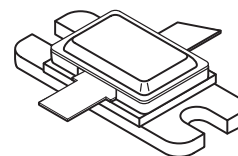


The RF Line

Microwave Pulse Power Transistor

Designed for 1025–1150 MHz pulse common base amplifier applications such as TCAS, TACAN and Mode–S transmitters.

- Guaranteed Performance @ 1090 MHz
Output Power = 350 Watts Peak
Gain = 8.5 dB Min, 9.0 dB (Typ)
- 100% Tested for Load Mismatch at All Phase Angles with 10:1 VSWR
- Hermetically Sealed Package
- Silicon Nitride Passivated
- Gold Metallized, Emitter Ballasted for Long Life and Resistance to Metal Migration
- Internal Input and Output Matching
- Characterized using Mode–S Pulse Format

MRF10350**350 W (PEAK)
1025–1150 MHz
MICROWAVE POWER
TRANSISTOR
NPN SILICON****CASE 355E–01, STYLE 1**

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CES}	65	Vdc
Collector–Base Voltage	V_{CBO}	65	Vdc
Emitter–Base Voltage	V_{EBO}	3.5	Vdc
Collector Current — Peak (1)	I_C	31	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (1), (2) Derate above 25°C	P_D	1590 9.1	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	–65 to +200	$^\circ\text{C}$
Junction Temperature	T_J	200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (3)	$R_{\theta JC}$	0.11	$^\circ\text{C}/\text{W}$

NOTES:

1. Under pulse RF operating conditions.
2. These devices are designed for RF operation. The total device dissipation rating applies only when the devices are operated as pulsed RF amplifiers.
3. Thermal Resistance is determined under specified RF operating conditions by infrared measurement techniques. (Worst Case θ_{JC} measured using Mode–S pulse train, 128 μs burst 0.5 μs on, 0.5 μs off repeating at 6.4 ms interval.)



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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage ($I_C = 60\text{ mAdc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	65	—	—	Vdc
Collector–Base Breakdown Voltage ($I_C = 60\text{ mAdc}$, $I_E = 0$)	$V_{(BR)CBO}$	65	—	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10\text{ mAdc}$, $I_C = 0$)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 36\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	—	25	mAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 5.0\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	20	—	—	—
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FUNCTIONAL TESTS

Common–Base Amplifier Power Gain ($V_{CC} = 50\text{ Vdc}$, $P_{out} = 350\text{ W Peak}$, $f = 1090\text{ MHz}$)	G_{PB}	8.5	9.0	—	dB
Collector Efficiency ($V_{CC} = 50\text{ Vdc}$, $P_{out} = 350\text{ W Peak}$, $f = 1090\text{ MHz}$)	η	40	—	—	%
Load Mismatch ($V_{CC} = 50\text{ Vdc}$, $P_{out} = 350\text{ W Peak}$, $f = 1090\text{ MHz}$, $VSWR = 10:1$ All Phase Angles)	ψ	No Degradation in Output Power			

