

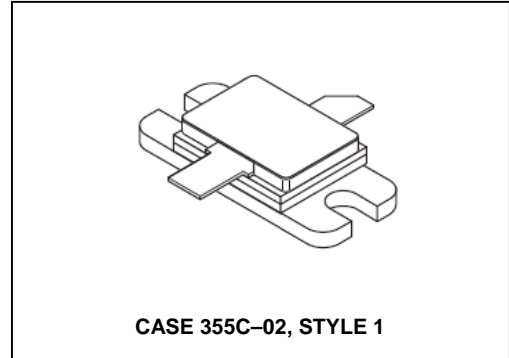
## Microwave Long Pulse Power Silicon NPN Transistor 120W (peak), 960–1215MHz

M/A-COM Products  
Released - Rev. 07.07

Designed for 960–1215 MHz long pulse common base amplifier applications such as JTIDS and Mode S transmitters.

- Guaranteed performance @ 1.215 GHz, 36 Vdc  
Output power = 120 W Peak  
Gain = 7.6 dB min., 8.5 dB (typ.)
- 100% tested for load mismatch at all phase angles with 3:1 VSWR
- Hermetically sealed industry standard package
- Silicon nitride passivated
- Gold metalized, emitter ballasted for long life and resistance to metal migration
- Internal input and output matching for broadband operation

### Product Image



### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CES}$	55	Vdc
Collector–Base Voltage	$V_{CBO}$	55	Vdc
Emitter–Base Voltage	$V_{EBO}$	3.5	Vdc
Collector Current — Peak (1)	$I_C$	15	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (1), (2) Derate above $25^\circ\text{C}$	$P_D$	380 2.17	Watts $\text{W}/^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +200	$^\circ\text{C}$
Junction Temperature	$T_J$	200	

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (3)	$R_{\theta JC}$	0.46	$^\circ\text{C}/\text{W}$

### 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 ( $I_C = 60 \text{ mAdc}$ , $V_{BE} = 0$ )	$V_{(BR)CES}$	55	—	—	Vdc
Collector–Base Breakdown Voltage ( $I_C = 60 \text{ mAdc}$ , $I_E = 0$ )	$V_{(BR)CBO}$	55	—	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 10 \text{ mAdc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 36 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	—	—	25	mAdc

### NOTES:

1. Under pulse RF operating conditions.
2. These devices are designed for RF operation. The total device dissipation rating applies only when the device is operated as RF amplifiers.
3. Thermal Resistance is determined under specified RF operating conditions by infrared measurement techniques.

(continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = 5.0 \text{ Adc}$ , $V_{CE} = 5.0 \text{ Vdc}$ )	$h_{FE}$	20	—	—	—
<b>FUNCTIONAL TESTS</b> (7.0 $\mu\text{s}$ Pulses @ 54% duty cycle for 3.4 ms; then off for 4.5 ms; overall duty cycle = 23%)					
Common-Base Amplifier Power Gain ( $V_{CC} = 36 \text{ Vdc}$ , $P_{out} = 120 \text{ W Peak}$ , $f = 1215 \text{ MHz}$ )	$G_{PB}$	7.6	8.5	—	dB
Collector Efficiency ( $V_{CC} = 36 \text{ Vdc}$ , $P_{out} = 120 \text{ W Peak}$ , $f = 1215 \text{ MHz}$ )	$\eta$	50	55	—	%
Load Mismatch ( $V_{CC} = 36 \text{ Vdc}$ , $P_{out} = 120 \text{ W Peak}$ , $f = 1215 \text{ MHz}$ , VSWR = 3:1 All Phase Angles)	$\psi$	No Degradation in Output Power			

