

The RF Line

NPN Silicon

RF Low Power Transistor

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

MRF8372R1, R2

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	mA dc
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	$^\circ\text{C/W}$

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
----------------	--------	-----	-----	-----	------

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

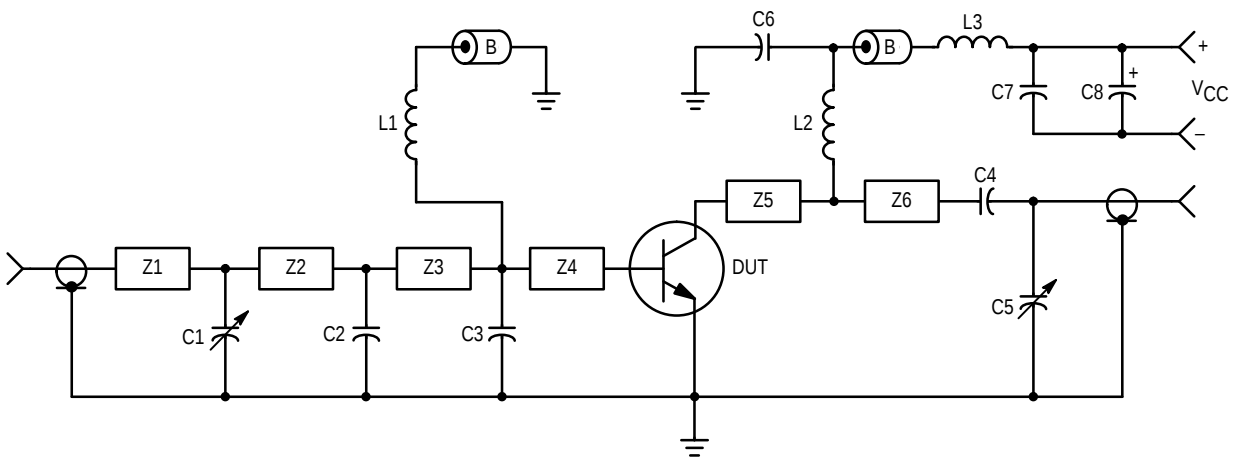
DC Current Gain ($I_C = 50\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)	h_{FE}	30	90	200	—
--	----------	----	----	-----	---

DYNAMIC CHARACTERISTICS

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

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

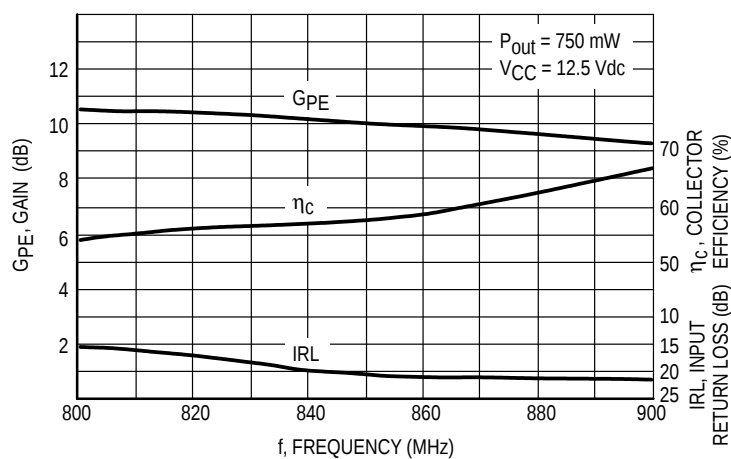


Figure 2. Typical Broadband Performance

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)

