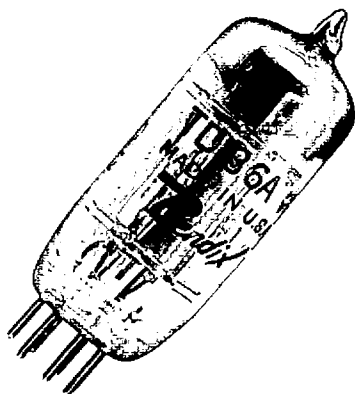


## CONSTANT FIRING DIODE



### DESCRIPTION

The TD-36A is a miniature cold cathode inert gas filled diode. It is designed for use as a firing diode in RC timing circuits, energy transfer circuits and as a protective device. It is specifically designed for circuits in which a very stable breakdown voltage is required from  $-55^{\circ}\text{C}$  to  $+135^{\circ}\text{C}$  and for applications where the tube must operate with minimum deviation from initial characteristics after long periods of off time over the above temperature range. Its large, bare metal cathode is capable of supplying high peak currents under condenser discharge conditions and adequate average currents during steady state operations.

### PHYSICAL CHARACTERISTICS

|                       |                                |
|-----------------------|--------------------------------|
| Base                  | Button: 7-pin miniature (E7-1) |
| Envelope              | T-5 1/2 (5-2)                  |
| Overall length (Max.) | 2 1/8"                         |
| Diameter (Max.)       | 3/4"                           |
| Seated Height (Max.)  | 1 7/8"                         |
| Mounting position     | Any                            |

### ELECTRICAL RATINGS

|                                                 |                                                                                                                                                                                                                                           |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ionization Voltage $E_z$                        | 133 Vdc, nom.<br>(Note 1)                                                                                                                                                                                                                 |
| Ambient temperature                             | $-55^{\circ}\text{C}$ to $+135^{\circ}\text{C}$                                                                                                                                                                                           |
| Total $\Delta E_z$ over above temperature range | 2 Vdc, max.<br>(Note 2)                                                                                                                                                                                                                   |
| Life (Fig. 6)                                   | 10,000 pulses, min.                                                                                                                                                                                                                       |
| Life test end point:<br>Total $\Delta E_z$      | 2 Vdc, max.                                                                                                                                                                                                                               |
| Operating voltage, $E_b$ ,<br>(at 20 mAdc)      | 95 Vdc, max.<br>(Note 3)                                                                                                                                                                                                                  |
| $E_z - E_b$                                     | 43 Vdc, min.<br>(Note 4)                                                                                                                                                                                                                  |
| Instantaneous peak $i_k$                        | 100 ma, max.                                                                                                                                                                                                                              |
| Average cathode current                         | 20 mAdc                                                                                                                                                                                                                                   |
| Maximum temperature<br>for extended storage     | $+135^{\circ}\text{C}$                                                                                                                                                                                                                    |
| Vibration                                       | 10 g's                                                                                                                                                                                                                                    |
| Note 1:                                         | 95% of the tubes break down between 130 Vdc and 135 Vdc. (see Figure 1)                                                                                                                                                                   |
| Note 2:                                         | A tube is tested 10 times at $-55^{\circ}\text{C}$ , at $+25^{\circ}\text{C}$ , and at $+135^{\circ}\text{C}$ . The total $\Delta E_z$ for all thirty readings is less than 2V. 95% of the tubes change less than 1.5 Vdc. (see Figure 3) |
| Note 3:                                         | 95% of the tubes have an operating voltage of 86 to 88 Vdc (see Figure 2)                                                                                                                                                                 |
| Note 4:                                         | 95% of the tubes have a difference, $E_z - E_b$ , of 43 to 51 Vdc (see Figure 4)                                                                                                                                                          |

### OPERATION

This tube was designed to operate continuously in a glow discharge. Consequently sufficient resistance must be inserted in series with the tube to limit the current passing through the tube to the rated values.

