



X109 TRIODE-HEXODE FREQUENCY CHANGER

DESCRIPTION

Type X109 is a triode-hexode mounted on the B9A miniature base and is intended for series heater operation in DC/AC equipments. It is suitable for use at frequencies up to 100 Mc/s.

RATINGS

| | | | | | | | | |
|-----------------------------|-----|-----|-----|-----|-----|-----|------|------------|
| Heater Current | ... | ... | ... | ... | ... | ... | 0.1 | amp |
| Heater Voltage | ... | ... | ... | ... | ... | ... | 19 | volts |
| Hexode Anode Voltage | ... | ... | ... | ... | ... | ... | 250 | max. volts |
| Screen Grid Voltage | ... | ... | ... | ... | ... | ... | 100 | max. volts |
| Triode Anode Voltage | ... | ... | ... | ... | ... | ... | 100 | max. volts |
| Cathode Current | ... | ... | ... | ... | ... | ... | 20 | mA |
| Optimum Triode Grid Voltage | ... | ... | ... | ... | ... | ... | 10 | peak volts |
| Triode Amplification Factor | ... | ... | ... | ... | ... | ... | 22* | |
| Triode Mutual Conductance | ... | ... | ... | ... | ... | ... | 2.8* | mA/V |

* Measured at $V_{at} = 100$, $V_{gt} = 0$, $I_{at} = 10$ mA.

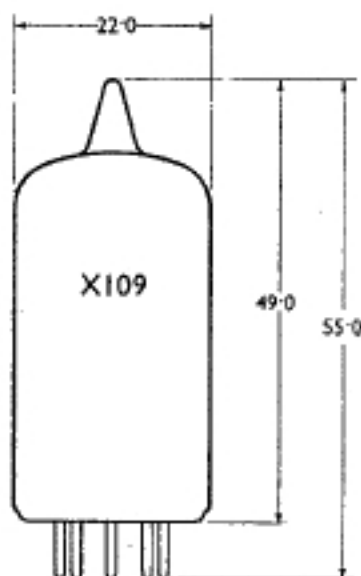
Capacitances (measured on unshielded valve) :

| | | | | | | | |
|--|-----|-----|-----|-----|-----|------|------------|
| Control Grid to Hexode Anode | ... | ... | ... | ... | ... | 0.11 | approx. pF |
| Control Grid to Triode Anode | ... | ... | ... | ... | ... | 0.08 | " " |
| Control Grid to Triode Grid | ... | ... | ... | ... | ... | 0.22 | " " |
| Triode Grid to Triode Anode | ... | ... | ... | ... | ... | 1.48 | " " |
| Control Grid to all other electrodes | ... | ... | ... | ... | ... | 4.1 | " " |
| Triode Anode to all other electrodes (triode grid earthed) | ... | ... | ... | ... | ... | 1.5 | " " |
| Triode Grid to all other electrodes (triode anode earthed) | ... | ... | ... | ... | ... | 5.47 | " " |
| Hexode Anode to all other electrodes | ... | ... | ... | ... | ... | 4.34 | " " |

OPERATING CONDITIONS

| | | | | | | | | |
|----------------------|-----|-----|-----|-----|-----|-----|-----|------------|
| Hexode Anode Voltage | ... | ... | ... | ... | ... | ... | 175 | volts |
| Screen Grid Voltage | ... | ... | ... | ... | ... | ... | 75 | volts |
| Triode Anode Voltage | ... | ... | ... | ... | ... | ... | 100 | volts |
| Triode Grid Voltage | ... | ... | ... | ... | ... | ... | 10 | peak volts |
| Control Grid Voltage | ... | ... | ... | ... | ... | ... | 0 | volts |
| Hexode Anode Current | ... | ... | ... | ... | ... | ... | 4.3 | mA |
| Screen Grid Current | ... | ... | ... | ... | ... | ... | 3.6 | mA |

DIMENSIONS



BASE



View looking on underside of base.

B9A

- Pin 1: Screen Grid
- 2: Control Grid
- 3: Cathode
- 4: Heater
- 5: Heater
- 6: Hexode Anode
- 7: Triode Grid
- 8: Triode Anode
- 9: I.C.

I.C. indicates that no external connection should be made to this pin.

