

Genalex

BEAM TETRODE

BRIEF DATA

The KT88 has an absolute maximum anode dissipation rating of 42W and is designed for use in the output stage of an a.f. amplifier. Two valves in Class AB1 give a continuous output of up to 100W. The KT88 is also suitable for use as a series valve in a stabilised power supply. The KT88 is a commercial version of the CV5220 and is similar to the 6550.

HEATER

| | | |
|--------------------------|-----|---|
| V_h | 6.3 | V |
| I_h (approx) | 1.6 | A |

MAXIMUM RATINGS

| | Absolute | Design Maximum | |
|-------------------------------|----------|----------------|------------|
| V_a | 800 | 800 | V |
| V_{g2} | 600 | 600 | V |
| $V_{a,g2}$ | 600 | 600 | V |
| $-V_{g1}$ | 200 | 200 | V |
| P_a | 42 | 35 | W |
| P_{g2} | 8 | 6 | W |
| P_{a+g2} | 46 | 40 | W |
| I_k | 230 | 230 | mA |
| V_{h-k} | 250 | 200 | V |
| T_{bulb} | 250 | 250 | °C |
| R_{g1-k} (cathode bias) | | | |
| $P_{a+g2} \leq 35W$ | 470 | | k Ω |
| $P_{a+g2} > 35W$ | 270 | | k Ω |
| R_{g1-k} (fixed bias) | | | |
| $P_{a+g2} \leq 35W$ | 220 | | k Ω |
| $P_{a+g2} > 35W$ | 100 | | k Ω |

CAPACITANCES (Measured on a cold unshielded valve)

| Triode Connection | | Tetrode Connection | |
|---|--------|--|--------|
| $C_{g1-a,g2}$ | 7.9 pF | C_{g1-a} | 1.2 pF |
| $C_{g1-all \text{ less } a,g2}$ | 9.3 pF | $C_{g1-all \text{ less } a}$ | 16 pF |
| $C_{a,g2-all \text{ less } g1}$ | 17 pF | $C_{a-all \text{ less } g1}$ | 12 pF |

CHARACTERISTICS

Tetrode Connected

| | | |
|--------------------|------|------------|
| V_a | 250 | V |
| V_{g2} | 250 | V |
| I_a | 140 | mA |
| I_{g2} (approx) | 3 | mA |
| $-V_{g1}$ (approx) | 15 | V |
| g_m | 11.5 | mA/V |
| r_a | 12 | k Ω |
| μ_{g1-g2} | 8 | |

Triode Connected

| | | |
|--------------------|-----|----------|
| $V_{a,g2}$ | 250 | V |
| $I_{a,g2}$ | 143 | mA |
| $-V_{g1}$ (approx) | 15 | V |
| g_m | 12 | mA/V |
| r_a | 670 | Ω |
| μ | 8 | |

TYPICAL OPERATION

Push-Pull, Class AB1, Cathode Bias, Tetrode Connection

| | | |
|------------------------|---------|------------|
| $V_{a(b)}$ | 560 | V |
| $V_{a(tot)}$ | 521 | V |
| V_{g2} | 300 | V |
| $I_{a(o)}$ | 2 x 64 | mA |
| I_a (max sig) | 2 x 73 | mA |
| $I_{g2(o)}$ | 2 x 1.7 | mA |
| I_{g2} (max sig) | 2 x 9 | mA |
| $R_{L(a-a)}$ | 9 | k Ω |
| R_k | 2 x 460 | Ω |
| $-V_{g1}$ (approx) | 30 | V |
| P_{out} | 50 | W |
| D_{tot} | 3 | % |
| \dagger I.M. | 11 | % |
| $P_{a(o)}$ | 2 x 33 | W |
| P_{a} (max sig) | 2 x 12 | W |
| $P_{g2(o)}$ | 2 x 0.5 | W |
| P_{g2} (max sig) | 2 x 2.7 | W |
| $V_{(g1-g2)act}$ crest | 60 | V |

*It is essential to use two separate cathode bias resistors.