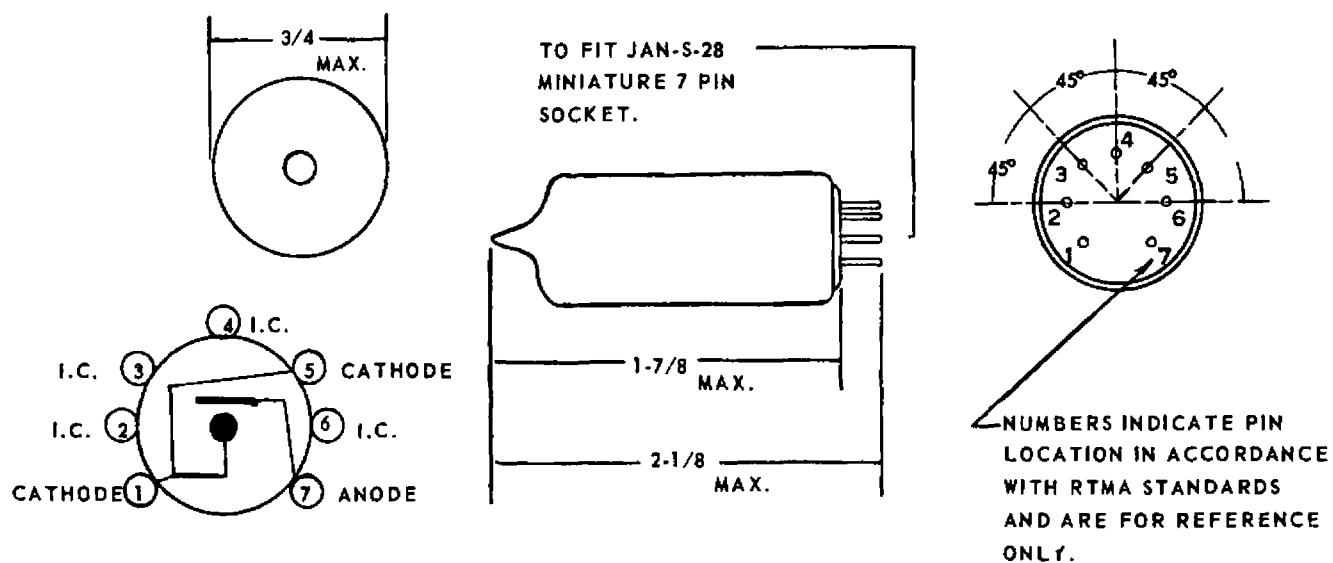


FIGURE 5  
OUTLINE DRAWING OF CONSTANT FIRING DIODE, 7416/TD-36A

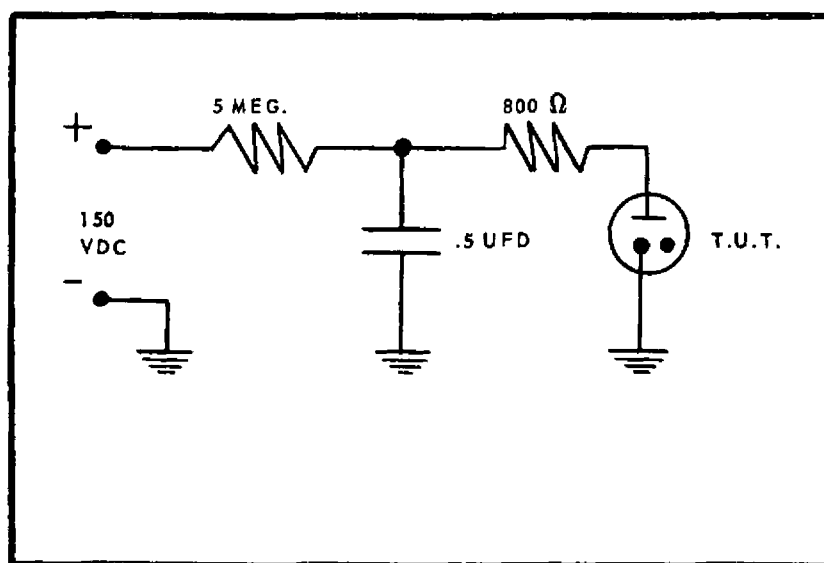


FIGURE 6  
LIFE TEST CIRCUIT OF TD-36 A

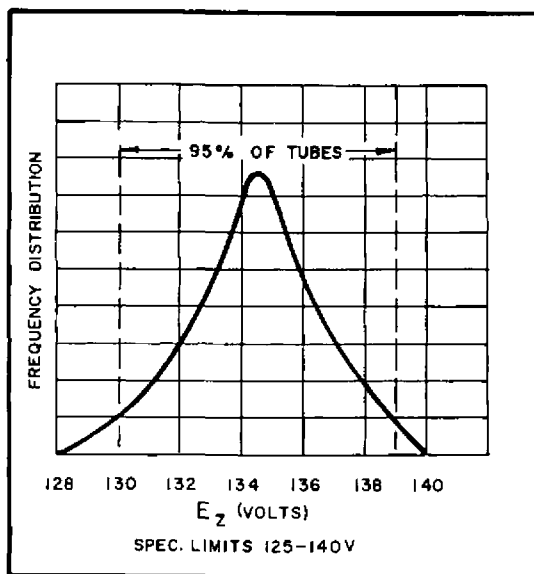


FIG. 1  
TYPICAL DISTRIBUTION OF  
IONIZATION VOLTAGES  
OF PRODUCTION LOTS

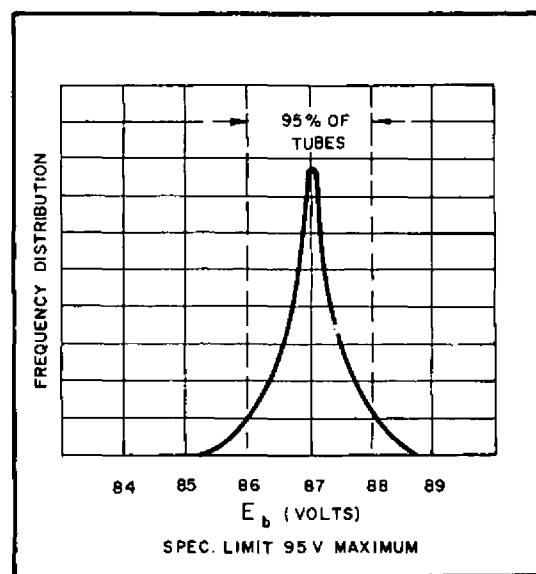


FIG. 2  
TYPICAL DISTRIBUTION OF  
