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°C (1) Derate above 75°C	P_D	1.67 22.2	Watts mW/°C
Storage Temperature Range	T_J, T_{stg}	–55 to +150	°C
Maximum Junction Temperature	T_{Jmax}	150	°C

THERMAL CHARACTERISTICS

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

DEVICE MARKING

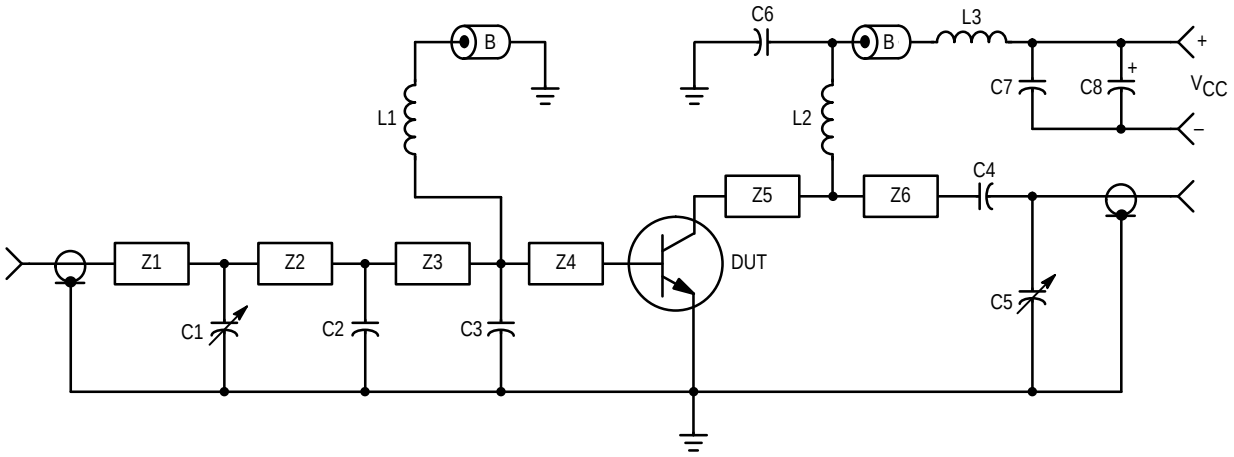
MRF8372 = 8372

NOTE:
1. Case temperature measured on collector lead immediately adjacent to body of package.

(Replaces MRF837/D)

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 5.0 mAdc, I_B = 0)	$V_{(BR)CEO}$	16	—	—	Vdc
Collector–Emitter Breakdown Voltage (I_C = 5.0 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 0.1 mAdc, I_C = 0)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current (V_{CE} = 15 Vdc, V_{BE} = 0, T_C = 25°C)	I_{CES}	—	—	0.1	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 50 mAdc, V_{CE} = 10 Vdc)	h_{FE}	30	90	200	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 15 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	—	1.8	2.5	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V_{CC} = 12.5 Vdc, P_{out} = 0.75 W, f = 870 MHz)	G_{pe}	8.0	10	—	dB
Collector Efficiency (V_{CC} = 12.5 Vdc, P_{out} = 0.75 W, f = 870 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 μF 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_O = 50 Ohms
Z3 — 0.25″ x 0.078″ Microstrip, Z_O = 50 Ohms
Z4 — 0.15″ x 0.078″ Microstrip, Z_O = 50 Ohms
Z5 — 0.30″ x 0.078″ Microstrip, Z_O = 50 Ohms
Z6 — 1.63″ x 0.078″ Microstrip, Z_O = 50 Ohms
PCB — 1/32″ Glass Teflon, ε_r = 2.56

