



THE DATASHEET OF MRF392

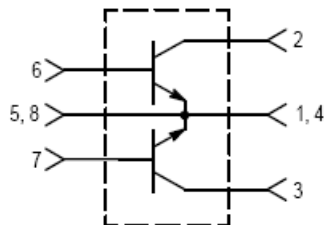


The RF Line Controlled “Q” Broadband Power Transistor 125W, 30 to 500MHz, 28V

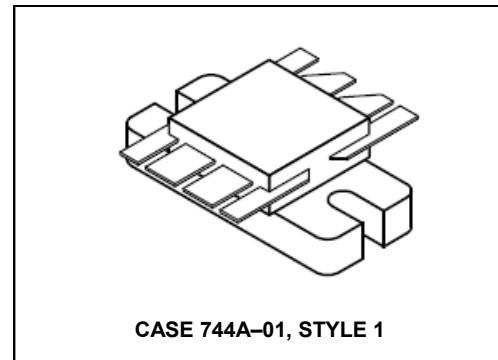
Rev. V1

Designed primarily for wideband large-signal output and driver amplifier stages in the 30 to 500 MHz frequency range.

- Specified 28 V, 400 MHz characteristics —
 - Output power = 125 W
 - Typical gain = 10 dB
 - Efficiency = 55% (typ.)
- Built-in input impedance matching networks for broadband operation
- Push-pull configuration reduces even numbered harmonics
- Gold metallization system for high reliability
- 100% tested for load mismatch



Product Image



The MRF392 is two transistors in a single package with separate base and collector leads and emitters common. This arrangement provides the designer with a space saving device capable of operation in a push-pull configuration.

PUSH-PULL TRANSISTORS

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CBO}	60	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	16	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (1) Derate above 25°C	P_D	270 1.54	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$
Junction Temperature	T_J	200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.65	$^\circ\text{C}/\text{W}$

NOTE:

- This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF push-pull amplifier.

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS (1)

Collector–Emitter Breakdown Voltage ($I_C = 50\text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	30	—	—	Vdc
Collector–Emitter Breakdown Voltage ($I_C = 50\text{ mAdc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	60	—	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 5.0\text{ mAdc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 30\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	—	5.0	mAdc

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 1.0\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	40	60	100	—
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DYNAMIC CHARACTERISTICS (1)

Output Capacitance ($V_{CB} = 28\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	75	95	pF
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FUNCTIONAL TESTS (2) — See Figure 1

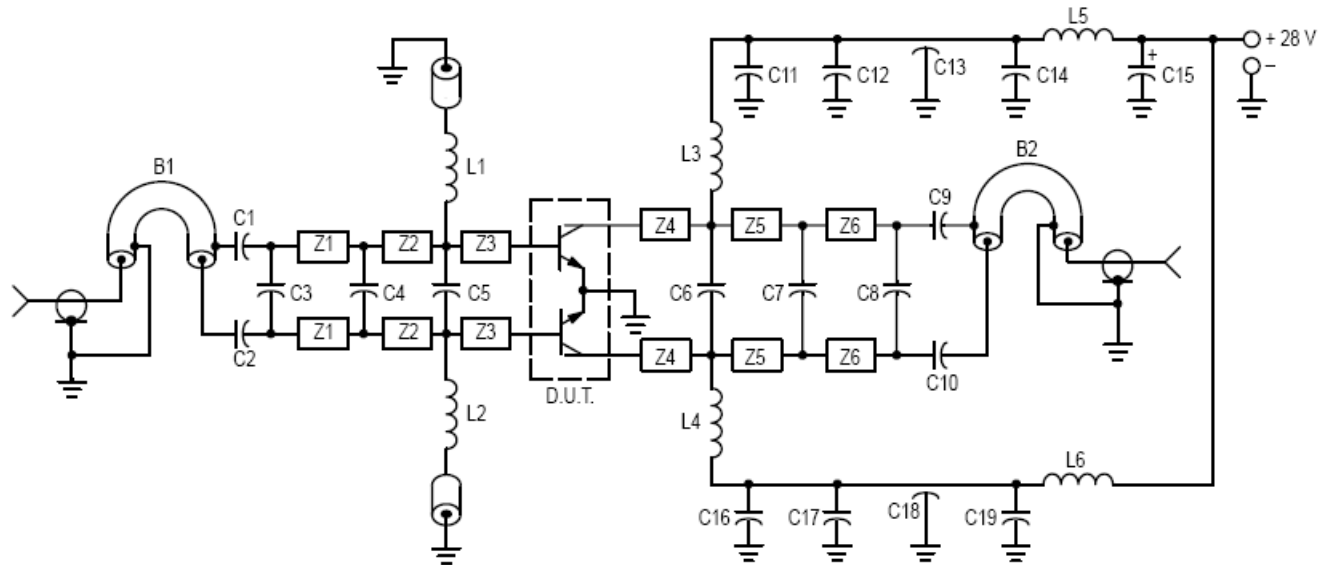
Common–Emitter Amplifier Power Gain ($V_{CC} = 28\text{ Vdc}$, $P_{out} = 125\text{ W}$, $f = 400\text{ MHz}$)	G_{pe}	8.0	10	—	dB
Collector Efficiency ($V_{CC} = 28\text{ Vdc}$, $P_{out} = 125\text{ W}$, $f = 400\text{ MHz}$)	η	50	55	—	%
Load Mismatch ($V_{CC} = 28\text{ Vdc}$, $P_{out} = 125\text{ W}$, $f = 400\text{ MHz}$, $V_{SWR} = 30:1$, all phase angles)	ψ	No Degradation in Output Power			

