

## S.Q. TUBE

Special quality double triode designed for use as A.F. amplifier, oscillator and multivibrator.

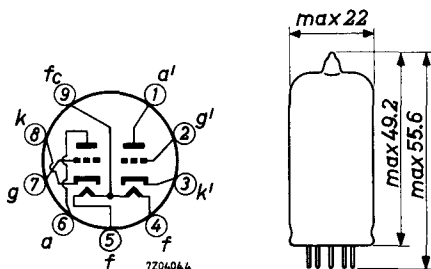
### QUICK REFERENCE DATA

|                          |                                           |
|--------------------------|-------------------------------------------|
| Life test                | 1000 hours                                |
| Low interface resistance |                                           |
| Mechanical quality       | Shock and vibration resistant             |
| Base                     | Noval                                     |
| Heating                  | Indirect<br>A.C. or D.C.; Parallel supply |
| Heater voltage           | $V_f$ 6.3 or 12.6 V                       |
| Heater current           | $I_f$ 300 or 150 mA                       |
| Anode current            | $I_a$ 1.2 mA                              |
| Mutual conductance       | $S$ 1.6 mA/V                              |
| Amplification factor     | $\mu$ 100                                 |

### DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval



**CHARACTERISTICS** Each system if applicable.

Column I Nominal value or setting of the tube

II Range values for equipment design: Initial spread

III Range values for equipment design: End of life

|                                                        |                | I    | II        | III       |            |
|--------------------------------------------------------|----------------|------|-----------|-----------|------------|
| Heater voltage                                         | $V_f$          | 6.3  |           |           | V          |
| Heater current                                         | $I_f$          | 300  | 276- 324  |           | mA         |
| Anode voltage                                          | $V_a$          | 250  |           |           | V          |
| Grid voltage                                           | $-V_g$         | 2    |           |           | V          |
| Anode current                                          | $I_a$          | 1.2  | 0.75-1.75 |           | mA         |
| Mutual conductance                                     | $S$            | 1.6  | 1.25-2.05 | min. 1.12 | mA/V       |
| Amplification factor                                   | $\mu$          | 100  |           |           |            |
| Internal resistance                                    | $R_i$          | 62.5 |           |           | k $\Omega$ |
| Difference in anode current of both systems            | $ I_a - I_a' $ |      | max. 0.6  |           | mA         |
| Negative grid current                                  | $-I_g$         |      | max. 0.5  | max. 0.5  | $\mu$ A    |
| Vibrational noise output<br>(units connected parallel) | $V_o$          |      | max. 25   |           | mVRMS      |
| Anode supply voltage<br>$V_{ba} = 250$ V               |                |      |           |           |            |
| Grid voltage $-V_g = 2$ V                              |                |      |           |           |            |
| Frequency $f = 25$ Hz                                  |                |      |           |           |            |
| Acceleration 2.5 g                                     |                |      |           |           |            |
| Anode resistor $R_a = 2$ k $\Omega$                    |                |      |           |           |            |
| <u>Amplification</u>                                   |                |      |           |           |            |
| Anode supply voltage                                   | $V_{ba}$       | 100  |           |           | V          |
| Grid voltage                                           | $V_g$          | 0    |           |           | V          |
| Anode resistor                                         | $R_a$          | 0.5  |           |           | M $\Omega$ |
| Grid resistor                                          | $R_g$          | 10   |           |           | M $\Omega$ |
| Input voltage                                          | $V_i$          | 0.2  |           |           | VRMS       |
| Output voltage                                         | $V_o$          |      | min. 8.4  |           | VRMS       |

