

The RF Line

NPN Silicon

RF Low Power Transistor

MRF8372R1, R2

Designed primarily for wideband large signal predriver stages in 800 MHz and UHF frequency ranges.

- Specified @ 12.5 V, 870 MHz Characteristics
 - Output Power = 750 mW
 - Minimum Gain = 8.0 dB
 - Efficiency 60% (Typ)
- State-of-the-Art Technology
 - Fine Line Geometry
 - Gold Top Metal and Wires
 - Silicon Nitride Passivated
 - Ion Implanted Arsenic Emitters
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.
- Order MRF8372 in tape and reel packaging by adding suffix:
 - R1 suffix = 500 units per reel
 - R2 suffix = 2,500 units per reel

750 mW, 870 MHz
 RF LOW POWER
 TRANSISTOR
 NPN SILICON



CASE 751-05, STYLE 1
 SORF (SO-8)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	16	Vdc
Collector-Base Voltage	V_{CBO}	36	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	200	mAdc
Total Device Dissipation @ $T_C = 75^\circ\text{C}$ (1) Derate above 75°C	P_D	1.67 22.2	Watts mW/ $^\circ\text{C}$
Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$
Maximum Junction Temperature	T_{Jmax}	150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	45	$^\circ\text{C}/\text{W}$

DEVICE MARKING

MRF8372 = 8372

NOTE:

- Case temperature measured on collector lead immediately adjacent to body of package.

(Replaces MRF837/D)



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 ($I_C = 5.0\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	16	—	—	Vdc
Collector–Emitter Breakdown Voltage ($I_C = 5.0\text{ mA}$, $V_{BE} = 0$)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 0.1\text{ mA}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 15\text{ Vdc}$, $V_{BE} = 0$, $T_C = 25^\circ\text{C}$)	I_{CES}	—	—	0.1	mA

ON CHARACTERISTICS

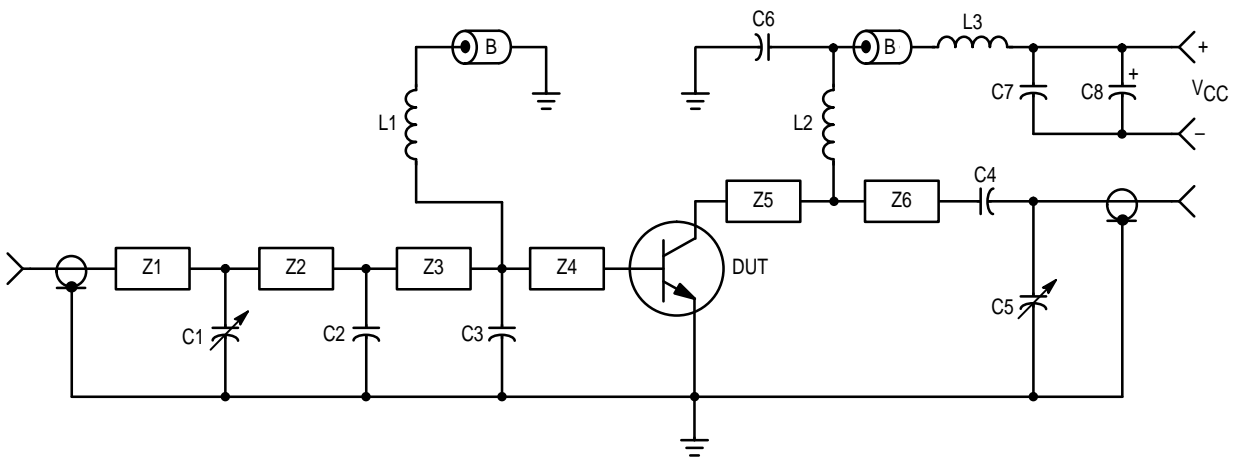
DC Current Gain ($I_C = 50\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)	h_{FE}	30	90	200	—
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DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 15\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	1.8	2.5	pF
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FUNCTIONAL TESTS

