

MRF10502



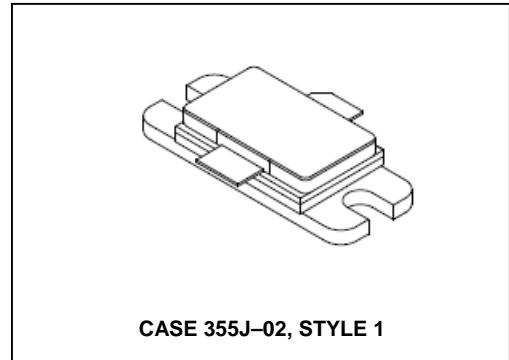
Microwave Pulse Power Silicon NPN Transistor
500W (peak), 1025–1150MHz

M/A-COM Products
 Released - Rev. 07.07

Product Image

Designed for 1025–1150 MHz pulse common base amplifier applications such as TCAS, TACAN and Mode-S transmitters.

- Guaranteed performance @ 1090 MHz
 Output power = 500 W peak
 Gain = 8.5 dB min, 9.0 dB (typ.)
- 100% tested for load mismatch at all phase angles with 10:1 VSWR
- Hermetically sealed industry package
- Silicon nitride passivated
- Gold metalized, emitter ballasted for long life and resistance to metal migration
- Internal input and output matching
- Characterized with 10 μ s, 1% duty cycle pulses



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V _{CES}	65	Vdc
Collector–Base Voltage	V _{CBO}	65	Vdc
Emitter–Base Voltage	V _{EBO}	3.5	Vdc
Collector Current — Peak (1)	I _C	29	Adc
Total Device Dissipation @ T _C = 25°C (1), (2) Derate above 25°C	P _D	1460 8.3	Watts W/°C
Storage Temperature Range	T _{stg}	–65 to +200	°C
Junction Temperature	T _J	200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (3)	R θ_{JC}	0.12	°C/W

NOTES:

1. Under pulse RF operating conditions.
2. These devices are designed for RF operation. The total device dissipation rating applies only when the devices are operated as pulsed RF amplifiers.
3. Thermal Resistance is determined under specified RF operating conditions by infrared measurement techniques. (Worst case θ_{JC} value measured @ 32 μ s, 2%.)

Microwave Pulse Power Silicon NPN Transistor 500W (peak), 1025–1150MHz

M/A-COM Products
Released - Rev. 07.07

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

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage (I _C = 60 mAdc, V _{BE} = 0)	V _{(BR)CES}	65	—	—	Vdc
Collector–Base Breakdown Voltage (I _C = 60 mAdc, I _E = 0)	V _{(BR)CBO}	65	—	—	Vdc
Emitter–Base Breakdown Voltage (I _E = 10 mAdc, I _C = 0)	V _{(BR)EBO}	3.5	—	—	Vdc
Collector Cutoff Current (V _{CB} = 36 Vdc, I _E = 0)	I _{CBO}	—	—	25	mAdc

ON CHARACTERISTICS

DC Current Gain (I _C = 5.0 Adc, V _{CE} = 5.0 Vdc)	h _{FE}	20	—	—	—
---	-----------------	----	---	---	---

FUNCTIONAL TESTS

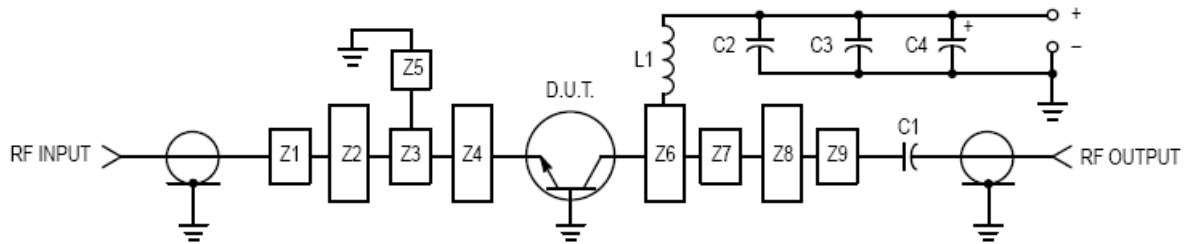
Common–Base Amplifier Power Gain (V _{CC} = 50 Vdc, P _{out} = 500 W Peak, f = 1090 MHz)	G _{PB}	8.5	9.0	—	dB
Collector Efficiency (V _{CC} = 50 Vdc, P _{out} = 500 W Peak, f = 1090 MHz)	η	40	45	—	%
Load Mismatch (V _{CC} = 50 Vdc, P _{out} = 500 W Peak, f = 1090 MHz, VSWR = 10:1 All Phase Angles)	ψ	No Degradation in Output Power			

