

RF Devices Division  
TRW Electronic Components Group



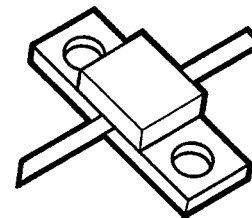
8825024 T R W ELEK CMPNT, R F

89D 03600 D 7-33-11

MRA0610-3, MRA0610-9, MRA0610-18A, MRA0610-40A

## 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



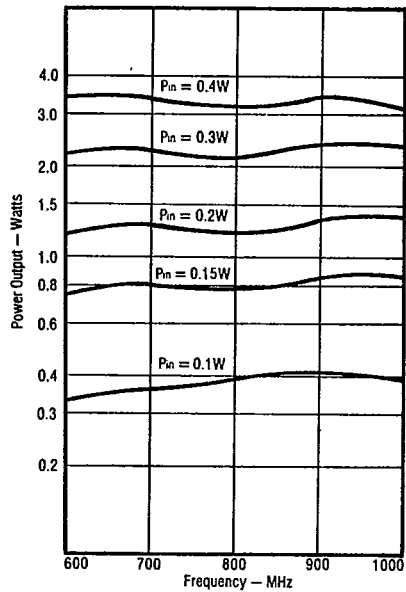
MRA .25

### Electrical Characteristics ( $T_{\text{ambient}} = 25\text{ }^{\circ}\text{C}$ )

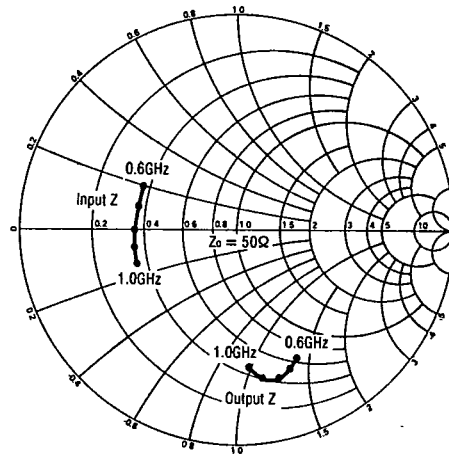
Symbol	Characteristic	MRA0610-3	MRA0610-9	MRA0610-18A	MRA0610-40A
$BV_{CES}$	Collector-Base Breakdown Voltage	$I_C = 20\text{ mA}$ 50 V Min	$I_C = 60\text{ mA}$ 50 V Min	$I_C = 100\text{ mA}$ 50 V Min	$I_C = 200\text{ mA}$ 50 V Min
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 0.25\text{ mA}$ 3.5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