OPERATING VOLTAGES  
OF PRODUCTION LOTS

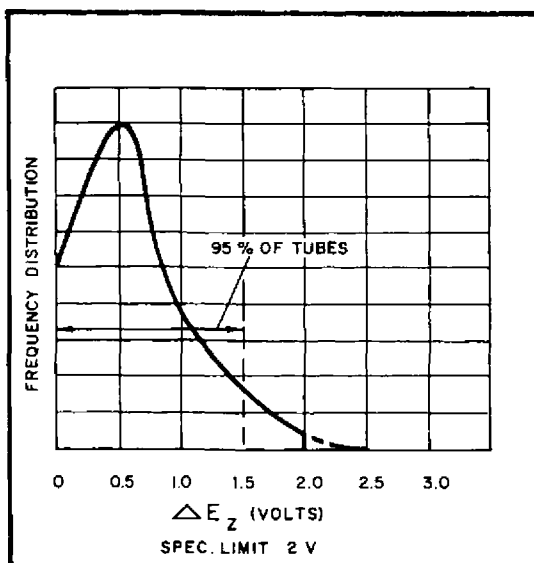


FIG. 3  
TYPICAL DISTRIBUTION OF  
CHANGE IN IONIZATION VOLTAGES  
FROM -55°C TO +135°C  
OF PRODUCTION LOTS

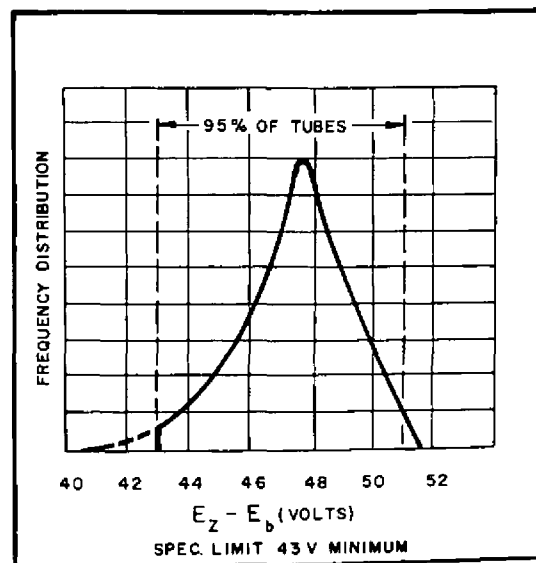


FIG. 4  
TYPICAL DISTRIBUTION OF  
THE DIFFERENCE BETWEEN  
IONIZATION AND OPERATING VOLTAGES  
OF PRODUCTION LOTS

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