

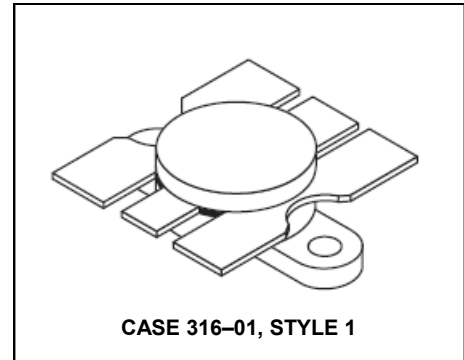
## The RF Line NPN Silicon Power Transistor 100W, 30-200MHz, 28V

Rev. V1

Designed primarily for wideband large-signal output amplifier stages in 30–200 MHz frequency range.

- Guaranteed performance at 150 MHz, 28 Vdc  
Output power = 100 W  
Minimum gain = 9.0 dB
- Built-in matching network for broadband operation
- 100% tested for load mismatch at all phase angles with 30:1 VSWR
- Gold metallization system for high reliability
- High output saturation power — ideally suited for 30 W carrier/120 W
- Peak AM amplifier service
- Guaranteed performance in broadband test fixture

### Product Image



### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	35	Vdc
Collector–Base Voltage	$V_{CBO}$	65	Vdc
Emitter–Base Voltage	$V_{EBO}$	4.0	Vdc
Collector Current — Continuous — Peak (10 seconds)	$I_C$	12 18	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (1) Derate above $25^\circ\text{C}$	$P_D$	270 1.54	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	$R_{\theta JC}$	0.65	$^\circ\text{C}/\text{W}$

### 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 ( $I_C = 100 \text{ mAdc}$ , $I_B = 0$ )	$V_{(BR)CEO}$	35	—	—	Vdc
Collector–Emitter Breakdown Voltage ( $I_C = 100 \text{ mAdc}$ , $V_{BE} = 0$ )	$V_{(BR)CES}$	65	—	—	Vdc
Collector–Base Breakdown Voltage ( $I_C = 100 \text{ mAdc}$ , $I_E = 0$ )	$V_{(BR)CBO}$	65	—	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 10 \text{ mAdc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 30 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	—	—	5.0	mAdc

### ON CHARACTERISTICS

DC Current Gain ( $I_C = 5.0 \text{ Adc}$ , $V_{CE} = 5.0 \text{ Vdc}$ )	$h_{FE}$	10	25	80	—
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NOTE:

(continued)

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
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### DYNAMIC CHARACTERISTICS

Output Capacitance ( $V_{CB} = 28 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{ob}$	—	150	175	pF
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### FUNCTIONAL TESTS (Figure 2)

Common–Emitter Amplifier Power Gain ( $V_{CC} = 28 \text{ Vdc}$ , $P_{out} = 100 \text{ W}$ , $f = 150 \text{ MHz}$ , $I_C (\text{Max}) = 6.5 \text{ Adc}$ )	$G_{PE}$	9.0	10	—	dB
Collector Efficiency ( $V_{CC} = 28 \text{ Vdc}$ , $P_{out} = 100 \text{ W}$ , $f = 150 \text{ MHz}$ , $I_C (\text{Max}) = 6.5 \text{ Adc}$ )	$\eta$	55	60	—	%
Load Mismatch ( $V_{CC} = 28 \text{ Vdc}$ , $P_{out} = 100 \text{ W CW}$ , $f = 150 \text{ MHz}$ , $V_{SWR} = 30:1$ all phase angles)	$\psi$	No Degradation in Output Power			