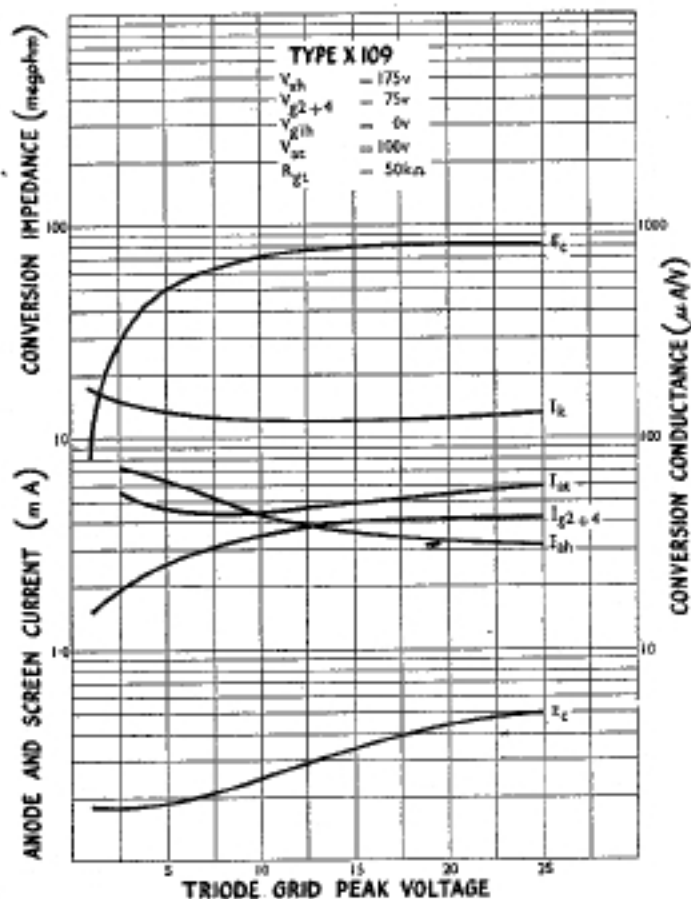
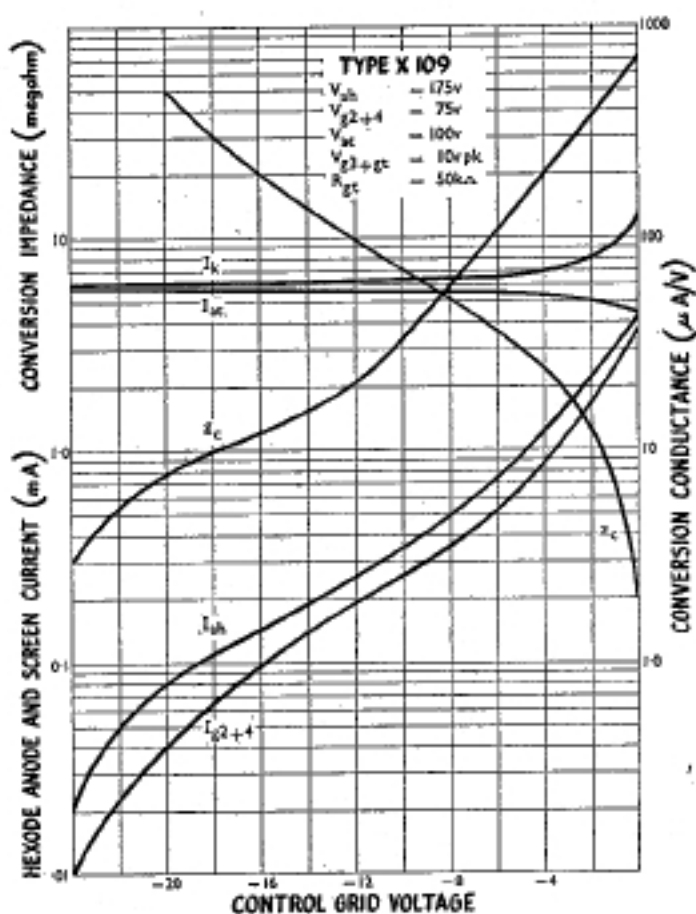
All dimensions are in mm. and are the maximum except where otherwise stated.

TYPE X109

OPERATING CONDITIONS—continued

| | | | |
|---|-----|---------|-----------------|
| Triode Anode Current | ... | 4.5 | mA |
| Conversion Conductance | ... | 710 | $\mu\text{A/V}$ |
| Conversion Impedance | ... | 0.25 | megohm |
| Triode Grid Resistor | ... | 0.05 | megohm |
| Equivalent Noise Resistance† | ... | 150,000 | ohms |
| Input Impedance at 45 Mc/s | ... | 3,600 | ohms |
| Control Grid to Cathode Capacitance at 45 Mc/s. | ... | 6.0 | pF |

† Referred to Control Grid.



KEY TO SYMBOLS.

- Z_c Conversion Impedance.
- g_c Conversion Conductance.
- I_{ah} Hexode Anode Current.
- I_{g2+4} Screen Grid Current.
- I_{at} Triode Anode Current.
- V_{g3+gt} Triode Grid Voltage

CHARACTERISTIC CURVES OF AVERAGE VALVE