†Intermodulation distortion; measured using two input signals at 50 and 5000Hz (ratio of amplitudes 4:1).

Push-Pull. Class AB1. Fixed Bias. Tetrode Connection

| | |
|-------------------------|---------|
| $V_{a(b)}$ | 560 |
| $V_{a(o)}$ | 552 |
| V_{g2} | 300 |
| $I_{a(o)}$ | 2 x 60 |
| I_a (max sig) | 2 x 145 |
| $I_{g2(o)}$ | 2 x 1.7 |
| I_{g2} (max sig) | 2 x 15 |
| $R_{L(a-a)}$ | 4.5 |
| * $-V_{g1}$ (approx) | 34 |
| P_{out} | 100 |
| D_{tot} | 2.5 |
| †I.M. | 10 |
| $P_{a(o)}$ | 2 x 33 |
| P_a (max sig) | 2 x 28 |
| $P_{g2(o)}$ | 2 x 0.5 |
| P_{g2} (max sig) | 2 x 4.5 |
| $V_{(g1-g1)(ac)}$ crest | 67 |

*It is essential to provide two separately adjustable bias voltage sources, having a voltage adjustment range of $\pm 25\%$.

†Intermodulation distortion; measured using two input signals at 50 and 6000Hz (ratio of amplitudes 4:1).

Push-Pull. Class AB1. Cathode Bias. Ultra-Linear Connection (40% Tapping Points)

| | | |
|-------------------------|---------|----------|
| $V_{a,g2(b)}$ | 500 | 375 |
| $V_{a,g2(o)}$ | 436 | 328 |
| $I_{a+g2(o)}$ | 2 x 87 | 2 x 87 |
| I_{a+g2} (max sig) | 2 x 99 | 2 x 96 |
| $R_{L(a-a)}$ | 6 | 5 |
| * R_k | 2 x 600 | 2 x 400 |
| $-V_{g1}$ (approx) | 52 | 35 |
| P_{out} | 50 | 30 |
| D_{tot} | 1.5 | 1 |
| †I.M. | 4 | 3 |
| $P_{a+g2(o)}$ | 2 x 38 | 2 x 28.5 |
| P_{a+g2} (max sig) | 2 x 17 | 2 x 16 |
| $V_{(g1-g1)(ac)}$ crest | 104 | 71 |
| Z_{out} | 4.8 | 4.5 |

*It is essential to use two separate cathode bias resistors.

†Intermodulation distortion; measured using two input signals at 50 and 6000Hz (ratio of amplitudes 4:1).

**Push-Pull, Class AB1, Fixed Bias, Ultra-Linear Connection,
(40% Tapping Points)**

| | | | |
|------------------------|----------|----------|------------|
| $V_{a,g2(b)}$ | 560 | 460 | V |
| $V_{a,g2(o)}$ | 553 | 453 | V |
| $I_{a,g2(o)}$ | 2 x 50 | 2 x 50 | mA |
| $I_{a,g2}$ (max sig) | 2 x 157 | 2 x 140 | mA |
| $R_{L(a-o)}$ | 4.5 | 4 | k Ω |
| $-V_{g1}$ (approx) | 75 | 59 | V |
| P_{out} | 100 | 70 | W |
| D_{tot} | .2 | 2 | % |
| *I.M. | 11 | 10 | % |
| $P_{a,g2(o)}$ | 2 x 27.5 | 2 x 22.5 | W |
| $P_{a,g2}$ (max sig) | 2 x 33 | 2 x 27 | W |
| $V_{(g1-g1)fac}$ crest | 140 | 114 | V |
| Z_{out} | .7 | 6.5 | k Ω |

*It is essential to provide two separately adjustable bias voltage sources, having a voltage adjustment range of $\pm 25\%$.

*Intermodulation distortion; measured using two input signals at 50 and 6000Hz (ratio of amplitudes 4:1).

