

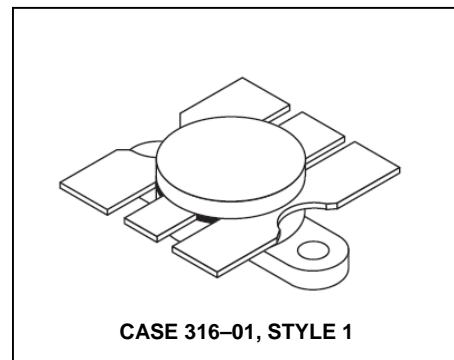
## The RF Line Controlled "Q" Broadband Power Transistor 80W, 100 to 500MHz, 28V

M/A-COM Products  
Released - Rev. 07.07

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

### 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)

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

M/A-COM Products  
Released - Rev. 07.07

### DYNAMIC CHARACTERISTICS

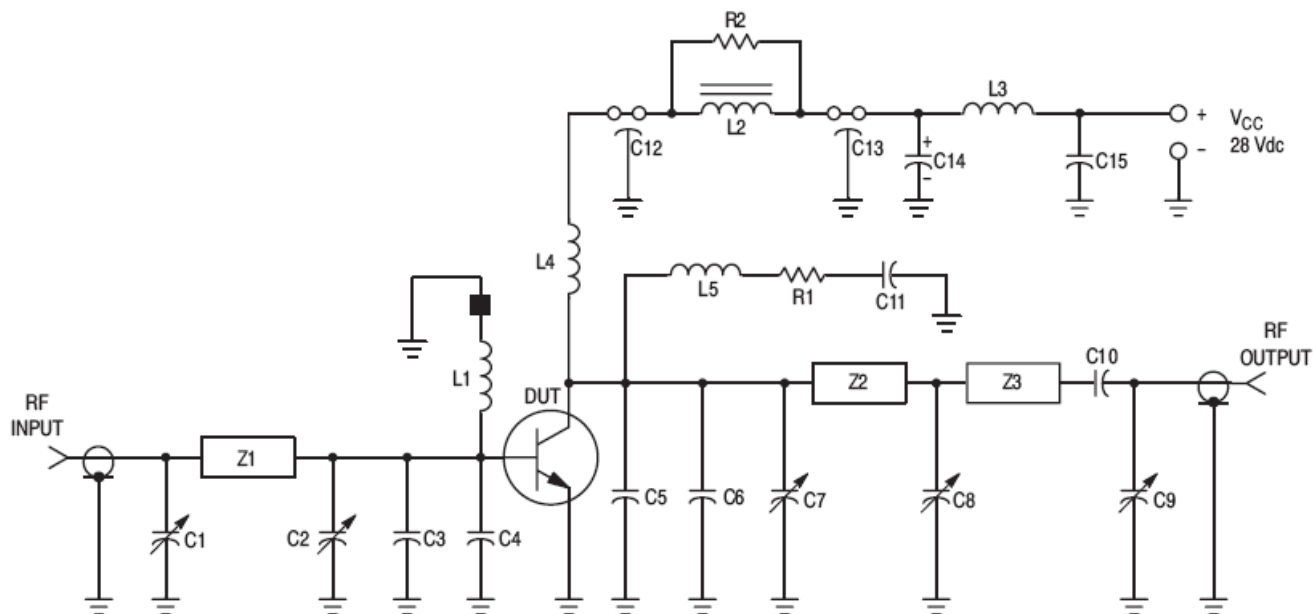
Output Capacitance ( $V_{CB} = 28 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{ob}$	—	95	125	pF
---	----------	---	----	-----	----

### 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 ( $V_{CC} = 28 \text{ Vdc}$ , $P_{out} = 80 \text{ W}$ , $f = 400 \text{ MHz}$ )	$\eta$	50	60	—	%
Load Mismatch ( $V_{CC} = 28 \text{ Vdc}$ , $P_{out} = 80 \text{ W}$ , $f = 400 \text{ MHz}$ , $VSWR = 30:1$ All Phase Angles)	$\psi$	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  $\mu\text{F}$  Erie Redcap
- C12, C13 — 680 pF Feedthru
- C14 — 1.0  $\mu\text{F}$  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 $\Omega$  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  $\Omega$  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

