

## V.H.F. POWER TRIODE

# TY2-125

All-glass triode rated for a maximum anode dissipation of 135 W and suitable for use at frequencies up to 200 Mc/s.

This data should be read in conjunction with "Operating Notes, Part 1—Power Valves" included in this volume of the Handbook.

|                 |                    |     |   |
|-----------------|--------------------|-----|---|
| <b>FILAMENT</b> | Thoriated tungsten |     |   |
| $V_f$           |                    | 6.3 | V |
| $I_f$           |                    | 5.4 | A |

**MOUNTING POSITION** Vertical only, base up or down.

|                     |  |     |                  |
|---------------------|--|-----|------------------|
| <b>CAPACITANCES</b> |  |     |                  |
| $C_{a-g}$           |  | 5.5 | $\mu\mu\text{F}$ |
| $C_{g-f}$           |  | 5.5 | $\mu\mu\text{F}$ |
| $C_{a-f}$           |  | 0.1 | $\mu\mu\text{F}$ |

**CHARACTERISTICS** (Measured at  $V_a = 2.5$  kV;  $I_a = 44$  mA)

|       |     |      |
|-------|-----|------|
| $g_m$ | 2.8 | mA/V |
| $\mu$ | 25  |      |

## COOLING

|                                   |     |                    |
|-----------------------------------|-----|--------------------|
| Maximum temperature of base pins  | 180 | $^{\circ}\text{C}$ |
| Maximum temperature of anode seal | 220 | $^{\circ}\text{C}$ |

When the valve is operated at near maximum ratings it is possible that the maximum temperature limits may be exceeded, in which case an air flow of up to 5 cu. ft. (150 litres) per minute must be directed towards the centre of the valve base.

An anode terminal connector having a large area is necessary in order to keep the anode seal cool.

## OPERATING CONDITIONS AS SINGLE VALVE R.F. POWER AMPLIFIER (CLASS "B" TELEPHONY)

### Limiting Values

|                                                                                           |     |            |
|-------------------------------------------------------------------------------------------|-----|------------|
| $V_a$ max.                                                                                | 2.5 | kV         |
| $p_a$ max. (corresponding to an anode temperature of $850^{\circ}\text{C}$ i.e. red heat) | 135 | W          |
| $p_g$ max.                                                                                | 16  | W          |
| $I_k$ max.                                                                                | 250 | mA         |
| $i_{k(pk)}$ max.                                                                          | 1.6 | A          |
| $R_{g-f}$ max. (fixed bias)                                                               | 100 | k $\Omega$ |
| $R_{g-f}$ max. (automatic bias)                                                           | 200 | k $\Omega$ |

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## V.H.F. POWER TRIODE

*All-glass triode rated for a maximum anode dissipation of 135 W and suitable for use at frequencies up to 200 Mc/s.*

### Typical Operating Conditions

| f                          | ≤150 | ≤150 | ≤150 | ≤200 | Mc/s |
|----------------------------|------|------|------|------|------|
| V <sub>a</sub>             | 1.5  | 2.0  | 2.5  | 2.0  | kV   |
| V <sub>g</sub>             | -45  | -67  | -87  | -67  | V    |
| I <sub>a</sub>             | 120  | 97   | 77   | 97   | mA   |
| V <sub>in(pk)</sub>        | 100  | 100  | 100  | 100  | V    |
| p <sub>a</sub>             | 121  | 130  | 128  | 134  | W    |
| P <sub>out</sub>           | 59   | 64   | 65   | 60   | W    |
| η                          | 33   | 33   | 34   | 31   | %    |
| *P <sub>load</sub>         | 47   | 51   | 52   | 48   | W    |
| <i>For 100% Modulation</i> |      |      |      |      |      |
| I <sub>g</sub>             | 52   | 28   | 20   | 28   | mA   |
| P <sub>drive</sub>         | 9.4  | 5.1  | 3.6  | 8.0  | W    |

\*With a circuit Transfer Efficiency of 80%

### OPERATING CONDITIONS AS SINGLE VALVE R.F. POWER OSCILLATOR OR AMPLIFIER (CLASS "C" TELEGRAPHY OR F.M. TELEPHONY)

#### Limiting Values

|                                                                                    |     |     |
|------------------------------------------------------------------------------------|-----|-----|
| V <sub>a</sub> max.                                                                | 2.5 | kV  |
| p <sub>a</sub> max. (corresponding to an anode temperature of 850°C i.e. red heat) | 135 | W   |
| p <sub>g</sub> max.                                                                | 16  | W   |
| I <sub>k</sub> max.                                                                | 250 | mA  |
| i <sub>k(pk)</sub> max.                                                            | 1.6 | A   |
| R <sub>g-r</sub> max. (fixed bias)                                                 | 100 | k Ω |
| R <sub>g-r</sub> max. (automatic bias)                                             | 200 | k Ω |

