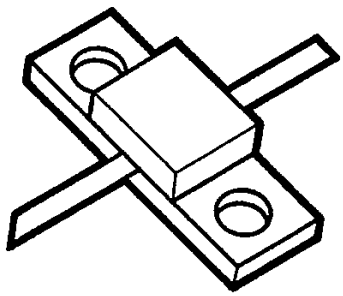
# MICROAMP® P-Band Class C Power Transistors

- 3 to 40 Watts
- Broadband 600-1000 MHz
- Internally Compensated*
- Gold Metalized
- Diffused Ballast Resistors
- MTTF Data
- Common Base



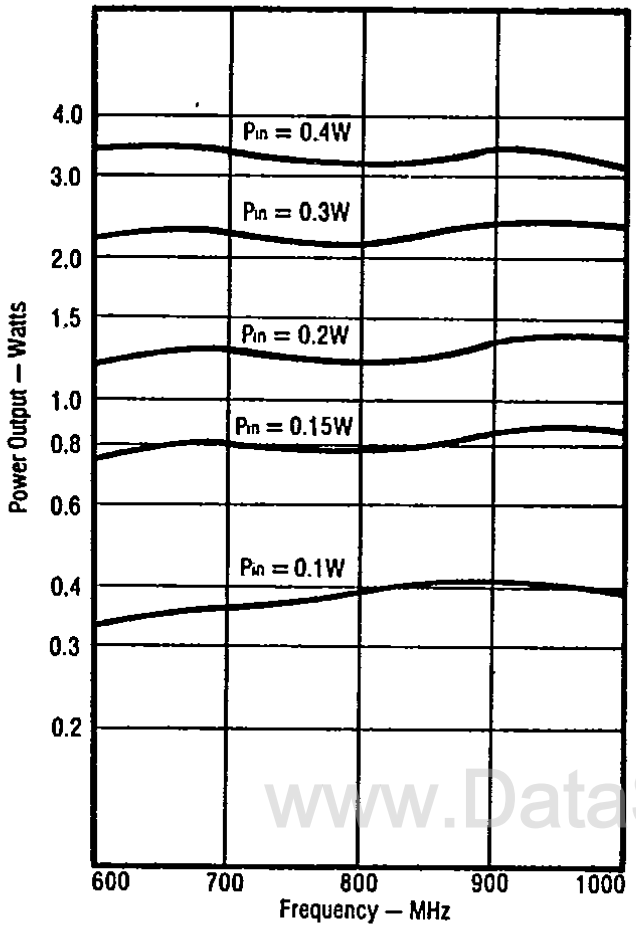
MRA .25

**Electrical Characteristics ($T_{Flange}$ = 25 °C)**

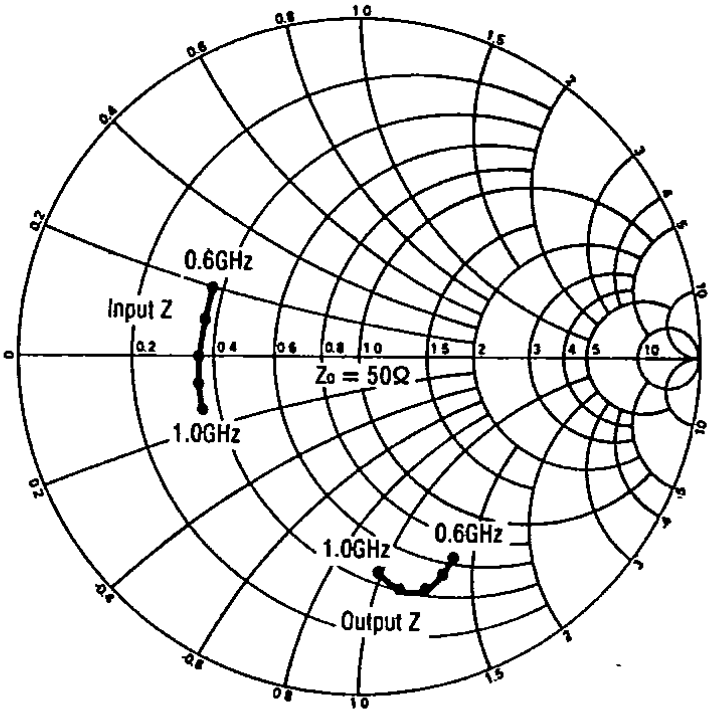
| Symbol | Characteristic | MRA0610-3 | MRA0610-9 | MRA0610-18A | MRA0610-40A |
|---|---|---|---|---|---|
| $BV_{CES}$ | Collector-Base Breakdown Voltage | $I_C$ = 20 mA<br>50 V Min | $I_C$ = 60 mA<br>50 V Min | $I_C$ = 100 mA<br>50 V Min | $I_C$ = 200 mA<br>50 V Min |
| $BV_{EBO}$ | Emitter-Base Breakdown Voltage | $I_E$ = 0.25 mA<br>3.5 V Min | $I_B$ = 0.75 mA<br>3.5 V Min | $I_B$ = 1.25 mA<br>3.5 V Min | $I_E$ = 2.5 mA<br>3.5 V Min |
| $I_{CBO}$ | Collector Cutoff Current<br>$I_E$ = 0 | $V_{CB}$ = 28 V<br>0.5 mA | $V_{CB}$ = 28 V<br>1.5 mA | $V_{CB}$ = 28 V<br>2.5 mA | $V_{CB}$ = 28 V<br>5.0 mA |
| $I_C$ | Max Continuous Collector Current<br>$V_{CE}$ = 4 V | 0.5 A | 1.5 A | 2.5A | 5A |
