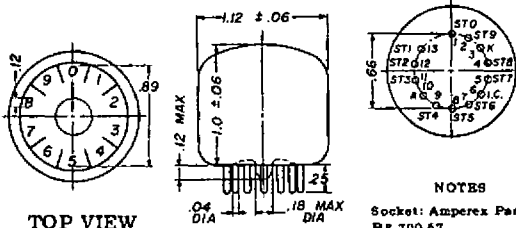


# AMPEREX TUBE TYPE 8453/Z550M

## GENERAL DESCRIPTION

The Amperex 8453/Z550M is a long-life, cold cathode, gas filled numerical indicator tube. It is top viewing with ten numbers 0 to 9 capable of individual indication with a bright red glow. The tube operates with a neon glow discharge on a pure molybdenum cathode. The pulsating dc supply voltage, after full or half wave rectification, causes one of the ten cathode numerals to glow. The particular numeral to glow is selected by raising the voltage level of the corresponding starter to a point at least 5 volts more positive with respect to the remaining starters by means of transistorized control circuits. Since the tube does not draw its power from the transistor control circuits, it presents negligible loading.



### NOTES

Socket: Amperex Part No. B5.700.67.

Mount tube with pin 1 above pin 8 in vertical axis. Number 0 is aligned with pin 1 to within 3°.

## LIMITING VALUES

Peak Anode Voltage, $E^1$	150 volts ac max. 90 volts ac min.
Frequency of Line Voltage	100 cps max. 40 cps min.
Voltage Between Starter and Anode, $E_{st-a}$ 2, 3	30 volts max. 5 volts min.
Cathode Current, $I_k$	6 ma max. 2 ma min.
Starter Circuit Resistance, $R_{st}$	470 k ohms max. 100 k ohms min.
Bulb Temperature	+70°C max. -55°C min.

1. The rectified ac voltage should be freed from spikes by  $C_k$ , a capacitor of about 0.033  $\mu f$  (for full wave rectifier) or 0.25  $\mu f$ /tube (for a half wave rectifier).
2. To control the indication of a given figure, the potential of the starter of that figure should be raised at least 5 volts with respect to the remaining starters. The common starter bias potential may deviate by a maximum of  $\pm 5$  volts dc from the anode potential.
3. In order to achieve longer life on continuous display of one digit, apply a voltage between starter and anode,  $E_{st-a}$  greater than 5 volts.

# 8453/Z550M

## TYPICAL OPERATION

(See Figures 1 and 2 for typical circuit and Figure 3 for voltage sensitivity characteristic)

Line Voltage	117 volts ac
Voltage Between Starter and Anode, $E_{st-a}$	See Figure 2
Maintaining Voltage, $E_a$	84 volts
Starter Current, $I_{st}$	50 $\mu$ a
Cathode Current, $I_k$	4 ma
Cathode Resistor, $R_k$	6.8 k ohms
Starter Series Resistor, $R_{st}^4$	330 k ohms
Shunt Capacitor, $C_k$ (full wave rectifier)	0.033 $\mu$ f
Shunt Capacitor, $C_k$ (half wave rectifier)	0.25 $\mu$ f/tube

## LIFE EXPECTANCY (Under above operating conditions)

Continuous display of one digit	5,000 hrs.
Sequential change of display digit every 100 hours or less	20,000 hrs. min.