### Typical Operating Conditions

| f                   | ≤150 | ≤150 | ≤150 | ≤150 | ≤200 | Mc/s |
|---------------------|------|------|------|------|------|------|
| V <sub>a</sub>      | 1.0  | 1.5  | 2.0  | 2.5  | 2.0  | kV   |
| V <sub>g</sub>      | -80  | -110 | -150 | -200 | -150 | V    |
| I <sub>a</sub>      | 205  | 205  | 205  | 205  | 175  | mA   |
| I <sub>g</sub>      | 40   | 40   | 40   | 40   | 35   | mA   |
| V <sub>in(pk)</sub> | 260  | 300  | 340  | 390  | 300  | V    |
| p <sub>a</sub>      | 79   | 98   | 115  | 122  | 105  | W    |
| P <sub>drive</sub>  | 10   | 11   | 13   | 14   | 20   | W    |
| P <sub>out</sub>    | 126  | 210  | 295  | 390  | 245  | W    |
| η                   | 61.5 | 68   | 72   | 76   | 70   | %    |
| *P <sub>load</sub>  | 100  | 168  | 236  | 312  | 196  | W    |

\*With a circuit Transfer Efficiency of 80%

All-glass triode rated for a maximum anode dissipation of 135 W and suitable for use at frequencies up to 200 Mc/s.

## OPERATING CONDITIONS FOR TWO VALVES AS R.F. POWER AMPLIFIER (CLASS "C" ANODE MODULATION)

### Limiting Values

|                                                                           |     |            |
|---------------------------------------------------------------------------|-----|------------|
| $V_a$ max.                                                                | 2.0 | kV         |
| $p_a$ max. (corresponding to an anode temperature of 850°C i.e. red heat) | 135 | W          |
| $p_g$ max.                                                                | 16  | W          |
| $I_k$ max.                                                                | 250 | mA         |
| $i_{k(pk)}$ max.                                                          | 2.5 | A          |
| $R_{g-f}$ max. (fixed bias)                                               | 100 | k $\Omega$ |
| $R_{g-f}$ max. (automatic bias)                                           | 200 | k $\Omega$ |

### Typical Operating Conditions

|                     |                 |                 |                |                |      |
|---------------------|-----------------|-----------------|----------------|----------------|------|
| $f$                 | $\leq 150$      | $\leq 150$      | $\leq 150$     | $\leq 200$     | Mc/s |
| $V_a$               | 1.0             | 1.5             | 2.0            | 1.5            | kV   |
| $V_g$               | -130            | -180            | -225           | -180           | V    |
| $I_a$               | $2 \times 127$  | $2 \times 127$  | $2 \times 127$ | $2 \times 127$ | mA   |
| $I_g$               | $2 \times 40$   | $2 \times 40$   | $2 \times 40$  | $2 \times 40$  | mA   |
| $V_{ln(g-g)pk}$     | 640             | 740             | 830            | 740            | V    |
| $P_{drive}$         | $2 \times 11.5$ | $2 \times 13.5$ | $2 \times 15$  | $2 \times 21$  | W    |
| $p_a$               | $2 \times 32$   | $2 \times 38$   | $2 \times 51$  | $2 \times 41$  | W    |
| $P_{out}$           | 190             | 306             | 408            | 300            | W    |
| $\eta$              | 74              | 80              | 80             | 78             | %    |
| * $P_{load}$        | 152             | 245             | 325            | 240            | W    |
| For 100% Modulation |                 |                 |                |                |      |
| $P_{mod}$           | 126             | 191             | 255            | 191            | W    |

\*With a circuit Transfer Efficiency of 80%

## OPERATING CONDITIONS FOR TWO VALVES AS GROUNDED GRID R.F. POWER AMPLIFIER (CLASS "C" TELEGRAPHY OR F.M. TELEPHONY)

### Limiting Values

|                                                                           |     |            |
|---------------------------------------------------------------------------|-----|------------|
| $V_a$ max.                                                                | 2.5 | kV         |
| $p_a$ max. (corresponding to an anode temperature of 850°C i.e. red heat) | 135 | W          |
| $p_g$ max.                                                                | 16  | W          |
| $I_k$ max.                                                                | 250 | mA         |
| $i_{k(pk)}$ max.                                                          | 1.6 | A          |
| $R_{g-f}$ max. (fixed bias)                                               | 100 | k $\Omega$ |
| $R_{g-f}$ max. (automatic bias)                                           | 200 | k $\Omega$ |