Push-Pull, Class AB1, Cathode Bias, Triode Connection

| | | | |
|------------------------|----------|---------|------------|
| $V_{a,g2(b)}$ | 400 | 485 | V |
| $V_{a,g2(o)}$ | 349 | 422 | V |
| $I_{a,g2(o)}$ | 2 x 76 | 2 x 94 | mA |
| $I_{a,g2}$ (max sig) | 2 x 80 | 2 x 101 | mA |
| $R_{L(a-o)}$ | .4 | 4 | k Ω |
| $-V_{g1}$ (approx) | 40 | 50 | V |
| P_{out} | 17 | 31 | W |
| D_{tot} | 1.5 | 1.5 | % |
| *I.M. | 5.6 | 5.6 | % |
| $P_{a,g2(o)}$ | 2 x 26.5 | 2 x 40 | W |
| $P_{a,g2}$ (max sig) | 2 x 19 | 2 x 27 | W |
| R_k | 2 x 525 | 2 x 525 | Ω |
| $V_{(g1-g1)fac}$ crest | 78 | 114 | V |
| Z_{out} | .2 | 1.9 | k Ω |

*Intermodulation distortion; measured using two input signals at 50 and 6000Hz (ratio of amplitudes 4:1).

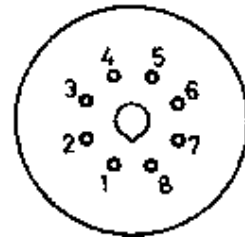
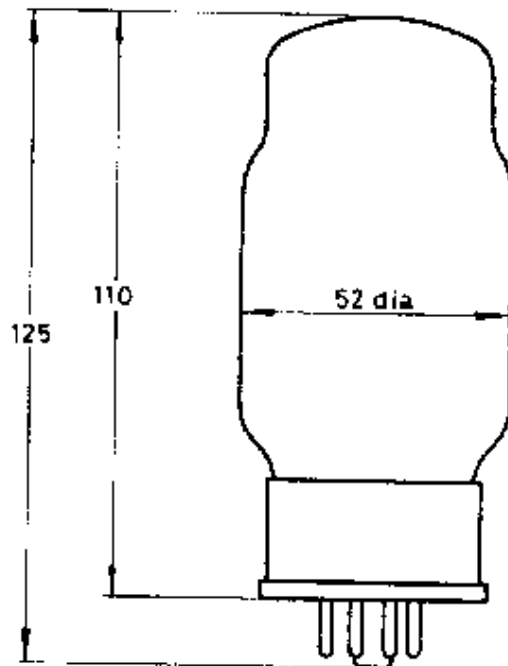
INSTALLATION

The tube may be mounted either vertically or horizontally.
When tubes are mounted vertically it is recommended that the centres of the tube sockets are not less than 4in. apart and that pins 4 and 8 of each tube are in line.

When tubes are mounted horizontally it is recommended that the centres of the tube sockets are not less than 4in. apart and that pins 4 and 8 of each tube are in the same vertical line. One tube should not be mounted directly above another.

Free air circulation around the tube is desirable.