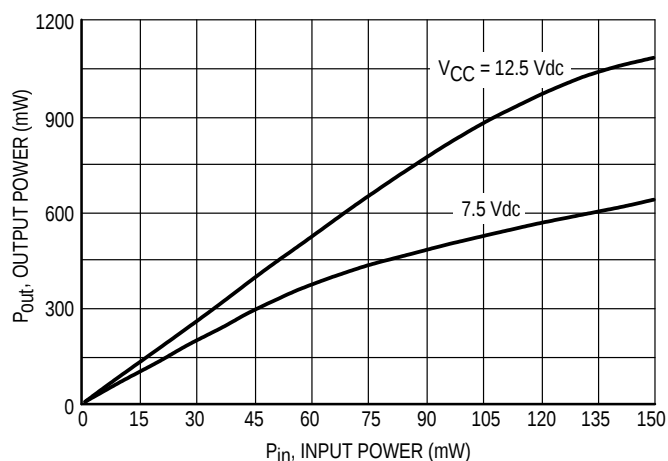


Figure 3. Output Power versus Input Power
f = 870 MHz

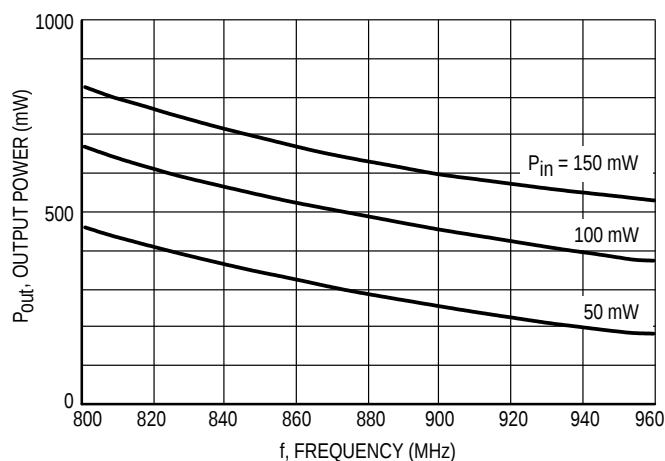


Figure 4. Output Power versus Frequency
VCC = 7.5 Vdc

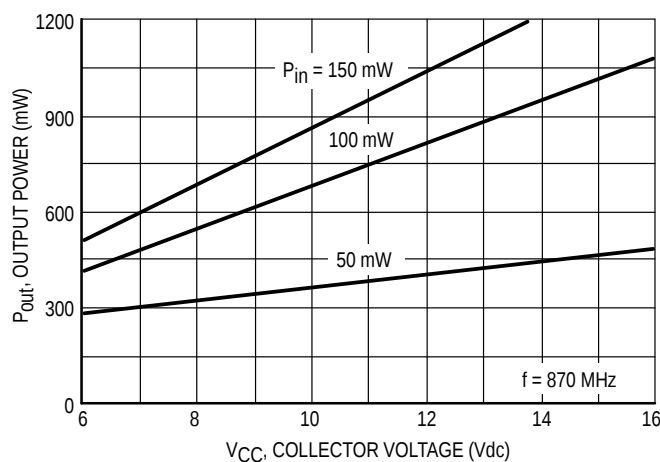


Figure 5. Output Power versus Collector Voltage

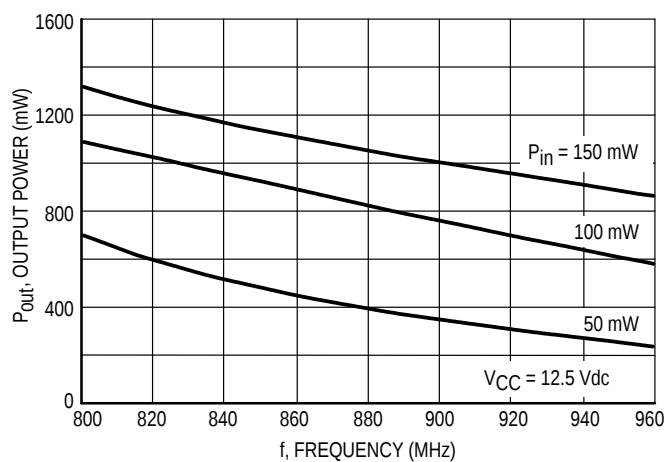


Figure 6. Output Power versus Frequency

TYPICAL CHARACTERISTICS
800/900 MHz BAND DATA (continued)