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### Typical Operating Conditions at $f \leq 150$ Mc/s

|                     |                |                |                |                |    |
|---------------------|----------------|----------------|----------------|----------------|----|
| $V_a$               | 1.0            | 1.5            | 2.0            | 2.5            | kV |
| $V_g$               | -80            | -110           | -150           | -200           | V  |
| $I_a$               | $2 \times 205$ | $2 \times 205$ | $2 \times 205$ | $2 \times 205$ | mA |
| $I_g$               | $2 \times 40$  | $2 \times 40$  | $2 \times 40$  | $2 \times 40$  | mA |
| $V_{in(g-g)p.k.}$   | 520            | 600            | 680            | 780            | V  |
| $P_{drive}$         | $2 \times 50$  | $2 \times 59$  | $2 \times 68$  | $2 \times 79$  | W  |
| $P_a$               | $2 \times 79$  | $2 \times 97$  | $2 \times 115$ | $2 \times 122$ | W  |
| $*P_{out}$          | $252 + 80$     | $420 + 96$     | $590 + 110$    | $780 + 130$    | W  |
| $\dagger \eta$      | 61.5           | 68             | 72             | 76             | %  |
| $\ddagger P_{load}$ | 265            | 410            | 560            | 730            | W  |

\*Includes power transferred from driver stage.

$\dagger$  Valve efficiency.

$\ddagger$  With a Circuit Transfer Efficiency of 80%.

### OPERATING CONDITIONS FOR TWO VALVES IN PUSH-PULL AS CLASS "B" A.F. POWER AMPLIFIER OR MODULATOR (With $I_{g1}$ )

#### Limiting Values

|                                 |     |            |
|---------------------------------|-----|------------|
| $V_a$ max.                      | 2.5 | kV         |
| $P_a$ max.                      | 135 | W          |
| $P_g$ max.                      | 16  | W          |
| $I_k$ max.                      | 250 | mA         |
| $i_{k(pk)}$ max.                | 1.6 | A          |
| $R_{g-f}$ max. (fixed bias)     | 100 | k $\Omega$ |
| $R_{g-f}$ max. (automatic bias) | 200 | k $\Omega$ |

#### Typical Operating Conditions

|                      |                |                |                |                |            |
|----------------------|----------------|----------------|----------------|----------------|------------|
| $V_a$                | 1.0            | 1.5            | 2.0            | 2.5            | kV         |
| $V_g$                | -23            | -46            | -65            | -86            | V          |
| $I_{a(o)}$           | $2 \times 30$  | $2 \times 30$  | $2 \times 30$  | $2 \times 30$  | mA         |
| $I_a$ (max.sig.)     | $2 \times 210$ | $2 \times 210$ | $2 \times 208$ | $2 \times 178$ | mA         |
| $I_g$                | $2 \times 40$  | $2 \times 40$  | $2 \times 42$  | $2 \times 42$  | mA         |
| $V_{in(g-g)} r.m.s.$ | 210            | 240            | 280            | 295            | V          |
| $P_{drive}$          | $2 \times 7.5$ | $2 \times 6.0$ | $2 \times 7.5$ | $2 \times 8.0$ | W          |
| $P_a$                | $2 \times 73$  | $2 \times 90$  | $2 \times 101$ | $2 \times 95$  | W          |
| $P_{out}$            | 274            | 450            | 630            | 700            | W          |
| $R_{a-a}$            | 5.0            | 8.5            | 12             | 18.2           | k $\Omega$ |
| $\eta$               | 65             | 71.5           | 76             | 78.5           | %          |
| $D_{tot}$            | 2.2            | 2.9            | 3.7            | 5.0            | %          |

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### INDUSTRIAL RATINGS

#### Limiting Values (Absolute Ratings)

|                                |     |            |
|--------------------------------|-----|------------|
| f max.                         | 150 | Mc/s       |
| $V_{a(d.c.)}$ max.             | 2.5 | kV         |
| $V_{a(pk)}$ a.c. max.          | 4.0 | kV         |
| $I_a$ max.                     | 200 | mA         |
| $I_{a(pk)}$ a.c. max.          | 260 | mA         |
| $P_a$ max.                     | 135 | W          |
| $I_g$ max. (at $P_a$ max.)     | 40  | mA         |
| $I_g$ max. (at 25% $P_a$ max.) | 50  | mA         |
| $R_{g-f}$ max.                 | 15  | k $\Omega$ |

### DIELECTRIC HEATER WITHOUT PROTECTION

Recommended rated operating condition for a dielectric heater employing single phase, full wave rectification (unsmoothed) for the anode supply.

|                               |             |            |
|-------------------------------|-------------|------------|
| f                             | 150         | Mc/s       |
| $V_{transformer}$ (r.m.s.)    | 2500-0-2500 | V          |
| $V_a$                         | 2.24        | kV         |
| $P_{in}$                      | 310         | W          |
| $I_a$                         | 112         | mA         |
| $I_g$                         | 33          | mA         |
| $R_{g-f}$                     | 6.0         | k $\Omega$ |
| $P_a$ (at 72% $\eta$ )        | 87          | W          |
| $P_{out}$ (less $P_{drive}$ ) | 203         | W          |
| * $P_{load}$                  | 162         | W          |

\*With a circuit transfer efficiency of 80%.