NOTES:

- Each transistor chip measured separately.
- Both transistor chips operating in push–pull amplifier.

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- C1, C2 — 240 pF, 100 Mil Chip Cap (ATC) or Equivalent
- C3 — 3.6 pF, 100 Mil Chip Cap (ATC) or Equivalent
- C4, C8 — 8.2 pF, 100 Mil Chip Cap (ATC) or Equivalent
- C5, C6 — 20 pF, 100 Mil Chip Cap (ATC) or Equivalent
- C7 — 18 pF, Mini Unelco or Equivalent
- C9, C10 — 270 pF, 100 Mil Chip Cap (ATC) or Equivalent
- C11, C12, C16, C17 — 470 pF 100 Mil Chip Cap (ATC) or Equivalent
- C13, C18 — 680 pF Feedthru
- C14, C19 — 0.1 μ F Erie Redcap or Equivalent
- C15 — 20 μ F, 50 V

- L1, L2 — 0.15 μ H Molded Choke With Ferrite Bead
- L3, L4 — 2-1/2 Turns #20 AWG, 0.200 ID
- L5, L6 — 3-1/2 Turns #18 AWG, 0.200 ID

- B1 — Balun, 50 Ω Semi-Rigid Coaxial Cable 86 Mil OD, 2" L
- B2 — Balun, 50 Ω Semi-Rigid Coaxial Cable 86 Mil OD, 2" L
- Z1 — Microstrip Line 270 Mil L x 125 Mil W
- Z2 — Microstrip Line 375 Mil L x 125 Mil W
- Z3 — Microstrip Line 280 Mil L x 125 Mil W
- Z4 — Microstrip Line 300 Mil L x 125 Mil W
- Z5 — Microstrip Line 350 Mil L x 125 Mil W
- Z6 — Microstrip Line 365 Mil L x 125 Mil W

Board Material — 0.0625" Teflon Fiberglass $\epsilon_r = 2.5 \pm 0.05$ 1 oz. Cu.
CLAD, Double Sided

Figure 1. 400 MHz Test Fixture

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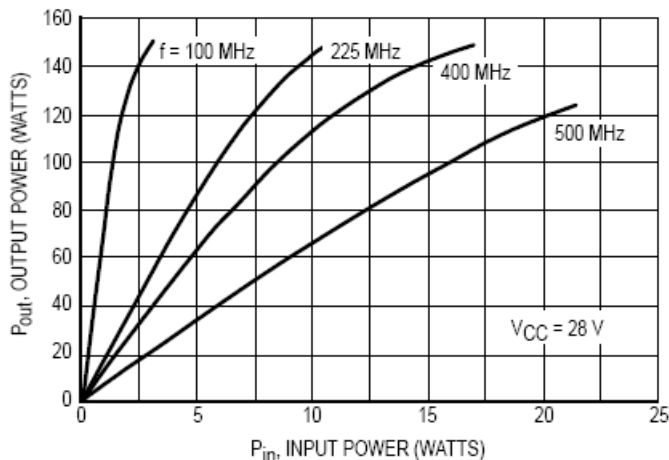


