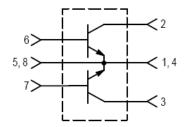


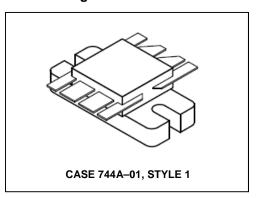
M/A-COM Products Released - Rev. 07.07

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

- Specified 28 V, 500 MHz characteristics —
 Output power = 100 W
 Typical gain = 9.5 dB (Class AB); 8.5 dB (Class C)
 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 MRF393 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	VCEO	30	Vdc	
Collector-Base Voltage	V _{CBO}	60	Vdc	
Emitter-Base Voltage	VEBO	4.0	Vdc	
Collector Current — Continuous	IC	16	Adc	
Total Device Dissipation @ T _C = 25°C (1) Derate above 25°C	PD	270 1.54	Watts W/°C	
Storage Temperature Range	T _{stg}	-65 to +150	°C	
Junction Temperature	TJ	200	°C	

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R ₀ JC	0.65	°C/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.

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

- North America Tel: 800.366.2266 / Fax: 978.366.2266
- Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
 Visit www.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

MRF393



The RF Line Controlled "Q" Broadband Power Transistor 100W, 30 to 500MHz, 28V

M/A-COM Products Released - Rev. 07.07

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

Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS (1)					
Collector–Emitter Breakdown Voltage (I _C = 50 mAdc, I _B = 0)	V(BR)CEO	30	_	_	Vdc
Collector–Emitter Breakdown Voltage (I _C = 50 mAdc, V _{BE} = 0)	V(BR)CES	60	_	_	Vdc
Emitter–Base Breakdown Voltage (I _E = 5.0 mAdc, I _C = 0)	V _{(BR)EBO}	4.0	_	_	Vdc
Collector Cutoff Current (V _{CB} = 30 Vdc, I _E = 0)	ICBO	_	_	5.0	mAdc
ON CHARACTERISTICS (1)					
DC Current Gain (I _C = 1.0 Adc, V _{CE} = 5.0 Vdc)	hFE	20	_	100	_
DYNAMIC CHARACTERISTICS (1)					
Output Capacitance (V _{CB} = 28 Vdc, I _E = 0, f = 1.0 MHz)	C _{ob}	40	75	95	pF
FUNCTIONAL TESTS (2) — See Figure 1					
Common–Emitter Amplifier Power Gain (V _{CC} = 28 Vdc, P _{out} = 100 W, f = 500 MHz)	G _{pe}	7.5	8.5	_	dB
Collector Efficiency (V _{CC} = 28 Vdc, P _{out} = 100 W, f = 500 MHz)	η	50	55	_	%
Load Mismatch (V _{CC} = 28 Vdc, P _{out} = 100 W, f = 500 MHz, VSWR = 30:1, all phase angles)	Ψ	No Degradation in Output Power			

NOTES:

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

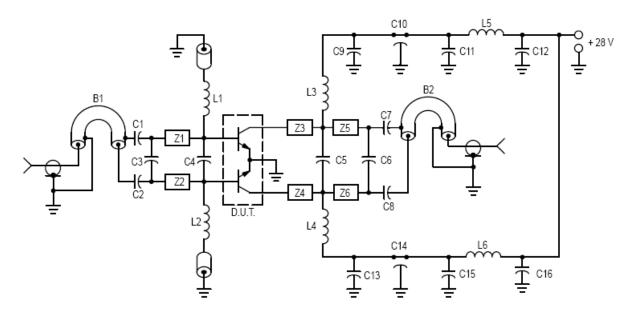
[•] North America Tel: 800.366.2266 / Fax: 978.366.2266

[•] **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300

Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
 Visit www.macomtech.com for additional data sheets and product information.



M/A-COM Products Released - Rev. 07.07



C1, C2, C7, C8 - 240 pF 100 mil Chip Cap

C3 - 15 pF 100 mil Chip Cap

C4 — 24 pF 100 mil Chip Cap

C5 - 33 pF 100 mil Chip Cap

C6 - 12 pF 100 mil Chip Cap

C9, C13 - 1000 pF 100 mil Chip Cap

C10, C14 — 680 pF Feedthru Cap

C11, C15 — 0.1 µF Ceramic Disc Cap

C12, C16 - 50 µF 50 V

L1, L2 - 0.15 μH 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, B2 — Balun 50 Ω Semi Rigid Coax, 86 mil OD, 4" Long

Z1, Z2 - 850 mil Long x 125 mil W. Microstrip

Z3, Z4 - 200 mil Long x 125 mil W. Microstrip

Z5, Z6 - 800 mil Long x 125 mil W. Microstrip

Board Material — 0.0325" Teflon–Fiberglass, ε_{Γ} = 2.56, 1 oz. Copper Clad both sides.