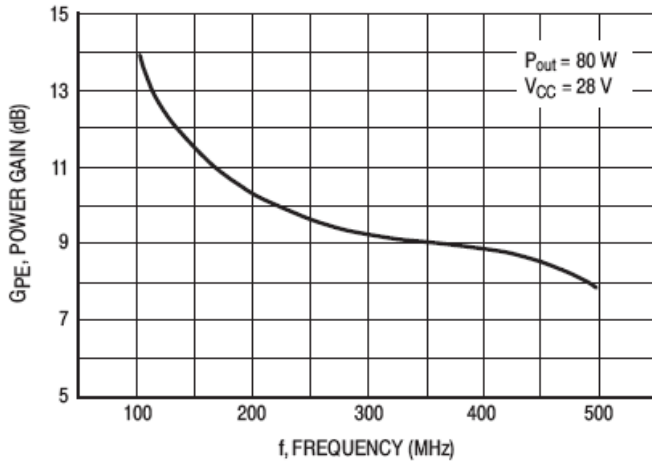


Figure 2. Power Gain versus Frequency

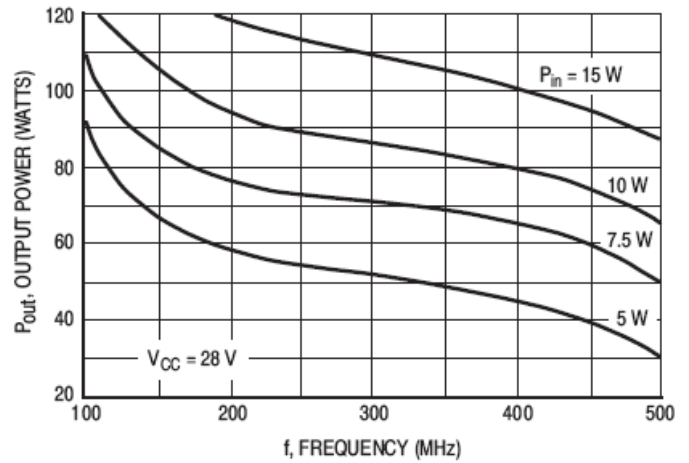


Figure 3. Output Power versus Frequency

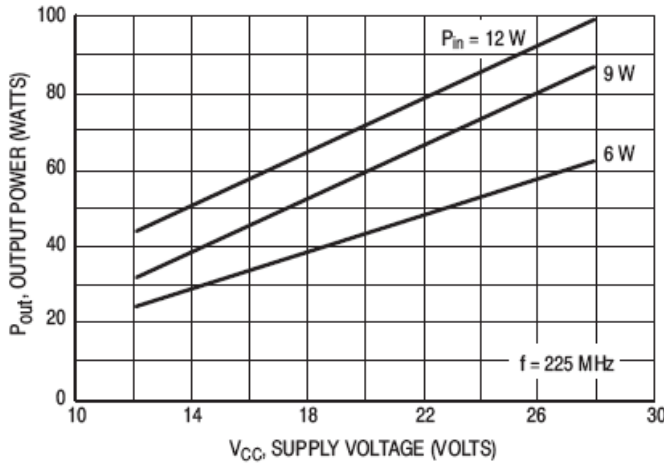


Figure 4. Output Power versus Supply Voltage

