ELECTRONIC INNOVATIONS IN ACTION

TUBES

—PRODUCT INFORMATION—

Diode

1BC2-B

FOR TV HIGH-VOLTAGE RECTIFIER APPLICATIONS

- MONOCHROME TV TYPE
- 15000 VOLTS DC
- 0.5 MILLIAMPERES DC
- X-RADIATION RATING

The 1BC2-B is a filamentary diode designed for use in the television receivers as the high-voltage rectifier to supply power to the anode of the television picture tube. It is primarily intended for use in flyback types of power supplies.

Features of the 1BC2-B include built-in X-radiation shielding and additional design and specification controls to reduce the X-radiation output to very low levels even under conditions of equipment misadjustment and/or circuit failure mode operation.

GENERAL

ELECTRICAL

Cathode - Coated Filament

Filament Characteristics and Ratings

Filament Voltage, AC or DC*	1.25 ± 0.2	Volts
Filament Current●	0.2	Amperes

Direct Interelectrode Capacitances, approximate▲

Plate to Filament: (p to f + i.s.)	1.0	pf

MECHANICAL

Operating Position - Any
Envelope - T-6½, Glass
Base - E9-1, Miniature Button 9-Pin
Top Cap - C1-2 or C1-45, Skirted Miniature
Outline Drawing - EIA 6-18

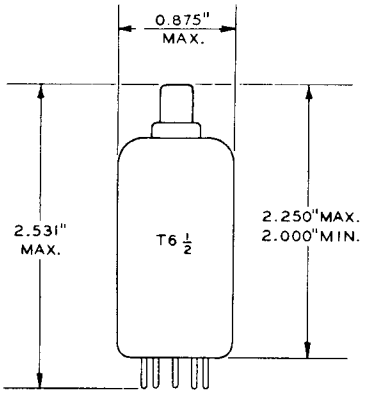
Maximum Diameter	0.875	Inches
Maximum Over-all Length	2.531	Inches
Maximum Seated Height	2.250	Inches
Minimum Seated Height	2.000	Inches

MAXIMUM RATINGS

FLYBACK RECTIFIER SERVICE♦—DESIGN-MAXIMUM VALUES UNLESS OTHERWISE STATED

Peak Inverse Plate Voltage		
DC Component (Absolute-Maximum Value)	15000	Volts
Total DC and Peak (Absolute-Maximum Value)§	18000	Volts
Steady-State Peak Plate Current	45	Milliamperes
DC Output Current	0.5	Milliamperes
Filament Voltage, AC or DC (Absolute-Maximum Value)§	1.45	Volts
Filament Voltage, AC or DC (Absolute-Minimum Value)	1.05	Volts

PHYSICAL DIMENSIONS

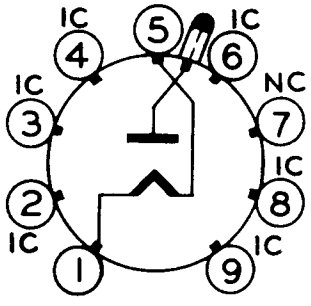


EIA 6-18

TERMINAL CONNECTIONS ⊕

Pin 1 - Filament and Internal Shield
Pin 2 - Internal Connection - Do Not Use
Pin 3 - Internal Connection - Do Not Use
Pin 4 - Internal Connection - Do Not Use
Pin 5 - Filament
Pin 6 - Internal Connection - Do Not Use
⊕ Pin 7 - No Connection
Pin 8 - Internal Connection - Do Not Use
Pin 9 - Internal Connection - Do Not Use
Cap - Plate

BASING DIAGRAM



EIA 9RG

MAXIMUM RATINGS (Cont'd)

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making allowance for the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all other electron devices in the equipment.