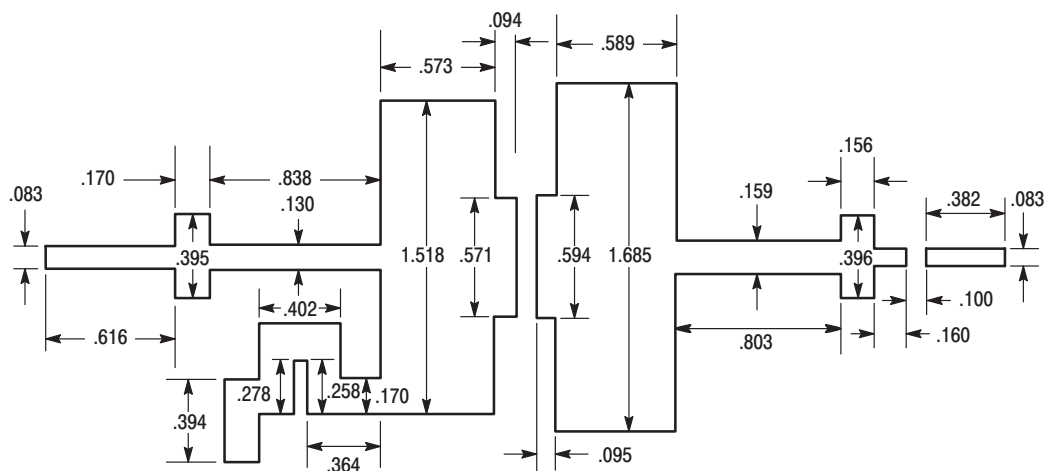
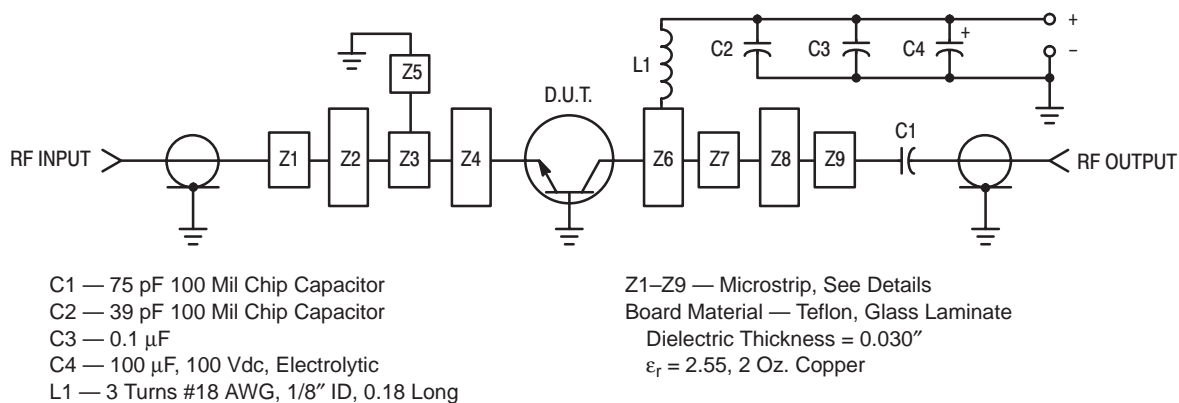
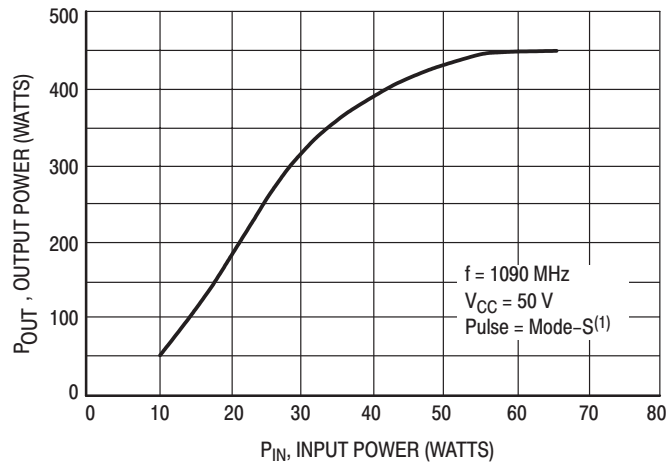
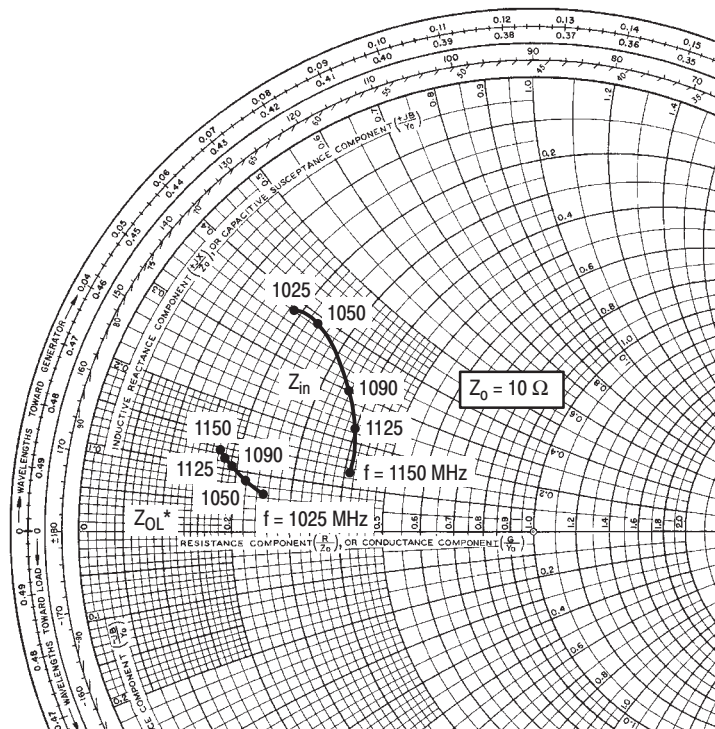