MRA0610-3 — 3 WATTS BROADBAND

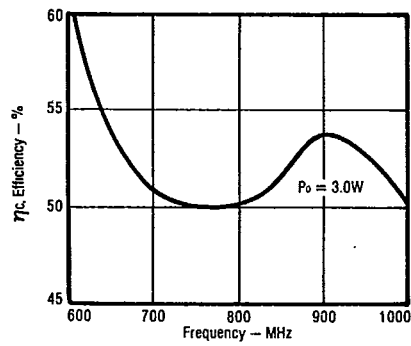
Typical Power Output vs Frequency



Impedance Data  
Vcc = 28V



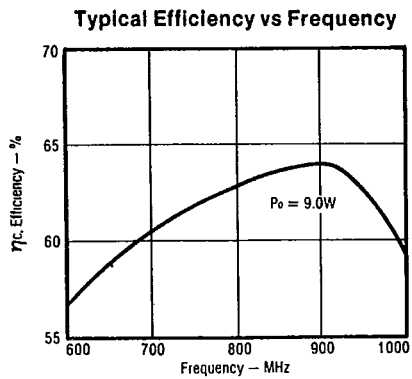
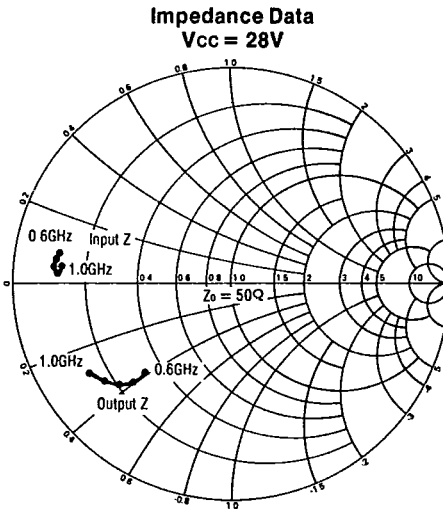
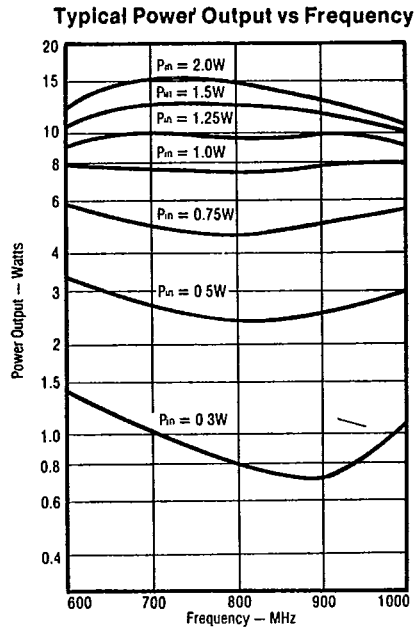
Typical Efficiency vs Frequency