MRF10502



Microwave Pulse Power Silicon NPN Transistor
500W (peak), 1025–1150MHz

M/A-COM Products
Released - Rev. 07.07



- C1 — 82 pF 100 Mil Chip Capacitor
- C2 — 39 pF 100 Mil Chip Capacitor
- C3 — 0.1 μ F
- C4 — 100 μ F, 100 Vdc, Electrolytic
- L1 — 3 Turns #18 AWG, 1/8" ID, 0.18 Long

- Z1–Z9 — Microstrip, See Details
- Board Material — Teflon, Glass Laminate
- Dielectric Thickness = 0.030"
- $\epsilon_r = 2.55$, 2 Oz. Copper

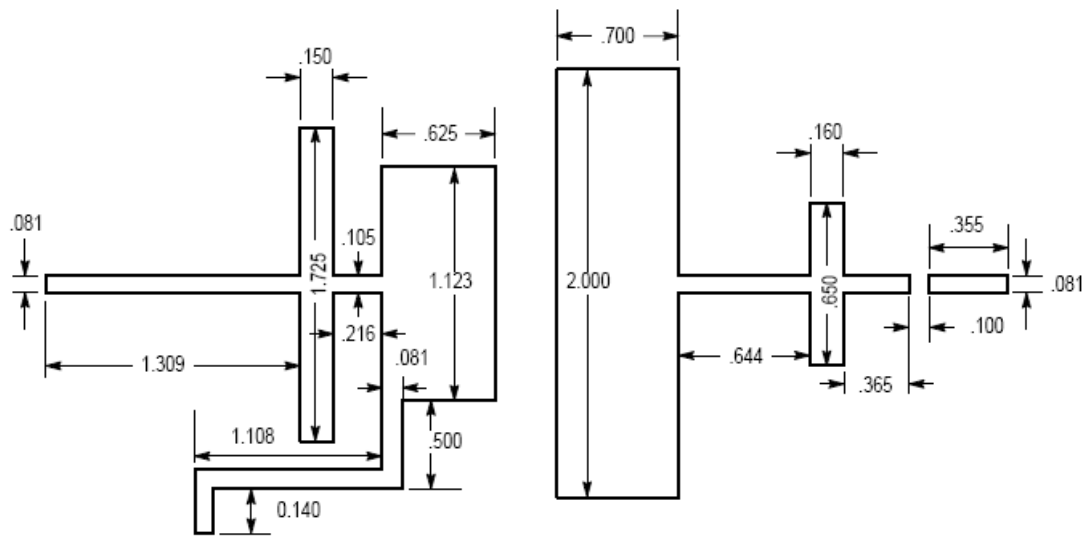


Figure 1. Test Circuit

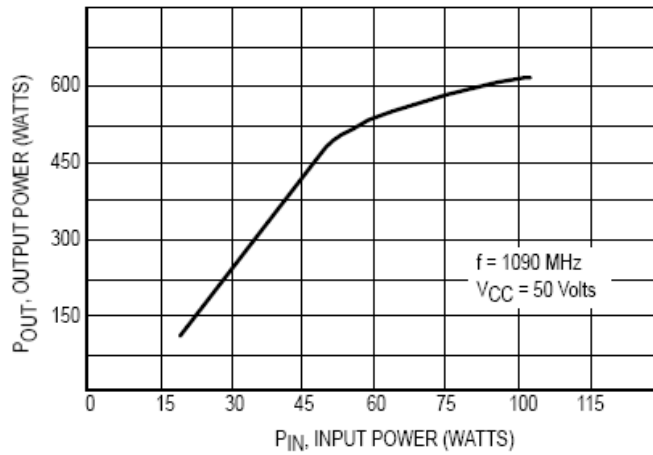
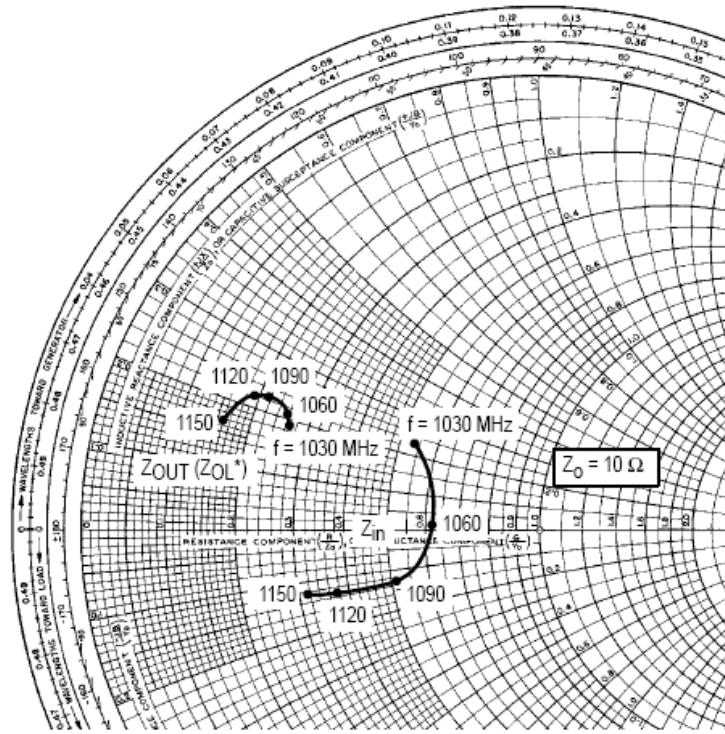