| $h_{FE}$ | Forward Current Transfer Ratio<br>$V_{CE}$ = 5 V | $I_C$ = 0.1 A<br>10-100 | $I_C$ = 0.3 A<br>10-100 | $I_C$ = 0.5 A<br>10-100 | $I_C$ = 1.0 A<br>10-100 |
| $\theta_{jF}$ | Thermal Resistance Junction to Flange<br>(at rated RF output) | 15 °C/W | 6 °C/W | 4 °C/W | 2.5 °C.W |
| $P_o$ | Min Broadband Power Output | 3.0 W | 9.0 W | 18.0 W | 40.0 W |
| $C_{ob}$ | Max Collector-Base Capacitance<br>$V_{CB}$ = 28 V, f = 1 MHz | 4.5 pF | 10 pF | 14 pF | 28 pF |
| $P_{G(dB)}$ | Min Power Gain in dB<br>$V_{CB}$ = 28 V | $P_o$ = 3.0 W<br>7.8 dB | $P_o$ = 9.0 W<br>7.8 dB | $P_o$ = 18.0 W<br>7.8 dB | $P_o$ = 40.0 W<br>7.0 dB |
| $\eta_c$ | Min Broadband Collector Efficiency | $P_o$ = 3.0 W<br>50 % | $P_o$ = 9.0 W<br>55 % | $P_o$ = 18.0 W<br>50 % | $P_o$ = 40.0 W<br>50 % |
| $T_J$ | -65 to +200°C | | | | |
| $T_{STG}$ | -65 to +150°C | | | | |

* The concept of input and/or output matching using MOS capacitors, wire bonds and other techniques is patented by TRW, inc. (US # 3,713,006).