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# MRF10120



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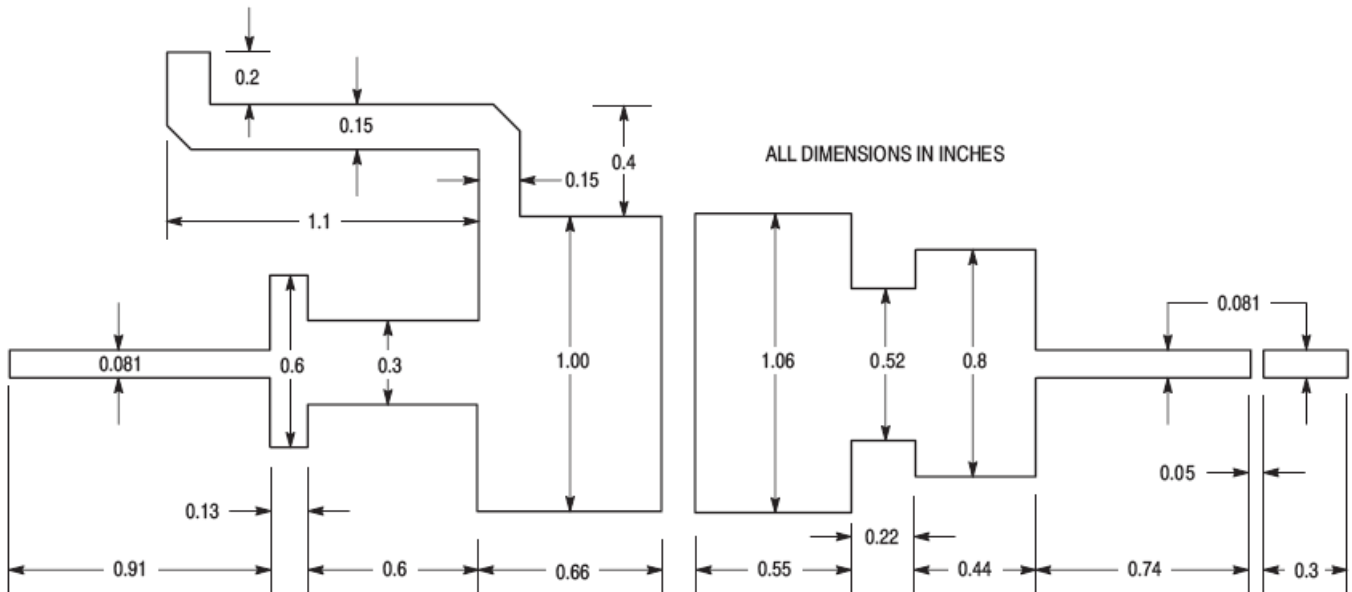
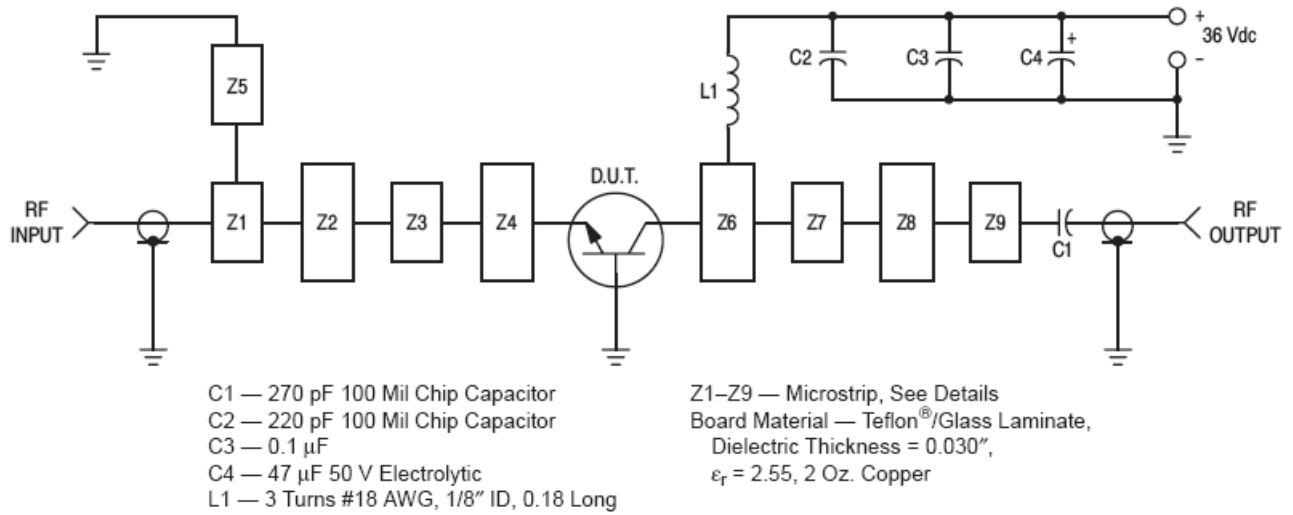