### DIELECTRIC HEATER WITH PROTECTION

Operating condition for a dielectric heater employing single-phase full wave rectification (unsmoothed) for the anode supply and incorporating the maximum protection for the valve against overload, under drive and inefficient operation.

|                               |             |            |
|-------------------------------|-------------|------------|
| f                             | 150         | Mc/s       |
| $V_{transformer}$ (r.m.s.)    | 2500-0-2500 | V          |
| $V_a$                         | 2.24        | kV         |
| $P_{in}$                      | 480         | W          |
| $I_a$                         | 173         | mA         |
| $I_g$                         | 36          | mA         |
| $R_{g-f}$                     | 5.5         | k $\Omega$ |
| $P_a$ (at 72% $\eta$ )        | 135         | W          |
| $P_{out}$ (less $P_{drive}$ ) | 325         | W          |
| * $P_{load}$                  | 260         | W          |

\*With a circuit transfer efficiency of 80%.

### WEIGHT

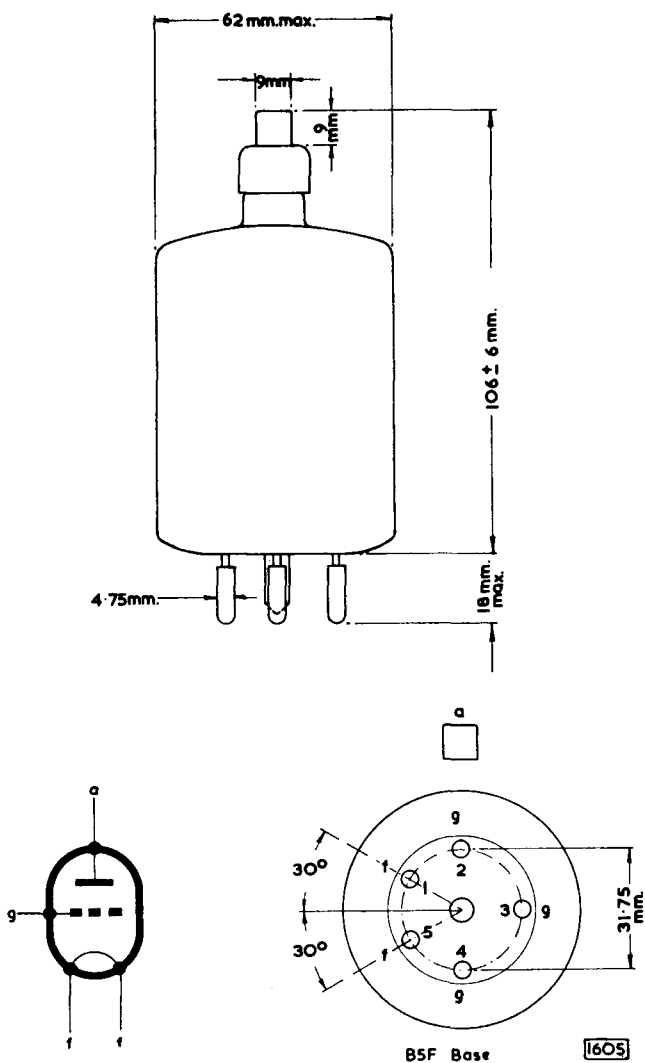
Valve only

{ 4  
110      ozs  
         g

# TY2-125

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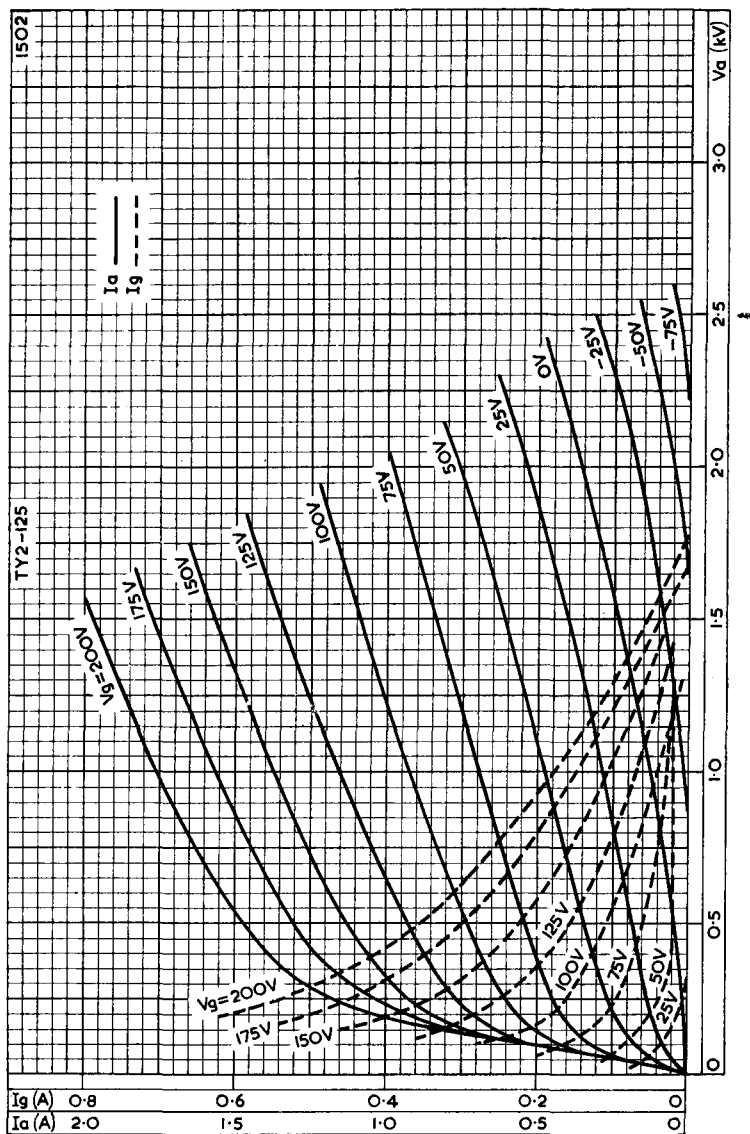
*All-glass triode rated for a maximum anode dissipation of 135 W and suitable for use at frequencies up to 200 Mc/s.*



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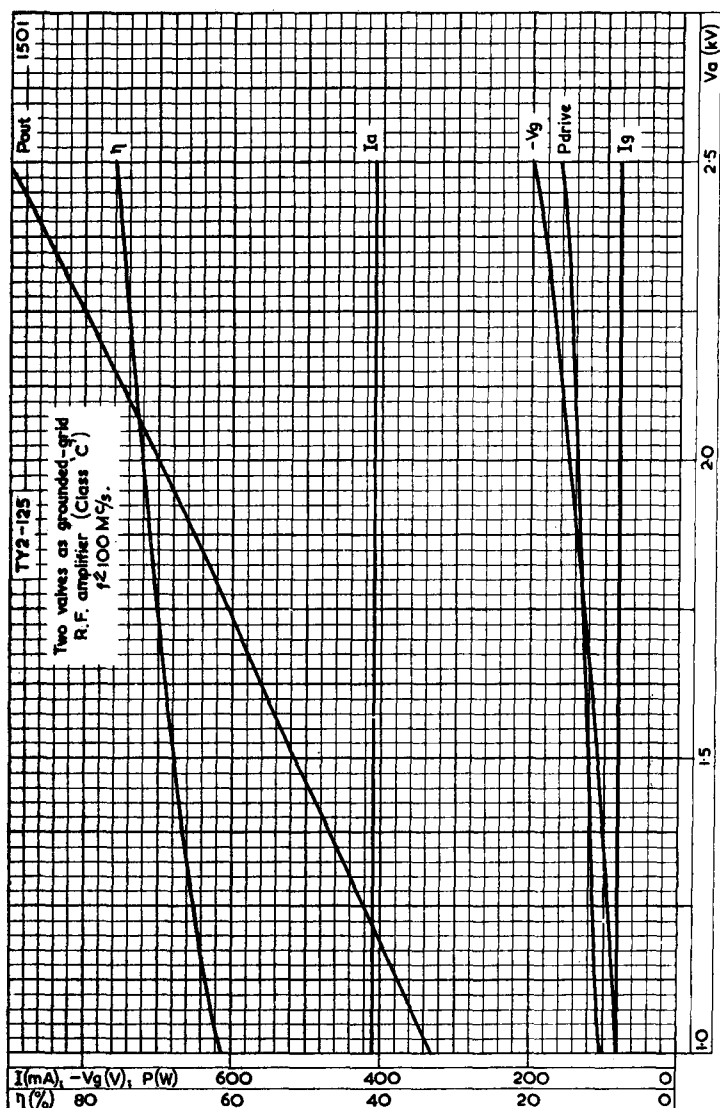