## Typical Power Output vs Frequency

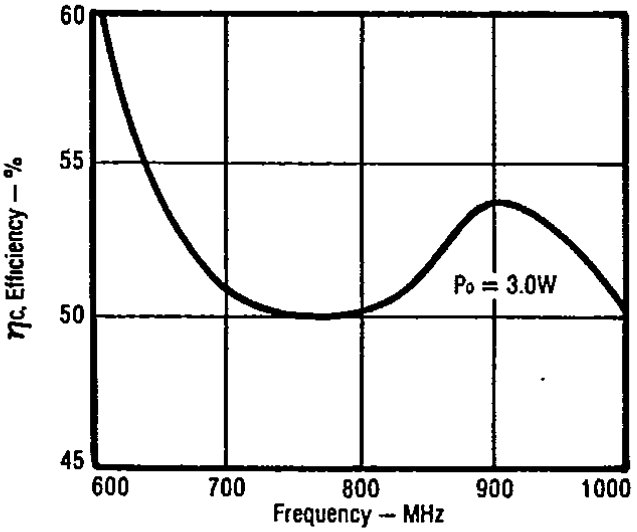



## Impedance Data
## Vcc = 28V

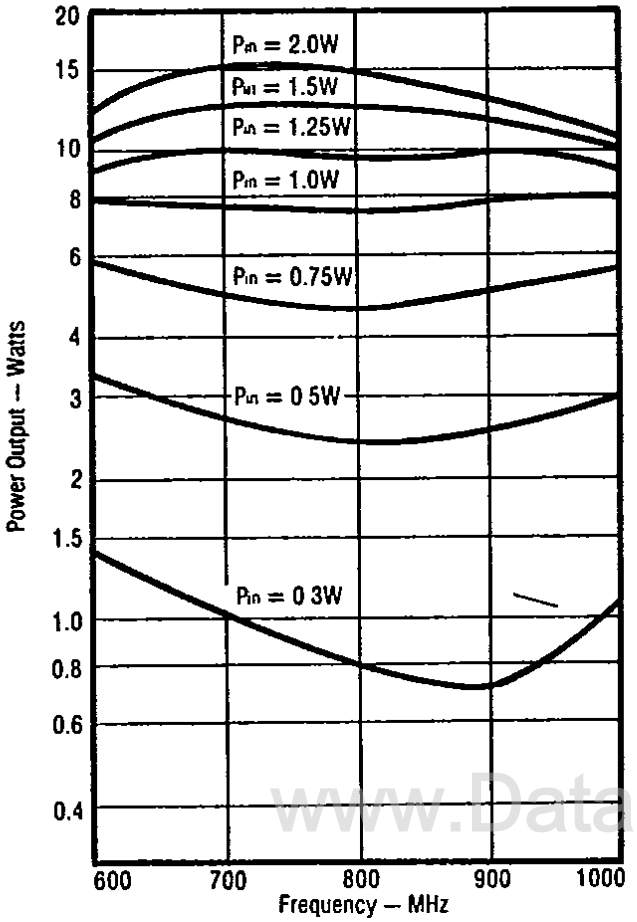





## Typical Efficiency vs Frequency



## Typical