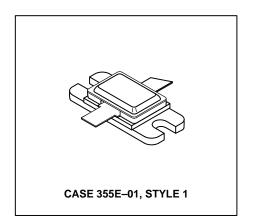
# The RF Line Microwave Pulse Power Transistor

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



#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	VCES	65	Vdc
Collector-Base Voltage	VCBO	65	Vdc
Emitter-Base Voltage	VEBO	3.5	Vdc
Collector Current — Peak (1)	IC	31	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C (1), (2) Derate above 25°C	PD	1590 9.1	Watts W/°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +200	°C
Junction Temperature	TJ	200	°C

#### THERMAL CHARACTERISTICS

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

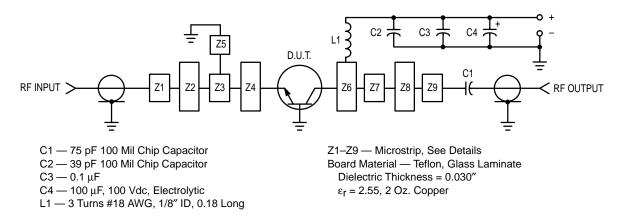
#### NOTES:

- 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<sub>JC</sub> 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** ( $T_C = 25^{\circ}C$ unless otherwise noted.)

Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 60 mAdc, V <sub>BE</sub> = 0)	V(BR)CES	65	_	_	Vdc
Collector–Base Breakdown Voltage (I <sub>C</sub> = 60 mAdc, I <sub>E</sub> = 0)	V(BR)CBO	65	_	_	Vdc
Emitter–Base Breakdown Voltage (I <sub>E</sub> = 10 mAdc, I <sub>C</sub> = 0)	V(BR)EBO	3.5	_	_	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 36 Vdc, I <sub>E</sub> = 0)	ICBO	_	_	25	mAdc
ON CHARACTERISTICS					
DC Current Gain (I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 5.0 Vdc)	hFE	20	_	_	_
FUNCTIONAL TESTS					
Common–Base Amplifier Power Gain (V <sub>CC</sub> = 50 Vdc, P <sub>out</sub> = 350 W Peak, f = 1090 MHz)	G <sub>PB</sub>	8.5	9.0	_	dB
Collector Efficiency (V <sub>CC</sub> = 50 Vdc, P <sub>out</sub> = 350 W Peak, f = 1090 MHz)	η	40	_	_	%
Load Mismatch (V <sub>CC</sub> = 50 Vdc, P <sub>out</sub> = 350 W Peak, f = 1090 MHz, VSWR = 10:1 All Phase Angles)	Ψ	No Degradation in Output Power			



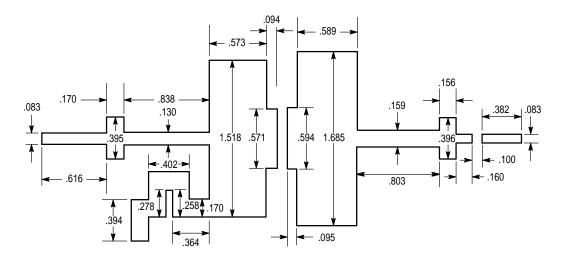


Figure 1. Test Circuit

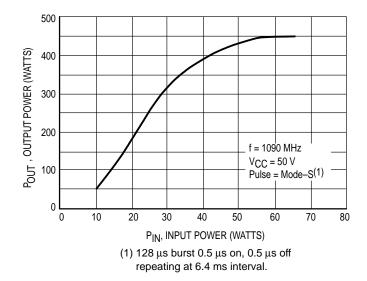
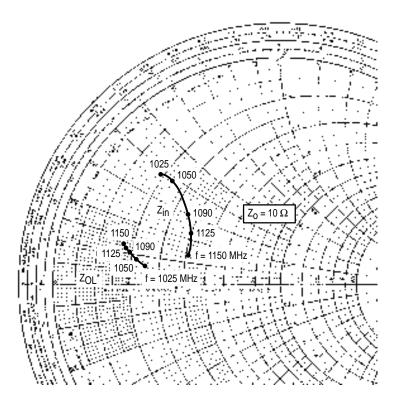


Figure 2. Output Power versus Input Power



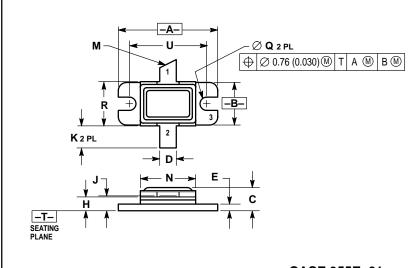
f MHz	Z <sub>in</sub> OHMS	Z <sub>OL</sub> * (1) OHMS
1025	1.92 + j3.80	2.52 + j0.70
1050	2.44 + j3.92	2.18 + j0.85
1090	3.55 + j3.02	1.94 + j1.13
1125	4.11 + j2.27	1.80 + j1.22
1150	4.13 + j1.35	1.71 + j1.31

 $Z_{\mbox{OL}^{*}}$  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

MOTOROLA RF DEVICE DATA MRF10350

#### PACKAGE DIMENSIONS



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

	INC	HES	MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.890	0.910	22.61	23.11
В	0.375	0.395	9.53	10.03
С	0.190	0.210	4.83	5.33
D	0.145	0.155	3.69	3.93
Е	0.055	0.065	1.40	1.65
Н	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: PIN 1. COLLECTOR 2. EMITTER 3. BASE

CASE 355E-01 **ISSUE B** 

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