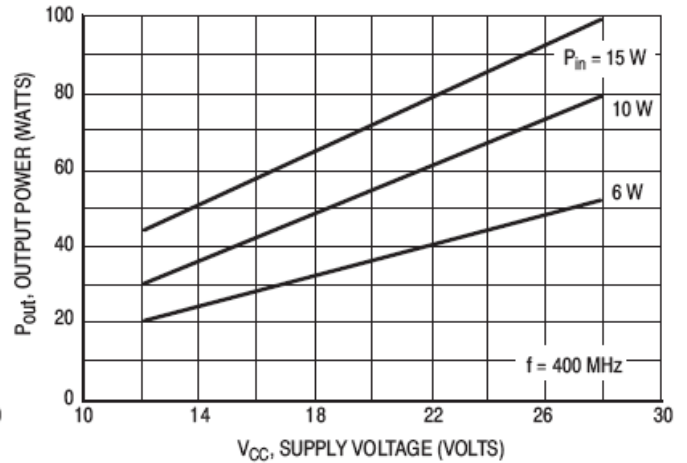


Figure 5. Output Power versus Supply Voltage

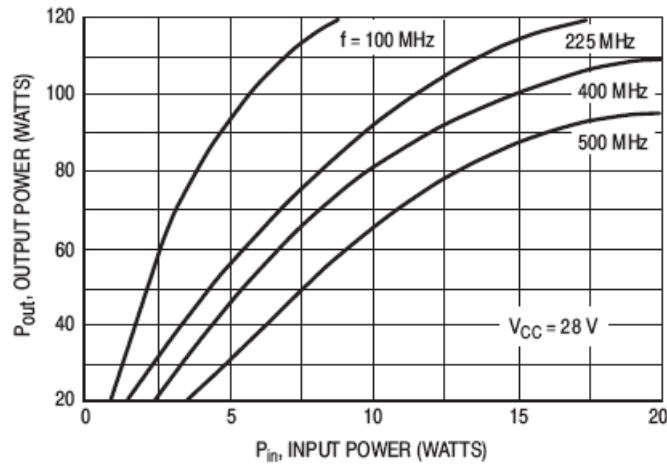


Figure 6. Output Power versus Input Power

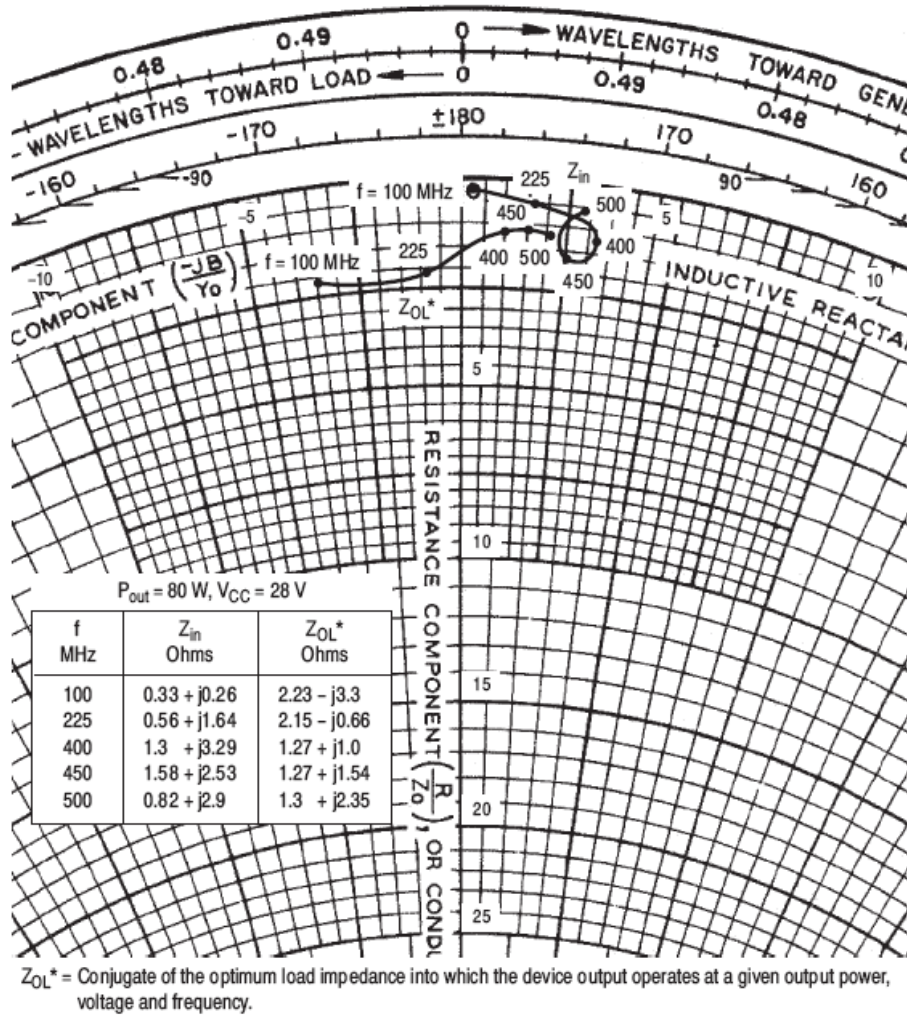


Figure 7. Series Equivalent Input-Output Impedance

## PACKAGE DIMENSIONS