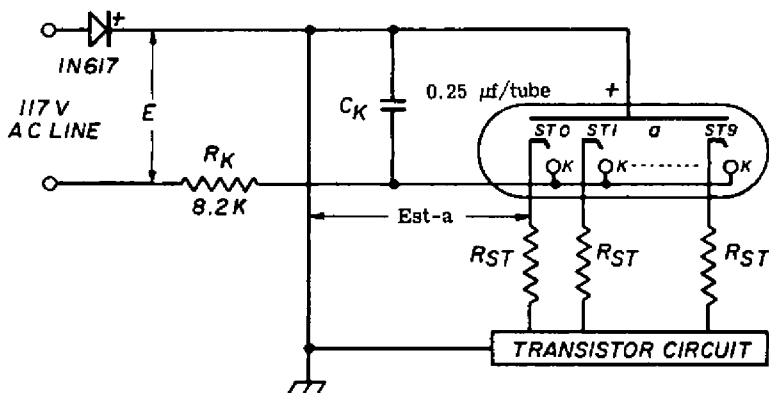


Figure 1. Typical Operating Circuit - Half Wave Rectifier

4. This resistor should be mounted close to the tube socket.

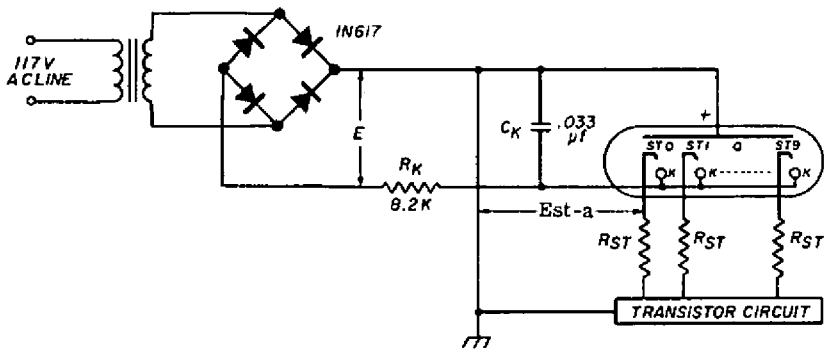


Figure 2. Typical Operating Circuit - Full Wave Rectifier

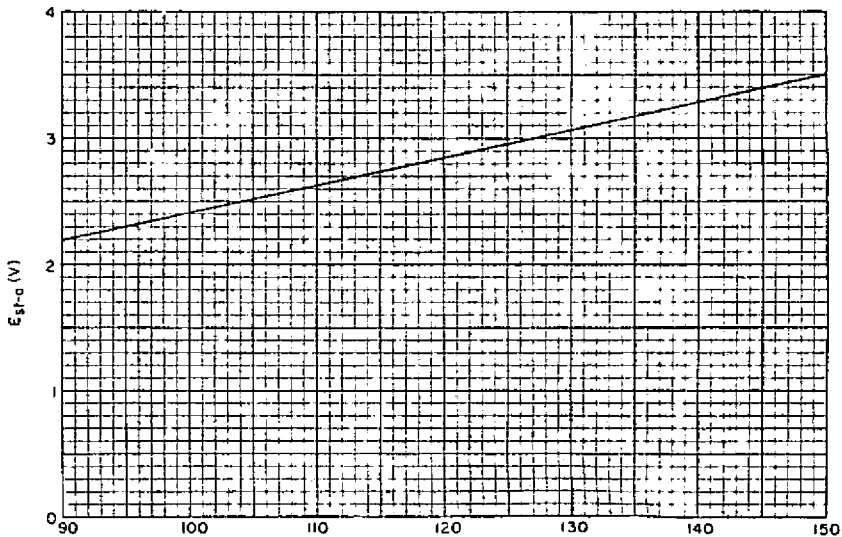


Figure 3. Voltage Sensitivity Curve  
 Starter to Anode Voltage Required to Switch One Digit to  
 Another vs. Applied Rectified Voltage

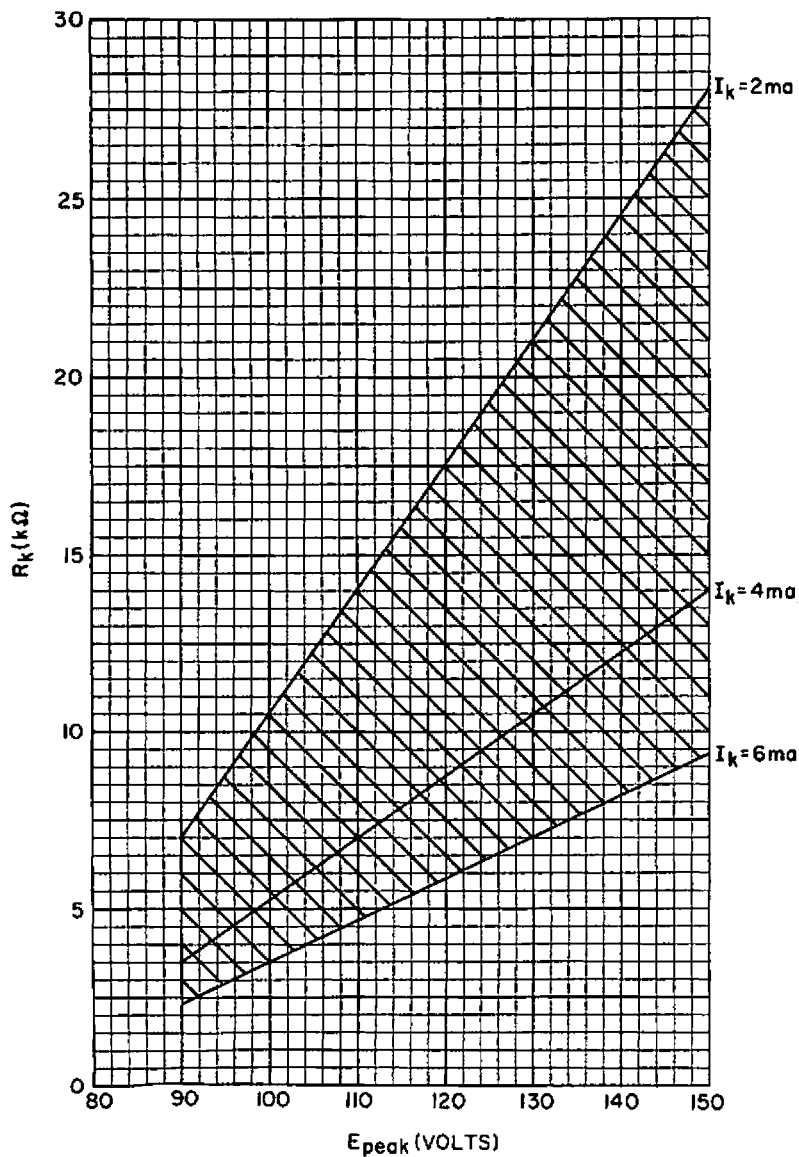


Figure 4. Area of Permissible Operation (shaded) as a Function of  $R_K$  and  $E_{peak}$