Figure 2. Output Power versus Input Power



$P_{OUT} = 500 \text{ W Pk}$ $V_{CC} = 50 \text{ V}$

f MHz	Z_{in} OHMS	$Z_{OL}^* (Z_{OUT})$ OHMS
1030	$5.3 + j2.25$	$2.6 + j1.89$
1060	$6.2 + j0.2$	$2.56 + j2.0$
1090	$5.2 - j1.4$	$2.12 + j2.2$
1120	$3.7 - j1.35$	$1.9 + j2.15$
1150	$3.15 - j1.3$	$1.6 + j1.62$

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

Figure 3. Series Equivalent Input/Output Impedances

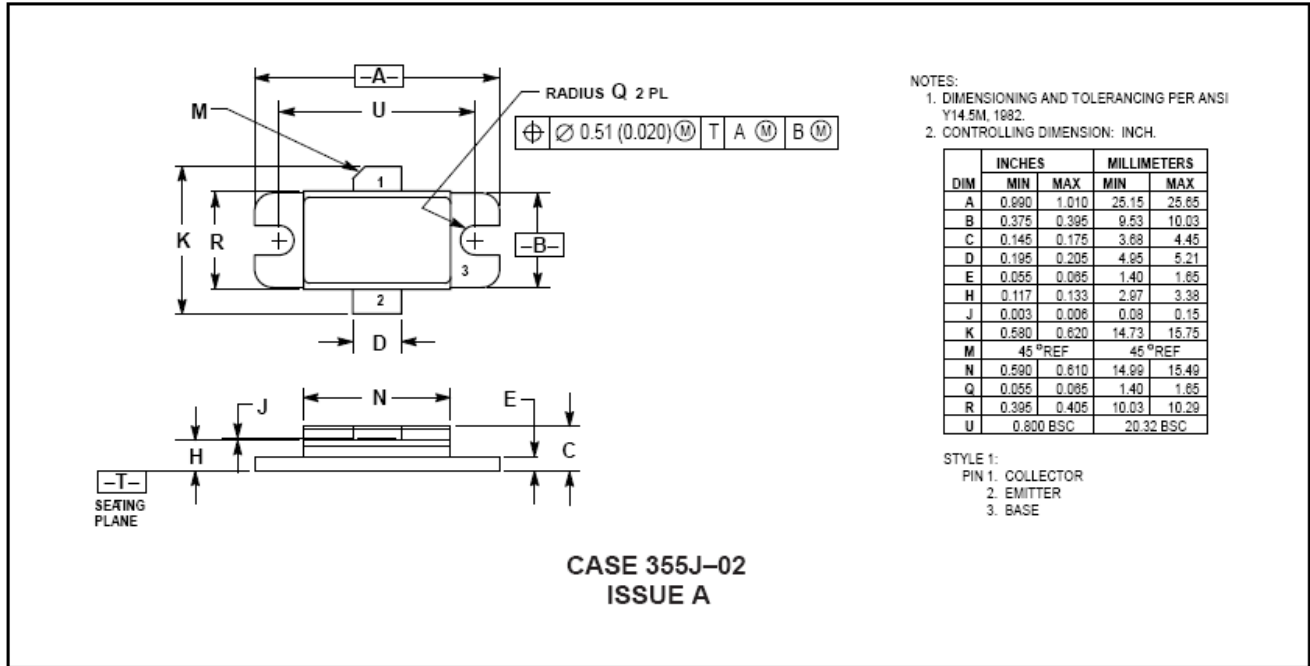
MRF10502



Microwave Pulse Power Silicon NPN Transistor
500W (peak), 1025–1150MHz

M/A-COM Products
Released - Rev. 07.07

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.990	1.010	25.15	25.65
B	0.375	0.395	9.53	10.03
C	0.145	0.175	3.68	4.45
D	0.195	0.205	4.95	5.21
E	0.055	0.085	1.40	1.65
H	0.117	0.133	2.97	3.38
J	0.003	0.006	0.08	0.15
K	0.580	0.620	14.73	15.75
M	45° REF		45° REF	
N	0.590	0.610	14.99	15.49
Q	0.055	0.085	1.40	1.65
R	0.395	0.405	10.03	10.29
U	0.800 BSC		20.32 BSC	

STYLE 1:
PIN 1. COLLECTOR
2. EMITTER
3. BASE

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 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.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.