

**V.H.F. BEAM  
POWER TETRODE**

**YL1150**

TENTATIVE DATA

QUICK REFERENCE DATA

Radiation and convection cooled beam power tetrode intended for use as a linear v. h. f. amplifier for s. s. b., Class 'C' v. h. f. amplifier or l. f. Class 'AB' amplifier or modulator.

|                     | Class 'AB'<br>Amplifier<br>or<br>Modulator | Class 'B'<br>Linear<br>Amplifier<br>for S. S. B. | Class 'C'<br>Telegraphy<br>or F. M.<br>Telephony |      |
|---------------------|--|--|--|------|
| f                   | -  | 30 60  | 30   | Mc/s |
| P <sub>out</sub>    | 2 x 100                                    | *120 *109  | 150  | W    |
| f max.              | -  | 60   | 60   | Mc/s |
| V <sub>a</sub> max. | 750  | 750  | 750  | V    |
| p <sub>a</sub> max. | 75   | 75   | 75   | W    |

\*P. E. P<sub>out</sub>

To be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES.

CLASS 'B' LINEAR AMPLIFIER FOR SINGLE SIDEBAND OPERATION

Maximum operating conditions

|                            |             |             |    |
|----------------------------|-------------|-------------|----|
| $f$                        | 30          | Mc/s        |    |
| P.E.P <sub>out</sub>       | 120         | W           |    |
| P.E.P <sub>load</sub>      | 110         | W           |    |
| **d <sub>3</sub>           | 30          | dB          |    |
| **d <sub>5</sub>           | 40          | dB          |    |
| V <sub>a</sub>             | 600         | V           |    |
| V <sub>g2</sub>            | 250         | V           |    |
| ***-V <sub>g1</sub>        | 55          | V           |    |
| I <sub>a(o)</sub>          | 100         | mA          |    |
| I <sub>g2(o)</sub>         | 3.0         | mA          |    |
|                            | Single tone | Double tone |    |
| I <sub>a</sub>             | 328         | 221         | mA |
| I <sub>g2</sub>            | 27.5        | 15          | mA |
| I <sub>g1</sub>            | 0           | 0           | mA |
| v <sub>in(pk)</sub>        | 40          | 40          | V  |
| P <sub>load (driver)</sub> | 1.0         | 1.0         | W  |
| p <sub>a</sub>             | 77          | 73          | W  |
| $\eta_a$                   | 61          | 45          | %  |

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|                           |             |             |    |
|---------------------------|-------------|-------------|----|
| f                         | 60          | Mc/s        |    |
| P.E. P <sub>out</sub>     | 109         | W           |    |
| P.E. P <sub>load</sub>    | 100         | W           |    |
| **d <sub>3</sub>          | 30          | dB          |    |
| **d <sub>5</sub>          | 40          | dB          |    |
| V <sub>a</sub>            | 600         | V           |    |
| V <sub>g2</sub>           | 250         | V           |    |
| ***-V <sub>g1</sub>       | 50          | V           |    |
| I <sub>a(o)</sub>         | 100         | mA          |    |
| I <sub>g2(o)</sub>        | 3.0         | mA          |    |
|                           | Single tone | Double tone |    |
| I <sub>a</sub>            | 325         | 220         | mA |
| I <sub>g2</sub>           | 28          | 14          | mA |
| I <sub>g1</sub>           | 0.5         | 0.1         | mA |
| v <sub>in(pk)</sub>       | 50          | 50          | V  |
| P <sub>load(driver)</sub> | 1.0         | 1.0         | W  |
| p <sub>a</sub>            | 75          | 72          | W  |
| η <sub>a</sub>            | 51          | 38          | %  |

\*\*Maximum values encountered at any level of drive voltage referred to the amplitude of either of the two tones at that level. Third and fifth order intermodulation products.

