



ELECTRONIC TUBE REFERENCE

1B45

Specialized - Switching Tube electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

SPARKGAPPULSESWITCH

Gas-filled cold-cathode series spark gap for high-voltage pulse switching. Ionization produces abrupt conduction for discharging pulse-forming networks and related high-energy 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	15500 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>	

1B45 Series Spark Gap Tube

Overview

The **1B45** is a gas-filled, two-electrode series spark gap tube designed for high-power pulse applications. Operating within a frequency range of 120 to 2000 cycles per second, the device functions as a high-voltage, high-current switch. It utilizes an ionizable gas medium between its two electrodes to initiate and conduct rapid electrical discharges under controlled breakdown conditions.

Physical Construction and Mounting

The 1B45 features a robust physical design to accommodate high-voltage operation and thermal dissipation. It is a two-electrode device with distinct top and bottom terminals.

Dimensions and Terminals

- **Overall Height:** $5" \pm 1/8"$
- **Maximum Body Diameter:** 2-3/8" Max.
- **Cathode Terminal (Top):** Located at the top of the tube, with a diameter of 1.238" (+.025", -.015") and a length of $21/32" \pm 1/32"$.
- **Anode Terminal (Bottom):** Located at the bottom of the tube, with a diameter of $0.566" \pm .015"$ and a length of $9/16" \pm 1/32"$.

Mounting Orientation

To ensure proper operation and containment of the ionizable gas medium, the 1B45 must be mounted in a specific orientation. The tube must be positioned with the **cathode end up** and maintained within **60° of vertical**.

Electrical Characteristics and Operating Parameters

The electrical behavior of the 1B45 is defined by its rapid transition from a non-conducting state to a highly conductive state when the breakdown voltage is reached.

- **Frequency Range:** 120 to 2000 Cycles/Sec.
- **Instantaneous Breakdown Voltage:**
 - **Initial Peak:** 15.5 Kilovolts
 - **Recurrent Peak:** 15.0 Kilovolts
- **Voltage Drop:** Once breakdown occurs, the voltage drop across the tube falls to 100 Volts, measured 0.5 microseconds after initiation.
- **Interelectrode Capacitance:** The electrostatic capacitance between the two electrodes is 7 Micro Microfarads.

Maximum Ratings and Environmental Limits

To prevent damage and ensure reliable operation, the 1B45 must be operated within strictly defined maximum limits. These ratings are based on a maximum duty cycle of 0.001.

Parameter	Maximum Rating
Peak Power Dissipation	45 Kilowatts
Peak Current	450 Amperes
Average Power Dissipation	25 Watts

Parameter	Maximum Rating
Average Current	210 Milliamps
Operating Frequency	2000 Cycles/Sec.
Ambient Temperature Range	-50 to +100°C
Duty Cycle	0.001

The low duty cycle of 0.001 allows the tube to handle extremely high peak power (45 kW) and peak current (450 A) while keeping the average power dissipation at a modest 25 W and average current at 210 mA.

Technical Summary

The **1B45** is a specialized gas-filled series spark gap tube designed for high-voltage switching. Featuring a two-electrode configuration with a top cathode terminal and a bottom anode terminal, it operates at frequencies up to 2000 cycles per second. The tube is characterized by an initial peak breakdown voltage of 15.5 kilovolts, a recurrent peak breakdown voltage of 15.0 kilovolts, and a low post-breakdown voltage drop of 100 volts. It is rated for peak currents up to 450 amperes and peak power dissipation of 45 kilowatts under a 0.001 duty cycle, requiring vertical or near-vertical mounting with the cathode end up.

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	15500 V	—
PeakPowerDissipation	45000 W	Pulse
AveragePowerDissipationMaximum	25 W	—
Duty Cycle Maximum	0.001	Pulse

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MaintainingOrVoltageDrop	100 V	—
RecurrentBreakdownVoltage	15000 V	—

TUBE TINKER

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