MRA 0610 Series

T-33-11

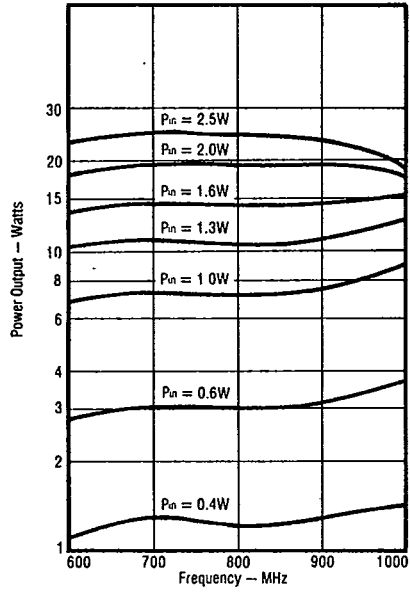
MRA0610-9 — 9 WATTS BROADBAND



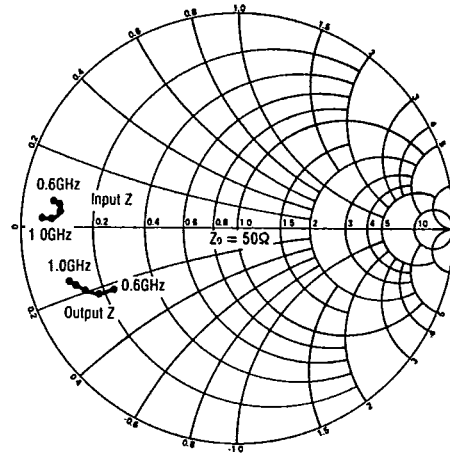
MRA 0610 Series T-33-11

MRA0610-18A - 18 WATTS BROADBAND

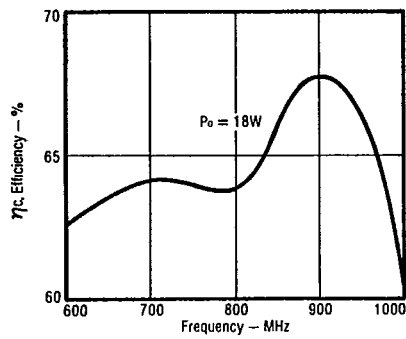
Typical Power Output vs Frequency



Impedance Data Vcc = 28V

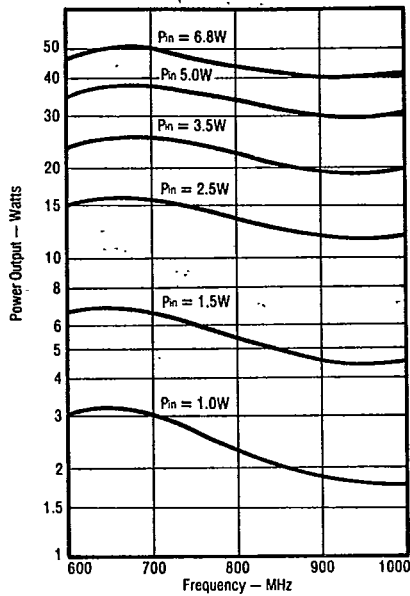


Typical Efficiency vs Frequency

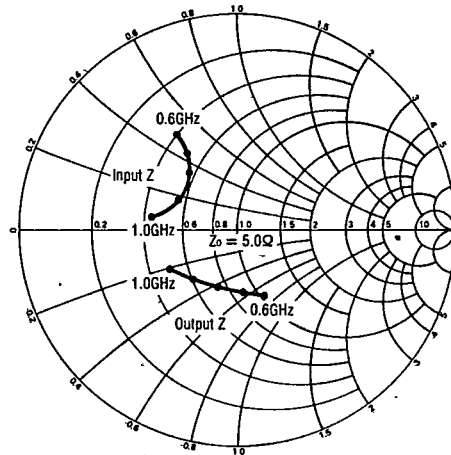


MRA0610-40A - 40 WATTS BROADBAND

Typical Power Output vs Frequency

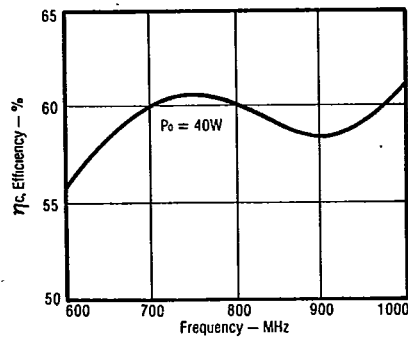


Impedance Data  
Vcc = 28V  
(5Ω Center)

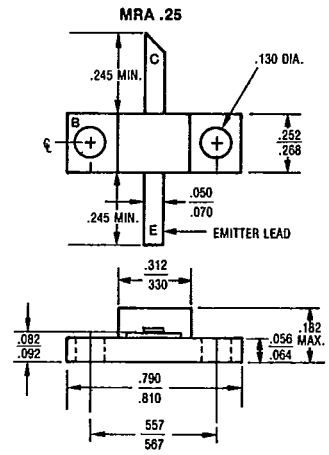
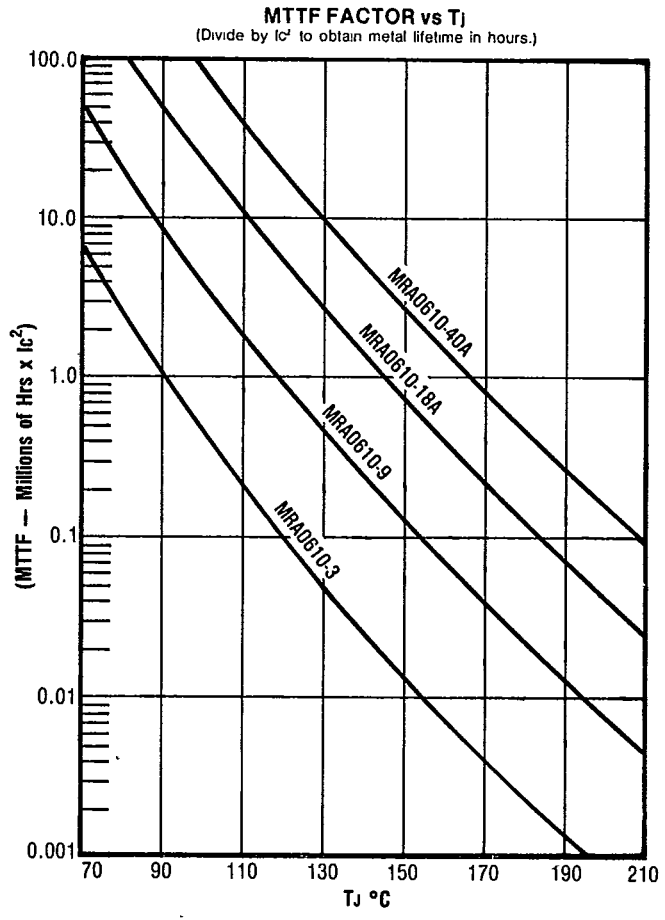