OUTLINE



1100

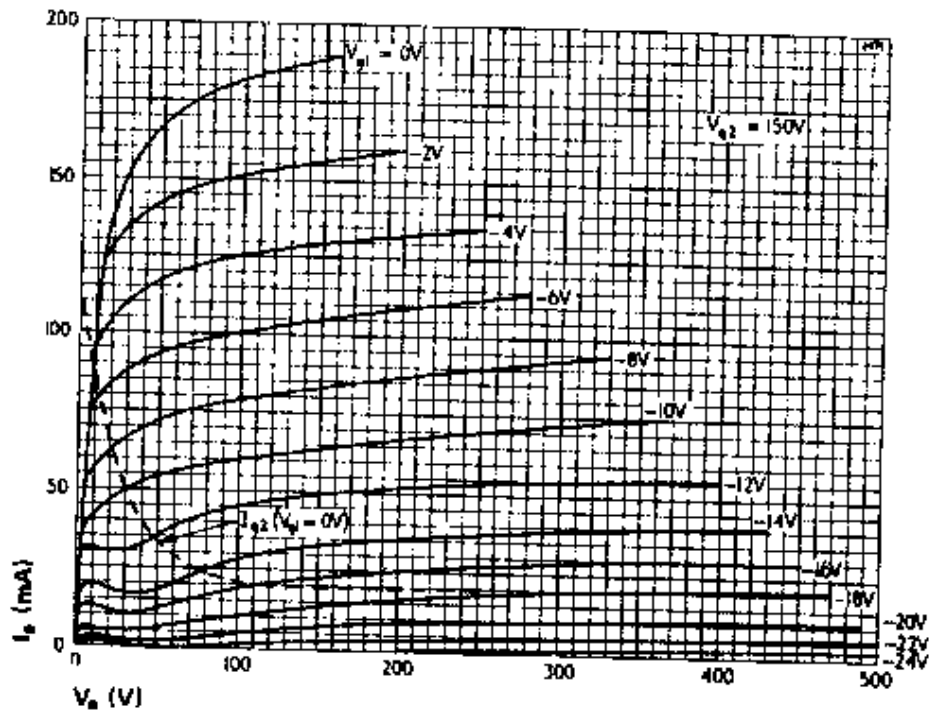
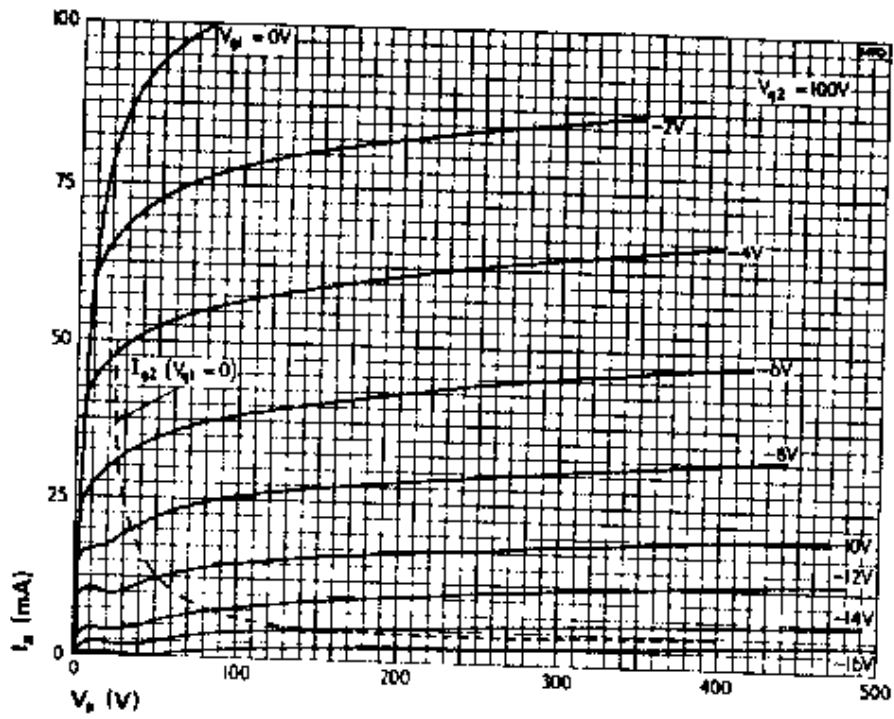
Base : Metal shell wafer octal

