

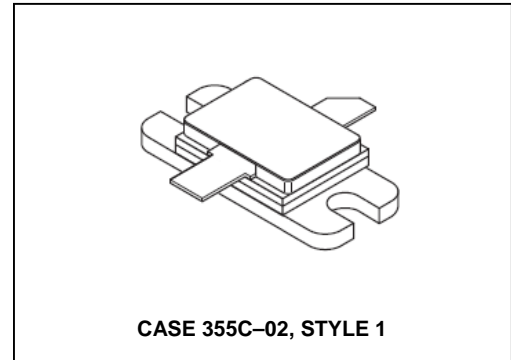
## Microwave Long Pulse Power Silicon NPN Transistor 120W (peak), 960–1215MHz

M/A-COM Products  
Released - Rev. 07.07

### Product Image

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



### 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
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)

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

M/A-COM Products  
 Released - Rev. 07.07

**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			

**ADVANCED:** Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.  
**PRELIMINARY:** Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit [www.macomtech.com](http://www.macomtech.com) for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

# MRF10120

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

M/A-COM Products  
Released - Rev. 07.07

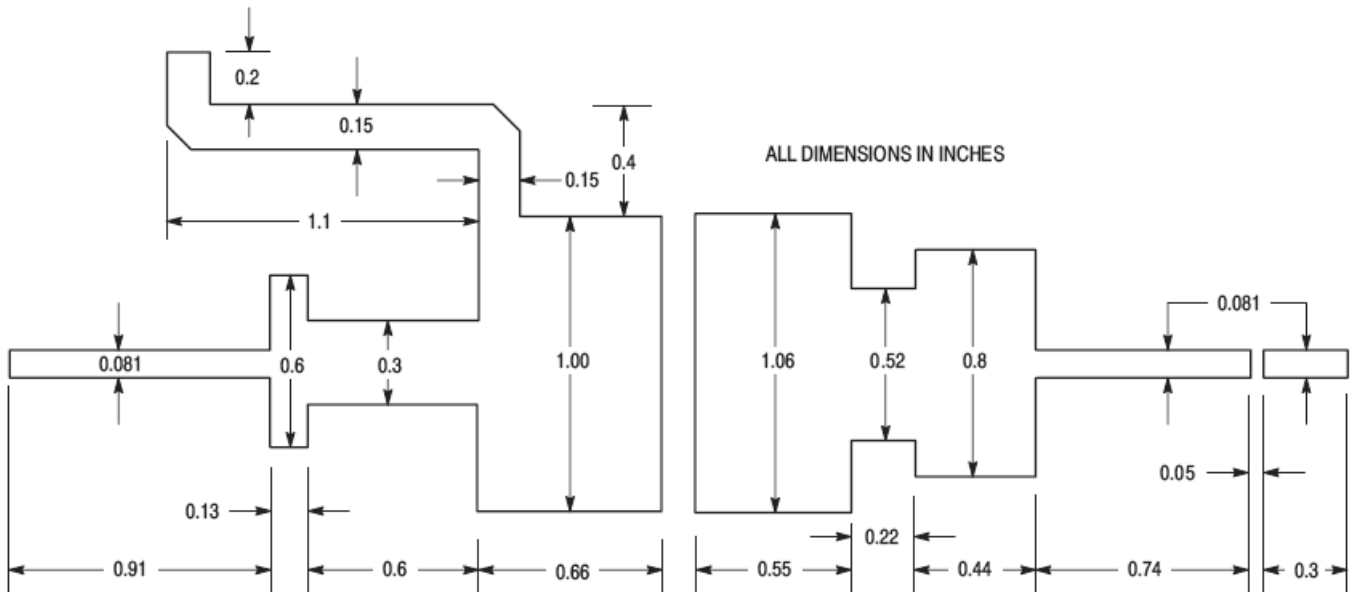
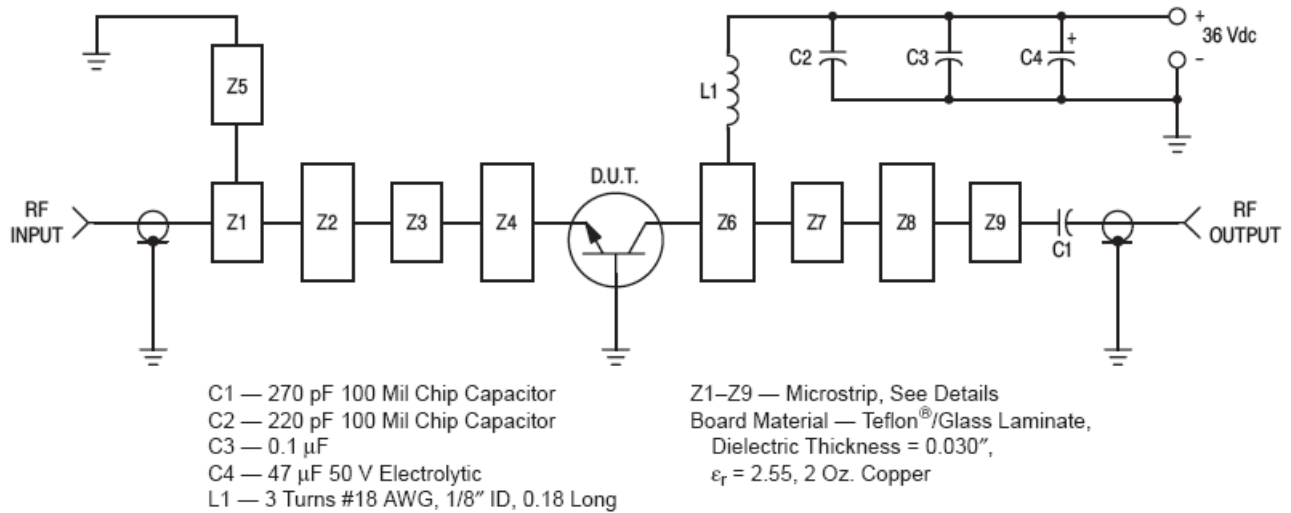


