



ELECTRONIC TUBE REFERENCE

150C4

Voltage Regulator electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

VOLTAGEREGULATOR

Gas-filled 150 V voltage stabilizer for approximately 5–30 mA operation, with only a few volts regulation change across its working range.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	7
NOMINAL HEATER	— / —	PARALLEL HEATER	— / —
HEATING	Indirect; cold cathode	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Voltage Regulator	
REGULATOR VOLTAGE	150 V
MINIMUM REGULATOR CURRENT	5 mA
MAXIMUM REGULATOR CURRENT	30 mA
STARTING VOLTAGE	185 V
MAINTAINING VOLTAGE	150 V
<i>Gas-discharge device.</i>	

150C4 — Gas-Filled Voltage Stabilising Tube

A cold-cathode, gas-filled voltage stabiliser designed to provide a constant 150 V output over a wide range of operating currents.

Overview

The **150C4** is a gas-filled voltage stabilising tube engineered to maintain a stable direct voltage of approximately 150 V. It operates over a cathode current range of 5.0 to 30 mA, offering a nominal regulation voltage of 3 V. The tube is designed for reliable voltage regulation in electronic equipment, maintaining its performance characteristics both initially and throughout its operating life.

Construction, Physical Dimensions, and Base Pinout

The 150C4 is constructed in a compact glass envelope utilizing a miniature **B7G** seven-pin base. The physical dimensions of the tube are specified as follows:

- **Maximum overall height:** 67.5 mm
- **Maximum seated height:** 60.5 mm
- **Maximum bulb diameter:** 19 mm

The B7G base connections provide multiple pins for the anode and cathode electrodes, which can be utilized for circuit strapping or safety interlocking. The pinout configuration, viewed from the bottom of the base, is as follows:

Pin	Connection
Pin 1	Anode (a)
Pin 2	Cathode (k)
Pin 3	Internal Connection (IC)
Pin 4	Cathode (k)
Pin 5	Anode (a)
Pin 6	Internal Connection (IC)
Pin 7	Cathode (k)

The internal connections (pins 3 and 6) must not be used for external circuit connections other than those specified by the equipment design guidelines.

Ignition and Maintaining Characteristics

To initiate conduction, the voltage applied to the 150C4 must exceed its ignition threshold. The minimum voltage necessary for ignition is highly dependent on the presence of ambient light:

- **In some ambient light:** A minimum of 185 V is required.
- **In complete darkness:** A minimum of 225 V is required.

The nominal ignition delay time is 10 seconds. The dark ignition delay time is statistically distributed; the probability of the tube igniting within a given timeframe increases as the applied supply voltage is

increased.

Once ignited, the tube exhibits a stable maintaining (or burning) voltage. The maintaining voltage varies slightly depending on the operating current and the age of the tube:

- **Initial maintaining voltage (at 30 mA):** 156 V to 158 V maximum.
- **Initial maintaining voltage (at 5.0 mA):** 142 V to 143 V minimum.
- **Maintaining voltage over life (at 30 mA):** 156 V to 161 V maximum.
- **Maintaining voltage over life (at 5.0 mA):** 139 V minimum.

Regulation and Life Performance

The regulation voltage represents the change in maintaining voltage when the cathode current is varied across its full operating range of 5.0 to 30 mA.

- **Initial regulation voltage:** Typically 3.0 V, with a maximum limit of 5.0 V.
- **Regulation voltage over life:** Typically 3.0 V, with a maximum limit of 8.0 V.

The long-term stability of the maintaining voltage depends on the operating current:

- **Continuous operation at 30 mA:** Over 1,000 hours of life at room temperature, the maximum variation in maintaining voltage ranges from +1.5% to -5%, with an average variation of $\pm 1\%$.
- **Operation at an average current of 17.5 mA:** Over 1,000 hours of life, the typical variation in burning voltage is 1.0%, with a maximum variation of 3.0%.

Absolute Maximum Ratings

To ensure reliable operation and prevent premature failure, the 150C4 must be operated within its absolute maximum ratings:

Parameter	Rating
Maximum continuous cathode current	30 mA
Minimum cathode current	5.0 mA
Maximum surge (starting) current	75 mA
Maximum negative anode voltage	125 V
Maximum ambient temperature limits	-55 to +90 °C
Minimum bulb temperature (at $I_k = 0$ mA)	-55 °C
Maximum bulb temperature (for operation)	+150 °C
Maximum bulb temperature (for storage)	+100 °C

The maximum surge current of 75 mA is a transient rating and must be restricted for long tube life to approximately 30 seconds in each 8 hours of use.

Technical Summary

The **150C4** is a B7G-based, gas-filled voltage stabilising tube designed to maintain a stable 150 V reference. It supports a continuous cathode current range of 5.0 to 30 mA, with a typical regulation voltage of 3.0 V. The tube requires an ignition voltage of at least 185 V in ambient light and up to 225 V in complete darkness. With its robust thermal ratings and multiple electrode pin connections, the 150C4 provides dependable voltage regulation in professional and industrial electronic applications.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Mullard

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

1963 MULLARD

Section 1 · Voltage Regulator

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition voltage minimum - ambient light	185 V	—
Ignition voltage minimum - complete darkness	225 V	—
Burning current maximum	30 mA	—
Burning current minimum	5 mA	—
Starting current maximum	75 mA	—
Negative anode voltage maximum	125 V	—

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Burning voltage maximum at 30 mA initial	158 V	—
Burning voltage maximum at 30 mA over life	161 V	—
Burning voltage minimum at 5 mA initial	142 V	—
Burning voltage minimum at 5 mA over life	139 V	—
Burning-voltage difference maximum initial	5 V	—
Burning-voltage difference maximum over life	8 V	—
Burning-voltage difference typical	3 V	—
Burning-voltage life variation maximum	3 %	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Burning-voltage life variation typical	1 %	—

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	150 V gas voltage stabilization	—



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1971 Mullard Gas Filled Tubes

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

1971 MULLARD GAS FILLED TUBES

Section 1 · Voltage Regulator

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maintaining voltage	150 V	—
Regulation voltage	3 V	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition/striking voltage	185 V	—
Minimum cathode current	5 mA	—
Maximum cathode current	30 mA	—