0 \text{ mAdc}$, $I_C = 0$) | $V_{(BR)EBO}$ | 4.0 | — | — | Vdc |
| Collector–Base Breakdown Voltage ($I_C = 80 \text{ mAdc}$, $I_C = 0$) | $V_{(BR)CBO}$ | 60 | — | — | Vdc |
| Collector Cutoff Current ($V_{CB} = 30 \text{ Vdc}$, $I_E = 0$) | I_{CBO} | — | — | 5.0 | mAdc |

ON CHARACTERISTICS

| | | | | | |
|--|----------|----|---|----|---|
| DC Current Gain ($I_C = 4.0 \text{ Adc}$, $V_{CE} = 5.0 \text{ Vdc}$) | h_{FE} | 20 | — | 80 | — |
|--|----------|----|---|----|---|

NOTE:

1. This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF amplifier. (continued)

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DYNAMIC CHARACTERISTICS

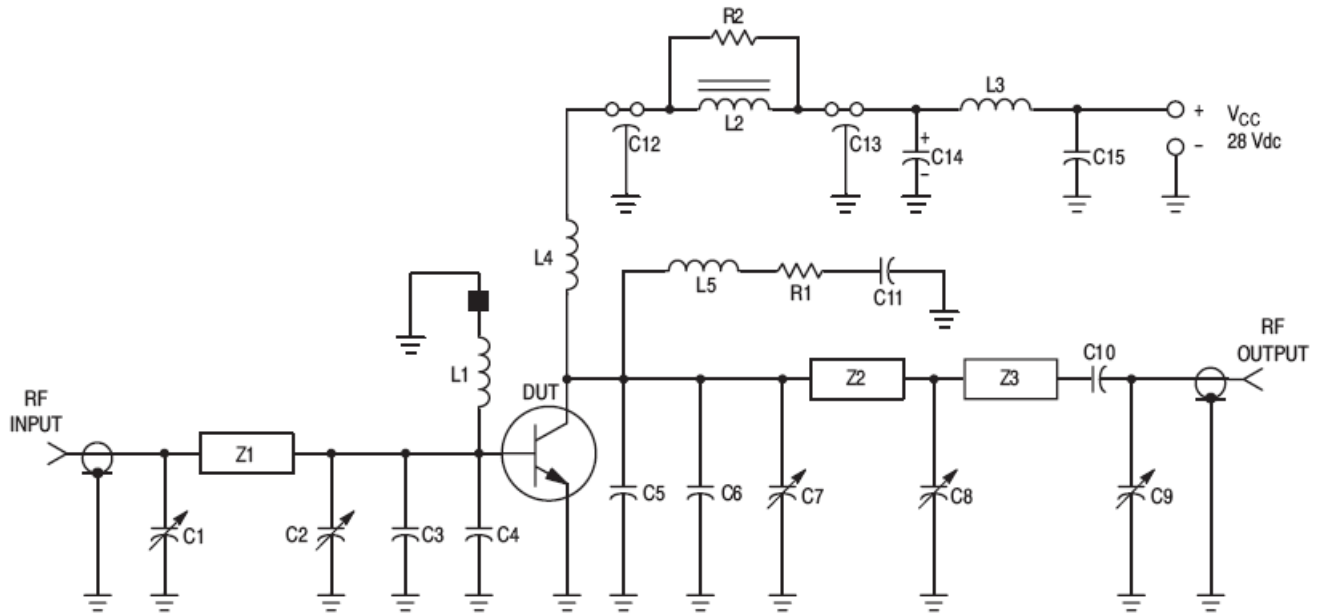
| | | | | | |
|---|----------|---|----|-----|----|
| Output Capacitance ($V_{CB} = 28 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$) | C_{ob} | — | 95 | 125 | pF |
|---|----------|---|----|-----|----|

ELECTRICAL CHARACTERISTICS – continued ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

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

FUNCTIONAL TESTS (Figure 1)

| | | | | | |
|--|----------|--------------------------------|-----|---|----|
| Common-Emitter Amplifier Power Gain ($V_{CC} = 28 \text{ Vdc}$, $P_{out} = 80 \text{ W}$, $f = 400 \text{ MHz}$) | G_{PE} | 7.3 | 9.0 | — | dB |
| Collector Efficiency ($V_{CC} = 28 \text{ Vdc}$, $P_{out} = 80 \text{ W}$, $f = 400 \text{ MHz}$) | η | 50 | 60 | — | % |
| Load Mismatch ($V_{CC} = 28 \text{ Vdc}$, $P_{out} = 80 \text{ W}$, $f = 400 \text{ MHz}$, VSWR = 30:1 All Phase Angles) | ψ | No Degradation in Output Power | | | |



