ADVANCE DATA

The Sylvania Type 6943 is a subminiature sharp cutoff pentode designed for radio frequency amplifier service. This type is characterized by extraordinary freedom from interelement short circuits of short term duration, by high resistance to inter-element leakage, and by stable performance. In addition, vibrational output when the tube is subjected to wide band (White Noise) vibration is held to a very low value. It is suitable for service at high altitudes and where severe conditions of mechanical shock, vibration and high temperature are encountered. These characteristics give the type special value in guided missile applications.

MECHANICAL DATA

Bulb T-3
Base E8-10 Subminiature Button
Outline 3-11
Basing 8DC
Cathode Coated Unipotential
Mounting Position Any

RATINGS

Bulb Temperature (At Hottest Point) 250 °C Max.
Operational Altitude 80,000 Ft. Max.

DURABILITY CHARACTERISTICS

Impact Acceleration 100 G
Vibrational Acceleration for an Extended Period 10 G
On-Off Heater Cycles 2000

ELECTRICAL DATA

HEATER CHARACTERISTICS

Heater Voltage 6.3 V
Heater Current 175 mA
Heater-Cathode Voltage (Absolute Values) 200 V Max.

CONTROLLED DETRIMENTS

Interelectrode Insulation 250 Meg Min.
Total Grid Current -0.1 μA Max.
Grid Emission -0.5 μA Max.
Hum Output 15 mv pk-pk Max.
White Noise Vibration Output 350 mv pk-pk Max.
Heater-Cathode Leakage 50 mV rms

SYLVANIA ELECTRIC PRODUCTS INC.
RADIO TUBE DIVISION
EMPORIUM, PA.

Prepared and Released By The TECHNICAL PUBLICATIONS SECTION EMPORIUM, PENNSYLVANIA
May 6, 1957
DIRECT INTERELECTRODE CAPACITANCES

Grid No. 1 to Plate 0.015 μF Max.
Input: gl to (h+k+g2+g3+i.s.+e.s.)
Output: p to (h+k+g2+g3+i.s.+e.s.)

RATINGS (Absolute Values)

Heater Voltage Variation 6.3 ± 10% V Max.
Instantaneous Plate Voltage 360 V Max.
Plate Voltage 250 Vdc Max.
Grid No. 2 Voltage 150 Vdc Max.
Plate Dissipation 1.0 W Max.
Grid No. 2 Dissipation 0.33 W Max.
Positive Grid No. 1 Voltage 0 Vdc Max.
Negative Grid No. 1 Voltage 55 Vdc Max.
External Grid No. 1 Circuit Resistance 1.0 Meg Max.
Average Cathode Current 15 mA dc Max.

AVERAGE CHARACTERISTICS

Conditions:
Heater Voltage 6.3 V
Plate Voltage 100 Vdc
Grid No. 2 Voltage 100 Vdc
Grid No. 3 Voltage 0
Cathode Bias Resistor 150 Ohms
Plate Current 8.0 mA dc
Grid No. 2 Current 2.3 mA dc
Transconductance 3600 μmhos
Plate Resistance 300,000 Ohms
Grid No. 1 Voltage for Ib = 10 μA -7.5 Vdc
Grid No. 1 Voltage for Ib = 200 μA -5.5 Vdc

Operation Time (maximum) 20 secs

NOTES:

1. Limiting values beyond which normal tube life and normal tube performance may be impaired.

2. Tests performed as a measure of the mechanical durability of the tube structure.

3. Force as applied in any direction by the Navy Type High Impact (Flyweight) Shock Machine for Electronic Devices. Shock duration = 4 milliseconds.

4. Vibrational forces applied in any direction for a period of six hours repeatedly sweeping the range from 30 cps to 3000 cps and back, with the period of the sweep cycle being three minutes.
5. One cycle consists of the application of $E_f = 7.0\, V$ for one minute and interruption of the filament voltage for four minutes. A voltage of $E_{hk} = 140\, V_{ac}$ is applied continuously.

6. Measured with $E_f = 6.3\, V$, $E_p-all = -300\, V_{dc}$; $E_g2-all = -200\, V_{dc}$; $E_g1-all = -100\, V_{dc}$; cathode is positive so that no cathode emission occurs.

7. Measured with $E_f = 6.3\, V$; $E_b = E_c2 = 100\, V_{dc}$; $R_k = 150\, \Omega_{ms}$; $R_g1 = 1.0\, \Omega_{meg}$.

8. Preheated for five minutes with $E_f = 7.5\, V$; $E_b = 250\, V_{dc}$; $E_c2 = 150\, V_{dc}$; $R_k = 1000\, \Omega_{ms}$; $R_g1 = 1.0\, \Omega_{meg}$; then tested with $E_f = 7.5\, V$; $E_b = E_c2 = 100\, V_{dc}$; $E_c1 = -7.5\, V_{dc}$; $R_g1 = 1.0\, \Omega_{meg}$. This is a destructive test and therefore must be conducted on a sample basis.

9. Test with $E_f = 6.3\, V$ (400 cps), $E_b = E_c2 = 100\, V_{dc}$; $R_k = 150\, \Omega_{ms}$; $R_g2 = 30,000\, \Omega_{ms}$; $R_l = 10,000\, \Omega_{ms}$; measure the hum output across $R_l$ in the frequency band from 20 cps to 5000 cps.

10. Test with $E_f = 6.3\, V$; $E_b = E_c2 = 100\, V_{dc}$; $R_k = 150\, \Omega_{ms}$; $R_p = 10,000\, \Omega_{ms}$. The White Noise voltage across $R_p$ is filtered to roll off approximately 35 db between 10,000 cps and 13,000 cps and is then measured with both a peak to peak meter and an rms reading meter. The vibrational force applied to the tube under test is such that the instantaneous values of acceleration form a White Noise spectrum from 100 cps to 5000 cps. Energy within this spectrum is distributed such that each octave of bandwidth delivers 2.3 G's rms acceleration. The degree of clipping is such that peak values of acceleration exceed 15 G's.

11. Measured with $E_f = 6.3\, V$; $E_{hk} = \pm 100\, V_{dc}$.

12. Capacitances are measured with an external shield of 0.405" i.d.

13. Operation time is the time required for a tube to reach a value of plate current equal to 85% of that value attained after three minutes.
AVERAGE PLATE CHARACTERISTICS

\[ E_f = \text{RATED VALUE} \]

\[ E_{c2} = 100 \text{ VOLTS} \]

CURRENTS IN MA

PLATE VOLTAGE
CURRENTS in mA

PLATE VOLTAGE

Ef = RATED VALUE
Ec2 = 150 VOLTS

Ib Ec1 = 0 Volts
E_f = RATED VALUE
E_b = 100 VOLTS
E_c2 = 100 VOLTS

GRID NO. 1 VOLTAGE

CURRENTS IN MA

PLATE RESISTANCE (r_p) IN MEGOHMS

TRANSCONDUCTANCE (g_m) IN AMPS
$Eb = \text{RATED VALUE}$
$Eb = 150 \text{ VOLTS}$
$Ec2 = 150 \text{ VOLTS}$

**GRID NO. 1 VOLTAGE**

**PLATE RESISTANCE (rP) IN MEGOMS**

**CURRENTS IN MA**

**TRANS CONDUCTANCE (Gm) IN AMPS**

**GRID No. 1 VOLTAGE**