Figure 1. 500 MHz Test Fixture

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
Visit www.macomtech.com for additional data sheets and product information.

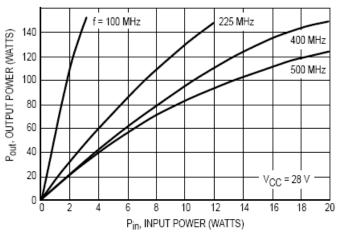
[•] North America Tel: 800.366.2266 / Fax: 978.366.2266

[•] **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300



M/A-COM Products Released - Rev. 07.07

CLASS C



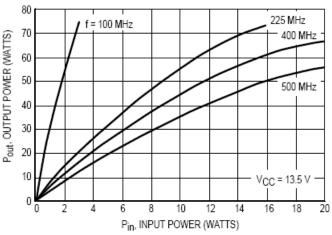
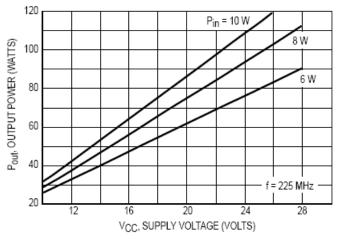


Figure 2. Output Power versus Input Power

Figure 3. Output Power versus Input Power

CLASS C



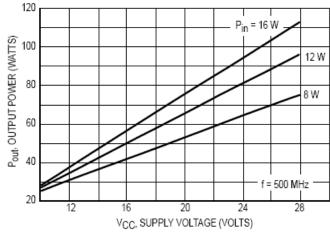


Figure 4. Output Power versus Supply Voltage

Figure 5. Output Power versus Supply Voltage

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
Visit www.macomtech.com for additional data sheets and product information.

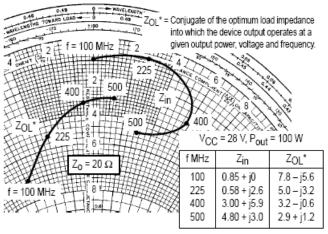
M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

[•] North America Tel: 800.366.2266 / Fax: 978.366.2266

[•] **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300



M/A-COM Products Released - Rev. 07.07



NOTE: Z_{in} & Z_{OL}* are given from base-to-base and collector-to-collector respectively.

Figure 6. Series Equivalent Input/Output Impedance

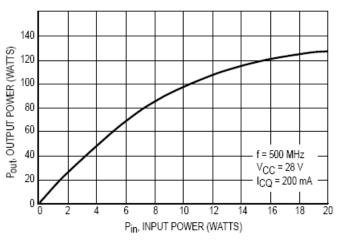


Figure 7. Class AB Output Power versus Input Power

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

[•] North America Tel: 800.366.2266 / Fax: 978.366.2266

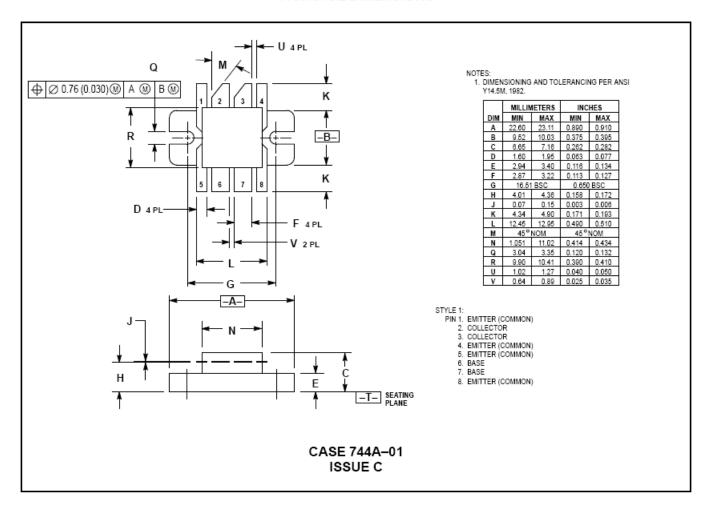
[•] **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300

Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
Visit www.macomtech.com for additional data sheets and product information.



M/A-COM Products Released - Rev. 07.07

PACKAGE DIMENSIONS



PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

[•] North America Tel: 800.366.2266 / Fax: 978.366.2266

[•] Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300

Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
Visit www.macomtech.com for additional data sheets and product information.