# R.F. POWER TETRODE

| QUICK REFERENCE DATA | | | | | | | |
|---|---|---|---|---|---|---|---|
| H.F. class C telegraphy | | | | Television service Neg. mod.; pos. sync. | | | |
| Freq. (MHz) | $V_a$ (V) | $W_o$ (W) | | Freq. (MHz) | $V_a$ (V) | $W_o$ (W) | |
| | | | | | | sync. | black |
| 110 | 4000 | 930 | | 220 | 2400 | 600 | 340 |
| | 3000 | 670 | | | 1850 | 300 | 170 |
| | 2500 | 530 | | | | | |

**HEATING**: direct, filament thoriated tungsten

| | | | | |
|---|---|---|---|---|
| Filament voltage | $V_f$ | = | 5 | V |
| Filament current | $I_f$ | = | 13.5 | A |

**CAPACITANCES**

| | | | | |
|---|---|---|---|---|
| Anode to all other elements except grid No.1 | $C_a$ | = | 5.6 | pF |
| Grid No.1 to all other elements except anode | $C_{g_1}$ | = | 12.8 | pF |
| Anode to grid No.1 | $C_{ag_1}$ | = | 0.05 | pF |

**TYPICAL CHARACTERISTICS**

| | | | | |
|---|---|---|---|---|
| Amplification factor of grid No.2 with respect to grid No.1 | $\mu_{g_2g_1}$ | = | 6.2 | |
| Mutual conductance | $S (I_a = 200$ mA) | = | 5.2 | mA/V |

**TEMPERATURE LIMITS** (Absolute limits)

| | | | |
|---|---|---|---|
| Temperature of seals | = | max. | 150 °C |
| Anode temperature | = | max. | 150 °C |

In order to keep the temperatures of the seals below the maximum permissible value it is necessary to direct an air flow to the seals. Cooling air must be applied to the seals and the anode cooler prior to the application of filament power and the cooling must be continued for three minutes after the power has been removed from the filament.

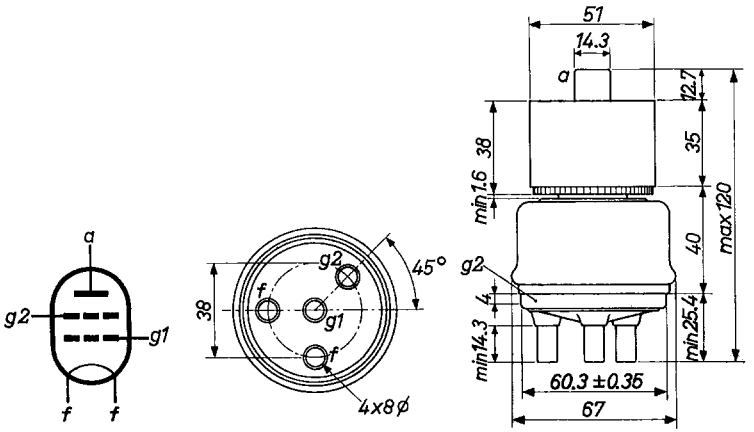
## COOLING CHARACTERISTICS

| $W_a$ (W) | h (m) | $T_{i\,max.}$ (°C) | $q_{min.}$ ($m^3$/min.) | $p_i$ (mm $H_2O$) |
|---|---|---|---|---|
| 300 | 0 | 35 | 0.50 | 9.8 |
| | 0 | 45 | 0.59 | 12.9 |
| | 1500 | 35 | 0.60 | 12.0 |
| | 3000 | 25 | 0.63 | 11.5 |
| 400 | 0 | 35 | 0.77 | 17.5 |
| | 0 | 45 | 0.90 | 23.0 |
| | 1500 | 35 | 0.93 | 21.3 |
| | 3000 | 25 | 0.97 | 20.5 |
| 500 | 0 | 35 | 1.13 | 35.5 |
| | 0 | 45 | 1.32 | 46.9 |
| | 1500 | 35 | 1.36 | 43.3 |
| | 3000 | 25 | 1.42 | 41.5 |

## MECHANICAL DATA

Dimensions in mm

Net weight: 530 g




Mounting position: vertical with anode up or down

## R.F. CLASS C TELEGRAPHY

### LIMITING VALUES (Absolute limits)

| Frequency | | f | | up to | 120 | MHz |
|---|---|---|---|---|---|---|
| Anode voltage | | $V_a$ | = | max. | 4000 | V |
| Anode input power | | $W_{ia}$ | = | max. | 1400 | W |
| Anode dissipation | | $W_a$ | = | max. | 500 | W |
| Anode current | | $I_a$ | = | max. | 350 | mA |
| Grid No.2 voltage | | $V_{g_2}$ | = | max. | 500 | V |
| Grid No.2 dissipation | | $W_{g_2}$ | = | max. | 30 | W |
| Negative grid No.1 voltage | | $-V_{g_1}$ | = | max. | 500 | V |
| Grid No.1 current | | $I_{g_1}$ | = | max. | 30 | mA |
| Grid No.1 circuit resistance | | $R_{g_1}$ | = | max. | 30 | kΩ |