Figure 1. 800 – 900 MHz Broadband Circuit

800/900 MHz BAND DATA

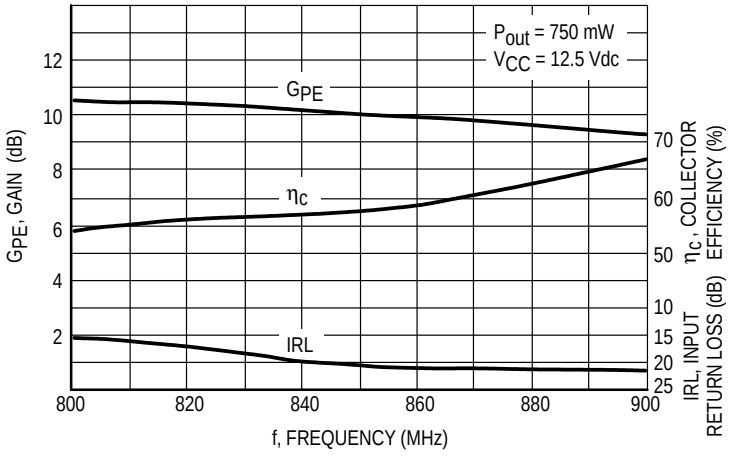


Figure 2. Typical Broadband Performance

f Frequency MHz	Z_{in} Ohms		Z_{OL}* Ohms	
	V_{CC} = 7.5 V	V_{CC} = 12.5 V	V_{CC} = 7.5 V	V_{CC} = 12.5 V
	P_{in} = 150 mW	P_{in} = 100 mW	P_{out} = 806 MHz = 820 mW P_{out} = 870 MHz = 635 mW P_{out} = 960 MHz = 530 mW	P_{out} = 806 MHz = 1.05 mW P_{out} = 870 MHz = 855 mW P_{out} = 960 MHz = 580 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)