Common–Emitter Amplifier Power Gain ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 0.75\text{ W}$, $f = 870\text{ MHz}$)	G_{pe}	8.0	10	—	dB
Collector Efficiency ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 0.75\text{ W}$, $f = 870\text{ MHz}$)	η	55	60	—	%



C1, C5 — 0.8–8.0 pF Johanson Gigatrim
 C2, C3 — 10 pF Ceramic Chip Capacitor
 C6 — 91 pF Clamped Mica, Mini-Underwood
 C4 — 47 pF Ceramic Chip Capacitor
 C7 — 91 pF Clamped Mica, Mini-Underwood
 C8 — 1.0 μ F 25 V Tantalum
 B — Bead, Ferroxcube 56–590–65/3B

L1, L2 — 4 Turns, #21 AWG, 5/32" ID
 L3 — 7 Turns, #21 AWG, 5/32" ID
 Z1, Z2 — 1" x 0.078" Microstrip, $Z_0 = 50$ Ohms
 Z3 — 0.25" x 0.078" Microstrip, $Z_0 = 50$ Ohms
 Z4 — 0.15" x 0.078" Microstrip, $Z_0 = 50$ Ohms
 Z5 — 0.30" x 0.078" Microstrip, $Z_0 = 50$ Ohms
 Z6 — 1.63" x 0.078" Microstrip, $Z_0 = 50$ Ohms
 PCB — 1/32" Glass Teflon, $\epsilon_r = 2.56$

Figure 1. 800–900 MHz Broadband Circuit

800/900 MHz BAND DATA

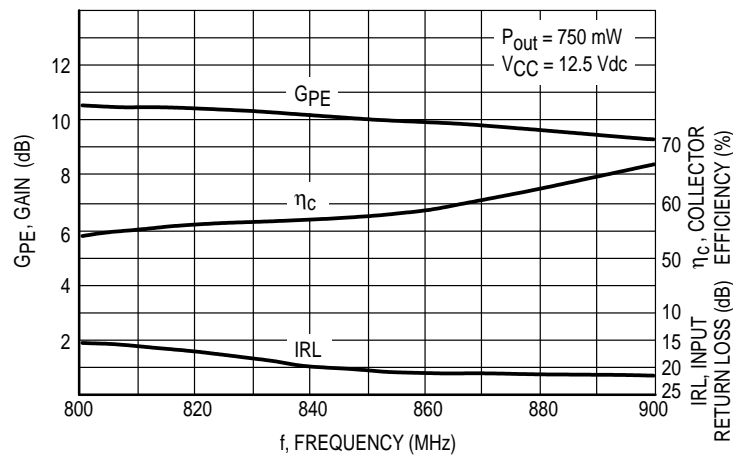


Figure 2. Typical Broadband Performance

f Frequency MHz	Z_{in} Ohms		Z_{OL}^* Ohms	
	$V_{CC} = 7.5\text{ V}$	$V_{CC} = 12.5\text{ V}$	$V_{CC} = 7.5\text{ V}$	$V_{CC} = 12.5\text{ V}$
	$P_{in} = 150\text{ mW}$	$P_{in} = 100\text{ mW}$	$P_{out} = 806\text{ MHz} = 820\text{ mW}$ $P_{out} = 870\text{ MHz} = 635\text{ mW}$ $P_{out} = 960\text{ MHz} = 530\text{ mW}$	$P_{out} = 806\text{ MHz} = 1.05\text{ mW}$ $P_{out} = 870\text{ MHz} = 855\text{ mW}$ $P_{out} = 960\text{ MHz} = 580\text{ mW}$
806	$8.0 + j1.9$	$4.0 + j1.2$	$24.7 - j19.2$	$20.9 - j31.0$
870	$5.2 + j3.5$	$6.0 + j1.9$	$36.9 - j20.5$	$32.1 - j26.6$
960	$6.8 + j4.0$	$6.1 + j2.5$	$39.3 - j18.5$	$36.3 - j25.7$