\*\*\*Adjust to give stated value of I<sub>a(o)</sub>

CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY

Maximum operating conditions

|                    |     |      |
|--------------------|-----|------|
| $f$                | 30  | Mc/s |
| $P_{out}$          | 150 | W    |
| $P_{load}$         | 120 | W    |
| $\eta_a$           | 76  | %    |
| $V_a$              | 600 | V    |
| $I_a$              | 330 | mA   |
| $V_{g2}$           | 250 | V    |
| $I_{g2}$           | 28  | mA   |
| $-V_{g1}$          | 90  | V    |
| $I_{g1}$           | 0   | mA   |
| $P_{load(driver)}$ | 1.0 | W    |
| $P_a$              | 48  | W    |
| $P_{g2}$           | 7.0 | W    |

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**CLASS 'AB' AUDIO AMPLIFIER OR MODULATOR**

Maximum operating conditions for two valves in push-pull

|                          |                |            |
|--------------------------|----------------|------------|
| $P_{out}$                | 200            | W          |
| $\dagger D_{tot}$        | $\leq 2$       | %          |
| $R_{a-a}$                | 2.8            | k $\Omega$ |
| $V_a$                    | 600            | V          |
| $V_{g2}$                 | 250            | V          |
| $\dagger\dagger -V_{g1}$ | 50             | V          |
| $I_{a(o)}$               | $2 \times 100$ | mA         |
| $I_{g2(o)}$              | $2 \times 3.0$ | mA         |
| $I_a$ (max. sig.)        | $2 \times 260$ | mA         |
| $I_{g2}$ (max. sig.)     | $2 \times 24$  | mA         |
| $I_{g1}$                 | 0              | mA         |
| $V_{in(g1-g1)}$ r. m. s. | 100            | V          |
| $P_a$                    | $2 \times 56$  | W          |
| $\eta_a$                 | 64             | %          |

$\dagger$ Total distortion encountered at maximum output.

$\dagger\dagger$ Adjust to give the stated value of  $I_{a(o)}$ .

ABSOLUTE MAXIMUM RATINGS

|                 |     |            |
|-----------------|-----|------------|
| $V_a$ max.      | 750 | V          |
| $V_{g2}$ max.   | 300 | V          |
| $-V_{g1}$ max.  | 100 | V          |
| $I_k$ max.      | 360 | mA         |
| $p_a$ max.      | 75  | W          |
| $p_{g2}$ max.   | 7.5 | W          |
| $I_{g1}$ max.   | 10  | mA         |
| $R_{g1-k}$ max. | 10  | k $\Omega$ |
| $V_{h-k}$ max.  | 100 | V          |

CATHODE

Indirectly heated, oxide coated

|       | Parallel | Series |   |
|-------|----------|--------|---|
| $V_h$ | 6.3      | 12.6   | V |
| $I_h$ | 2.6      | 1.3    | A |

CAPACITANCES

|            |      |    |
|------------|------|----|
| $c_{out}$  | 10.7 | pF |
| $c_{in}$   | 22   | pF |
| $c_{a-g1}$ | 0.2  | pF |

CHARACTERISTICS (measured at  $V_a = 600V$ ,  $V_{g2} = 250V$  and  $I_a = 100mA$ )

|               |     |      |
|---------------|-----|------|
| $g_m$         | 35  | mA/V |
| $\mu_{g1-g2}$ | 4.7 |      |

MOUNTING POSITION

Vertical or horizontal with plane of anodes vertical.

