

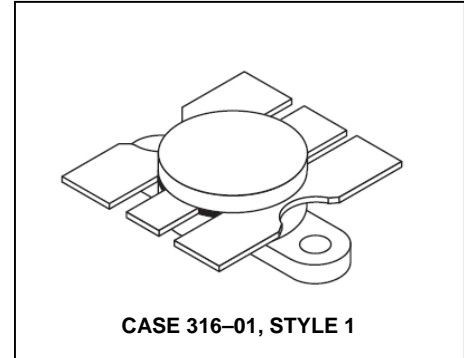
The RF Line Controlled "Q" Broadband Power Transistor 80W, 100 to 500MHz, 28V

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°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
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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	—
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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

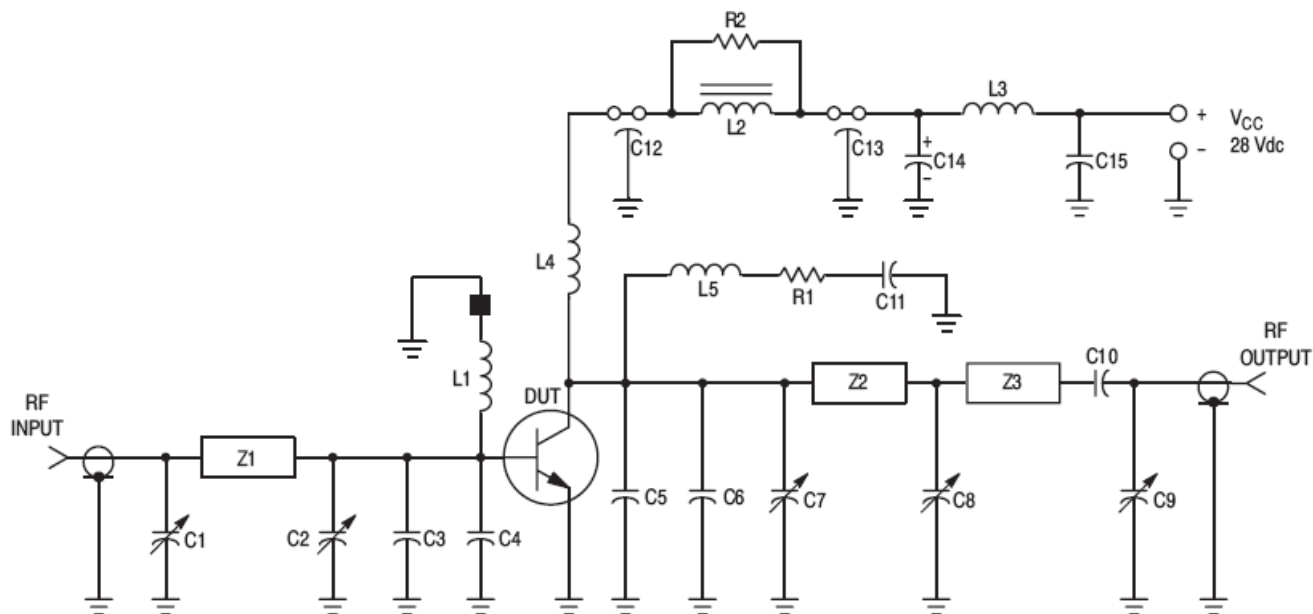
Output Capacitance ($V_{CB} = 28 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{ob}	—	95	125	pF
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ELECTRICAL CHARACTERISTICS – continued ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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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

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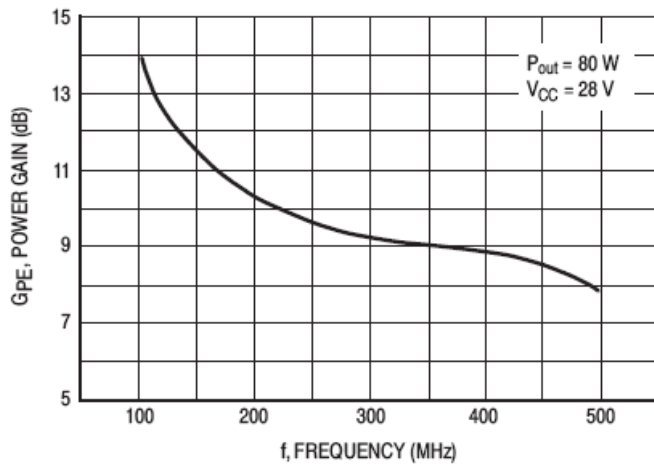