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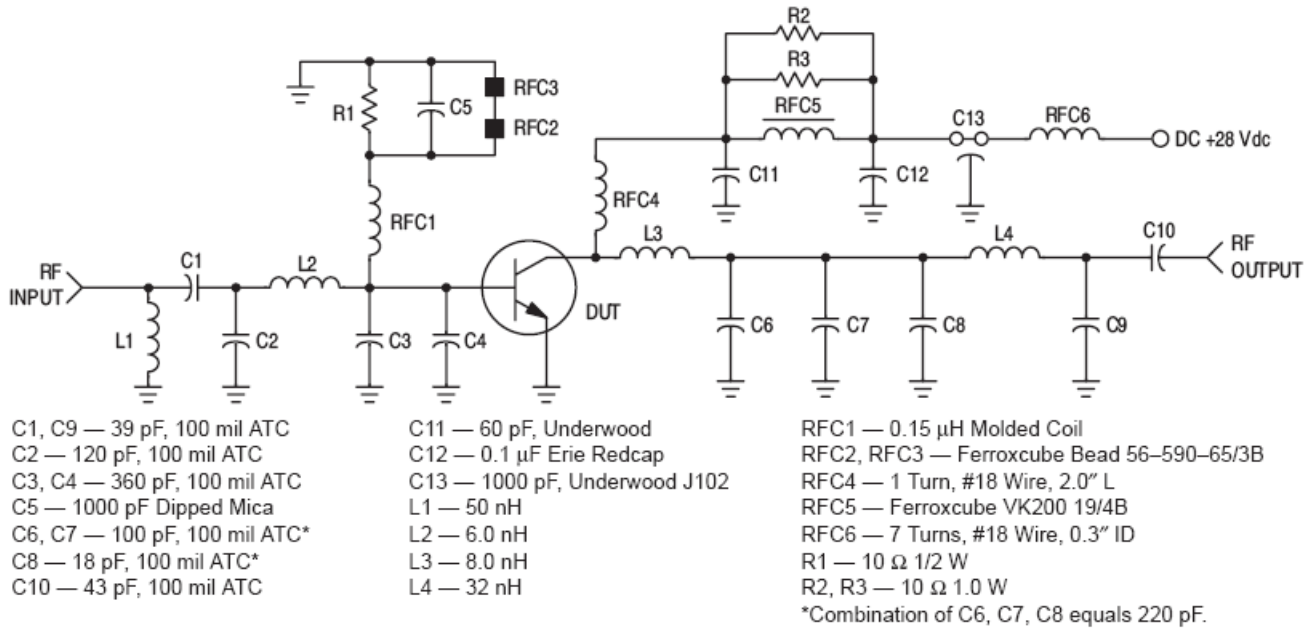