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**COOLING**

Radiation and convection

Maximum temperatures

|                |     |    |
|----------------|-----|----|
| Bulb           | 360 | °C |
| Anode seal     | 220 | °C |
| Base pin seals | 180 | °C |

**PHYSICAL DATA**

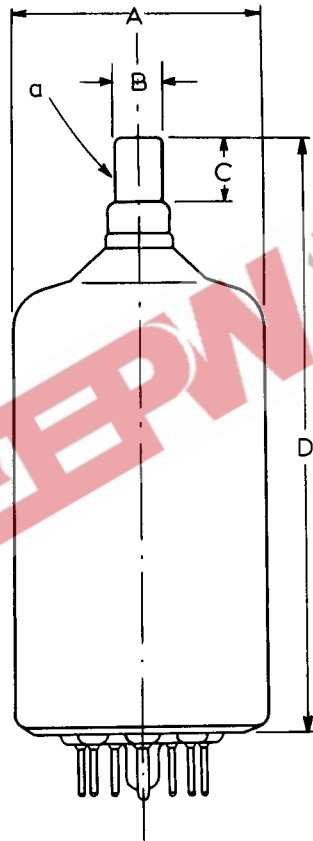
|                 |     |     |
|-----------------|-----|-----|
| Weight of valve | oz  | g   |
|                 | 3.9 | 110 |

**ACCESSORIES**

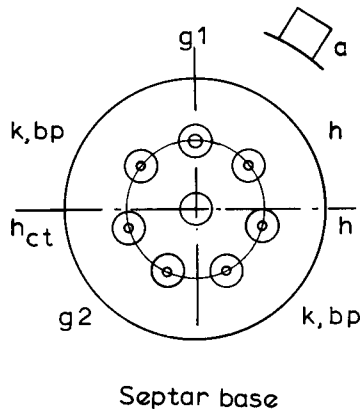
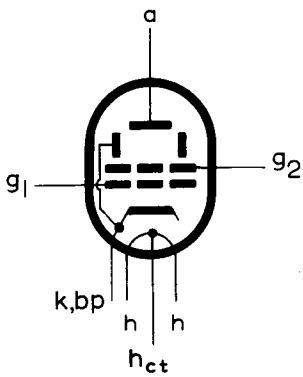
|                 |       |
|-----------------|-------|
| Socket          | 40202 |
| Anode connector | 40624 |

B2795

| Dimensions |        |             |
|------------|--------|-------------|
|            | Inches | Millimetres |
| A          | 2.047  | 52 max      |
| B          | 0.358  | 9.1         |
| C          | 0.472  | 12 min      |
| D          | 4.646  | 120         |



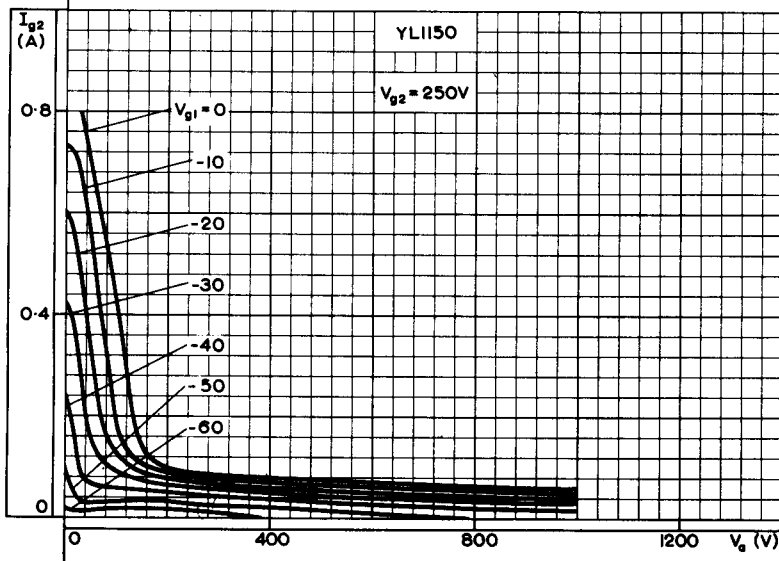
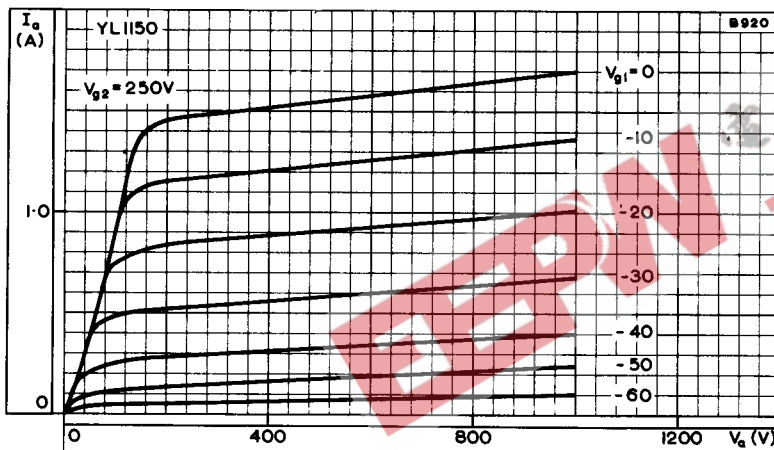
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ANODE AND SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER  $V_{g2} = 250V$