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

Table 1. Series Equivalent Input/Output Impedance

TYPICAL CHARACTERISTICS 800/900 MHz BAND DATA (continued)

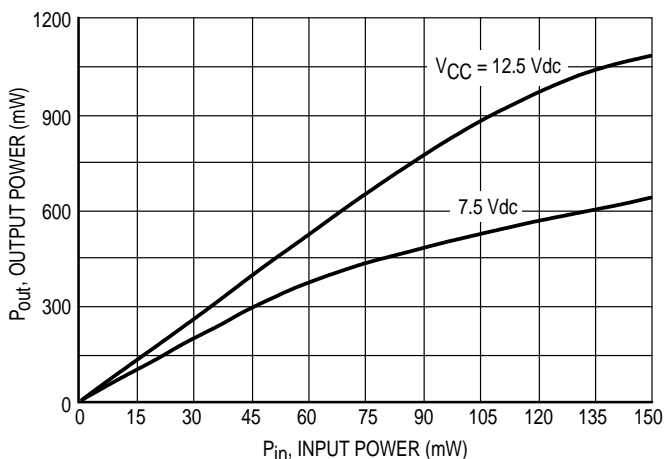


Figure 3. Output Power versus Input Power
 $f = 870\text{ MHz}$

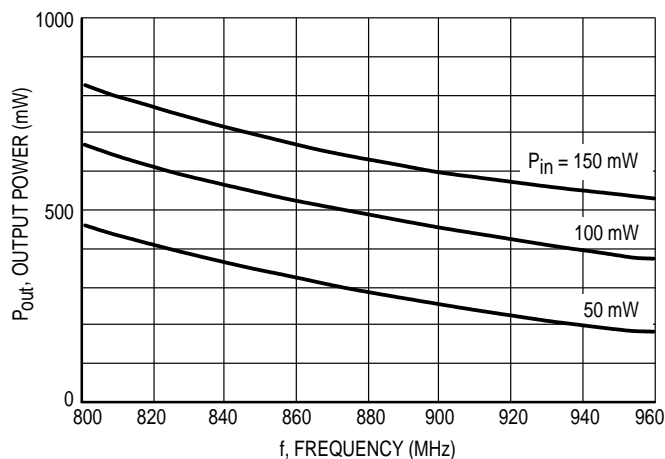


Figure 4. Output Power versus Frequency
 $V_{CC} = 7.5\text{ Vdc}$

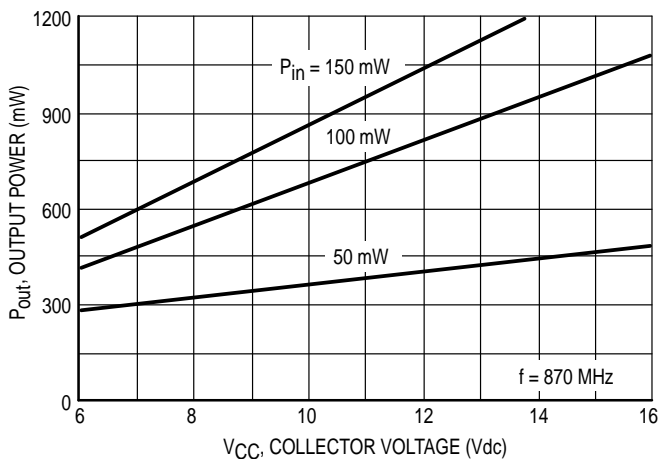


Figure 5. Output Power versus Collector Voltage

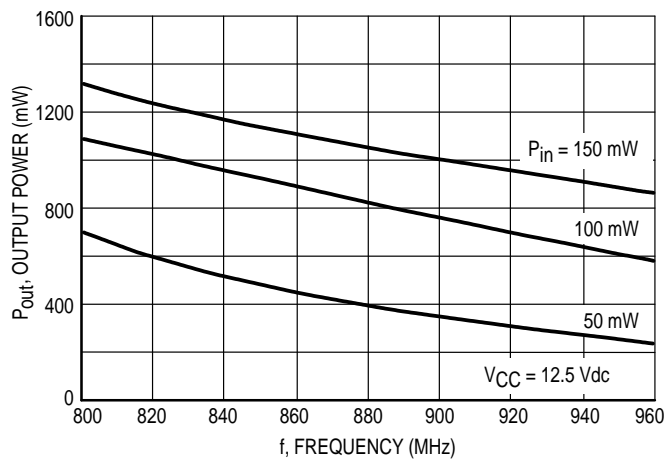


Figure 6. Output Power versus Frequency

TYPICAL CHARACTERISTICS 800/900 MHz BAND DATA (continued)