ANODE AND GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE

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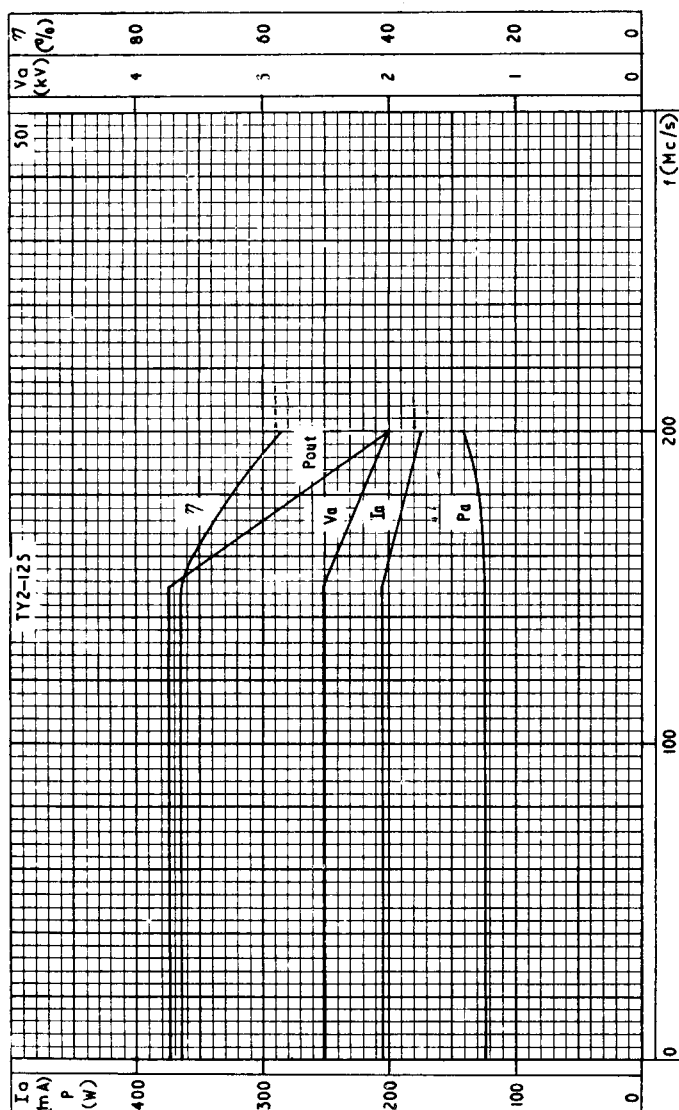


TWO VALVES AS CLASS "C" GROUNDED-GRID R.F. AMPLIFIER

# V.H.F. POWER TRIODE

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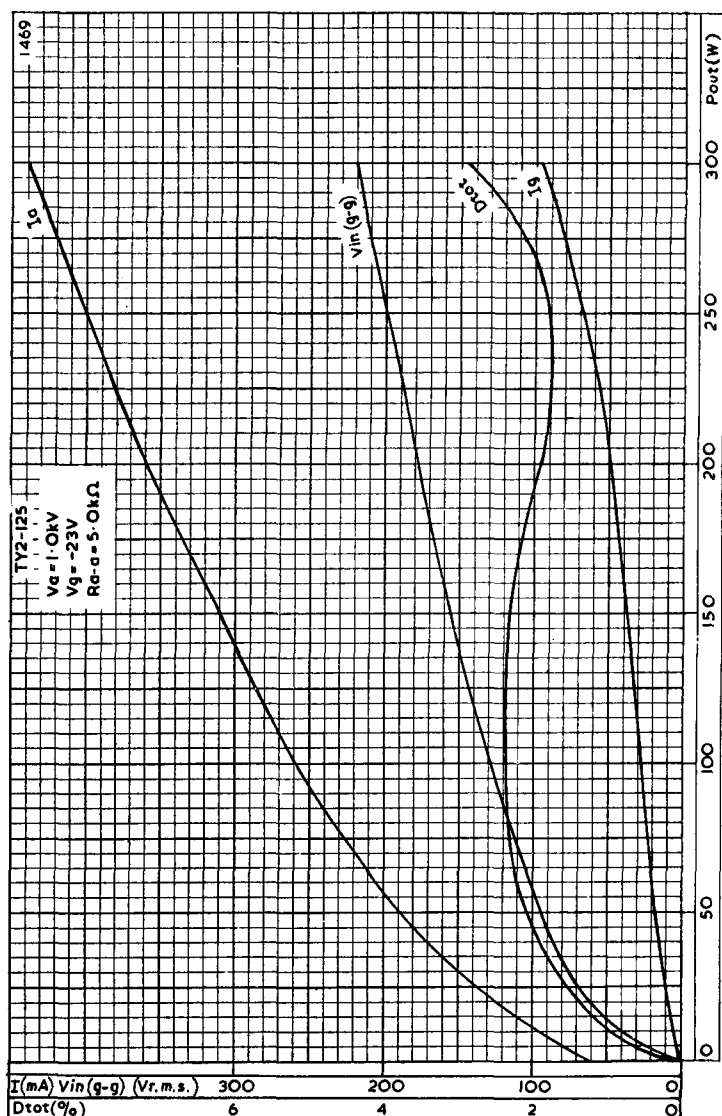


