

MRF1325M

325 W PEAK, 1020-1150 MHz

MICROWAVE POWER TRANSISTOR

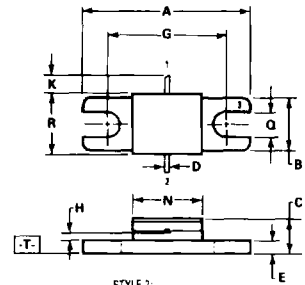
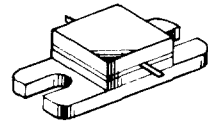
NPN SILICON

The RF Line

MICROWAVE PULSE POWER TRANSISTOR

... designed for Class B and C *common base* amplifier applications in short pulse TACAN, IFF, and DME transmitters.

- Guaranteed Performance @ 1090 MHz, 50 Vdc
 Output Power = 325 Watts Peak
 Minimum Gain = 6.0 dB
- 100% Tested for Load Mismatch at All Phase Angles with 10:1 VSWR
- Industry Standard Package
- Nitride Passivated
- Gold Metallized for Long Life and Resistance to Metal Migration
- Compatible with Other 1325M Types
- Internal Input and Output Matching for Broadband Operation



STYLE 2:
 PIN 1 COLLECTOR
 2 EMITTER
 3 BASE

- NOTES:
1. DIMENSIONS A, B AND R ARE DATUMS
 2. POSITIONAL TOLERANCE FOR MOUNTING HOLES
 $\pm 0.76 (0.030) \text{ (M)} \text{ (T)} \text{ (A)} \text{ (M)} \text{ (B)} \text{ (M)}$
 - POSITIONAL TOLERANCE FOR LEADS
 $\pm 0.25 (0.010) \text{ (M)} \text{ (T)} \text{ (A)} \text{ (M)} \text{ (R)} \text{ (M)}$
 3. -(T) IS BOTH A SEATING PLANE AND A DATUM SURFACE
 4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5 1973

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	22.81	23.11	0.898	0.910
B	9.85	9.91	0.388	0.390
C	4.06	5.84	0.160	0.230
D	0.51	0.76	0.020	0.030
E	1.40	1.65	0.055	0.065
G	16.51 BSC		0.650 BSC	
H	1.14	1.77	0.045	0.070
K	2.54	—	0.100	—
N	9.91	10.41	0.390	0.410
Q	3.00	3.61	0.118	0.142
R	9.91	10.41	0.390	0.410

CASE 336-03

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector Base Voltage	V_{CB0}	70	Vdc
Emitter Base Voltage	V_{EB0}	4.0	Vdc
Collector Current Peak (1, 2)	I_C	24	Adc
Peak Device Dissipation (at $T_C = 25^\circ\text{C}$ (1, 2) Derate above 25°C)	P_D	1166	Watts
		6.67	$\text{W}/^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (1, 2, 3)	$R_{\theta JC}$	0.15	$^\circ\text{C}/\text{W}$

- (1) Pulse Width = 10 μs , Duty Cycle = 1%.
- (2) This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF short pulse amplifier.
- (3) Thermal Resistance is determined under specified RF operating conditions by infrared measurement techniques.