Figure 1. 110–160 MHz Broadband Amplifier — Test Fixture Schematic

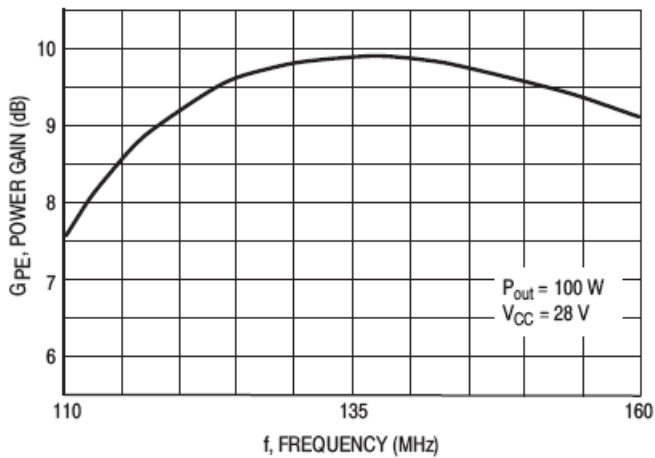


Figure 2. Power Gain versus Frequency  
Broadband Test Fixture

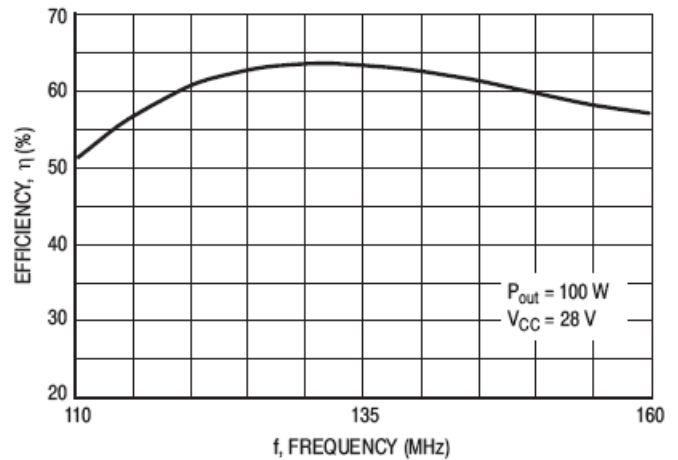


Figure 3. Efficiency versus Frequency  
Broadband Test Fixture

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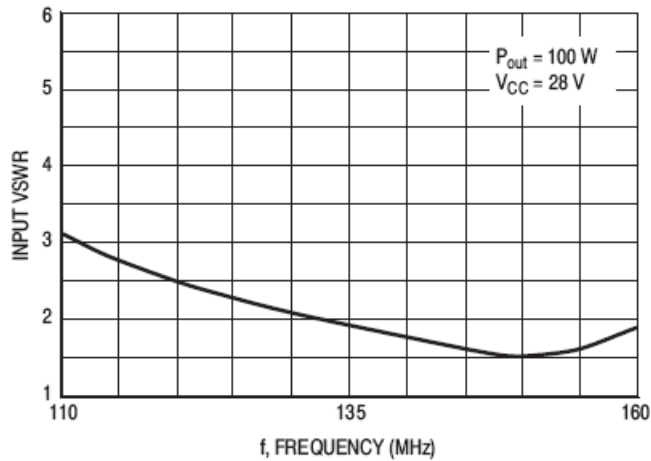