Figure 1. Test Circuit

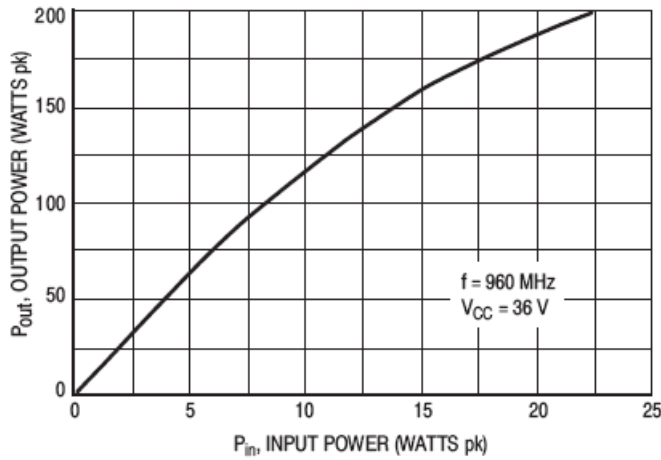


Figure 2. Output Power versus Input Power

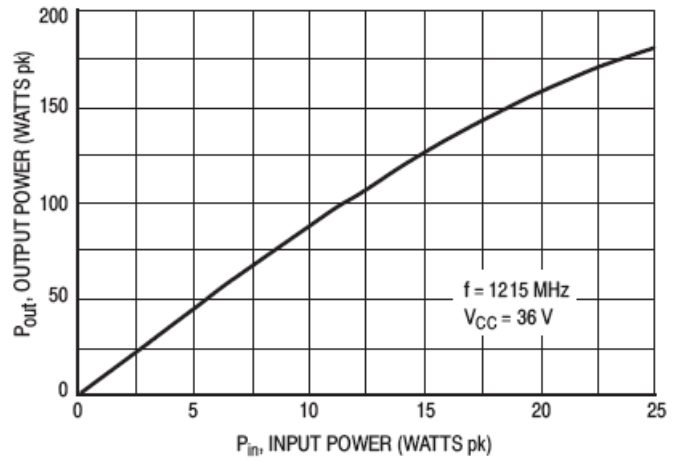


Figure 3. Output Power versus Input Power

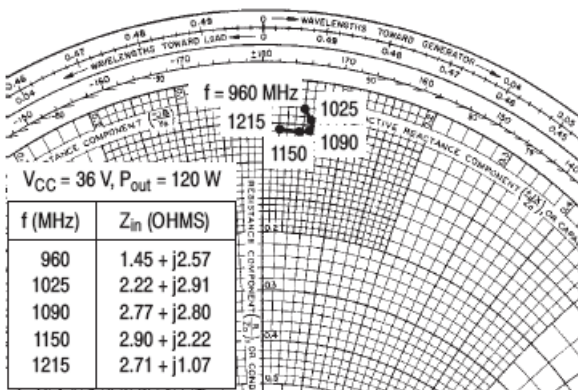
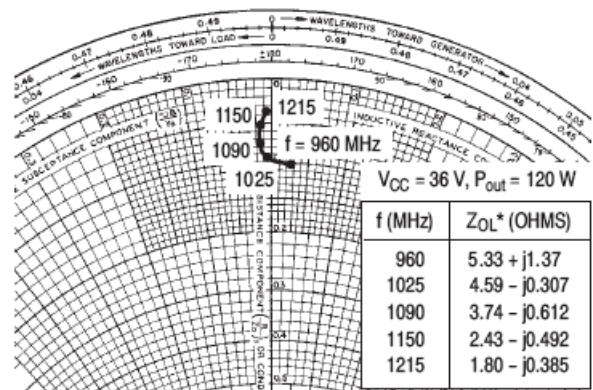