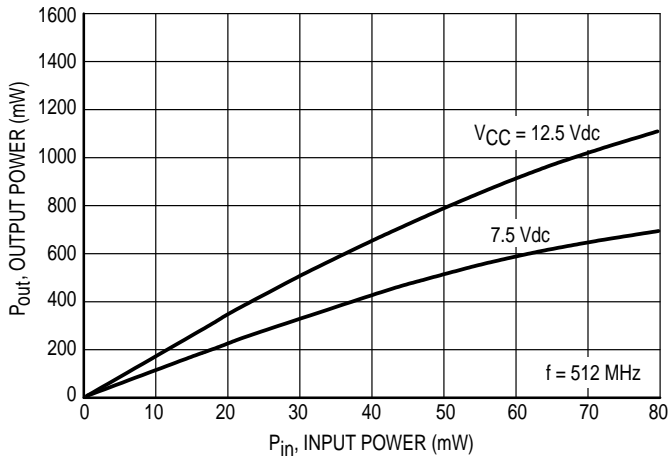


Figure 7. Output Power versus Input Power

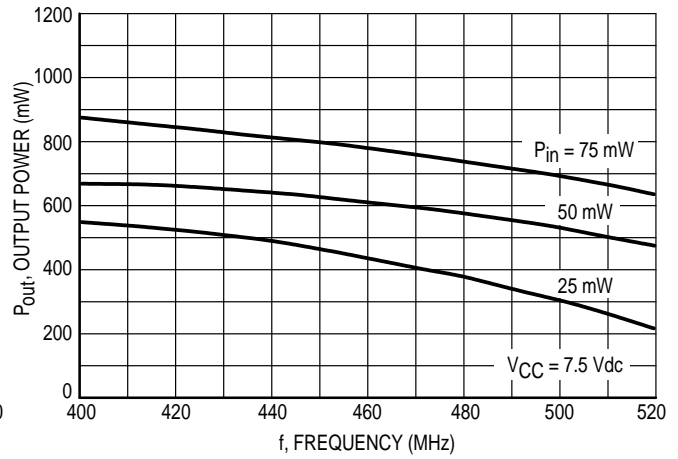


Figure 8. Output Power versus Frequency

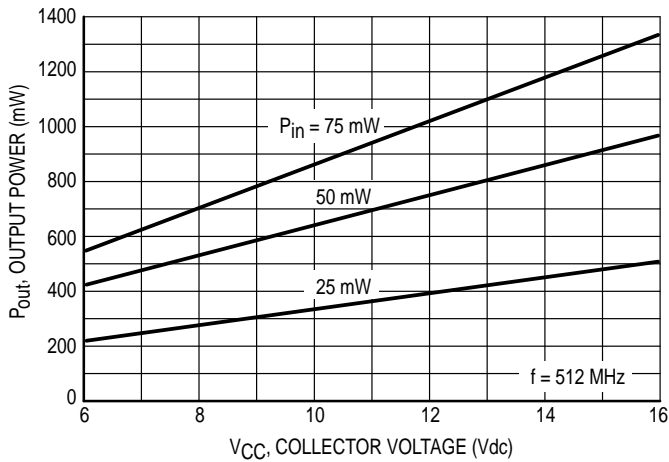