Power Output vs Frequency

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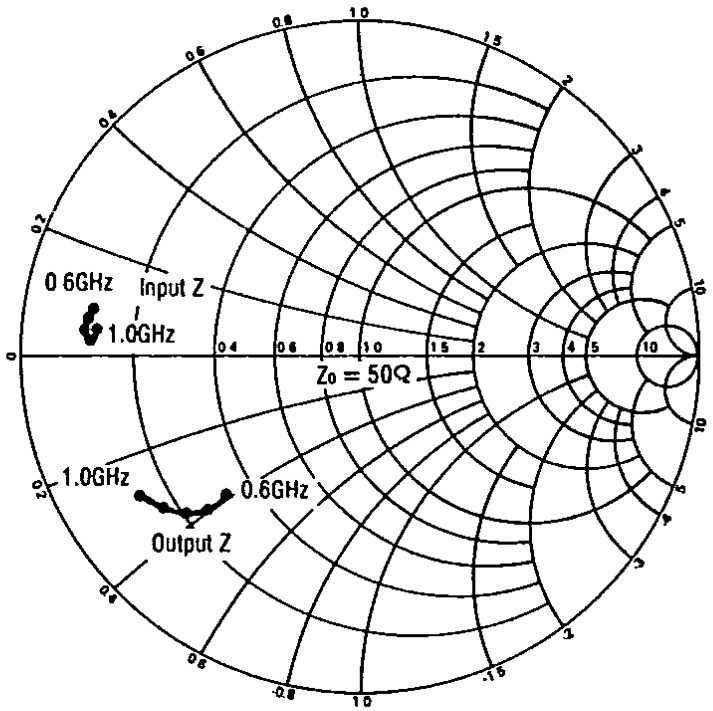
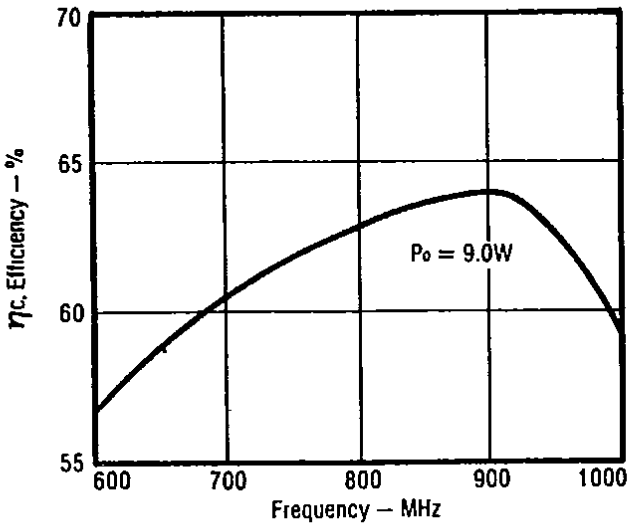
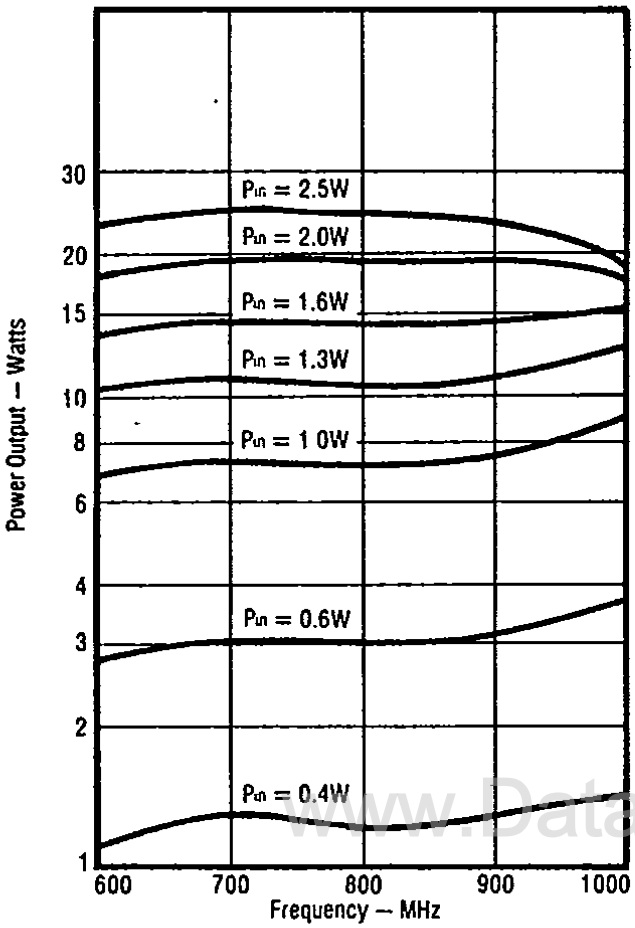





