

# The RF Line

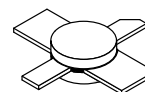
## Microwave Pulse Power Transistors

Designed for Class B and C common base amplifier applications in short and long pulse TACAN, IFF, DME, and radar transmitters.

- Guaranteed Performance @ 1090 MHz, 50 Vdc  
Output Power = 35 Watts Peak  
Minimum Gain = 10 dB
- 100% Tested for Load Mismatch at All Phase Angles with 10:1 VSWR
- Industry Standard Package
- Nitride Passivated
- Gold Metallized, Emitter Ballasted for Long Life and Resistance to Metal Migration
- Internal Input Matching for Broadband Operation

**MRF1035MB**

**35 W (PEAK), 960–1215 MHz  
MICROWAVE POWER  
TRANSISTORS  
NPN SILICON**



**CASE 332A-03, STYLE 1**

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CES}$	60	Vdc
Collector-Base Voltage	$V_{CBO}$	60	Vdc
Emitter-Base Voltage	$V_{EBO}$	4.0	Vdc
Collector-Current — Continuous	$I_C$	2.0	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (1) Derate above $25^\circ\text{C}$	$P_D$	35 200	Watts mW/ $^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (2)	$R_{\theta JC}$	5.0	$^\circ\text{C/W}$

### 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 ( $I_C = 20\text{ mAdc}$ , $V_{BE} = 0$ )	$V_{(BR)CES}$	60	—	—	Vdc
Collector-Base Breakdown Voltage ( $I_C = 20\text{ mAdc}$ , $I_E = 0$ )	$V_{(BR)CBO}$	60	—	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 2.0\text{ mAdc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 50\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	—	—	2.0	mAdc

### ON CHARACTERISTICS

DC Current Gain ( $I_C = 500\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ )	$h_{FE}$	10	40	100	—
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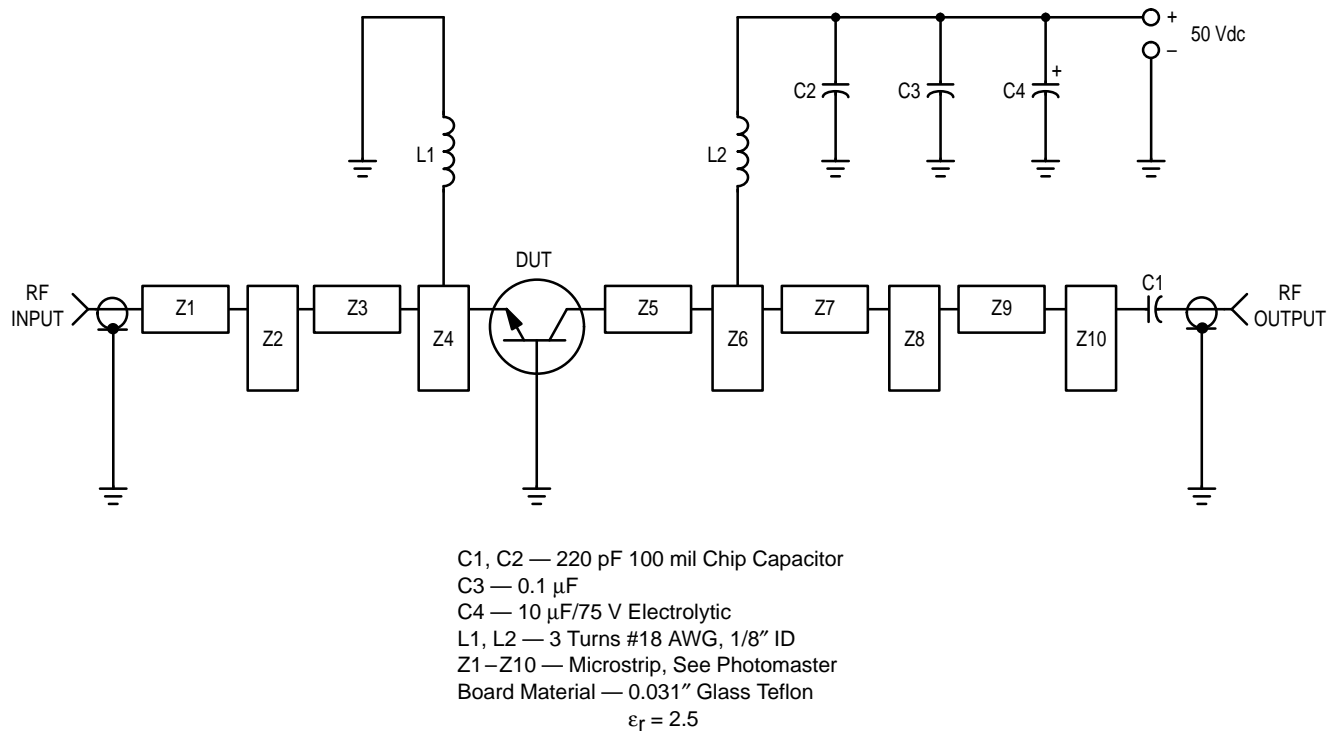
- These devices are designed for RF operation. The total device dissipation rating applies only when the device is operated as RF amplifiers.
- Thermal Resistance is determined under specified RF operating conditions by infrared measurement techniques.