**CHARACTERISTICS** (continued)

|                                                     |           | I    | II       | III     |            |
|-----------------------------------------------------|-----------|------|----------|---------|------------|
| Anode voltage                                       | $V_a$     | 100  |          |         | V          |
| Grid voltage                                        | $-V_g$    | 1    |          |         | V          |
| Anode current                                       | $I_a$     | 0.5  |          |         | mA         |
| Mutual conductance                                  | S         | 1.25 |          |         | mA/V       |
| Amplification factor                                | $\mu$     | 100  |          |         |            |
| Internal resistance                                 | $R_i$     | 80   |          |         | k $\Omega$ |
| <u>Insulation resistance between electrodes</u>     | $R_{ins}$ |      | min. 100 | min. 50 | M $\Omega$ |
| Voltage between electrodes<br>$V = 100$ V           |           |      |          |         |            |
| <u>Leakage current between cathode and heater</u>   | $I_{kf}$  |      | max. 10  | max. 20 | $\mu$ A    |
| Voltage between cathode and heater $V_{kf} = 100$ V |           |      |          |         |            |

**CAPACITANCES** . Without external screen.  
Each system if applicable.

|                                   |              |     |    |
|-----------------------------------|--------------|-----|----|
| Anode to grid, cathode and heater | $C_{a/gkf}$  | 3.9 | pF |
| Anode to cathode and heater       | $C_{a/kf}$   | 0.4 | pF |
|                                   | $C_{a'/'kf}$ | 0.3 | pF |
| Grid to anode, cathode and heater | $C_{g/akf}$  | 3.7 | pF |
| Grid to cathode and heater        | $C_{g/kf}$   | 1.6 | pF |
| Anode to grid                     | $C_{ag}$     | 1.7 | pF |

**SHOCK AND VIBRATION RESISTANCE**

The following test conditions are applied to assess the mechanical quality of the tube. These conditions are not intended to be used as normal operating conditions.

Shock

The tube is subjected 5 times in each of 4 positions to an acceleration of 500 g supplied by an NRL shock machine with the hammer lifted over an angle of  $30^\circ$ .

**SHOCK AND VIBRATION RESISTANCE (continued)**Vibration

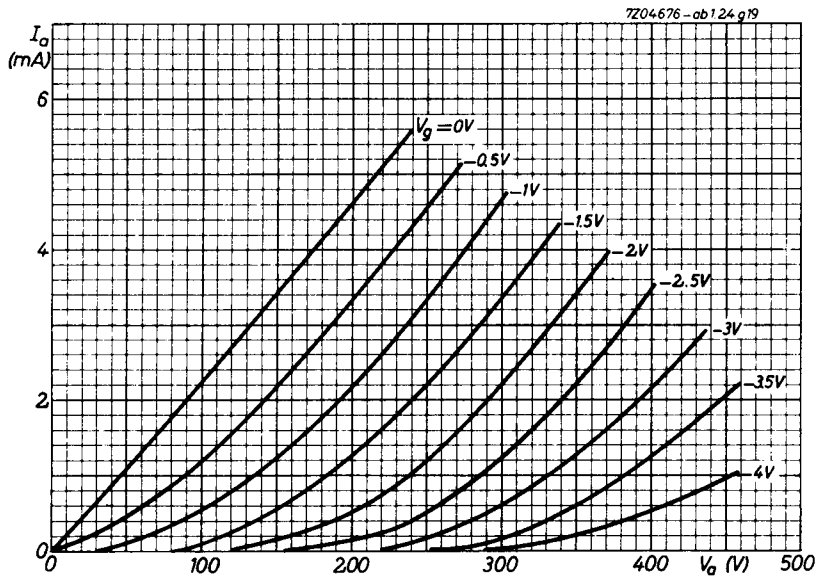
The tube is subjected during 32 hours in each of 3 positions to a vibration frequency of 50 Hz with an acceleration of 2.5 g.