Figure 2. Output Power versus Input Power

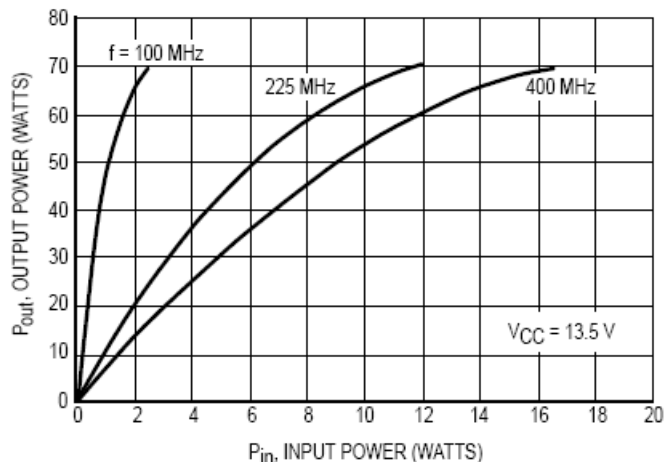


Figure 3. Output Power versus Input Power

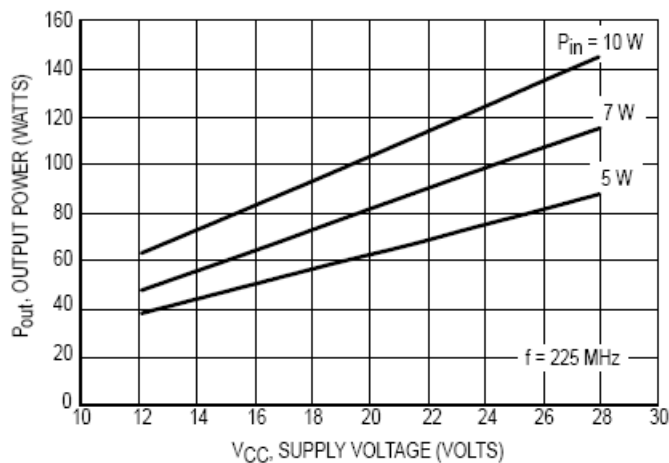


Figure 4. Output Power versus Supply Voltage

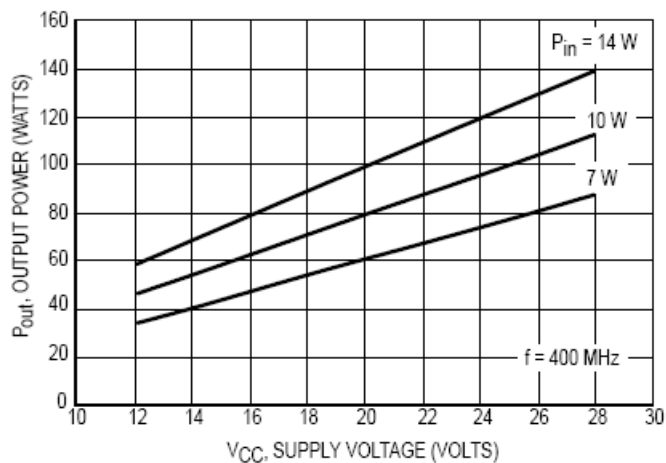


Figure 5. Output Power versus Supply Voltage