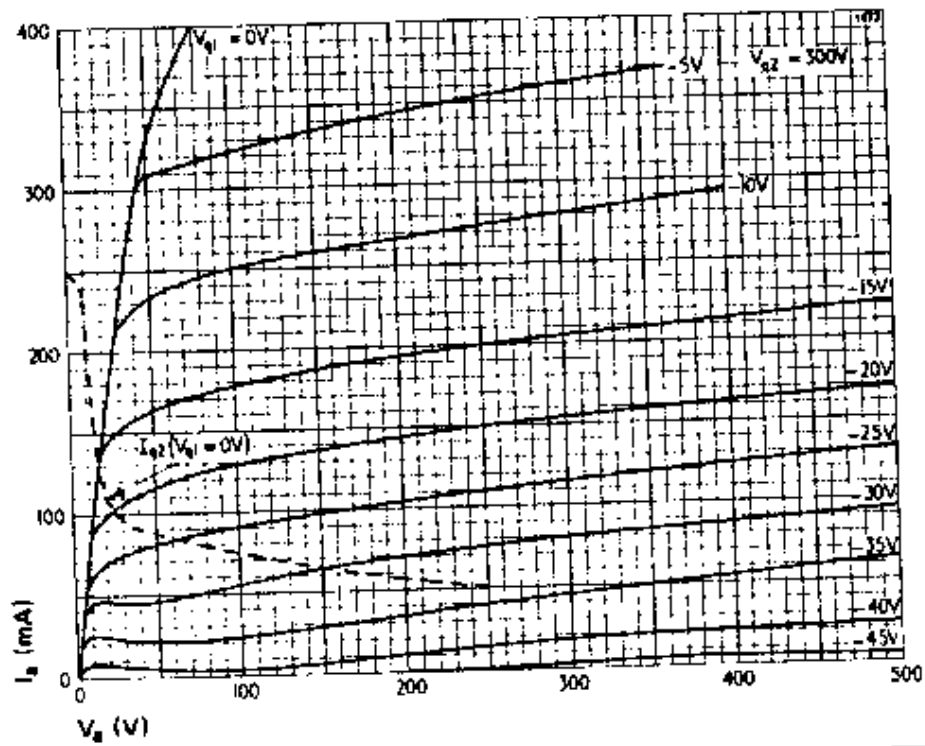
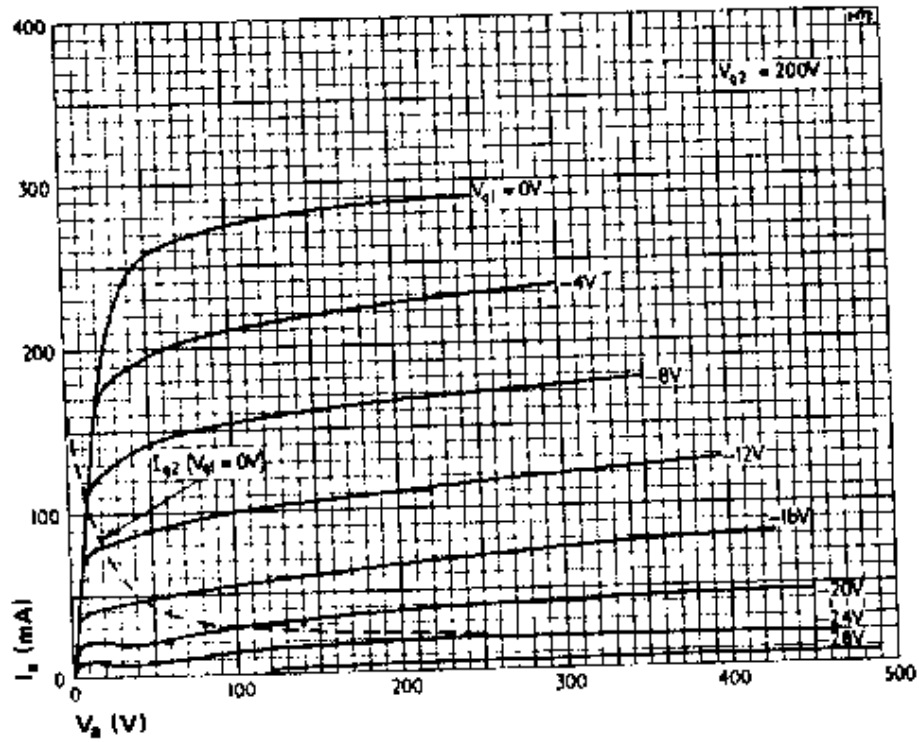
| | | | | |
|------|---|------------|---|-------|
| Pin: | 1 | base shell | 5 | g1 |
| | 2 | h | 6 | NP |
| | 3 | a | 7 | h |
| | 4 | g2 | 8 | k, bp |

