ELECTRON TUBE DATA SHEET

WESTERN ELECTRIC 453A ELECTRON TUBE

DESCRIPTION

The 453A is a two-electrode inert-gas filled cold cathode tube designed primarily for use as a voltage reference tube. This tube has characteristics which are exceptionally stable with life and with variations in ambient temperature. The tube is relatively free from voltage jumps. (See Note 6, page 3.)

CHARACTERISTICS

Cathode Current	4 to 6	milliamperes
Anode Voltage Drop	83	volts
Regulation at 4 to 6 milliamperes d-c (Note 5, Page 3)	1.2	volts

File: Cold Cathode Section

RATINGS, Absolute System (Note 1)

Cathode Current, Forward		
Maximum	8	milliamperes
Minimum	4	milliamperes
Maximum Inverse Anode Current	0.0	milliampere
Ambient Temperature Limits	-55 to +60	centigrade

ELECTRICAL DATA, Throughout Life

	Min.	Bogey	Max.	
Anode Breakdown Voltage	95	100	105	volts
Anode Voltage Drop(E_{td})at 6 Milliamperes(D-C) (Note 2)	81	83	87	volts
Regulation (4 to 6 Milliamperes, D-C) (Note 5)	-	0.75	1.2	volts
Temperature Sensitivity of Anode Voltage Drop Anode Current, 5 Milliamperes (D-C)	-	-0.0035	-	volt/c
Fluctuation (Note 3)	-	0.002	0.005	volt
Average Ionization Time (Note 4)	-	5.0	-	milliseconds
Voltage Jump (Note 6)	-	5.0	-	millivolts

MECHANICAL DATA

Mounting Position	Any
New Weight, Approximate	0.3 ounce
Bulb	T 6½
Base	Small Button 9 pin

Dimensions and connections shown in outline drawing on page 4.

LIFE DATA

Typical Drift in Anode Voltage Drop (E_{td}) at 5 mAdc . . . . . See Figure 1

HANDLING

This tube contains a small amount of krypton-85 gas which is a by-product radioactive material. The amount of krypton-85 is less than five microcuries, which is too small an amount to require any special care in use.

Atomic Energy Commission regulations require that the individual tube carton for tubes containing by-product radioactive material be appropriately marked. The marking includes the statement that tube disposal should be in approved manner.

Approved instructions for disposal of tubes containing krypton-85 are as follows:

> Tubes to be disposed of should be broken or crushed in a well ventilated place releasing any resulting vapors to the outside atmosphere. The residual broken or crushed tubes should be disposed of in a normal public trash disposal system. Tubes should be disposed of at a rate of not more than 100 each week from any one location. Avoid breathing vapors from broken tubes.