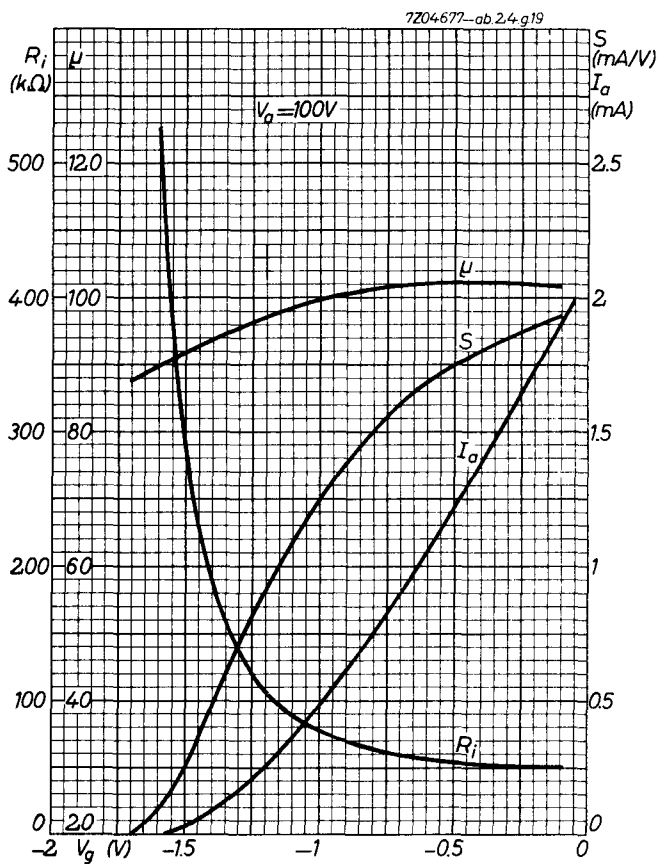
**LIFE**

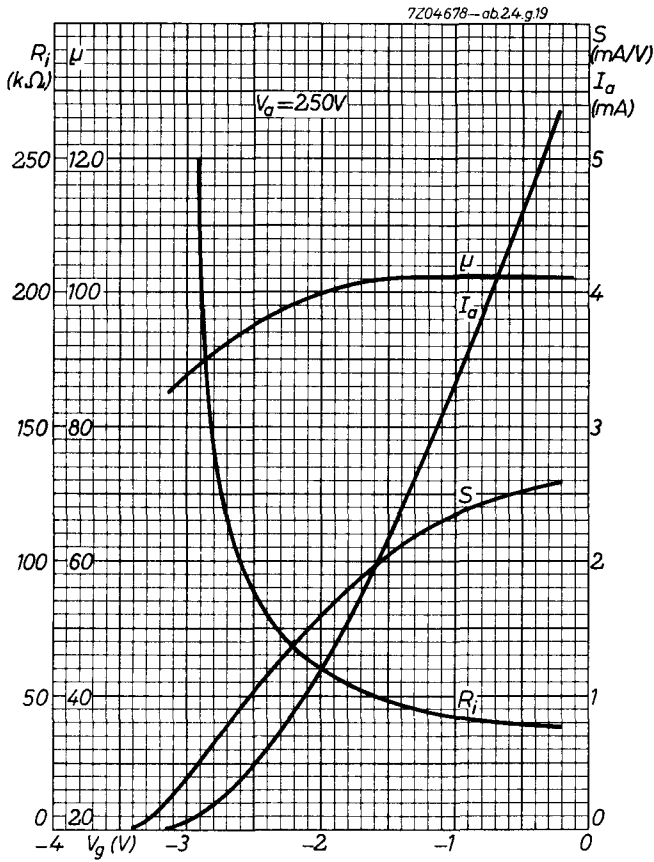
Production samples are tested to be within the end of life values (column III)

**LIMITING VALUES (Absolute max. rating system)**

|                                    |            |                   |
|------------------------------------|------------|-------------------|
| Anode voltage                      | $V_a$      | max. 330 V        |
| Anode dissipation                  | $W_a$      | max. 1.1 W        |
| Cathode current                    | $I_k$      | max. 20 mA        |
| Grid resistor with fixed bias      | $R_g$      | max. 1 M $\Omega$ |
| Voltage between cathode and heater | $V_{kf}$   | max. 100 V        |
| Bulb temperature                   | $t_{bulb}$ | max. 165 °C       |







# PHILIPS

## Data handbook



**Electronic  
components  
and materials**

### 12AX7S

| page | sheet | date       |
|------|-------|------------|
| 1    | 1     | 1968.12    |
| 2    | 2     | 1968.12    |
| 3    | 3     | 1968.12    |
| 4    | 4     | 1968.12    |
| 5    | 5     | 1968.12    |
| 6    | 6     | 1968.12    |
| 7    | FP    | 2001.04.19 |