

ELECTRONIC TUBE REFERENCE

1A1

Specialized - Ballast electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
BALLAST

RMA-standardized ballast tube for series-load regulation, specified for approximately 470–510 mA load current over a 1.8–2.2 V load range.

GENERAL CHARACTERISTICS

BASE DESIGNATION	–	BASE PINS	4
NOMINAL HEATER	– / –	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Ballast
No fixed ratings recorded.
Ballast/regulator element; load-current and load-voltage ranges stored as parameters.

1A1 Ballast Tube

The **1A1** is a ballast tube designed for current regulation in electrical circuits. It serves as a resistive regulating device to maintain stable operating conditions when operating from a variable battery source.

Overview

The 1A1 is classified as a ballast tube rather than an active amplifying valve. Its primary function is to regulate current delivered to a load under varying supply voltage conditions. It is designed to operate in series with a load, absorbing excess voltage from a battery supply to maintain a relatively constant current and voltage across the load.

Physical Construction and Basing

The 1A1 is constructed using an **ST-12** glass envelope. It features a **small 4-pin base** for mechanical mounting and electrical connection.

Within the 4-pin base configuration, the electrical connections to the internal resistive ballast element are made specifically to the normal heater or filament terminals, which correspond to the two large pins of the base. The remaining pins are not utilized for active connections, aligning with standard ballast design practices where only a series resistance path is required.

Electrical Characteristics and Operating Parameters

The electrical operation of the 1A1 is defined by its ability to drop voltage and regulate current between a battery source and a specific load. The operating window is characterized by the following parameters:

- **Battery Voltage:** The tube is designed to operate with a source battery voltage ranging from **2.4 to 3.2 volts**.
- **Load Voltage:** Under normal operating conditions, the voltage across the regulated load is maintained between **1.8 and 2.2 volts**.
- **Load Current:** The load current is specified from **0.470 to 0.510 amperes** (defined as the current drawn by the load at a nominal 2 volts).

In practice, the ballast tube absorbs the voltage difference between the battery supply (2.4 to 3.2 V) and the load (1.8 to 2.2 V). For example, if the battery is at its maximum charge of 3.2 V and the load is operating at 2.0 V, the 1A1 drops the remaining 1.2 V while keeping the current within the designated 0.470 to 0.510 A range. This prevents damage to delicate filaments or components in the load circuit as the battery discharges down toward 2.4 V.

Technical Summary

The **1A1** is an ST-12 bulb ballast tube equipped with a small 4-pin base, utilizing the two large filament pins for its series connection. It is engineered to regulate a load current of **0.470 to 0.510 A** at a nominal load voltage of **1.8 to 2.2 V** when supplied by a battery source of **2.4 to 3.2 V**.

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 · Ballast

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Load current minimum	470 mA	—
Load current maximum	510 mA	—
Load voltage minimum	1.8 V	—
Load voltage maximum	2.2 V	—