



ELECTRONIC TUBE REFERENCE

1B49

Specialized - Switching Tube electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

SPARKGAPPULSESWITCH

Gas-filled cold-cathode series spark gap for high-voltage pulse switching. Its discharge action provides rapid conduction in pulse-forming and high-energy switching circuits.

GENERAL CHARACTERISTICS

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

SECTION RATINGS

SECTION1 SparkGapPulseSwitch	
MAXIMUM CATHODE CURRENT	450 mA
STARTING VOLTAGE	12000 V
MAINTAINING VOLTAGE	100 V
<i>Published electrical limits promoted from the source. Passive microwave reference cavities have their electrical frequency/Q values in TUBE_SECTION_PARAMETER because no applicable promoted frequency field exists in the fixed section schema.</i>	

1B49 Series Spark Gap

The **1B49** is a gas-filled series spark gap containing two electrodes. It is designed to operate within a frequency range of 120 to 2000 Cycles/Sec.

Physical Construction and Mounting Requirements

The 1B49 is a two-electrode device utilizing gas as its ionizable medium.

The physical dimensions of the 1B49 are:

- **Overall Height:** 5" $\pm$ 1/8"
- **Maximum Body Diameter:** 2-3/8"
- **Cathode Terminal (Top):** Diameter of 1.238" (+0.025" / -0.015") and a length of 21/32" $\pm$ 1/32"
- **Anode Terminal (Bottom):** Diameter of 0.566" $\pm$ 0.015" and a length of 9/16" $\pm$ 1/32"

For proper installation, the mounting position of the 1B49 must be with the **Cathode End Up** and within **60° of vertical**.

Electrical Characteristics

The electrical characteristics of the 1B49 are defined by the following parameters:

- **Frequency Range:** 120 to 2000 Cycles/Sec
- **Instantaneous Breakdown Voltage (Initial Peak):** 12.0 Kilovolts
- **Instantaneous Breakdown Voltage (Recurrent Peak):** 11.5 Kilovolts
- **Voltage Drop:** 100 Volts, measured after 0.5 Microseconds
- **Interelectrode Capacitance:** 7 Micro Microfarads

Maximum Ratings and Operating Limits

The maximum ratings for the 1B49 are:

- **Peak Power Dissipation:** 45 Kilowatts
- **Peak Current:** 450 Amperes
- **Average Power Dissipation:** 25 Watts
- **Average Current:** 210 Milliamps
- **Frequency:** 2000 Cycles/Sec
- **Ambient Temperature Range:** -50 to +100°C
- **Duty Cycle:** 0.001

Calculated Operating Relationships

The relationship between the peak and average ratings can be analyzed mathematically using the specified maximum duty cycle of 0.001:

- **Power Dissipation Calculation:** Operating at the maximum peak power dissipation of 45 Kilowatts with a duty cycle of 0.001 yields a calculated average power dissipation of: $45,000 \text{ W} \times 0.001 = 45 \text{ Watts}$ Because the maximum average power dissipation rating is restricted to 25 Watts, the average power dissipation limit is the overriding constraint.
- **Current Calculation:** Operating at the maximum peak current of 450 Amperes with a duty cycle of 0.001 yields a calculated average current of: $450 \text{ A} \times 0.001 = 0.450 \text{ Amperes}$ (450 Milliamps) Because the maximum average current rating is restricted to 210 Milliamps, the operating parameters must be adjusted to avoid exceeding this limit.

Technical Summary

The **1B49** is a gas-filled series spark gap featuring a two-electrode configuration. It operates within a frequency range of 120 to 2000 Cycles/Sec, with an initial peak breakdown voltage of 12.0 Kilovolts and a recurrent peak breakdown voltage of 11.5 Kilovolts. The device exhibits a voltage drop of 100 Volts measured after 0.5 Microseconds and has an interelectrode capacitance of 7 Micro Microfarads.

Mechanically, the 1B49 must be mounted with the cathode end up and within 60° of vertical. Its physical dimensions include an overall height of $5" \pm 1/8"$, a maximum body diameter of $2-3/8"$, a top cathode terminal, and a bottom anode terminal. The device is rated for a maximum peak power dissipation of 45 Kilowatts, a peak current of 450 Amperes, an average power dissipation of 25 Watts, an average current of 210 Milliamps, and a maximum duty cycle of 0.001, within an ambient temperature range of -50 to +100°C.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1947 Westinghouse

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

1947 WESTINGHOUSE

Section 1 · SparkGapPulseSwitch

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MaximumCurrent	450 mA	—
BreakdownOrStartingVoltage	12000 V	—
PeakPowerDissipation	45000 W	Pulse
AveragePowerDissipationMaximum	25 W	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MaintainingOrVoltageDrop	100 V	—
RecurrentBreakdownVoltage	11500 V	—