Figure 9. Output Power versus Collector Voltage

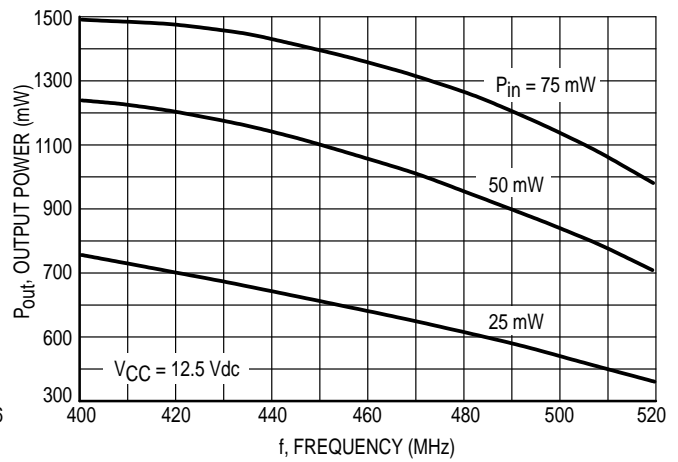
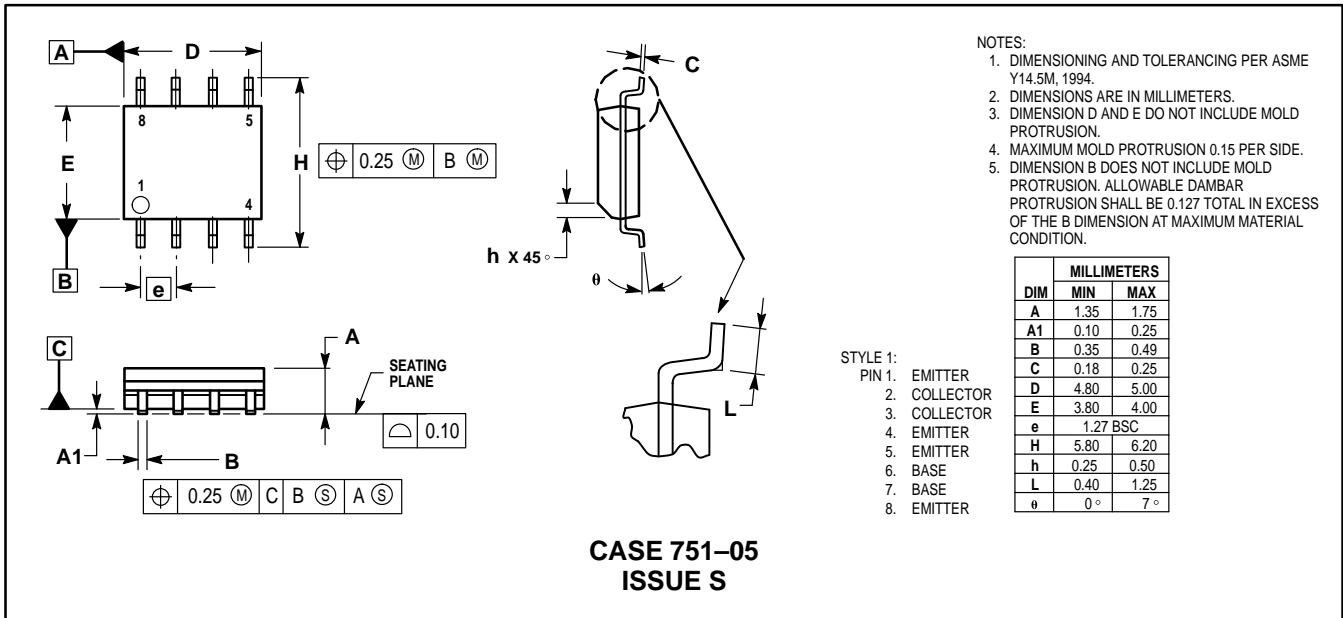


Figure 10. Output Power versus Frequency

PACKAGE DIMENSIONS



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