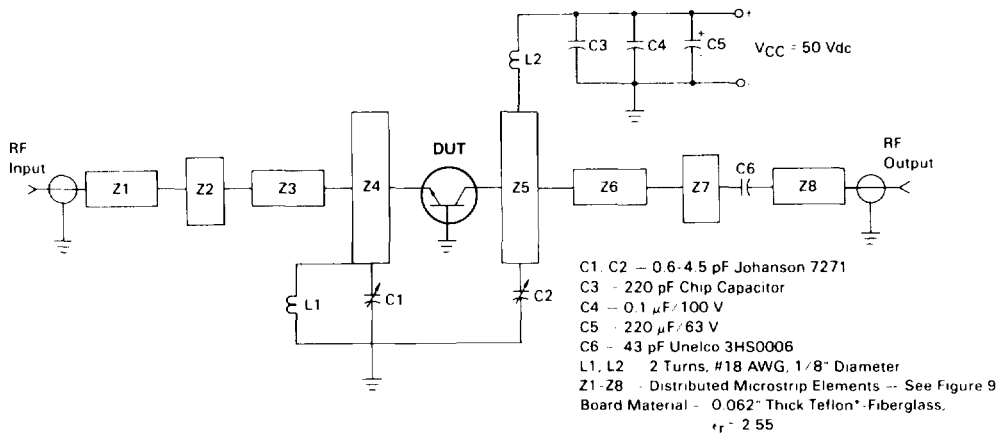
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ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 100\text{ mA dc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	70	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 100\text{ mA dc}$, $I_E = 0$)	$V_{(BR)CBO}$	70	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10\text{ mA dc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 50\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	—	20	mA dc
ON CHARACTERISTICS					
DC Current Gain* ($I_C = 10\text{ A dc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	10	30	—	—
FUNCTIONAL TESTS (Pulse Width = $10\ \mu\text{s}$, Duty Cycle = 1.0%)					
Common-Base Amplifier Power Gain ($V_{CC} = 50\text{ Vdc}$, $P_{out} = 325\text{ W pk}$, $f = 1090\text{ MHz}$)	GPB	6.0	7.2	—	dB
Collector Efficiency ($V_{CC} = 50\text{ Vdc}$, $P_{out} = 325\text{ W pk}$, $f = 1090\text{ MHz}$)	η	33	—	—	%
Load Mismatch ($V_{CC} = 50\text{ Vdc}$, $P_{out} = 325\text{ W pk}$, $f = 1090\text{ MHz}$, $VSWR = 10:1$ All Phase Angles)	ψ	No Degradation in Power Output			

*80 μs Pulse on Tektronix 576 or equivalent

FIGURE 1 -- 1090 MHz TEST CIRCUIT



*Registered Trademark of DuPont

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FIGURE 2 — OUTPUT POWER versus INPUT POWER