# V.H.F. BEAM POWER TETRODE

# YL1150

## TENTATIVE DATA

### QUICK REFERENCE DATA

Beam power tetrode primarily intended for use as a linear v.h.f. amplifier in single sideband transmitters.

|                     | Linear Amplifier<br>for S.S.B. Operation,<br>Class 'AB' | A.F. Amplifier<br>and Modulator,<br>Class 'AB' |      |
|---------------------|---|--|------|
| f                   | 30  | -  | Mc/s |
| P <sub>out</sub>    | 124 (P. E. P.)  | 2 x 100  | W    |
| f max.              | 60  | -  | Mc/s |
| V <sub>a</sub> max. | 750   | 750  | V    |
| p <sub>a</sub> max. | 75  | 75   | W    |

To be read in conjunction with

### GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES

### AUDIO AMPLIFIER AND MODULATOR, CLASS 'AB' (Two valves in push-pull)

#### OPERATING CONDITIONS

|                              |         |     |
|------------------------------|---------|-----|
| P <sub>out</sub>             | 200     | W   |
| *D <sub>tot</sub>            | ≤2      | %   |
| R <sub>a-a</sub>             | 2.8     | kΩ  |
| V <sub>a</sub>               | 600     | V   |
| V <sub>g2</sub>              | 250     | V   |
| **V <sub>g1</sub>            | 50      | V   |
| I <sub>a(o)</sub>            | 2 x 100 | mA  |
| I <sub>g2(o)</sub>           | 2 x 3.0 | mA  |
| I <sub>a(max.sig.)</sub>     | 2 x 260 | mA  |
| I <sub>g2(max.sig.)</sub>    | 2 x 24  | mA  |
| I <sub>g1</sub>              | 0       | mA  |
| V <sub>in(g1-g1)r.m.s.</sub> | 71      | V ← |
| p <sub>a</sub>               | 2 x 56  | W   |
| p <sub>g2</sub>              | 2 x 6.0 | W ← |
| η <sub>a</sub>               | 64      | %   |

\*Total distortion encountered at maximum output.

\*\*Adjust to give the desired value of I<sub>a(o)</sub>.