## Typical Efficiency vs Frequency



## Typical Power Output vs Frequency

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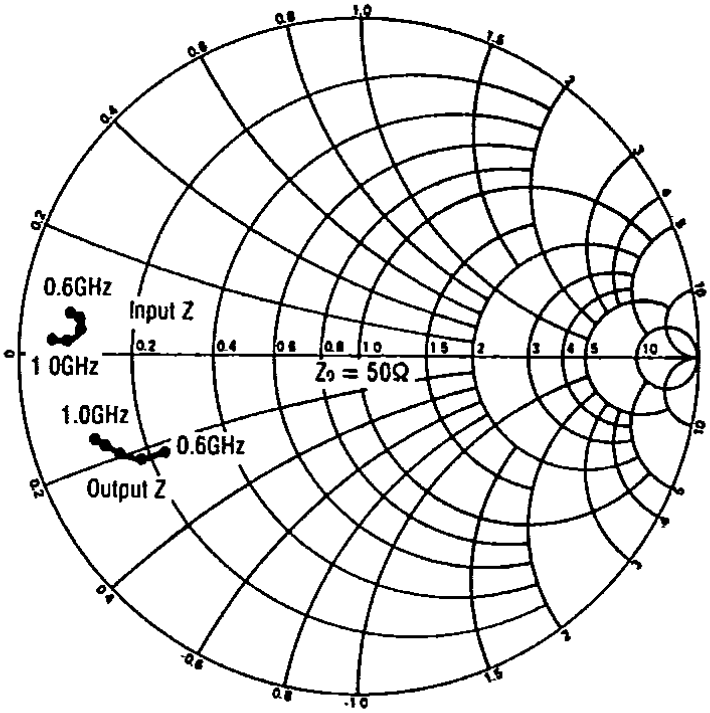
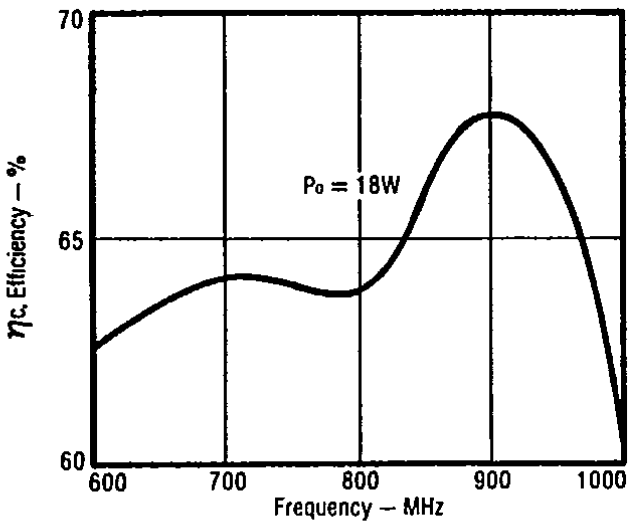
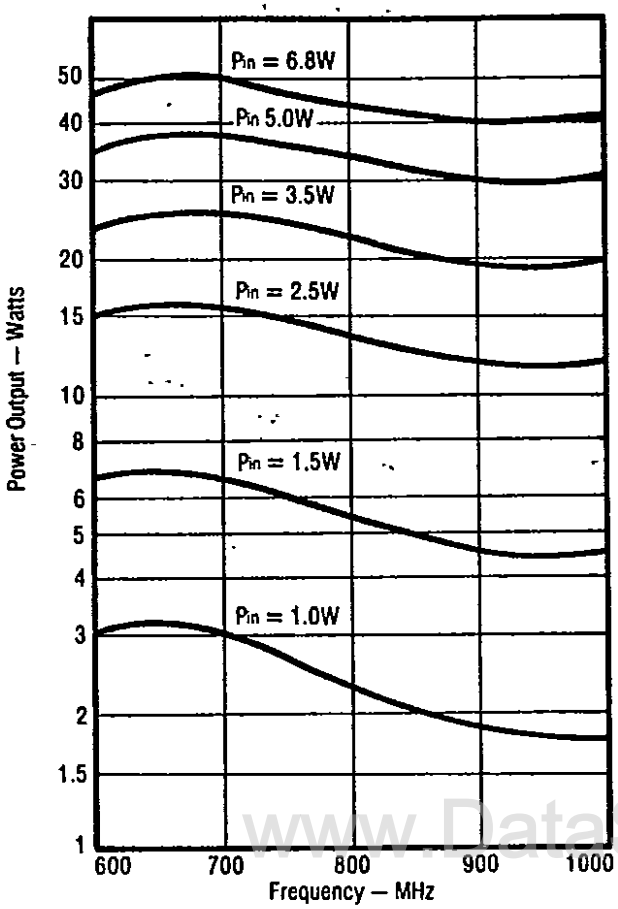
## Vcc = 28V