C1, C2, C7, C8, C9 — 1.0–20 pF Piston Trimmer (Johanson JMC 5501)
 C3, C4 — 36 pF ATC 100 mil Chip Capacitor
 C5, C6 — 43 pF ATC 100 mil Chip Capacitor
 C10 — 100 pF UNELCO
 C11, C15 — 0.1 μF Erie Redcap
 C12, C13 — 680 pF Feedthru
 C14 — 1.0 μF 50 V Tantalum
 L1 — 4 Turns #22 AWG Enameled, 3/16" ID Closewound with Ferroxcube Bead (#56–590–65/4B) on Ground End of Coil
 L2 — Ferroxcube VK200–19/4B Ferrite Choke
 L3 — 7 Turns #18 AWG, 11/16" Long, Wound on a 100 k Ω 2.0 Watt Resistor

L4 — 6 Turns #20 AWG Enameled, 3/16" ID Closewound
 L5 — 4 Turns #22 AWG Enameled, 1/8" ID Closewound
 Z1 — Microstrip 0.2" W x 1.5" L
 Z2 — Microstrip 0.17" W x 1.16" L
 Z3 — Microstrip 0.17" W x 0.63" L
 R1, R2 — 10 Ω 2.0 Watt
 Board — Glass Teflon $\epsilon_r = 2.56$, $t = 0.062$ "
 Input/Output Connectors Type N
 DUT Socket Lead Frame Etched from 80–mil–Thick Copper

Figure 1. 400 MHz Test Circuit

The RF Line Controlled "Q" Broadband Power Transistor 80W, 100 to 500MHz, 28V

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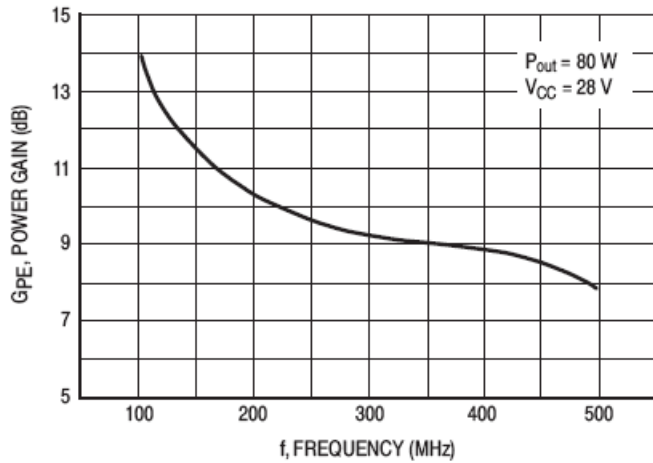