**LINEAR AMPLIFIER FOR SINGLE SIDEBAND OPERATION, CLASS 'AB'**

OPERATING CONDITIONS

←

|                           |             |             |    |
|---------------------------|-------------|-------------|----|
| f                         | 30          | Mc/s        |    |
| P. E. P <sub>out</sub>    | 124         | W           |    |
| P. E. P <sub>load</sub>   | 110         | W           |    |
| *d <sub>3</sub>           | 33          | dB          |    |
| *d <sub>5</sub>           | 40          | dB          |    |
| V <sub>a</sub>            | 600         | V           |    |
| V <sub>g2</sub>           | 250         | V           |    |
| ** -V <sub>g1</sub>       | 50          | V           |    |
| I <sub>a(o)</sub>         | 100         | mA          |    |
| I <sub>g2(o)</sub>        | 3.0         | mA          |    |
|                           | Single Tone | Double Tone |    |
| I <sub>a</sub>            | 325         | 220         | mA |
| I <sub>g2</sub>           | 22          | 12          | mA |
| I <sub>g1</sub>           | 0           | 0           | mA |
| v <sub>in(pk)</sub>       | 50          | 50          | V  |
| P <sub>load(driver)</sub> | 2.0         | 2.0         | W  |
| p <sub>g</sub>            | 71          | 70          | W  |
| p <sub>g2</sub>           | 7.0         | 3.5         | W  |
| η <sub>a</sub>            | 57          | 42          | %  |

\*Third and fifth order intermodulation products. Maximum values encountered at any level of drive voltage referred to the amplitude of either of the two tones at that level.

Relative to the peak envelope power these figures will be increased by 6dB.

\*\*Adjust to give the desired value of I<sub>a(o)</sub>.

**CATHODE**

Indirectly heated, oxide coated

|                       | Parallel | Series |     |
|-----------------------|----------|--------|-----|
| V <sub>h</sub>        | 6.3      | 12.6   | V   |
| I <sub>h</sub>        | 1.62     | 0.81   | A ← |
| t <sub>h-k</sub> min. | 30       |        | s ← |



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**RATINGS (ABSOLUTE MAXIMUM SYSTEM)**

|                        | S.S.B.<br>Class 'AB' | A.F. Amplifier<br>Class 'AB' |      |
|------------------------|----------------------|------------------------------|------|
| f max.                 | 60                   | -                            | Mc/s |
| V <sub>a</sub> max.    | 750                  | 750                          | V    |
| V <sub>g2</sub> max.   | 300                  | 300                          | V    |
| -V <sub>g1</sub> max.  | 100                  | 100                          | V    |
| I <sub>a</sub> max.    | 350                  | 350                          | mA   |
| p <sub>a</sub> max.    | 75                   | 75                           | W    |
| p <sub>g2</sub> max.   | 7.5                  | 7.5                          | W    |
| I <sub>g1</sub> max.   | 10                   | 10                           | mA   |
| p <sub>g1</sub> max.   | 0.5                  | 0.5                          | W    |
| R <sub>g1-k</sub> max. | 10                   | 10                           | kΩ   |

**CAPACITANCES**

|                   |      |    |
|-------------------|------|----|
| c <sub>a-g1</sub> | 0.2  | pF |
| c <sub>out</sub>  | 10.7 | pF |
| c <sub>in</sub>   | 22   | pF |

**CHARACTERISTICS**

|  |     |        |
|--|-----|--------|
| g <sub>m</sub> (at V <sub>a</sub> = 600V, V <sub>g2</sub> = 250V, I <sub>a</sub> = 100mA)    | 10  | mA/V ← |
| μ <sub>g1-g2</sub> (at V <sub>a</sub> = 600V, V <sub>g2</sub> = 250V, I <sub>a</sub> = 0.1A) | 4.7 |        |

**MOUNTING POSITION**

Any

**COOLING**

Radiation and convection cooling

Maximum temperatures

|               |     |    |
|---------------|-----|----|
| Bulb          | 350 | °C |
| Base pin seal | 180 | °C |
| Anode seal    | 220 | °C |

**PHYSICAL DATA**

|                 |     |     |
|-----------------|-----|-----|
|                 | oz  | g   |
| Weight of valve | 3.9 | 110 |