Test Circuit Details available from TRW Semiconductors.

Typical Efficiency vs Frequency



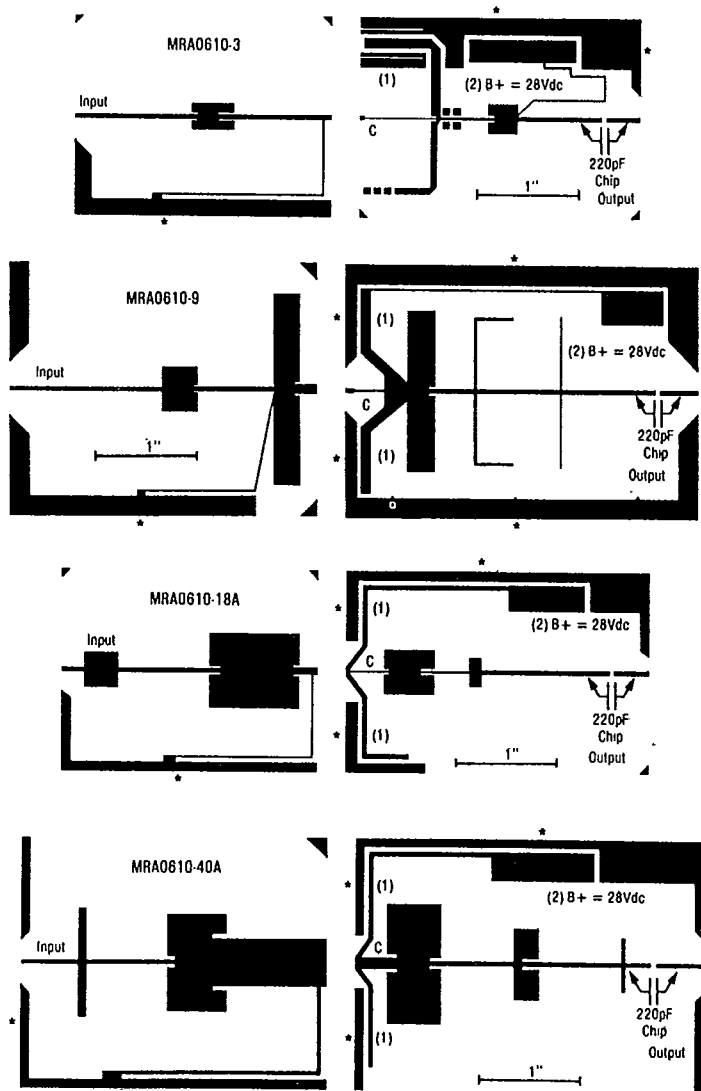
MRA 0610 Series T-33-11



**MRA0610-3, MRA0610-9, MRA0610-18A, MRA0610-40A**

**TEST CIRCUIT BOARDS FOR MRA0610 SERIES**

NOTE: Scale is not 1:1.



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

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

(2) Use B+ bypass of 0.01 and 1  $\mu$ F capacitors at this point.