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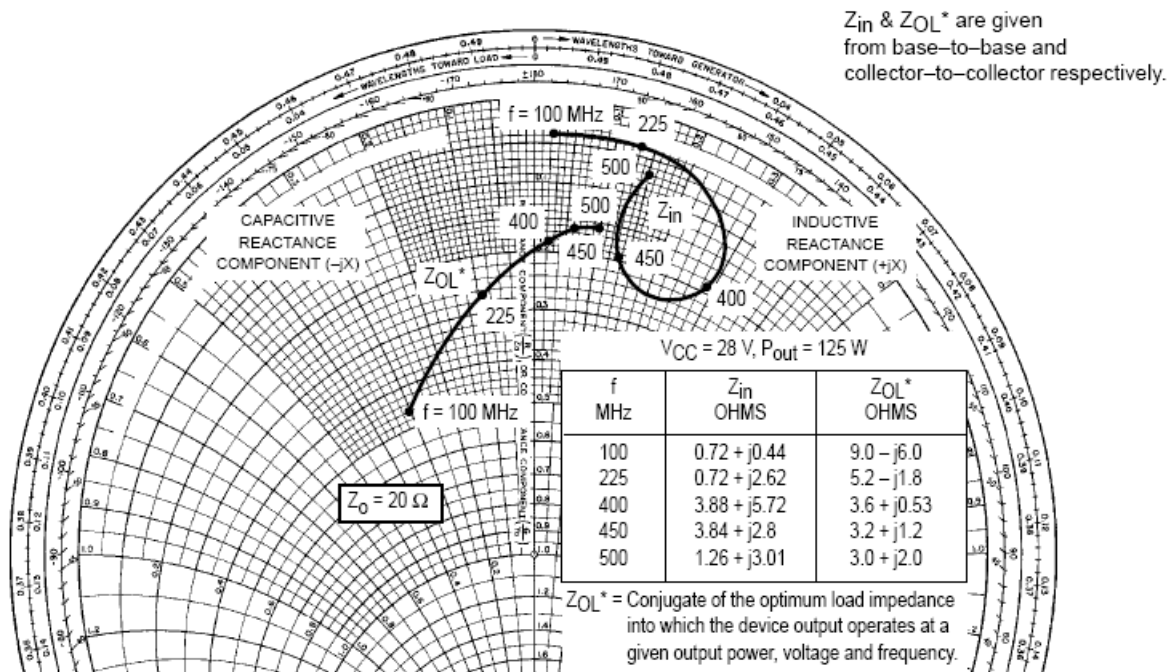
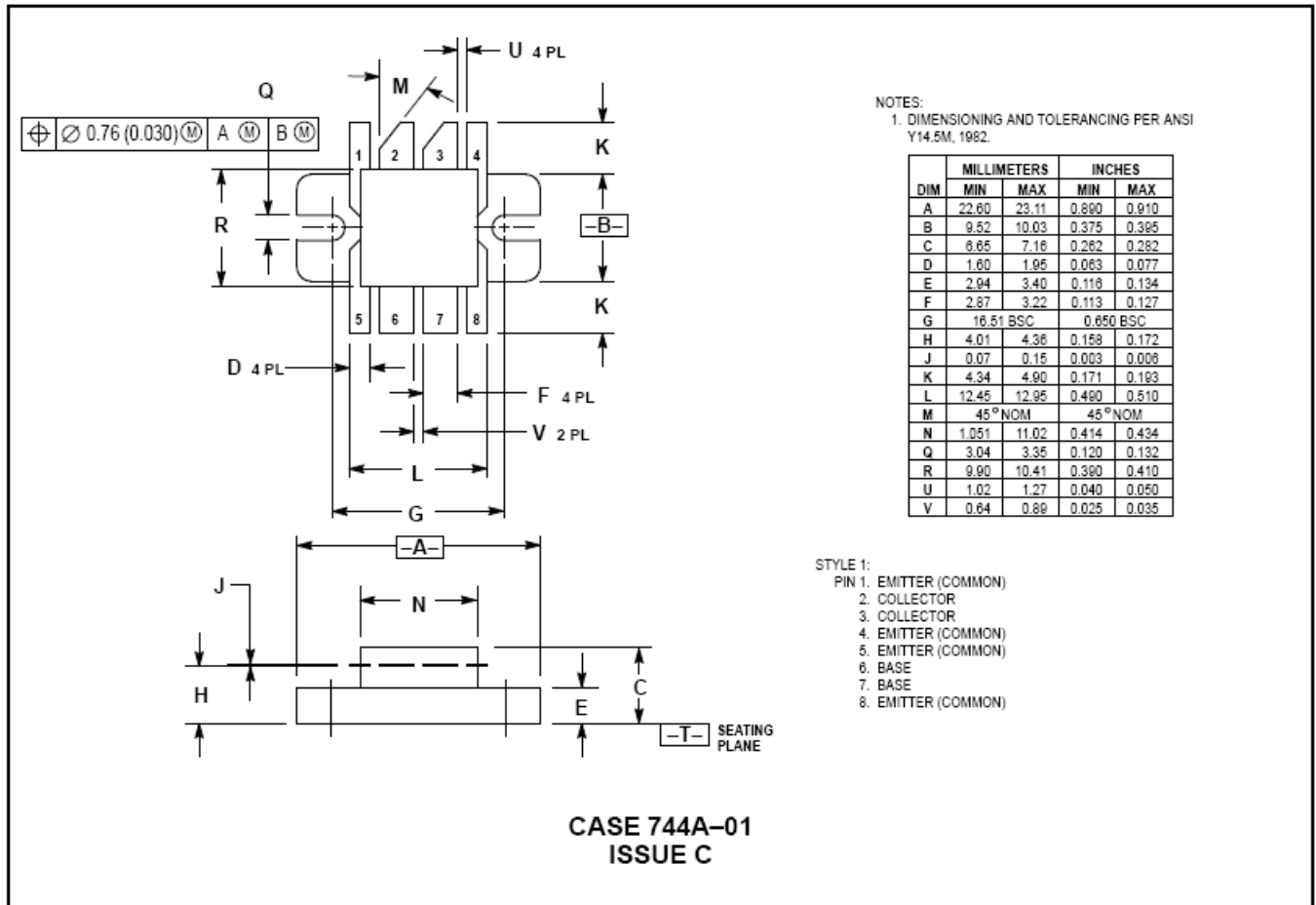


Figure 6. Series Equivalent Input/Output Impedance

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PACKAGE DIMENSIONS



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