Figure 4. Input VSWR versus Frequency  
Broadband Test Fixture

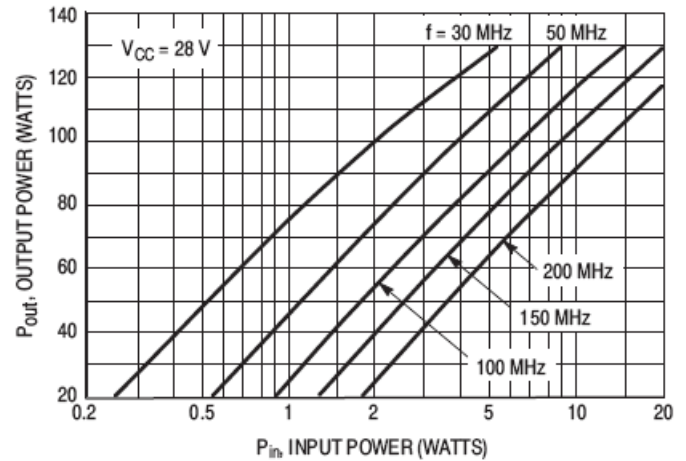


Figure 5. Output Power versus Input Power

### TYPICAL PERFORMANCE CURVES

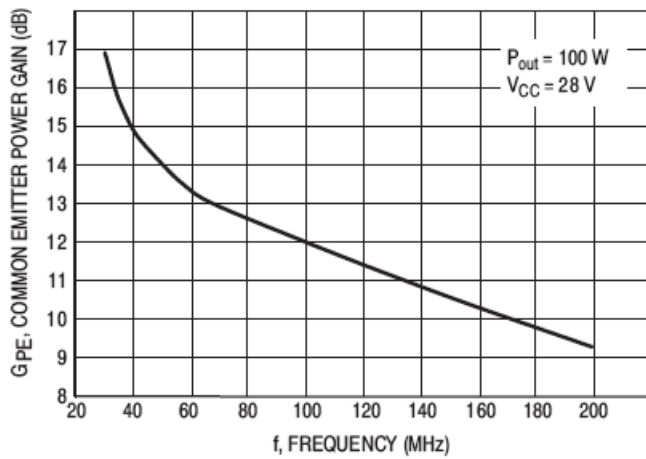


Figure 6. Power Gain versus Frequency

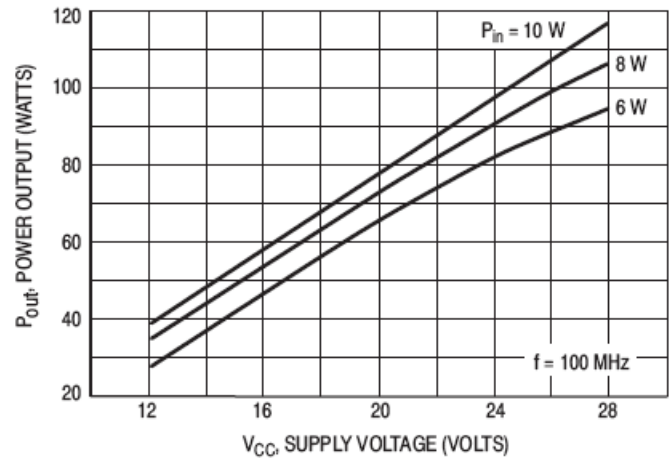


Figure 7. Power Output versus Supply Voltage

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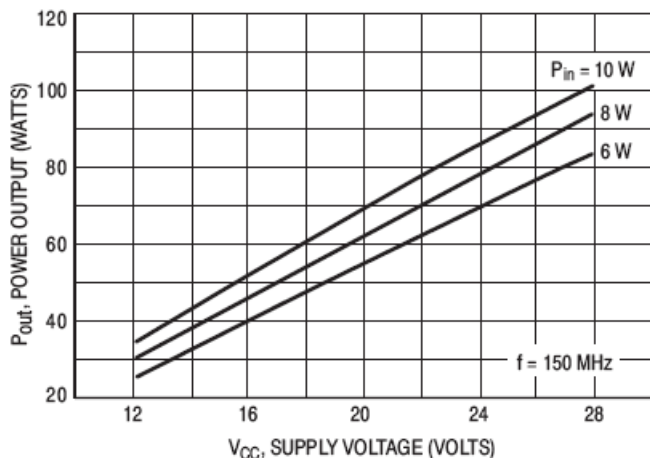


Figure 8. Power Output versus Supply Voltage

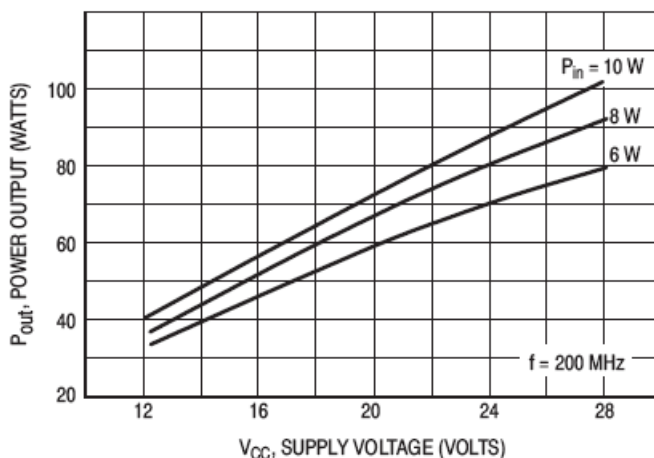
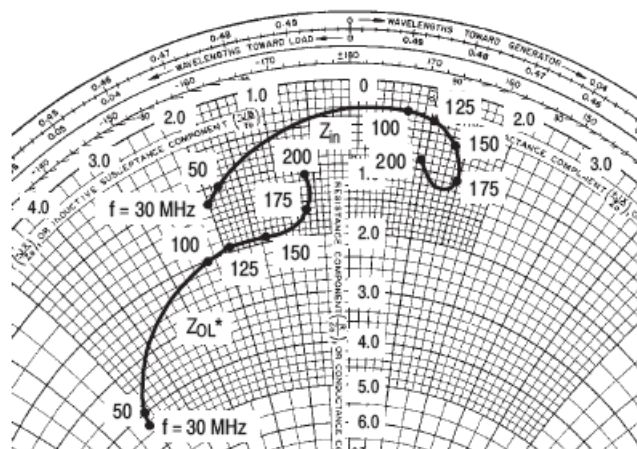