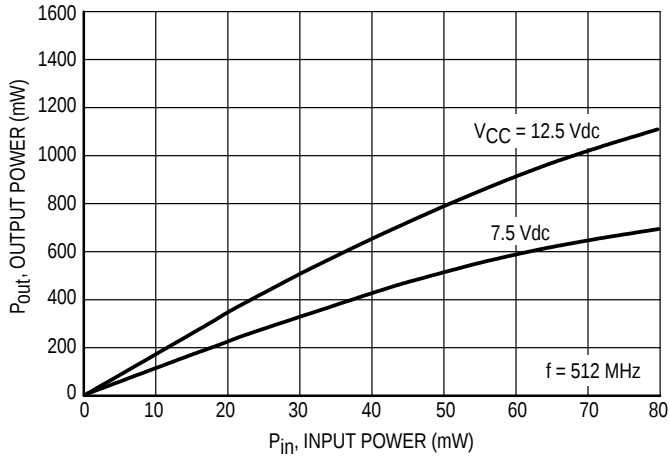


Figure 7. Output Power versus Input Power

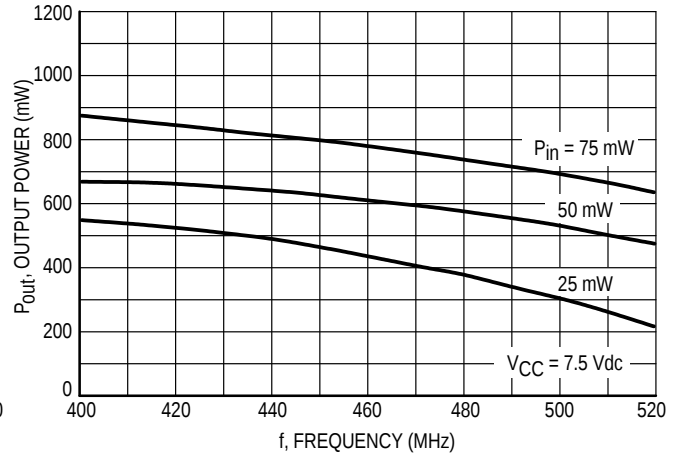


Figure 8. Output Power versus Frequency

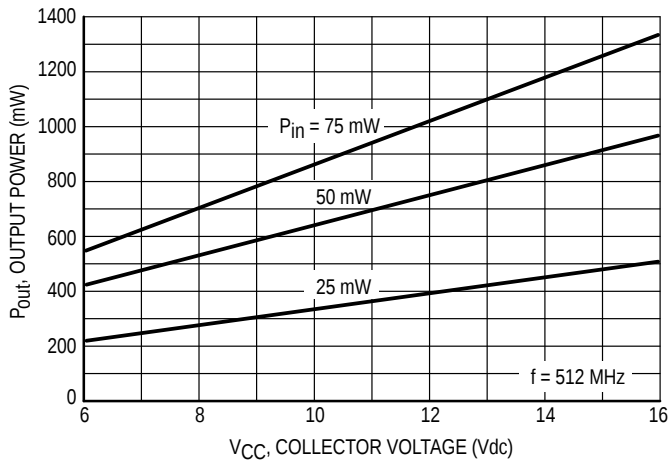


Figure 9. Output Power versus Collector Voltage

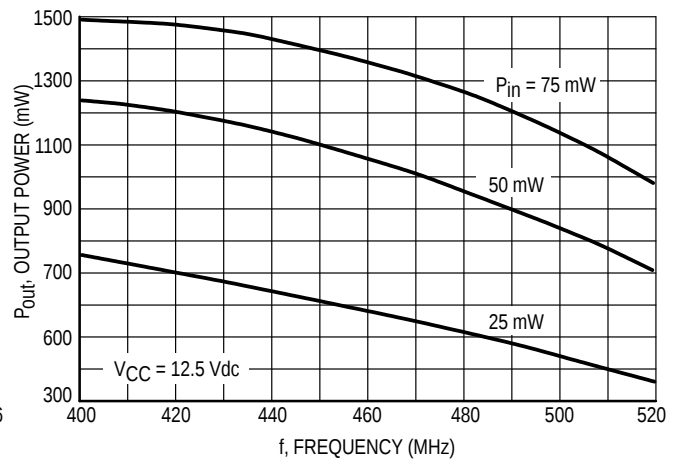
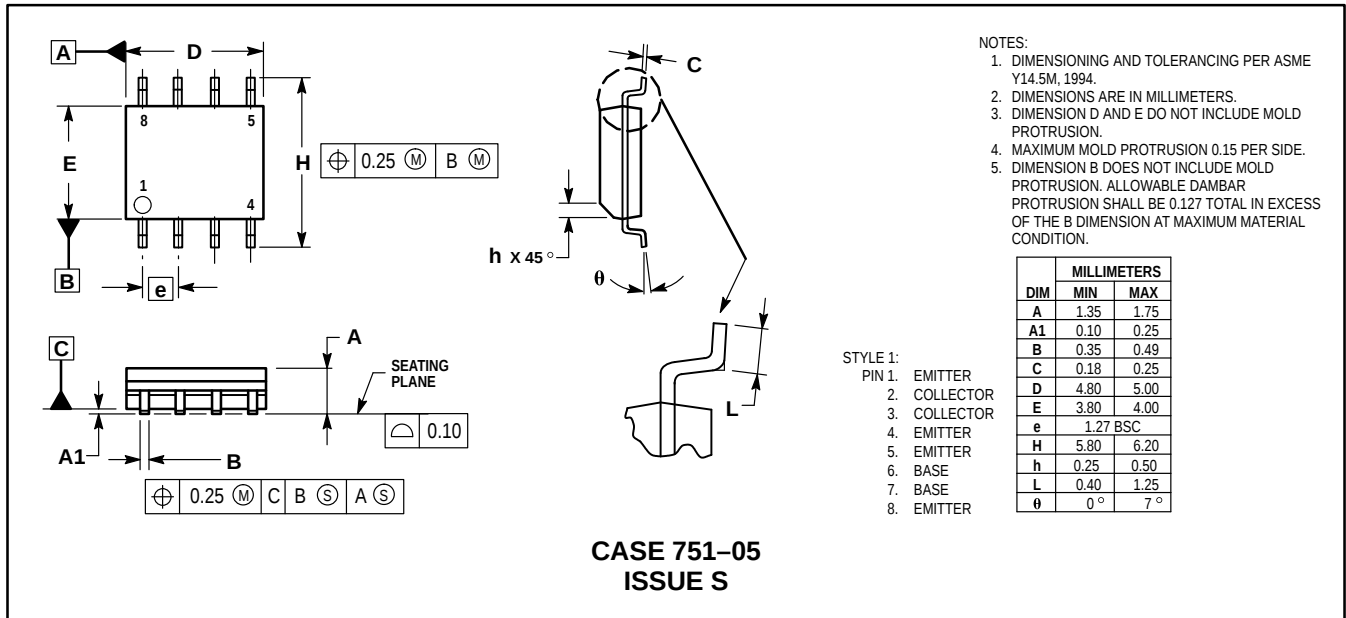


Figure 10. Output Power versus Frequency

PACKAGE DIMENSIONS



Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Mfax is a trademark of Motorola, Inc.

How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
 P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

JAPAN: Nippon Motorola Ltd.: SPD, Strategic Planning Office, 4-32-1,
 Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan. 81-3-5487-8488

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609
 – US & Canada ONLY 1-800-774-1848

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

INTERNET: <http://motorola.com/sps>



MRF8372/D