AMPLEREX TUBE TYPE 8453/Z550M

GENERAL DESCRIPTION

The Ampex 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.

LIMITING VALUES

- Peak Anode Voltage, $E^1$: 150 volts ac max.
- Frequency of Line Voltage: 100 cps max.
- Voltage Between Starter and Anode, $E_{st-a}$: 30 volts max.
- Cathode Current, $I_k$: 6 ma max.
- Starter Circuit Resistance, $R_{st}$: 470 k ohms max.
- Bulb Temperature: $+70^\circ\text{C}$ max.

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.
TYPICAL OPERATION

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

Line Voltage
Voltage Between Starter and Anode, $E_{st-a}$
Maintaining Voltage, $E_a$
Starter Current, $I_{st}$
Cathode Current, $I_k$
Cathode Resistor, $R_k$
Starter Series Resistor, $R_{st}$
Shunt Capacitor, $C_k$ (full wave rectifier)
Shunt Capacitor, $C_k$ (half wave rectifier)

117 volts ac
See Figure 2
84 volts
50 μa
4 ma
6.8 k ohms
330 k ohms
0.033 μf
0.25 μf/tube

LIFE EXPECTANCY (Under above operating conditions)

Continuous display of one digit
Sequential change of display digit every
100 hours or less
5,000 hrs.
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 $E_{peak}$