Figure 9. Power Output versus Supply Voltage



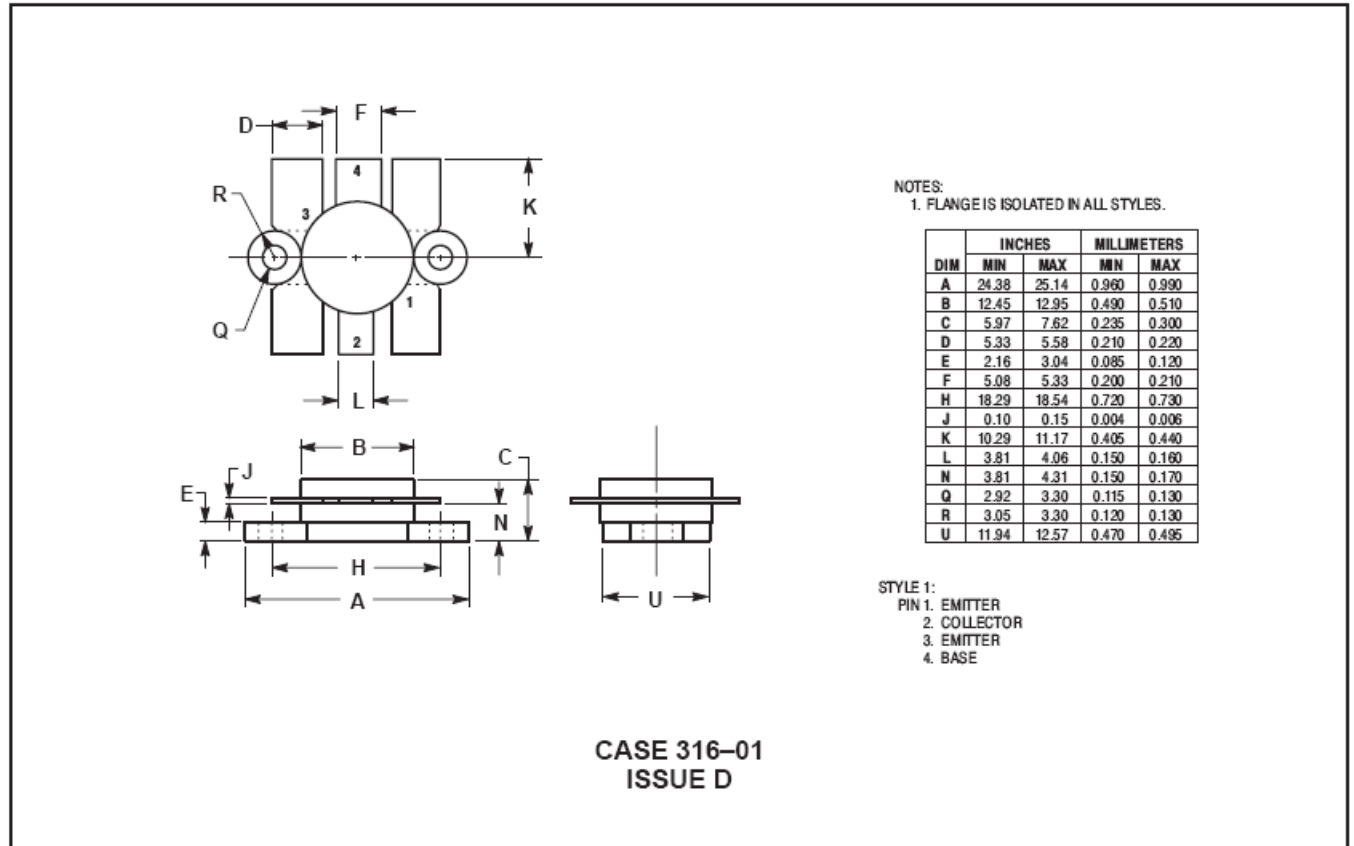
$V_{CC} = 28\text{ V}, P_{out} = 100\text{ W}$

f MHz	$Z_{in}$ OHMS	$Z_{OL}^*$ OHMS
30	1.2 - j2.0	4.3 - j5.0
50	1.0 - j1.8	4.0 - j4.9
100	0.3 + j0.7	2.0 - j2.3
125	0.3 + j1.0	1.9 - j1.9
150	0.6 + j1.3	1.9 - j1.3
175	1.0 + j1.5	1.6 - j0.6
200	0.9 + j1.0	1.1 - j0.6

$Z_{OL}^*$  = Conjugate of the optimum load impedance into which the device output operates at a given output power, voltage and frequency.

Figure 10. Series Equivalent Input-Output Impedance

## PACKAGE DIMENSIONS



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