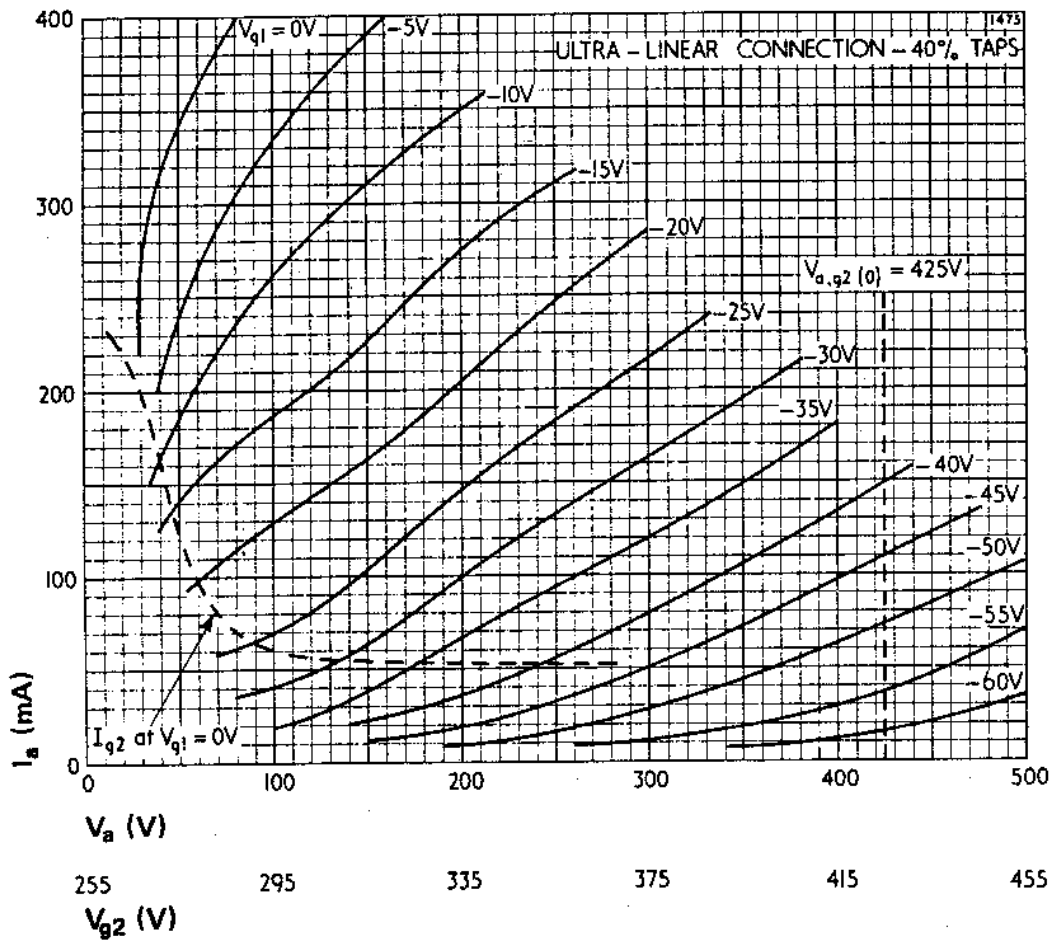
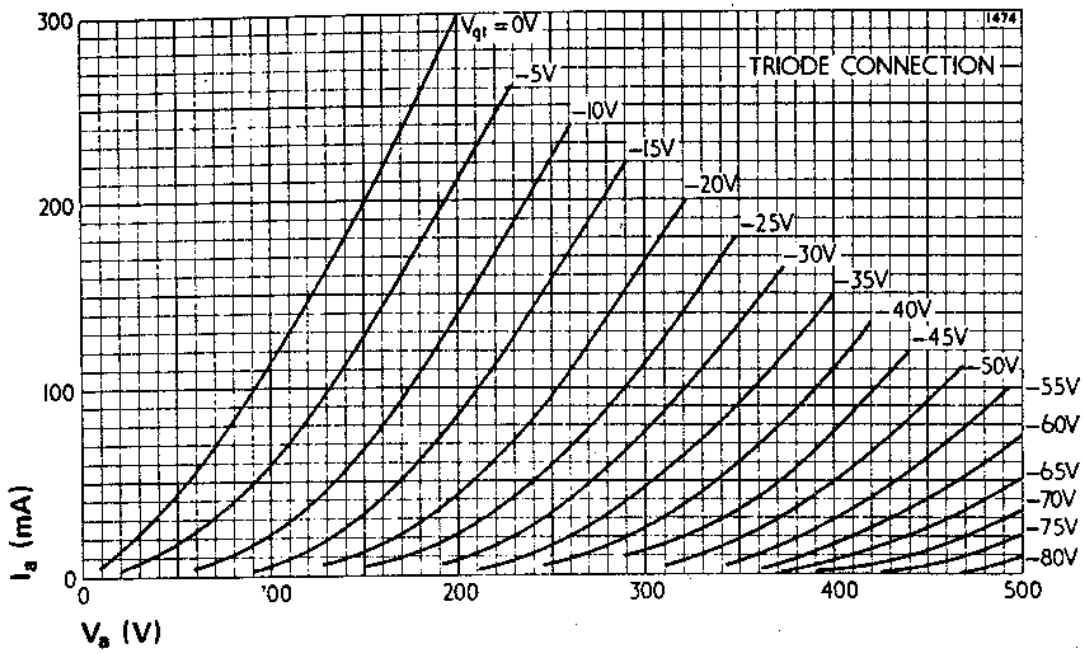
Dimensions are in mm and are maximum