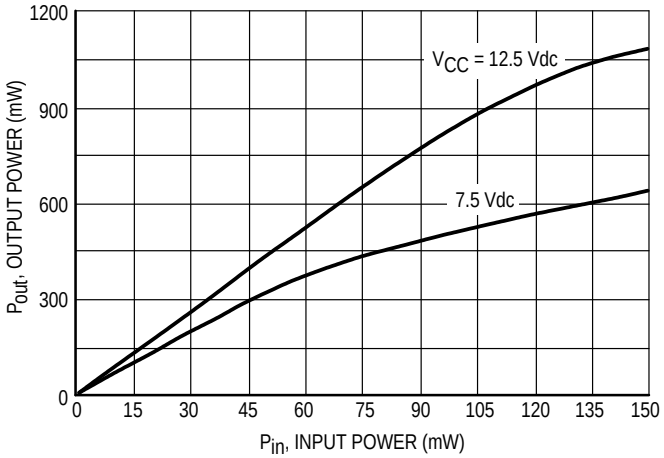


Figure 3. Output Power versus Input Power
f = 870 MHz

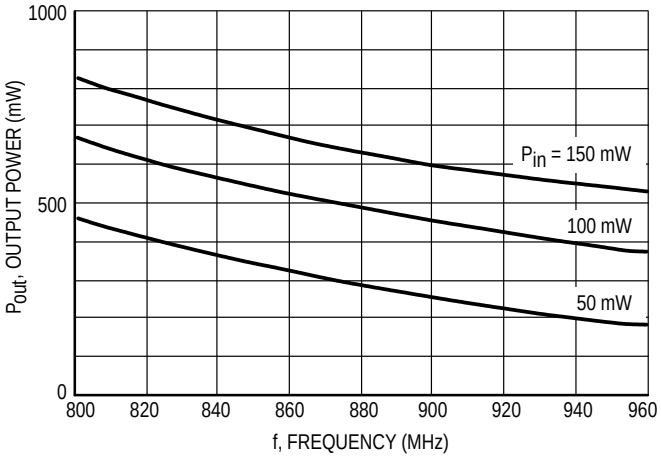


Figure 4. Output Power versus Frequency
V_{CC} = 7.5 Vdc

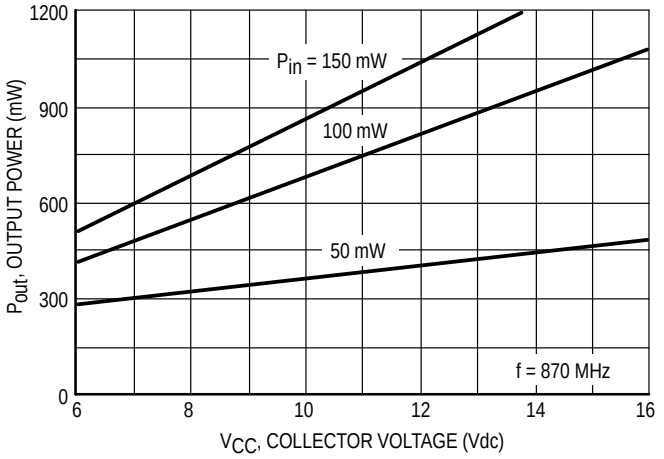


Figure 5. Output Power versus Collector Voltage

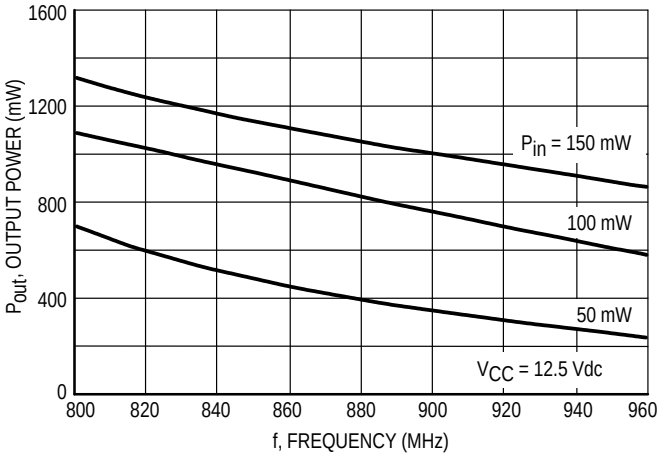


Figure 6. Output Power versus Frequency

TYPICAL CHARACTERISTICS
800/900 MHz BAND DATA (continued)