FREQUENCY CHARACTERISTICS

# TY2-125

## V.H.F. POWER TRIODE

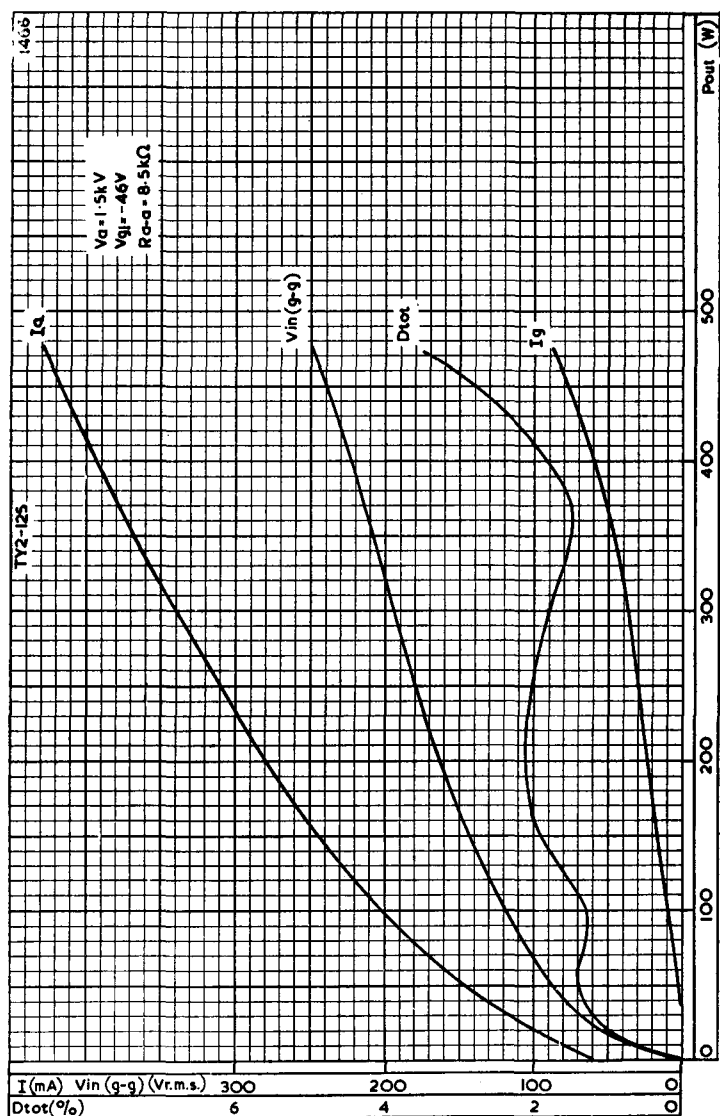
All-glass triode rated for a maximum anode dissipation of 135 W and suitable for use at frequencies up to 200 Mc/s.



TWO VALVES AS CLASS "B" A.F. AMPLIFIER  $V_a = 1.0 \text{ kV}$



All-glass triode rated for a maximum anode dissipation of 135 W and suitable for use at frequencies up to 200 Mc/s.