Absolute-Maximum ratings are limiting values of operating and environmental conditions applicable to any electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making no allowance for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

The equipment manufacturer should design so that initially and throughout life no absolute-maximum value for the intended service is exceeded with any tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

AVERAGE CHARACTERISTICS

Tube Voltage Drop, approximate
Ib = 7.0 Milliamperes ..... 80 Volts

X-RADIATION RATING♦

MAXIMUM RATED OPERATING CONDITIONS

Total DC and Peak Inverse Voltage	Maximum X-Radiation Output
§18 KV	0.5 mR/hr

Based on accumulated sample test data taken initially and during life test, tubes do not exceed the maximum rating limit of 0.5 mR/hr at any time throughout their useful life, when operated within the maximum ratings, including filament voltage, specified on this data sheet.

This X-radiation maximum rating is based on the use of the Victoreen 440 RF/C survey meter as the standard instrument for X-radiation measurement. X-radiation is measured with the plastic spacer of the 440 RF/C survey meter at a distance of four (4) inches from the external surface of the tube under test. This rating information is not necessarily applicable when a different radiation measuring instrument is used.

Operation at voltages outside of the Absolute-Maximum Ratings will cause permanent damage to the tube resulting in short life and/or catastrophic failure. Any tube known to have operated above 18 KV peak inverse voltage and/or 1.45 V filament voltage should be replaced with the latest version of the same tube type.

The X-radiation characteristics are measured in accordance with JEDEC Publication No. 67A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes," and controlled in accordance with JEDEC Publication No. 73A, "Recommended Practice for Quality Control of X-Radiation from High Voltage Rectifier and Shunt Regulator Receiving Tubes."

The General Electric Company makes no representation concerning the X-radiation output from these tubes when operated beyond the maximum ratings set forth herein, except as noted under "X-Radiation Characteristics."

X-RADIATION CHARACTERISTICS

EQUIPMENT MISADJUSTMENT AND/OR CIRCUIT FAILURE MODE OPERATION

The 1BC2-B will produce varying levels of X-radiation depending upon operating conditions. Based on known attenuation factors of tube construction materials and accumulated sample test data taken initially and during life test, X-radiation output is not expected to exceed the indicated value under equipment misadjustment and/or circuit failure mode operations of plate and filament voltage listed below.

Total DC and Peak Inverse Voltage	Maximum Filament Voltage	Maximum Expected X-Radiation Output
§20 KV	§1.8 V	0.5 mR/hr

The General Electric Company makes no representation concerning the X-radiation output from these tubes when operated with total DC and peak inverse voltage above 20 KV, or with filament voltage above 1.8 V.

Operation at voltages outside of the Absolute-Maximum Ratings will cause permanent damage to the tube resulting in short life and/or catastrophic failure. Any tube known to have operated above 18 KV peak inverse voltage and/or 1.45 V filament voltage should be replaced with the latest version of the same tube type.

WARNING

X-RADIATION

X-radiation in excess of 0.5 mR/hr may constitute a health hazard on prolonged exposure at close range. Therefore, equipment design must provide for adequate shielding.

Operation of the 1BC2-B with total DC and peak inverse voltage greater than 20 KV may result in radiation in excess of the "Maximum Expected X-Radiation Output" listed under "X-Radiation Characteristics."

Precautions must be exercised during the servicing of the equipment employing the 1BC2-B to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

SHOCK HAZARD

The high voltages at which the 1BC2-B is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of and in the servicing and adjustment of any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 1BC2-B in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while connecting or disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

NOTES

* The equipment designer should design the equipment so that filament voltage is centered at the specified bogey value, with filament supply variations restricted to maintain filament voltage within the specified tolerance.

• Filament current of a bogey tube at Ef = 1.25 volts.

▲ Without external shield.

– May be used as a tie-point for filament dropping resistor or may be connected to filament. Do not connect to any other circuits.

♦ For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.

CAUTION - Operation at voltages outside of the Absolute-Maximum Ratings will cause permanent damage to the tube resulting in short life and or catastrophic failure. Any tube known to have operated above 18 KV peak inverse voltage and 1.45 V filament voltage should be replaced with the latest version of the same type.

TUBE PRODUCTS DEPARTMENT
Owensboro, Kentucky 42301

GENERAL ELECTRIC