(Replaces MRF1035MA/D)



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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>DYNAMIC CHARACTERISTICS</b>					
Output Capacitance ( $V_{CB} = 50\text{ Vdc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ob}$	—	10	15	pF
<b>FUNCTIONAL TESTS</b> (Pulse Width = $10\text{ }\mu\text{s}$ , Duty Cycle = 1%)					
Common-Base Amplifier Power Gain ( $V_{CC} = 50\text{ Vdc}$ , $P_{out} = 35\text{ W Peak}$ , $f = 1090\text{ MHz}$ )	$G_{PB}$	10	12.4	—	dB
Collector Efficiency ( $V_{CC} = 50\text{ Vdc}$ , $P_{out} = 35\text{ W Peak}$ , $f = 1090\text{ MHz}$ )	$\eta$	30	34	—	%
Load Mismatch ( $V_{CC} = 50\text{ Vdc}$ , $P_{out} = 35\text{ W Peak}$ , $f = 1090\text{ MHz}$ , $VSWR = 10:1$ All Phase Angles)	$\psi$	No Degradation in Power Output			



**Figure 1. 1090 MHz Test Circuit**

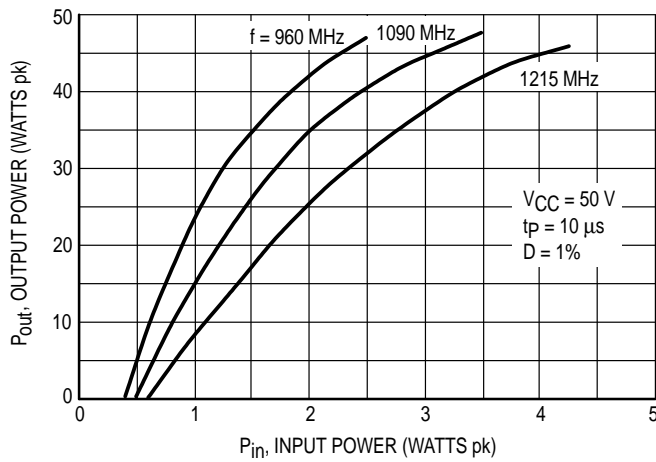


Figure 2. Output Power versus Input Power

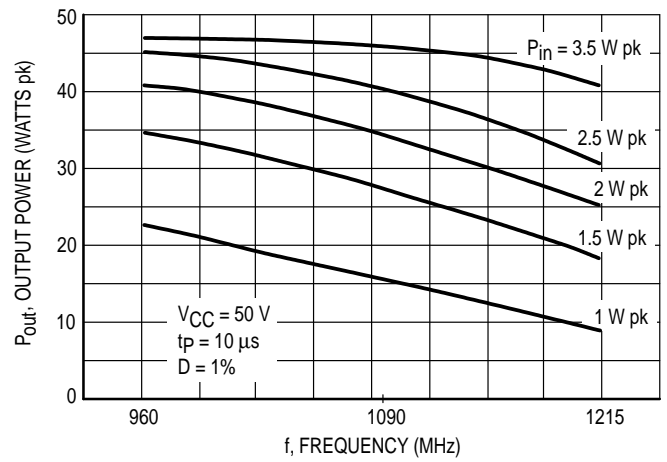


Figure 3. Output Power versus Frequency

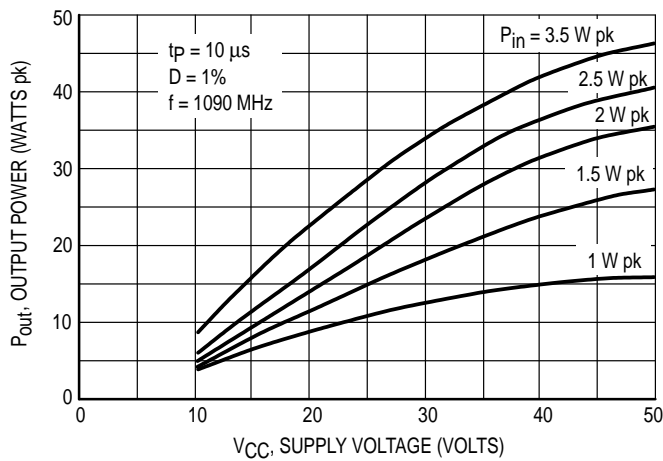


Figure 4. Output Power versus Supply Voltage