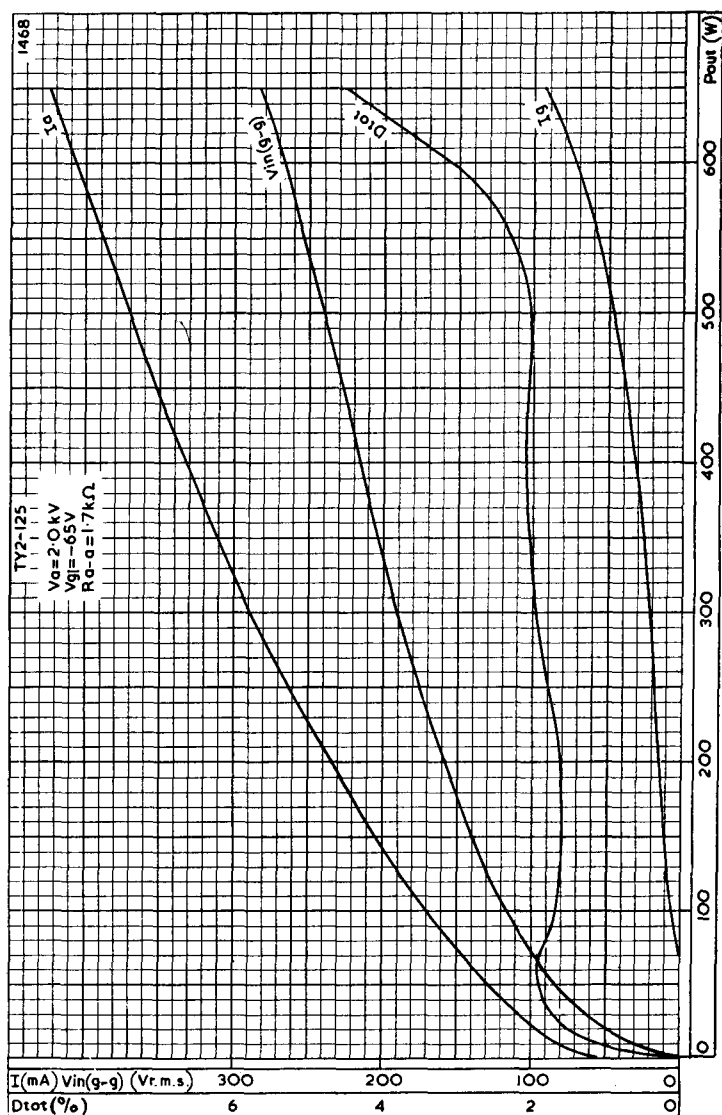


TWO VALVES AS CLASS "B" A.F. AMPLIFIER.  $V_a = 1.5 \text{ kV}$

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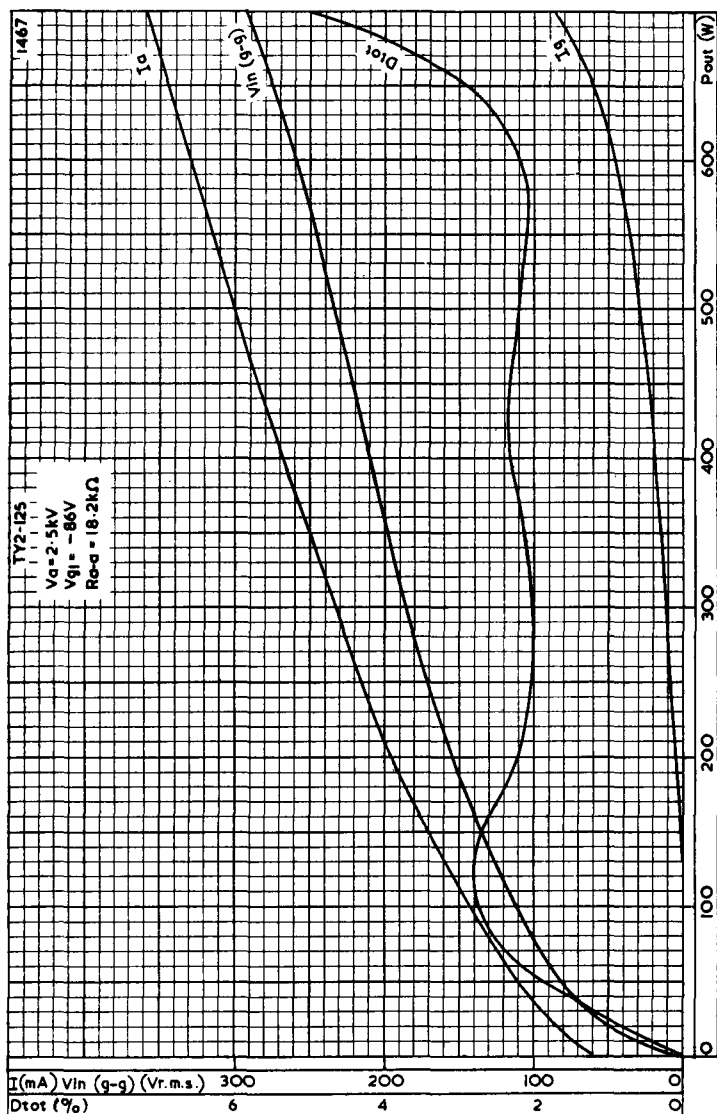


TWO VALVES AS CLASS "B" A.F. AMPLIFIER.  $V_a = 2.0 \text{ kV}$

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TWO VALVES AS CLASS "B" A.F. AMPLIFIER.  $V_a = 2.5 \text{ kV}$