

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
MICROWAVETR SWITCH

1B40

Specialized - Switching Tube electronic tube

Argon-filled separate-cavity microwave gas switch for pulsed transmitter/receiver switching and protection service.

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

SECTION 1 MicrowaveTRSwitch
<i>No fixed ratings recorded.</i>
<i>Argon-filled microwave gas-switching tube; ignition, keep-alive, leakage and insertion-loss data retained as parameters.</i>

1B40 — Argon-Filled Gas Switching Tube

Overview

The **1B40** is an argon-filled gas switching tube of the separate cavity type. It is designed for high-frequency switching applications, utilizing a single ignitor to establish a keep-alive discharge. The device was classified as obsolete as of October 15, 1947.

Electrical and RF Characteristics

The electrical operation of the 1B40 is defined by its ignition threshold, keep-alive current limits, and high-frequency transmission performance.

Keep-Alive and Ignition Parameters

The tube requires a keep-alive current to maintain a localized ionization, which facilitates rapid RF breakdown. Under a specified test configuration consisting of a 300 Vdc supply and a 0.47 MΩ series limiting resistor, the keep-alive current is maintained within the following limits:

- **Minimum Keep-Alive Current:** 180 μA
- **Maximum Keep-Alive Current:** 320 μA

The maximum ignition voltage required to initiate the discharge is **250 V**.

High-Frequency Performance

The 1B40 is characterized by low insertion loss and low leakage power in the microwave frequency range:

- **Insertion Loss:** 1.0 dB maximum at a frequency of 1080 Mc.
- **Leakage Power:** 0.7 μW maximum continuous leakage power. This limit is specified at an operating frequency of 1050 Mc, with a peak input power of 500 W, a pulse repetition frequency of 1000 pps, and a pulse width of 1.0 μs.

Physical and Environmental Specifications

The 1B40 is a compact, single-ignitor tube designed for mounting in any position.

Mechanical Dimensions

The physical envelope and pin dimensions of the 1B40 are specified as follows:

- **Maximum Bulb Diameter:** 0.500 in.
- **Maximum Bulb Height:** 1 1/2 in.
- **Maximum Lower Section Height:** 1/16 in.
- **Base Diameter:** 0.750 in. with a tolerance of +0.002 in. / -0.008 in.
- **Pin Diameter:** 0.050 in. with a tolerance of ±0.005 in.
- **Pin Length:** 1.000 in. with a tolerance of ±0.030 in.

Environmental Limits

The tube is rated to withstand a wide range of ambient temperatures during storage or non-operating periods:

- **Minimum Non-Operating Temperature:** -40°C
- **Maximum Non-Operating Temperature:** 100°C

Technical Summary

The **1B40** is an argon-filled, separate-cavity gas switching tube featuring a single ignitor. It operates with a maximum ignition voltage of 250 V and a keep-alive current of 180 to 320 μA under a 300 Vdc supply with a 0.47 M Ω limiting resistor. At microwave frequencies, it exhibits a maximum insertion loss of 1.0 dB at 1080 Mc and a maximum continuous leakage power of 0.7 μW under pulsed conditions (1050 Mc, 500 W peak, 1000 pps, 1.0 μs pulse width). The tube is designed for mounting in any position, has a maximum bulb height of 1 1/2 inches, and is rated for non-operating ambient temperatures from -40°C to 100°C.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 Sylvania

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

1950 SYLVANIA

Section 1 · Microwave TR Switch

CHARACTERISTICS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Gas filling	Argon	—
Keep-alive current minimum	180 μ A	—
Keep-alive current maximum	320 μ A	—
Insertion loss maximum at 1080 MHz	1 dB	—

OTHER

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition voltage maximum	250 V	—

TUBE TINKER

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