Figure 2. Power Gain versus Frequency

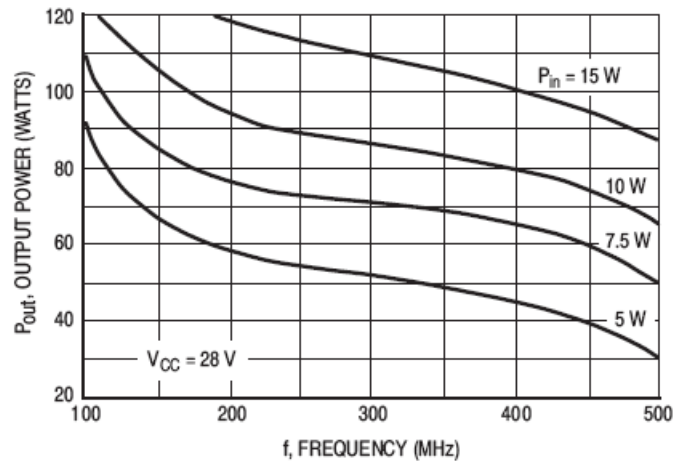


Figure 3. Output Power versus Frequency

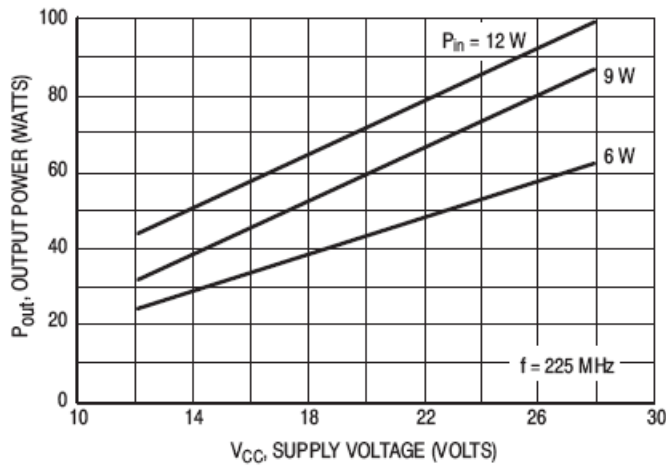


Figure 4. Output Power versus Supply Voltage

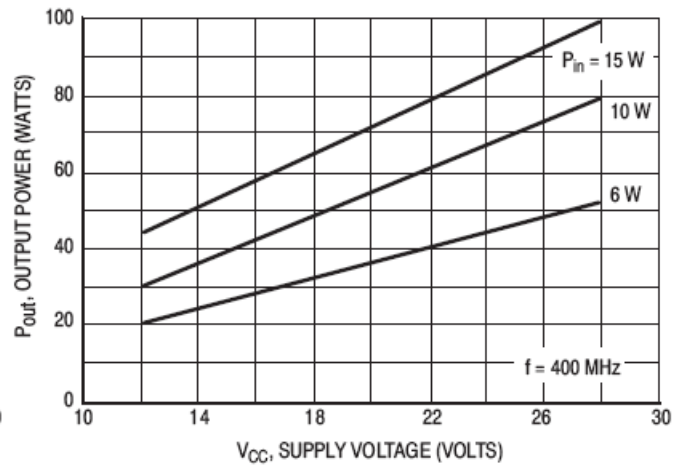


Figure 5. Output Power versus Supply Voltage

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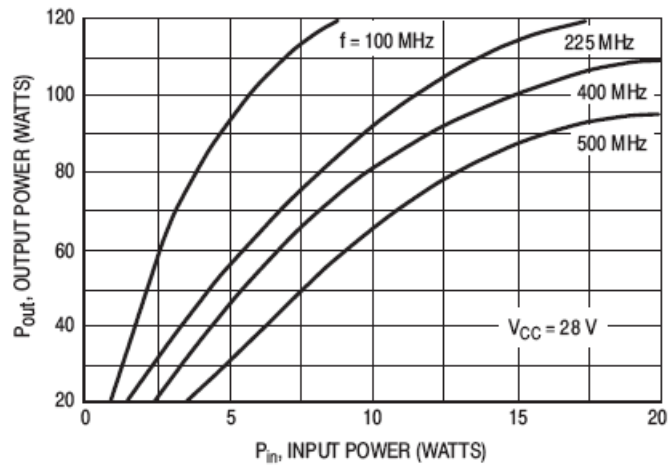