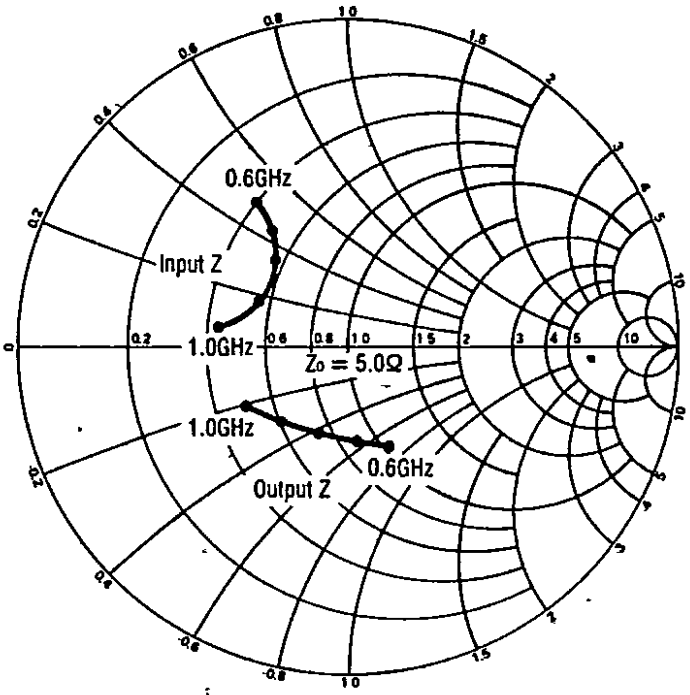

## Typical Efficiency vs Frequency



## Typical Power Output vs Frequency



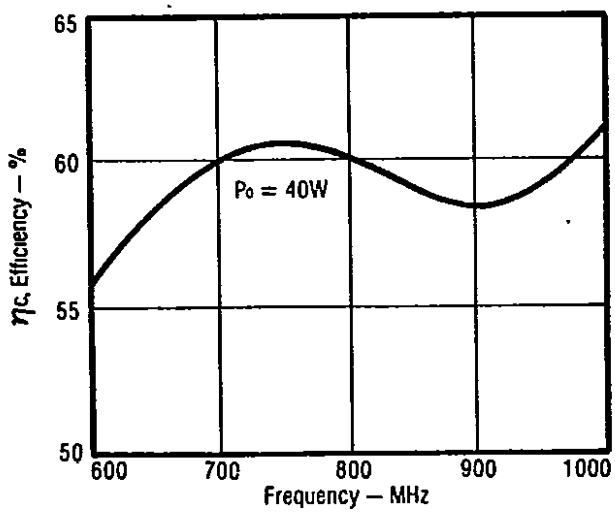

## Impedance Data
Vcc = 28V
(5Ω Center)




Test Circuit Details available from TRW Semiconductors.