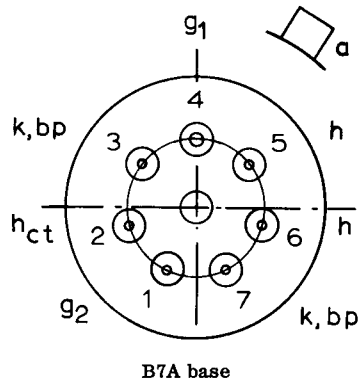
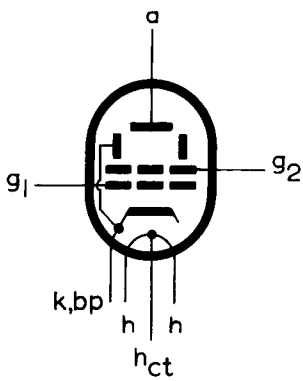
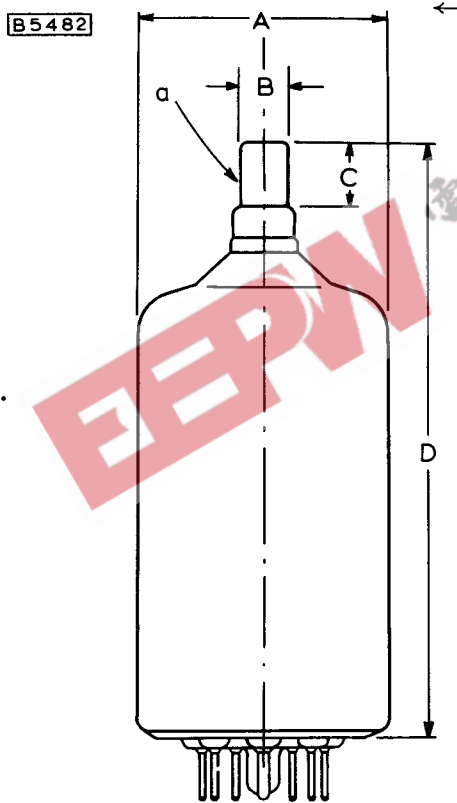
**ACCESSORIES**

|                 |       |
|-----------------|-------|
| Socket          | 40202 |
| Anode connector | 40624 |

**DIMENSIONS**

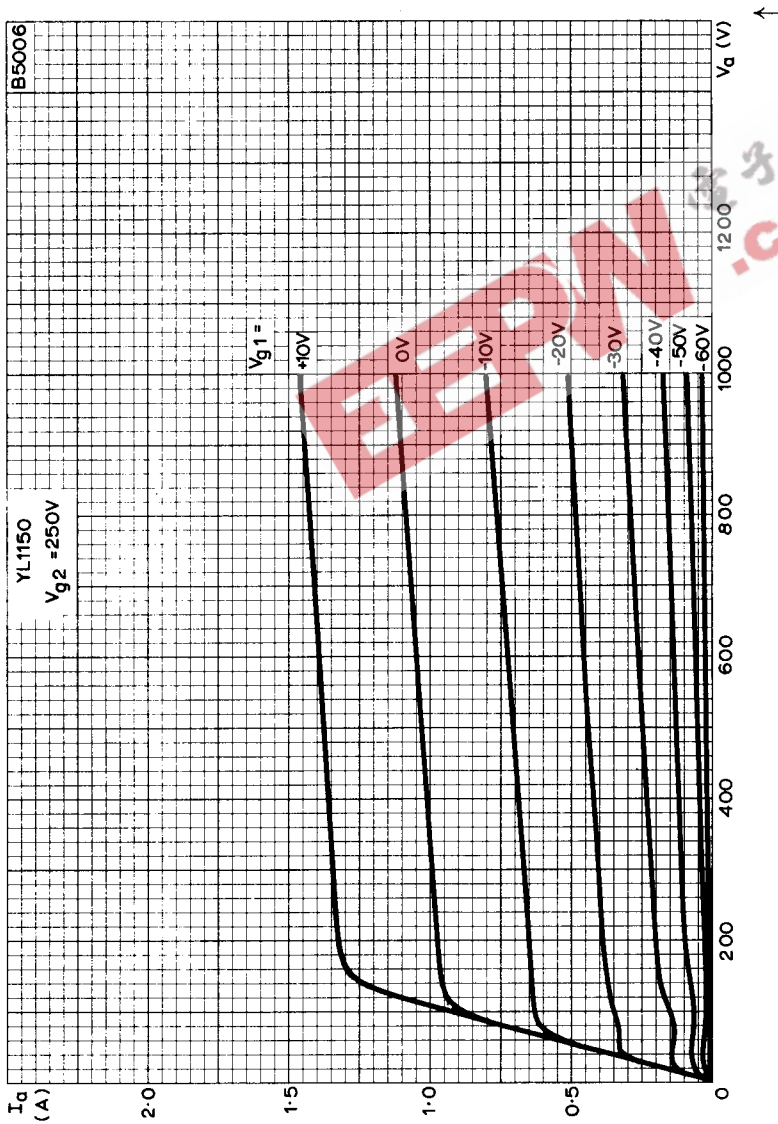
|   | Inches | Millimetres |
|---|--------|-------------|
| A | 1.97   | 50          |
| B | 0.358  | 9.1         |
| C | 0.51   | 13          |
| D | 4.65   | 120         |

