



ELECTRONIC TUBE REFERENCE

152

Power - Triode electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

TRIODE

Three-electrode transmitting triode for Class B/C RF power amplification, Class C oscillator operation, and Class B modulation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	10 V / 3.25 A	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Triode	
TRANSCONDUCTANCE	0.004 S
AMPLIFICATION FACTOR	25
MAXIMUM PLATE VOLTAGE	1500 V
MAXIMUM PLATE DISSIPATION	125 W
Representative electrical section; promoted values mapped from published ratings and characteristics where applicable.	

152 — Three-Electrode Transmitting Triode

The **GL-152** is a three-electrode transmitting triode designed for high-power applications. It is engineered for use as a Class B and Class C radio-frequency power amplifier, a Class C oscillator, or a Class B audio-frequency modulator. The tube is capable of operating at its full maximum ratings at frequencies up to 15 megacycles, and can be operated at reduced ratings at frequencies up to 60 megacycles.

Mechanical and Physical Specifications

The GL-152 is a convection-cooled tube designed to operate in environments with a maximum ambient temperature of 60 degrees centigrade. It has a substantial physical profile, with a net weight of approximately 14 ounces.

Dimensions and Mounting

- **Maximum Diameter:** 2-3/4 inches
- **Maximum Overall Length:** 9-1/2 inches
- **Mounting Position:** The tube can be mounted vertically with the base either up or down. It may also be mounted horizontally, provided the filament is oriented in a vertical plane.

Terminals and Connections

The tube features separate terminal connections at both ends of its glass envelope to ensure high-voltage isolation:

- **Anode (Plate) Terminal:** Located at the top of the envelope, utilizing a Base #3917 cap.
- **Grid and Filament Terminals:** Located at the bottom of the tube, utilizing a Base #4310 configuration. The grid terminal and filament terminals are positioned on the bottom pins, with the plane of the internal elements oriented at a 45-degree angle relative to the pin layout.

Electrical and Filament Characteristics

The GL-152 features a filamentary cathode designed for direct heating.

Filament Ratings

- **Filament Voltage:** 10 volts (D-C or A-C)
- **Filament Current:** 3.25 amperes
- **Calculated Filament Power:** 32.5 watts (calculated as $10\text{ V} \times 3.25\text{ A}$)

Average Characteristics

- **Amplification Factor:** 25
- **Grid-Plate Transconductance:** 4000 micromhos

Direct Interelectrode Capacitances

- **Grid-to-Plate (C_{gp}):** 8.4 pF (picofarads)
- **Grid-to-Filament (C_{gf}):** 7.5 pF (picofarads)
- **Plate-to-Filament (C_{pf}):** 3.9 pF (picofarads)

Operating Conditions and Maximum Ratings

The GL-152 can be configured for several distinct classes of service. The maximum ratings and typical operating conditions for these configurations are detailed below.

Class B Audio-Frequency Power Amplifier (Two Tubes)

In this configuration, ratings are averaged over any audio-frequency cycle.

Parameter	Typical Operation (2 Tubes)	Maximum Ratings (Per Tube)
D-c plate voltage	1250 V	1500 V
D-c grid voltage	-40 V	—
Zero signal d-c plate current	16 mA	—
Max signal d-c plate current	320 mA (combined)	175 mA
D-c max signal plate input	—	250 W
Plate dissipation	—	125 W
Effective load (plate-to-plate)	8400 Ω	—
Max signal plate power output	250 W (approx)	—

Class B Radio-Frequency Power Amplifier

These carrier conditions are specified per tube for use with a maximum modulation factor of 1.0.

Parameter	Typical Operation	Maximum Ratings
D-c plate voltage	1250 V	1500 V
D-c grid voltage	-40 V	—
D-c plate current	132 mA	175 mA
Plate input	—	200 W
Plate dissipation	—	125 W
Plate power output	55 W (approx)	—

Class C Radio-Frequency Power Amplifier and Oscillator (Plate Modulated)

These carrier conditions are specified per tube for use with a maximum modulation factor of 1.0.

Parameter	Typical Operation	Maximum Ratings
D-c plate voltage	1000 V	1250 V
D-c grid voltage	-200 V	-400 V
D-c plate current	160 mA	175 mA
D-c grid current	30 mA (approx)	60 mA (approx)
Plate input	—	220 W
Plate dissipation	—	80 W
Plate power output	100 W	—

Class C Radio-Frequency Power Amplifier and Oscillator (Unmodulated)

These key-down conditions are specified per tube without modulation. Essentially negative modulation may be used if the positive peak of the audio-frequency envelope does not exceed 115 percent of the carrier conditions.

Parameter	Typical Operation	Maximum Ratings
D-c plate voltage	1250 V	1500 V
D-c grid voltage	-150 V	-400 V
D-c plate current	180 mA	200 mA
D-c grid current	30 mA (approx)	60 mA (approx)
Plate input	—	300 W
Plate dissipation	—	125 W
Plate power output	150 W (approx)	—

High-Frequency Operation and Derating

When operating the GL-152 at frequencies above 15 megacycles, the maximum values of plate voltage and power input must be reduced to prevent damage and ensure reliable operation. Other maximum ratings remain unchanged. Special attention must be given to providing adequate ventilation of the bulb at these elevated frequencies.

The table below outlines the highest permissible percentage of maximum plate voltage and plate input for various classes of service up to 60 megacycles:

Frequency	15 Mc	30 Mc	60 Mc
Class B	100%	85%	69%
Class C (Plate Modulated)	100%	75%	50%
Class C (Unmodulated)	100%	75%	50%

Characteristic Curves and Interpretation

The electrical behavior of the GL-152 is illustrated by its transfer and plate characteristics under direct-current filament operation ($E_f = 10$ V D-C).

Plate-Grid Transfer Characteristics

The plate-grid transfer curves map grid current in milliamperes against plate voltage in volts across a range of positive grid voltages (E_c) from +25 V to +150 V. These curves show that at lower plate voltages, grid current rises significantly as the grid becomes more positive, peaking sharply before tapering off as plate voltage increases. For instance, at a positive grid voltage of +150 V, the grid current reaches its highest levels when the plate voltage is below 200 V, demonstrating the partition of current between the grid and plate when the plate potential is relatively low.

Average Plate Characteristics

The average plate characteristics map plate current in amperes against plate voltage in volts. The curves cover grid voltages ranging from positive values (+150 V down to +25 V), through zero bias ($E_c = 0$), to negative bias values (-25 V down to -75 V). These curves illustrate the triode's high power-handling capability:

- At positive grid voltages, the plate current rises rapidly even at low plate voltages, reaching currents of 0.8 amperes at $E_c = +150$ V.
- At negative grid voltages, the plate current curves shift to the right, requiring higher plate voltages to initiate conduction, which is typical for a medium-mu triode with an amplification factor of 25.

Technical Summary

The **GL-152** is a robust, convection-cooled transmitting triode featuring a 10 V, 3.25 A filamentary cathode and an amplification factor of 25. It is designed for high-power RF amplification, oscillation, and Class B modulation. The tube is rated for full-power operation up to 15 megacycles, with defined derating schedules extending up to 60 megacycles. With its physical separation of the anode terminal at the top cap and grid/filament terminals at the base, the GL-152 provides reliable high-voltage isolation and high power output across a variety of transmitter and modulator configurations.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 General Electric Transmitting Types

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1950 GENERAL ELECTRIC TRANSMITTING TYPES

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum signal plate input per tube	250 W	ClassB Audio
Maximum signal plate power output	250 W	ClassB Audio

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