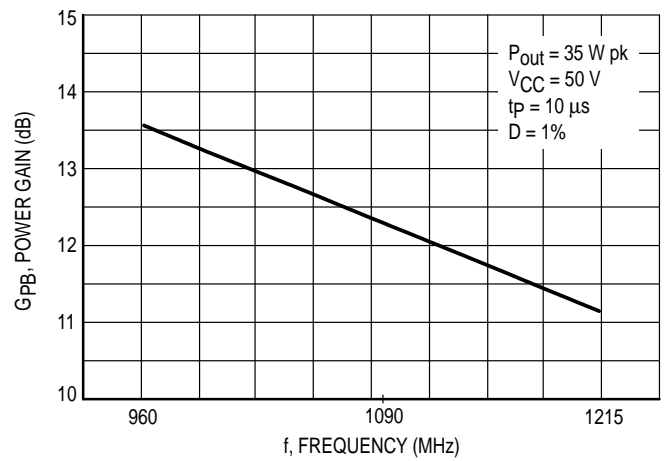
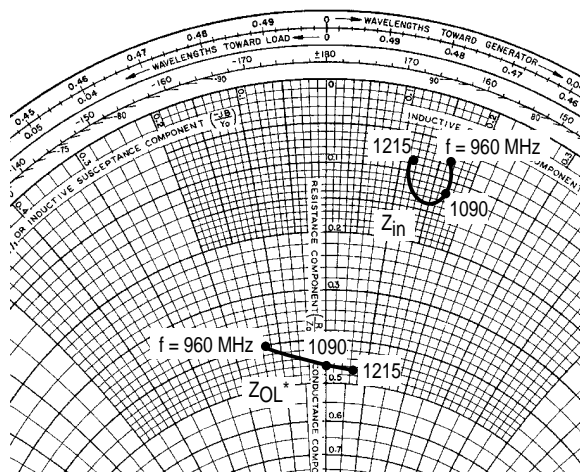


Figure 5. Power Gain versus Frequency



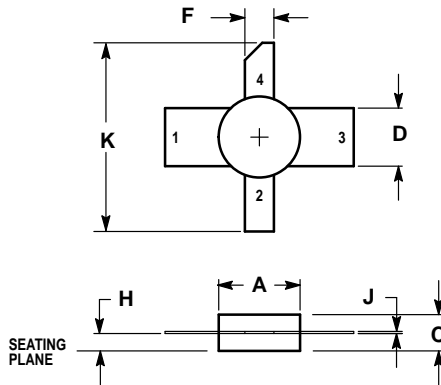
$P_{out} = 35 \text{ W pk}$   $V_{CC} = 50 \text{ V}$   
 $t_p = 10 \mu s$   $D = 1\%$

f MHz	$Z_{in}$ Ohms	$Z_{OL}^*$ Ohms
960	$3.8 + j8.2$	$7.5 - j3.3$
1090	$6.0 + j8.2$	$9.0 + j0$
1215	$4.2 + j5.7$	$9.1 + j1.7$

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

Figure 6. Series Equivalent Input/Output Impedances

## PACKAGE DIMENSIONS




- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.270	0.290	6.86	7.36
C	0.115	0.135	2.93	3.42
D	0.195	0.205	4.96	5.20
F	0.095	0.105	2.42	2.66
H	0.050	0.070	1.27	1.77
J	0.003	0.007	0.08	0.17
K	0.600	—	15.24	—

STYLE 1:

- PIN 1: BASE
- EMITTER
- BASE
- COLLECTOR

### CASE 332A-03 ISSUE D

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**Mfax™:** RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
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51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

**INTERNET:** <http://motorola.com/sps>



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