Inch dimensions derived from original millimetre dimensions.

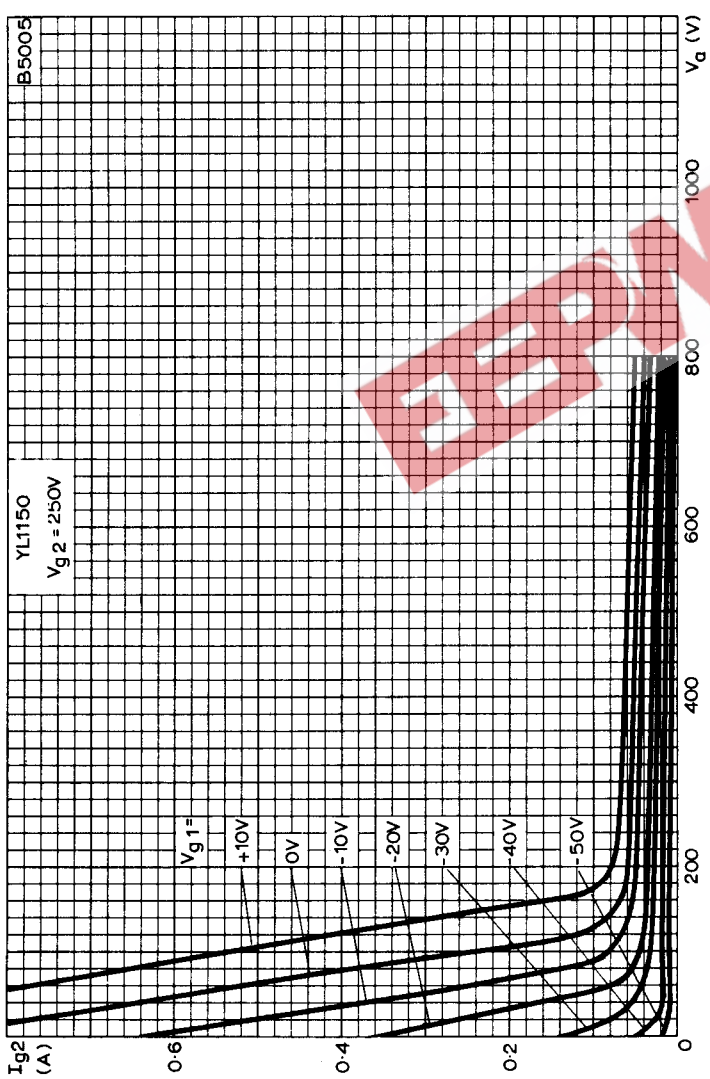


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ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER.  $V_{g2} = 250V$



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SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER,  $V_{g2} = 250V$