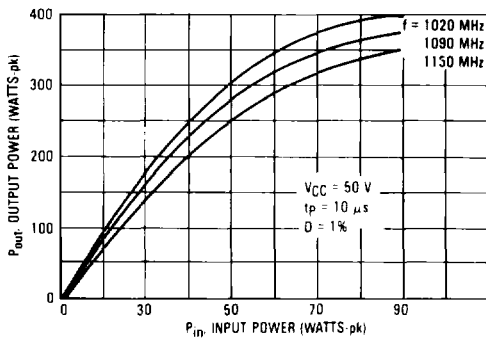


FIGURE 3 — OUTPUT POWER versus FREQUENCY

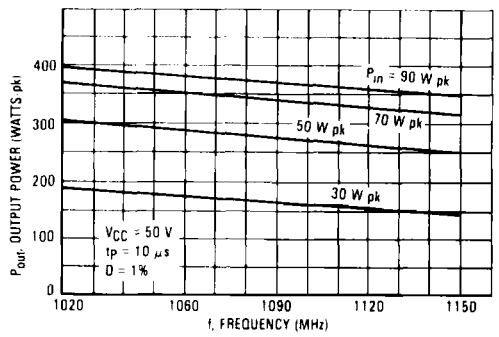


FIGURE 4 — OUTPUT POWER versus SUPPLY VOLTAGE

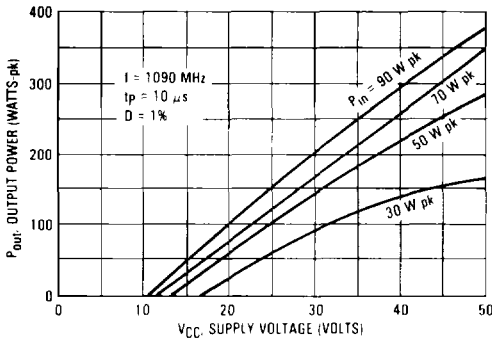


FIGURE 5 — POWER GAIN versus FREQUENCY

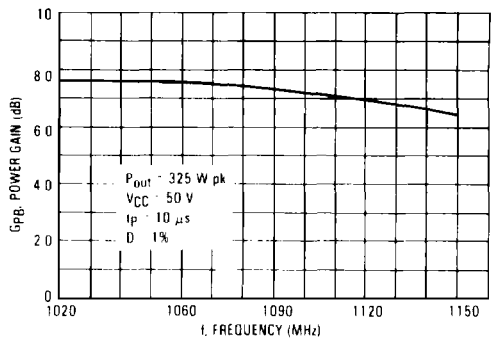
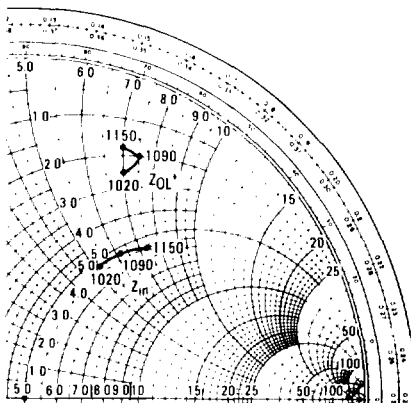


FIGURE 6 — SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCE



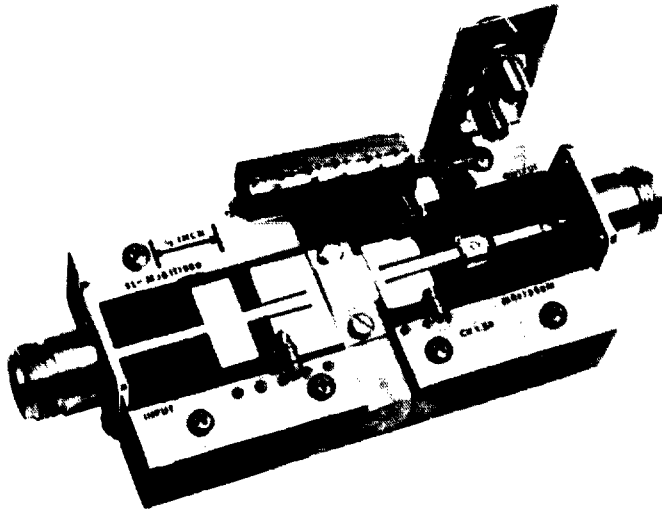
$P_{out} = 325 \text{ W-pk}$ $V_{CC} = 50 \text{ V}$
 $t_p = 10 \mu s$ $D = 1\%$

f MHz	Z_{in} Ohms	Z_{out}^* Ohms
1020	$5.2 + j5.2$	$2.5 + j7.0$
1090	$5.2 + j6.2$	$2.0 + j7.5$
1150	$5.5 + j7.3$	$1.8 + j7.0$

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

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FIGURE 7 — 1090 MHz TEST AMPLIFIER



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FIGURE 8 — TYPICAL PULSE PERFORMANCE

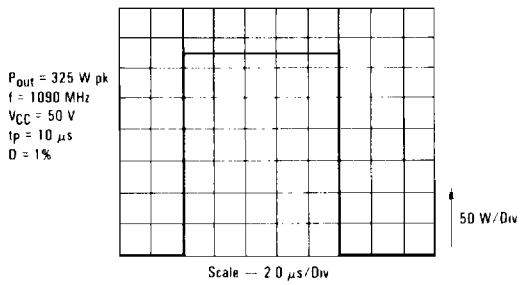
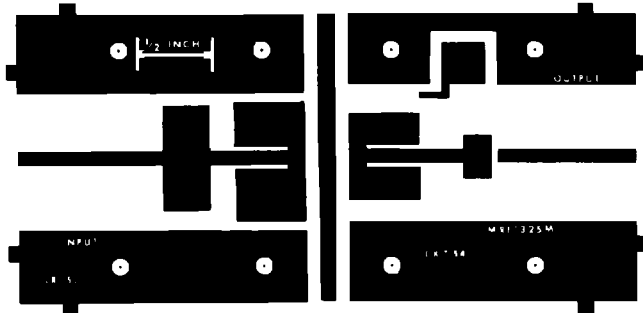


FIGURE 9 — PRINTED CIRCUIT BOARD LAYOUT — 1090 MHz TEST CIRCUIT



⊙ Soldered Eyelet

NOTE: The Printed Circuit Board shown is 75% of the original.