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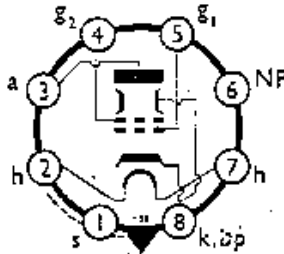
S.E.C.
VALVES

OUTPUT BEAM PENTODE
6.3V INDIRECTLY HEATED

KT88
NOVEMBER, 1956

The KT88 is a pentode having an anode dissipation of 35W. It is primarily designed for use in the output stage of an AF amplifier in which two valves will provide up to 100W.

BASE CONNECTIONS AND VALVE DIMENSIONS



Base : Octal
Bulb : Tubular
Max. overall length : 125 mm.
Max. seated length : 110 mm.
Max. diameter : 52 mm.

View from underside of base.

HEATER

V_h 6.3 V
 I_h 1.8 A

MAXIMUM RATINGS

V_a 600 V
 V_{g2} 600 V
 $V_{a, g2}$ 600 V
 P_a 35 W
 P_{g2} 6 W
 P_{a+g2} 40 W
 I_k 174 mA
 V_{h-k} 150 V

*Triode connection.

CAPACITANCES

C_{g-a} 1.2 pF C_{in} 16 pF C_{out} 12 pF

CHARACTERISTICS

| Pentode Connection | | | Triode Connection | | |
|--------------------|-----|------------|-------------------|------|----------|
| V_a | 250 | V | $V_{a, g2}$ | 450 | V |
| V_{g2} | 250 | V | V_{g1} | -48 | V |
| I_a | 140 | mA | g_m | 13 | mA/V |
| g_m | 11 | mA/V | r_a | 6150 | Ω |
| r_a | 12 | k Ω | μ | 8 | |
| μ_{g1-g2} | 8 | | | | |