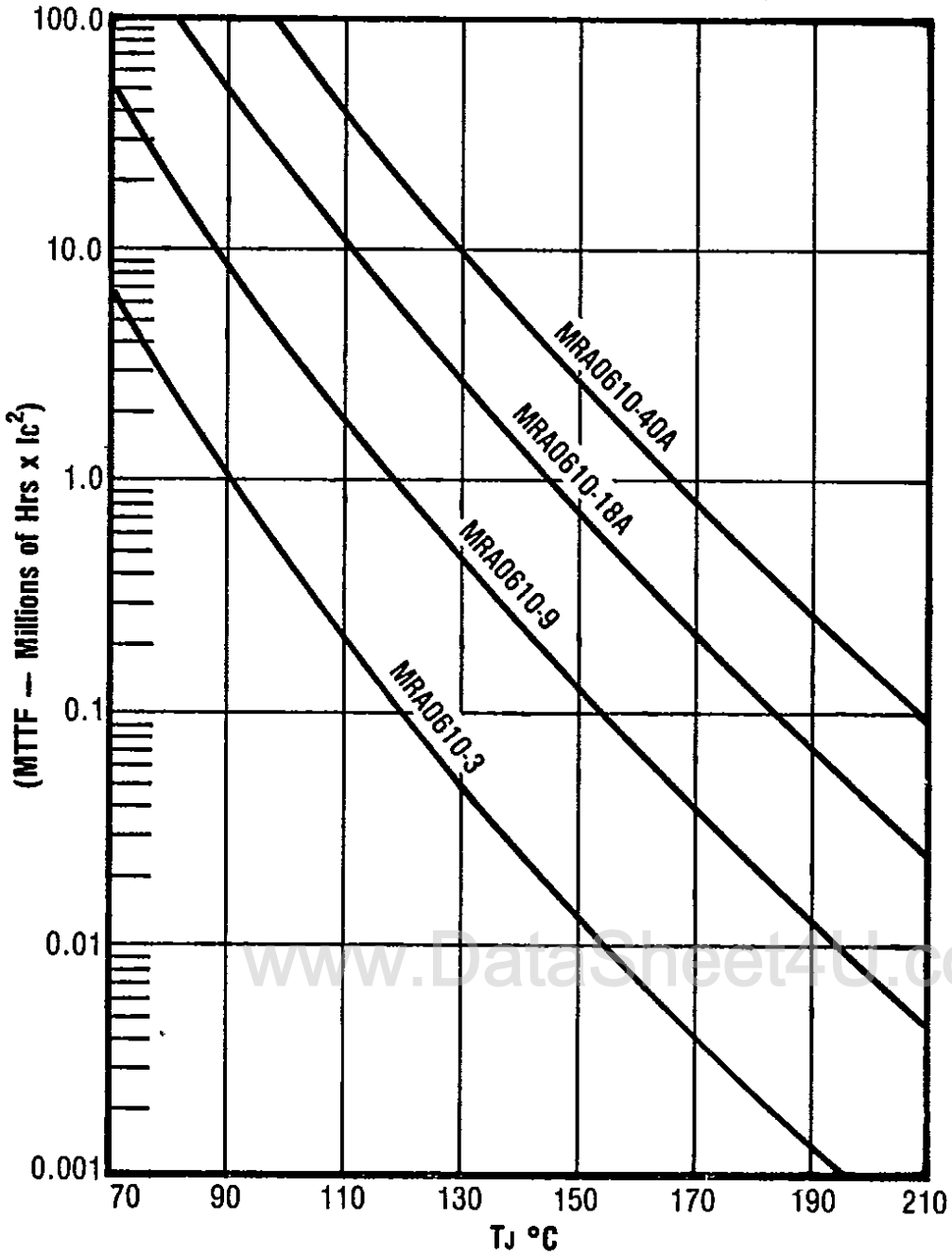


## Typical Efficiency vs Frequency



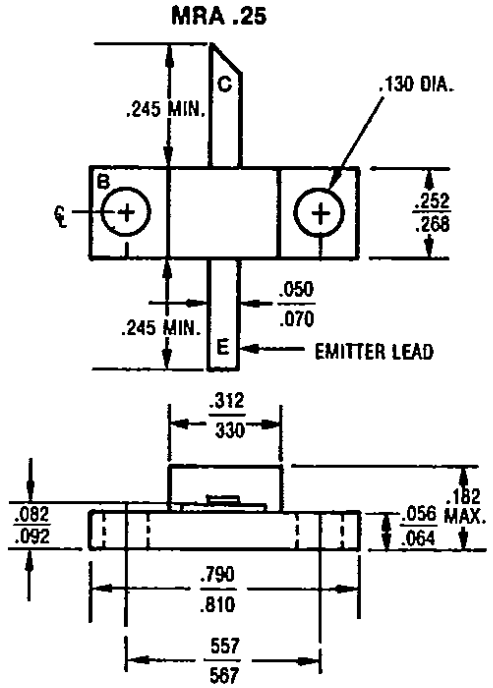
## MTTF FACTOR vs Tj

(Divide by $I_C^2$ to obtain metal lifetime in hours.)