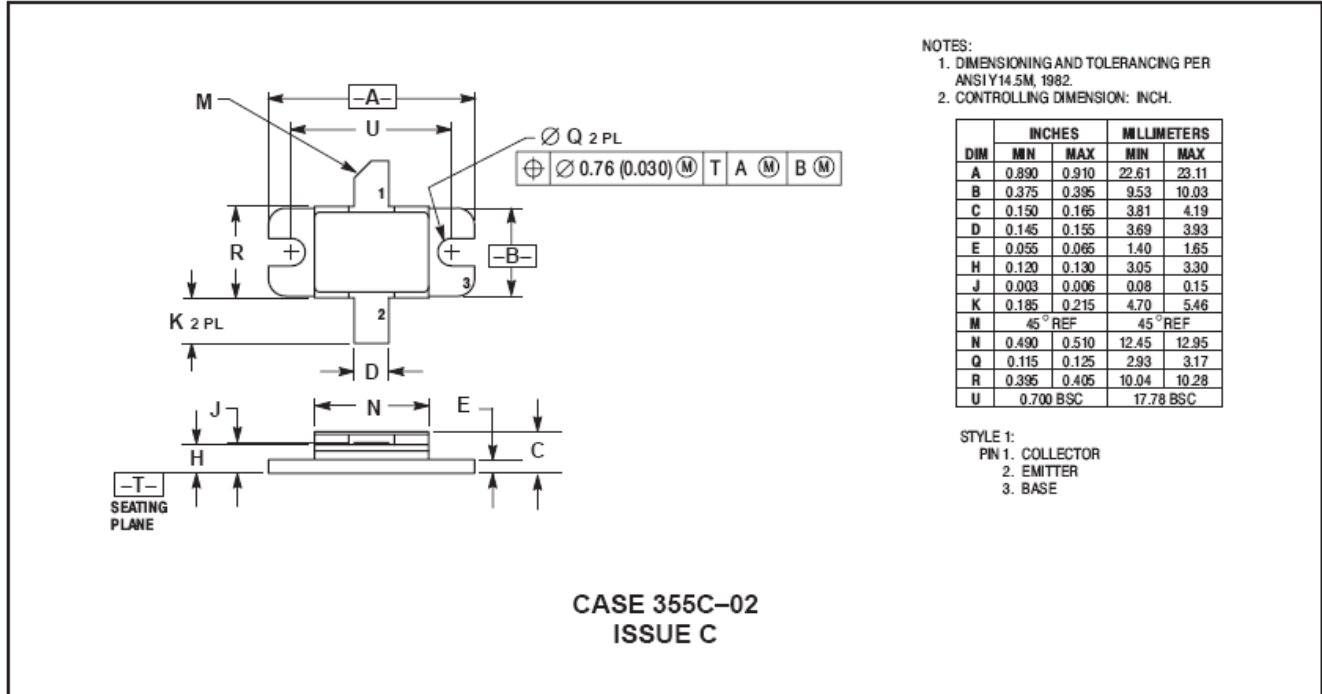
Figure 4. Series Equivalent Input Impedances



Z<sub>OL\*</sub> = Conjugate of the optimum load impedance into which the device operates at a given output power, voltage and frequency.

Figure 5. Series Equivalent Output Impedance

## PACKAGE DIMENSIONS



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