Figure 1. Test Circuit

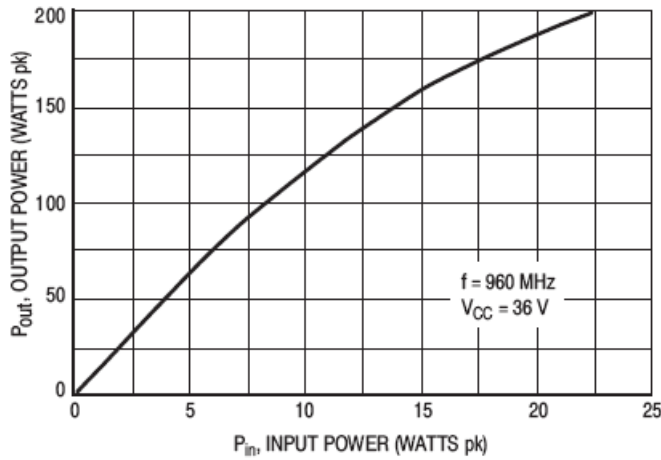


Figure 2. Output Power versus Input Power

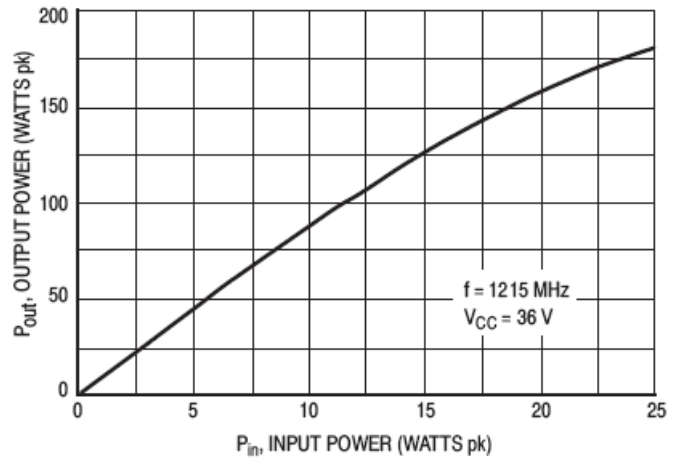


Figure 3. Output Power versus Input Power

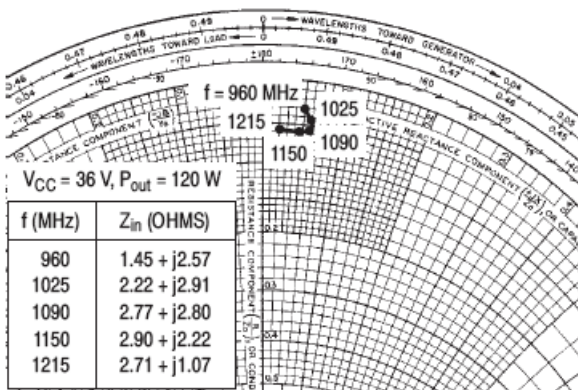
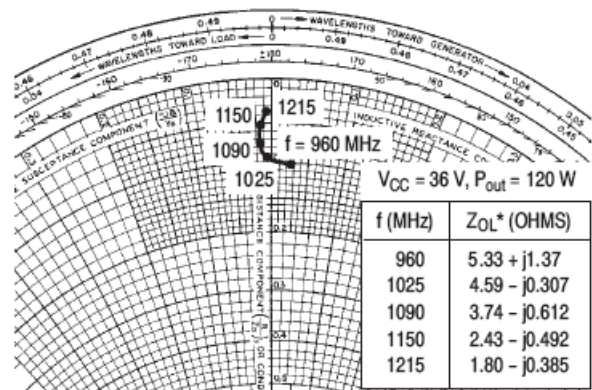


Figure 4. Series Equivalent Input Impedances



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