Figure 2. Power Gain versus Frequency

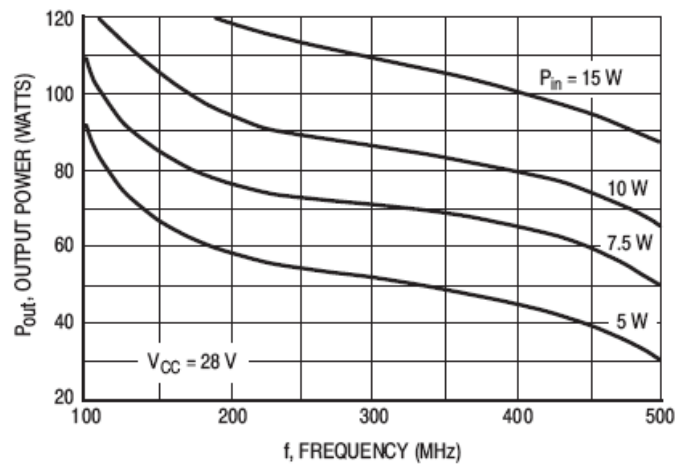


Figure 3. Output Power versus Frequency

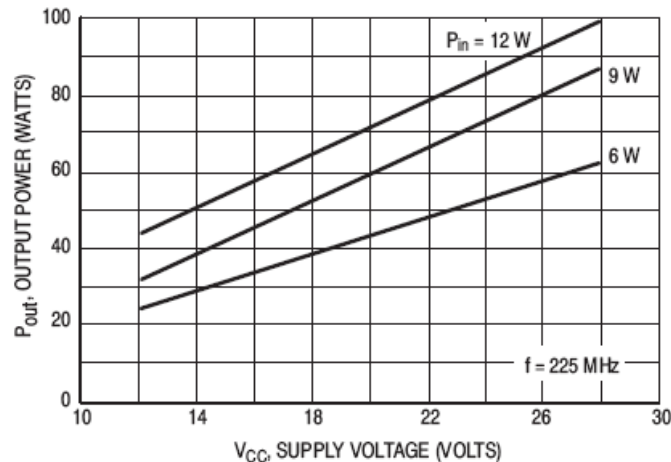


Figure 4. Output Power versus Supply Voltage

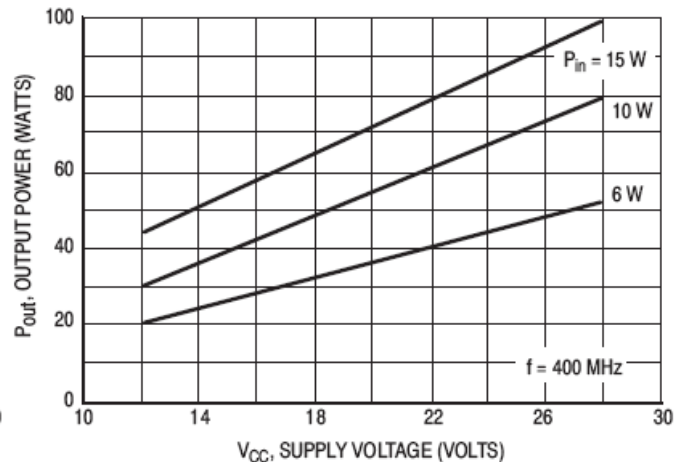