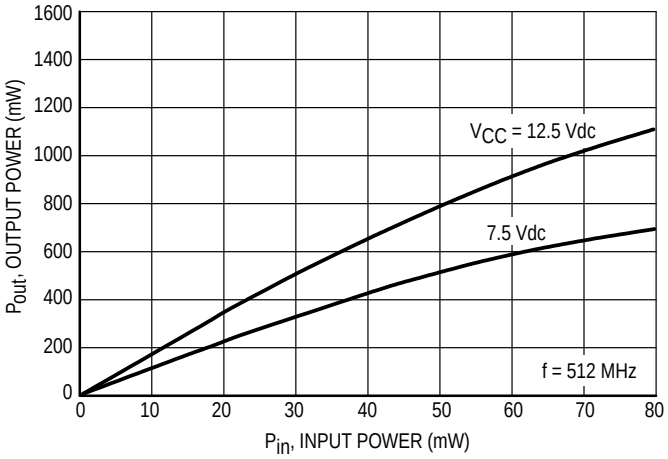


Figure 7. Output Power versus Input Power

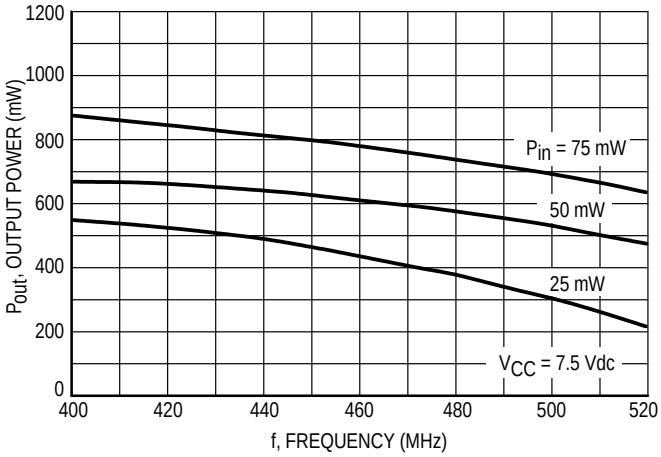


Figure 8. Output Power versus Frequency

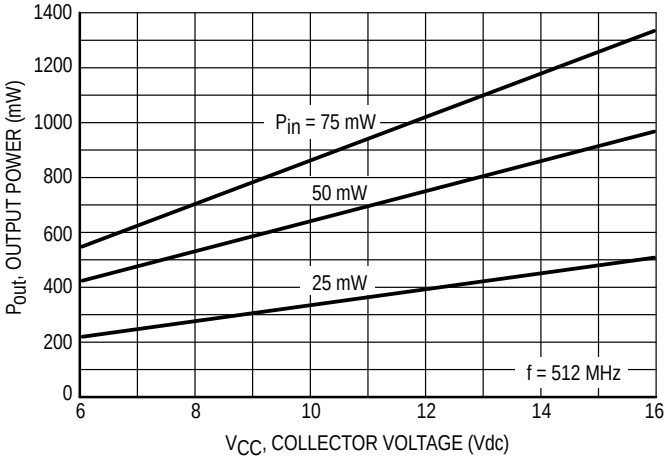


Figure 9. Output Power versus Collector Voltage

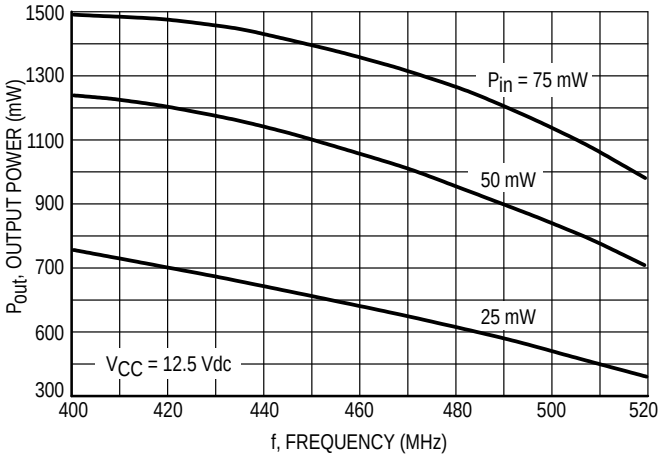
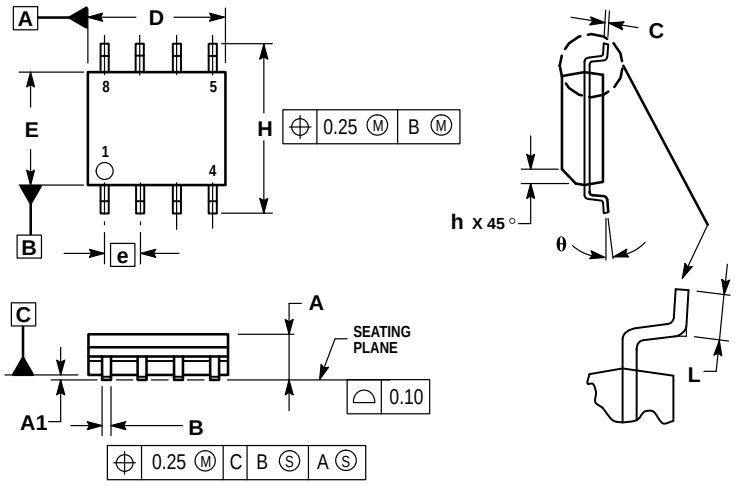


Figure 10. Output Power versus Frequency

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. DIMENSIONS ARE IN MILLIMETERS.
3. DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE B DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS	
DIM	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.18	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
θ	0°	7°

STYLE 1:
PIN 1. EMITTER
2. COLLECTOR
3. COLLECTOR
4. EMITTER
5. EMITTER
6. BASE
7. BASE
8. EMITTER

CASE 751–05
ISSUE S

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