Figure 6. Output Power versus Input Power

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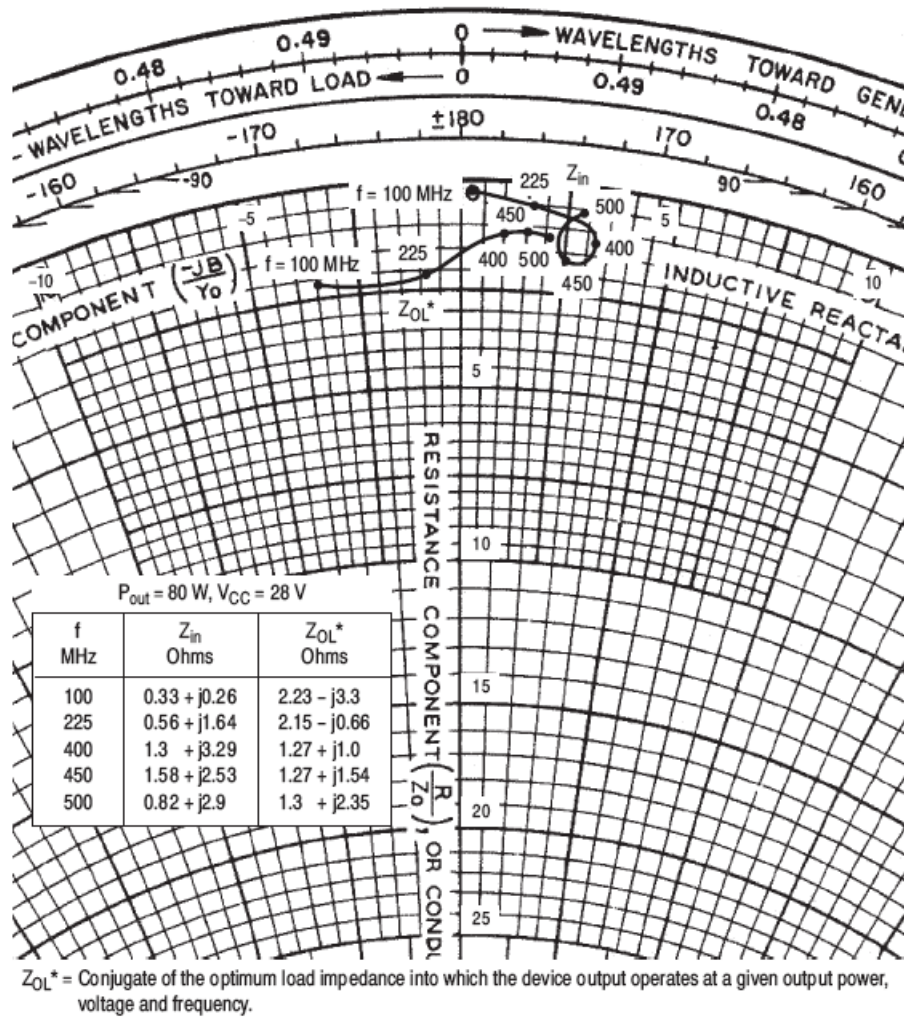
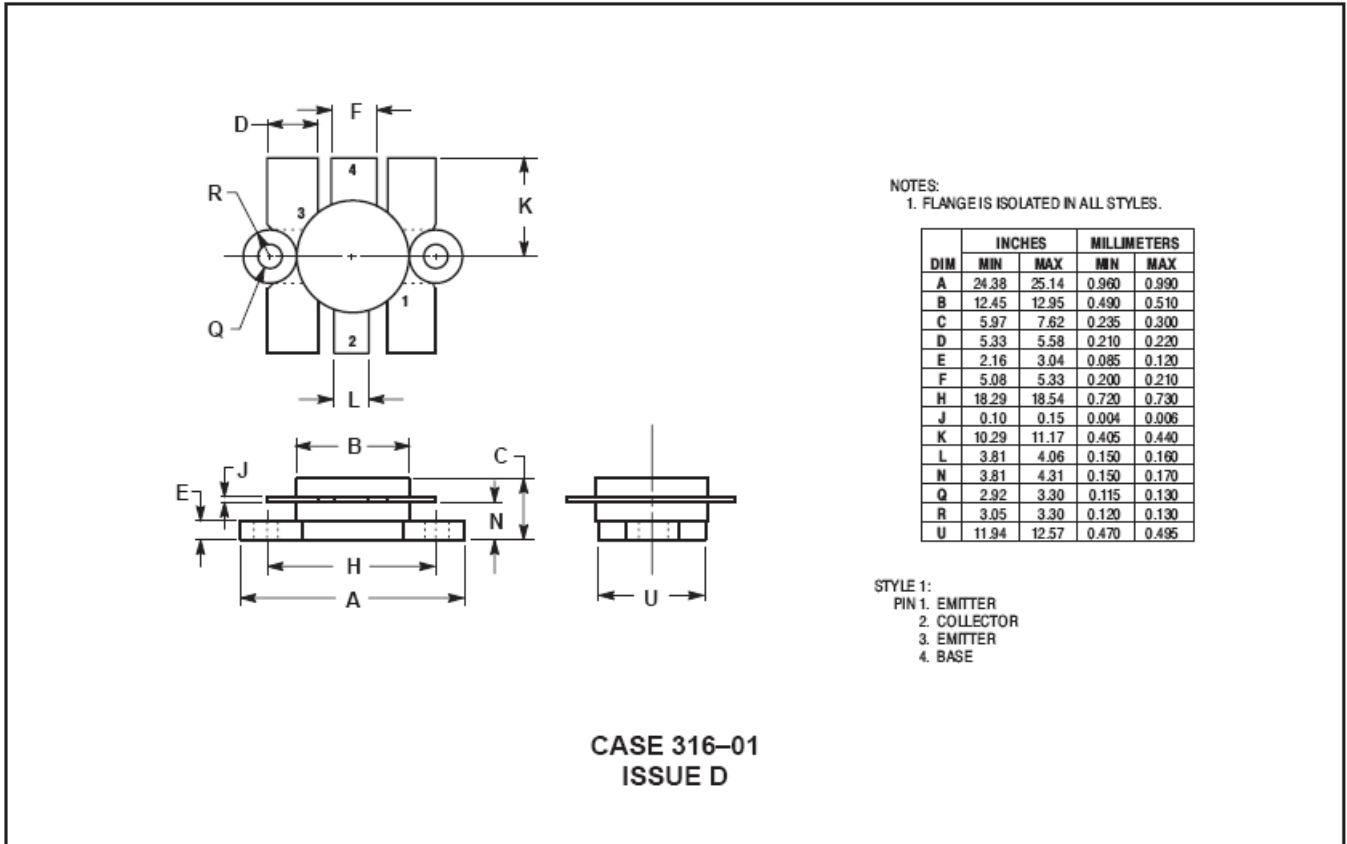


Figure 7. Series Equivalent Input-Output Impedance

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PACKAGE DIMENSIONS



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