Figure 5. Output Power versus Supply Voltage

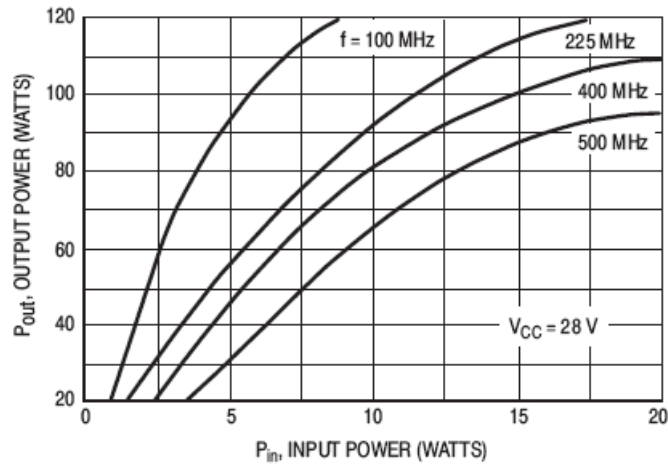


Figure 6. Output Power versus Input Power

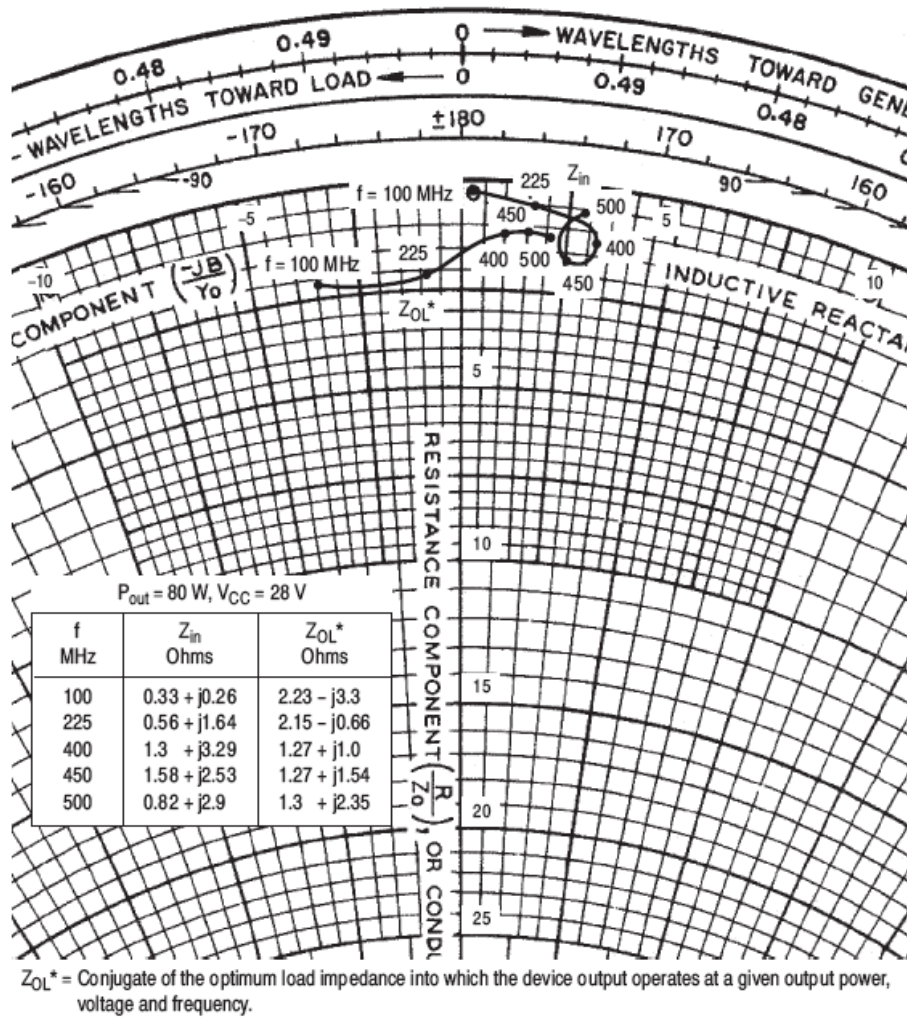


Figure 7. Series Equivalent Input-Output Impedance

PACKAGE DIMENSIONS