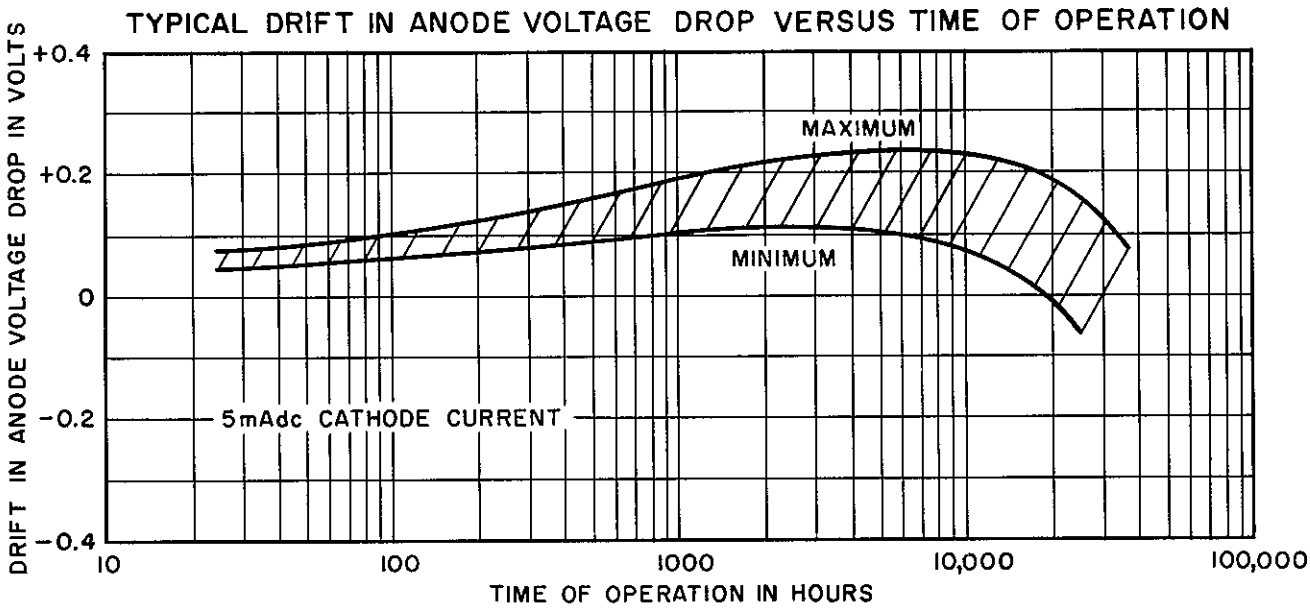


FIG. 1

Note 1: In the "Absolute System" the maximum ratings specified are limiting values above which the serviceability of the device may be impaired from the viewpoint of life and satisfactory performance. Maximum ratings, as such, do not constitute a set of operating conditions and all values may not, therefore, be attained simultaneously.

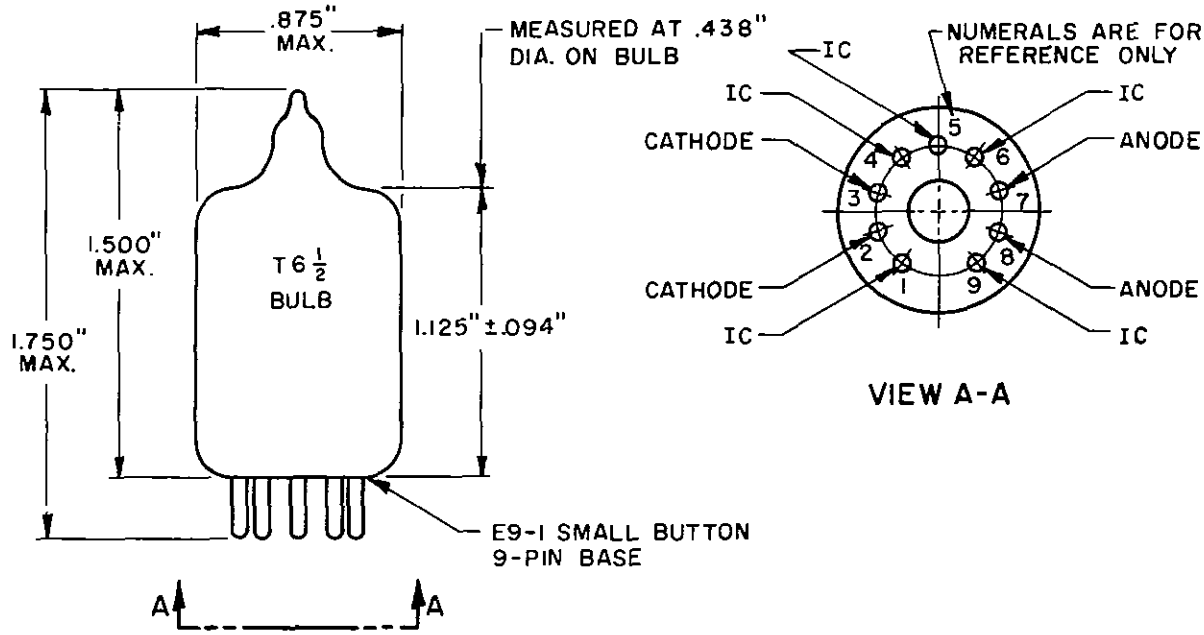
Note 2: These values are for new tubes. Anode voltage drop will stabilize within 3 minutes after starting.

Note 3: The anode voltage drop variation during a short period of time (one to ten minutes), with the tube operating at one value of current and temperature within its ratings, will not exceed the above stated maximum value.

Note 4: With 15 volts overvoltage (15 volts above Anode Breakdown Voltage) with tube in total darkness. Average of 10 measurements taken at 1 second intervals.

Note 5: Regulation is defined to be Anode Voltage Drop (E_{td}) at 6 mAdc minus Anode Voltage Drop (E_{td}) at 4 mAdc.

Note 6: Voltage jump is an abrupt change or discontinuity in tube anode voltage drop when the tube current is varied. Voltage jumps greater than the specified value are relatively rare in the range of anode current of 4 to 6 mAdc.



VIEW A-A

NOTE: PINS MARKED IC (INTERNAL CONNECTION) SHOULD NOT BE CONNECTED TO ANY PORTION OF AN EXTERNAL CIRCUIT. FAILURE TO OBSERVE THIS PRECAUTION MAY RESULT IN IMPROPER OPERATION OF THE TUBE.

A development of Bell Telephone Laboratories, the research laboratories of the American Telephone and Telegraph Company and the Western Electric Company.

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