### OPERATING CONDITIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| Frequency | f | = | 110 | 110 | 110 | MHz |
| Anode voltage | $V_a$ | = | 4000 | 3000 | 2500 | V |
| Grid No.2 voltage | $V_{g_2}$ | = | 500 | 500 | 500 | V |
| Grid No.1 voltage | $V_{g_1}$ | = | −150 | −150 | −150 | V |
| Anode current | $I_a$ | = | 315 | 310 | 310 | mA |
| Grid No.2 current | $I_{g_2}$ | = | 22 | 24 | 26 | mA |
| Grid No.1 current | $I_{g_1}$ | = | 16 | 16 | 15 | mA |
| Peak grid No.1 A.C. voltage | $V_{g_{1p}}$ | = | 230 | 230 | 230 | V |
| Grid No.1 input power | $W_{ig_1}$ | = | 5 | 5 | 5 | W |
| Grid No.2 dissipation | $W_{g_2}$ | = | 11 | 12 | 13 | W |
| Anode input power | $W_{ia}$ | = | 1260 | 930 | 775 | W |
| Anode dissipation | $W_a$ | = | 330 | 260 | 245 | W |
| Output power | $W_o$ | = | 930 | 670 | 530 | W |
| Efficiency | $\eta$ | = | 73.5 | 72 | 68.5 | % |
| Useful power in the load | $W_\ell$ | = | 835 | 600 | 475 | W |

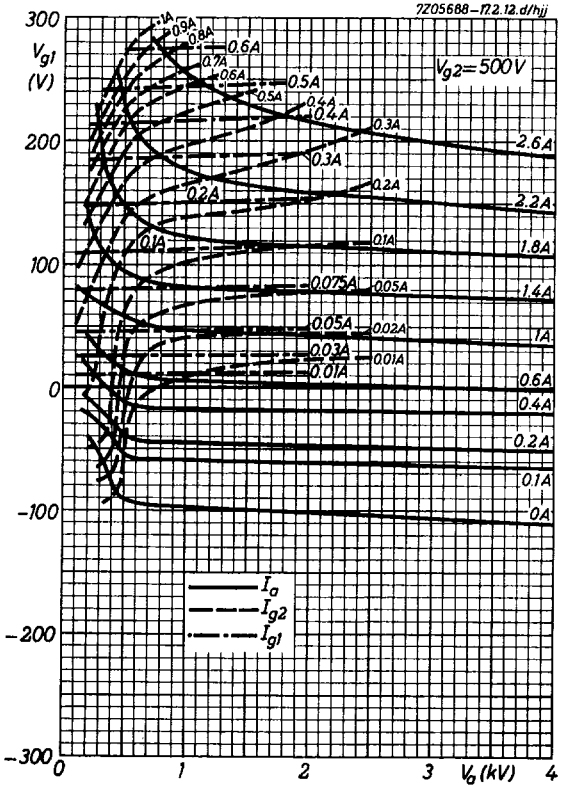
**R.F. CLASS B AMPLIFIER FOR TELEVISION SERVICE**; negative modulation, positive synchronisation.

**LIMITING VALUES** (black level; absolute limits)

| Frequency | | f | | | up to | 220 | MHz |
|---|---|---|---|---|---|---|---|
| Anode voltage | | $V_a$ | = | max. | 3000 | | V |
| Grid No.2 voltage | | $V_{g_2}$ | = | max. | 500 | | V |
| Anode current | | $I_a$ | = | max. | 350 | | mA |
| Anode input power | | $W_{ia}$ | = | max. | 1050 | | W |
| Anode dissipation | | $W_a$ | = | max. | 500 | | W |
| Grid No.2 dissipation | | $W_{g_2}$ | = | max. | 30 | | W |
| Grid No.1 current | | $I_{g_1}$ | = | max. | 30 | | mA |
| Grid No.1 circuit resistance | | $R_{g_1}$ | = | max. | 30 | | kΩ |

**OPERATING CONDITIONS**, one tube

| | | | | | | |
|---|---|---|---|---|---|---|
| Frequency | f | | = | 220 | 220 | MHz |
| Bandwidth | B | | = | 6 | 6 | MHz |
| Anode voltage | $V_a$ | | = | 2400 | 1850 | V |
| Grid No.2 voltage | $V_{g_2}$ | | = | 500 | 500 | V |
| Grid No.1 voltage | $V_{g_1}$ | | = | −100 | −100 | V |
| Peak grid No.1 A.C. voltage | $V_{g_1p}$ | sync | = | 185 | 140 | V |
| Anode current | $I_a$ | sync | = | 400 | 285 | mA |
| | | black | = | 300 | 215 | mA |
| Grid No.2 current | $I_{g_2}$ | sync | = | 35 | 20 | mA |
| | | black | = | 3 | 2 | mA |
| Grid No.1 current | $I_{g_1}$ | sync | = | 15 | 10 | mA |
| | | black | = | 5 | 2 | mA |
| Grid No.1 input power | $W_{ig_1}$ | sync | = | 25 | 15 | W |
| Anode input power | $W_{ia}$ | sync | = | 960 | 525 | W |
| | | black | = | 720 | 400 | W |
| Output power | $W_o$ | sync | = | 600 | 300 | W |
| | | black | = | 340 | 170 | W |


7Z05688-7Z2.12.d/hjj
$V_{g1}$ (V)
$V_{g2}$=500V
300
200
100
0
-100
-200
-300
0
1
2
3
4
$V_b$ (kV)
$I_a$
$I_{g2}$
$I_{g1}$
2.6A
2.2A
1.8A
1.4A
1A
0.6A
0.4A
0.2A
0.1A
0A