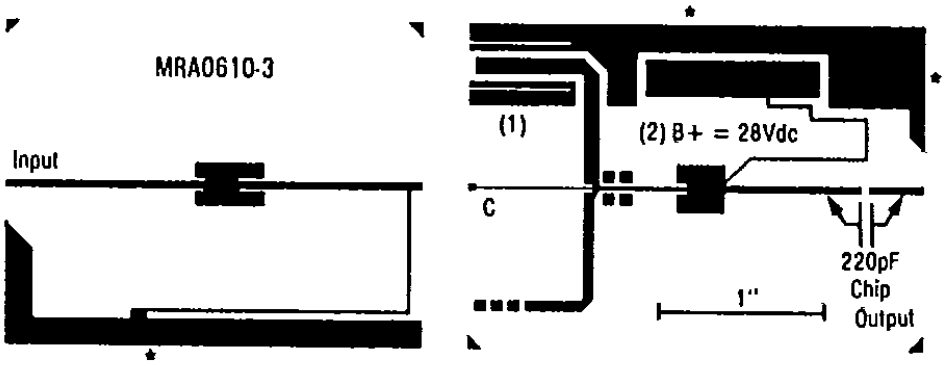

## MRA .25



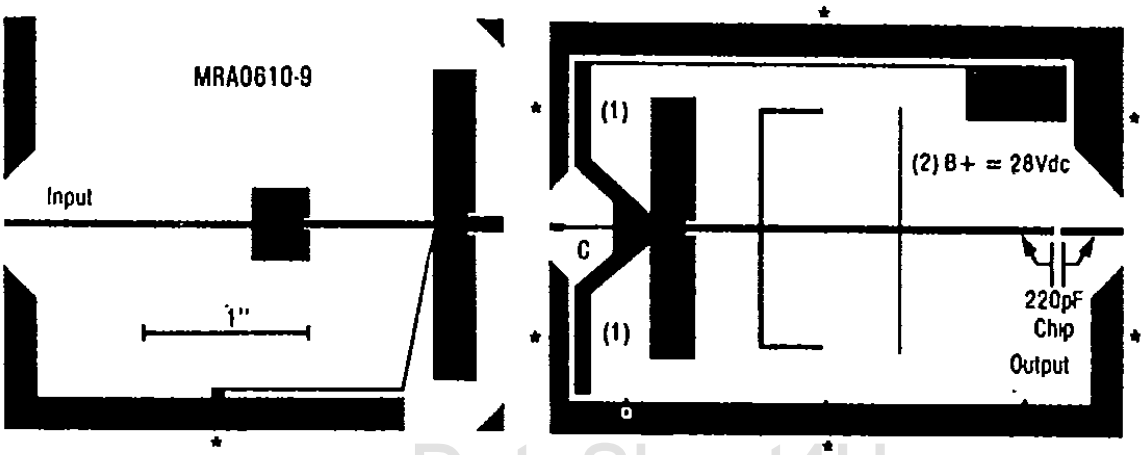
## TEST CIRCUIT BOARDS FOR MRA0610 SERIES

NOTE: Scale is not 1:1.

MRA0610-3

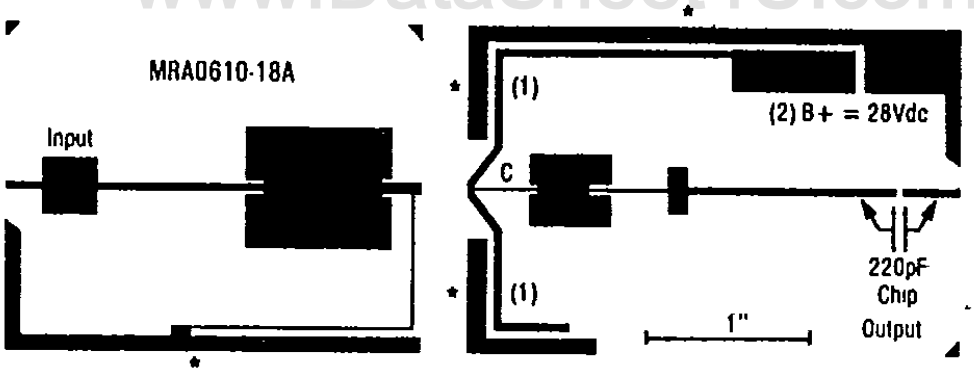



MRA0610-9

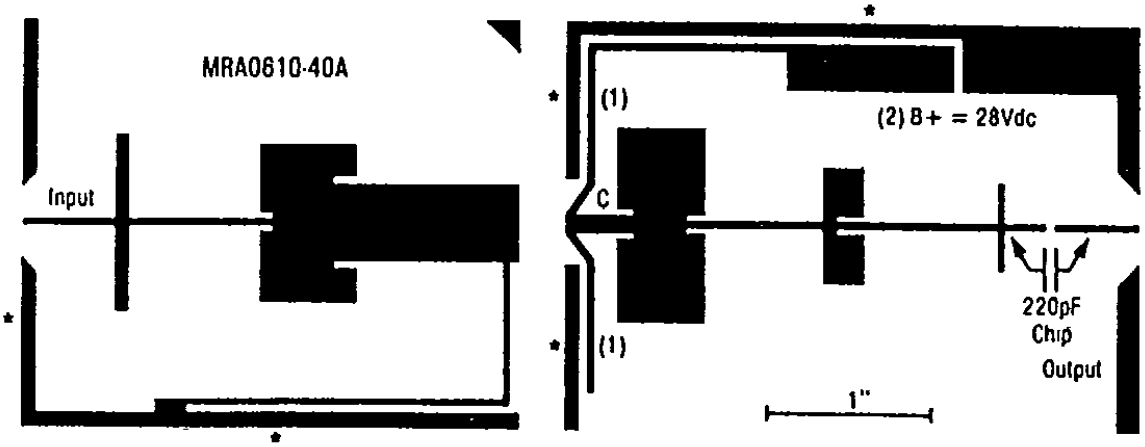





MRA0610-18A




MRA0610-40A




*Foil wrap or plate around to ground plane. Board material 0.020 inch glass teflon $\varepsilon_r = 2.55$.

(1) Bypass capacitor to ground for shunt inductor (220pF chip).

(2) Use B+ bypass of 0.01 and 1μF capacitors at this point.