Figure 1. Test Circuit



(1) 128 μs burst 0.5 μs on, 0.5 μs off
repeating at 6.4 ms interval.

Figure 2. Output Power versus Input Power



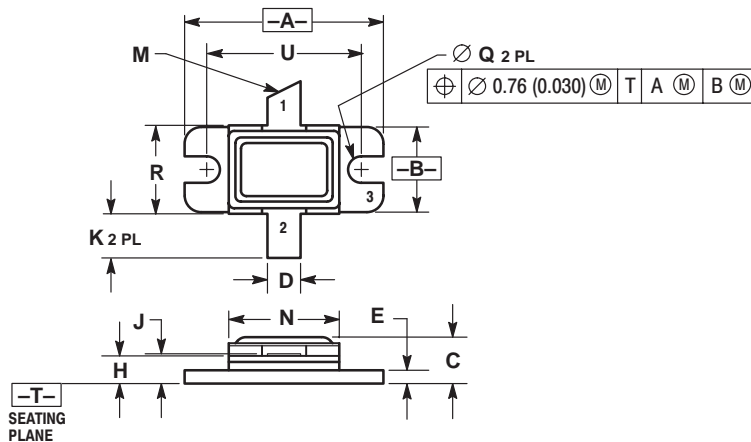
$P_{OUT} = 350 \text{ W Pk}$ $V_{CC} = 50 \text{ V}$

f MHz	Z_{in} OHMS	$Z_{OL}^* (1)$ OHMS
1025	$1.92 + j3.80$	$2.52 + j0.70$
1050	$2.44 + j3.92$	$2.18 + j0.85$
1090	$3.55 + j3.02$	$1.94 + j1.13$
1125	$4.11 + j2.27$	$1.80 + j1.22$
1150	$4.13 + j1.35$	$1.71 + j1.31$

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

Figure 3. 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	0.890	0.910	22.61	23.11
B	0.375	0.395	9.53	10.03
C	0.190	0.210	4.83	5.33
D	0.145	0.155	3.69	3.93
E	0.055	0.065	1.40	1.65
H	0.120	0.130	3.05	3.30
J	0.003	0.006	0.08	0.15
K	0.185	0.215	4.70	5.46
M	45° REF		45° REF	
N	0.490	0.510	12.45	12.95
Q	0.115	0.125	2.93	3.17
R	0.395	0.405	10.04	10.28
U	0.700 BSC		17.78 BSC	

STYLE 1:

1. COLLECTOR
2. EMITTER
3. BASE

CASE 355E-01 ISSUE B

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How to reach us:

USA/EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

MFAX: RMFAX0@email.sps.mot.com - TOUCHTONE (602) 244-6609
INTERNET: http://Design-NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



MRF10350/D