TYPICAL OPERATION

| Pentode connection. | Push-pull. | Cathode Bias. | |
|--------------------------------|------------|---------------|--------|
| Data per pair. | | | |
| V_a (b) | 400 | 450 | 475 V |
| V_a | 360 | 400 | 425 V |
| V_{g2} | 255 | 295 | 320 V |
| I_a (b) | 120 | 140 | 160 mA |
| I_a (max sig) | 135 | 155 | 180 mA |
| I_{g2} (c) | 7.5 | 10 | 12 mA |
| I_{g2} (max sig) | 25 | 30 | 33 mA |
| P_a (a) (per valve) | 22.5 | 30 | 35 W |
| P_a (max sig) (per valve) | 8 | 10 | 15 W |
| P_{g2} (c) (per valve) | 1 | 1.5 | 2 W |
| P_{g2} (max sig) (per valve) | 3.25 | 4.5 | 6 W |

KT88

| | | | | |
|-----------------------------|----------|----------|----------|---|
| *R _k (per valve) | 440 ± 5% | 440 ± 5% | 440 ± 5% | Ω |
| V _k (o) (app) | 28 | 34 | 38 | V |
| V _{in} (g1-g1') | 50 | 60 | 70 | V |
| R _L (a-a') | 6000 | 6000 | 6000 † | Ω |
| z _{out} | 15000 | 15000 | 15000 | Ω |
| P _{out} | 34 | 42 | 48 | W |
| D | 3 | 3 | 3 | % |

*Separate bias resistors are essential.

Pentode connection Push-Pull. Fixed Bias.

Data per pair.

| | | | |
|---------------------------------------|------|------|----|
| V _a (b) | 460 | 625 | V |
| V _a | 450 | 600 | V |
| V _{g2} | 345 | 330 | V |
| I _a (o) | 100 | 100 | mA |
| I _a (max sig) | 240 | 250 | mA |
| I _{g2} (o) | 7.5 | 8 | mA |
| I _{g2} (max sig) | 35 | 32 | mA |
| P _a (o) (per valve) | 25 | 32 | W |
| P _a (max sig) (per valve) | 20 | 25 | W |
| P _{g2} (o) (per valve) | 1.5 | 1 | W |
| P _{g2} (max sig) (per valve) | 6 | 5.5 | W |
| *V _{g1} (app) | -48 | -45 | V |
| V _{in} (g1-g1') (app) | 70 | 50 | V |
| R _L (a-a') | 4000 | 5000 | Ω |
| z _{out} | 15 | 25 | kΩ |
| P _{out} | 65 | 100 | W |
| †D | 5-7 | 3-6 | % |

*A bias voltage range of not less than 40 to 65 is recommended.

†The distortion may vary accordingly to matching of pairs.

Triode Connection. Push-Pull. Cathode Bias.

Data per pair.

| | | | |
|-----------------------------------|----------|----------|----|
| V _a (b) | 400 | 485 | V |
| V _{a, g2} | 350 | 425 | V |
| I _{a+g2} (o) | 135 | 170 | mA |
| I _{a+g2} (max sig) | 145 | 180 | mA |
| P _{a+g2} (o) (per valve) | 24 | 40 | W |
| *R _k | 560 ± 5% | 560 ± 5% | Ω |
| V _k (o) | 38 | 48 | V |
| V _{in} (g1-g1') (app) | 60 | 70 | V |
| R _L (a-a') | 4000 | 4000 | Ω |
| z _{out} | 2000 | 2000 | Ω |
| P _{out} | 15 | 27 | W |
| †D | 1-3 | 1-3 | % |

*Separate bias resistors are essential.

†The distortion varies between 1% and 3% according to the degree of matching.

The external grid circuit resistance should be kept as low as possible and must not exceed 220kΩ ± 20% with cathode bias, or 100kΩ ± 20% with fixed bias.

MOUNTING

Any position.

VENTILATION

Free air circulation is preferable. The hottest part of the bulb must not exceed 250°C.

KT88

