

FULL-WAVE VACUUM RECTIFIER TYPE 5Y3-GT

The 5Y3-GT is a glass-octal, full-wave high-vacuum rectifier designed for service in power supplies of moderate current requirements. The tube should be mounted vertically, but horizontal mounting is permissible if pins 2 and 4 are in a vertical plane. Like all power handling tubes, it should be adequately ventilated.

ELECTRICAL

Cathode.....	Coated Filament
Voltage (ac or dc)	5.0 Volts
Current	2.0 Amperes

MECHANICAL

Bulb	T-9
Base.....	Intermediate Shell Octal (JEDEC B5-10)
	Short Intermediate Shell Octal (JEDEC B5-62)
Basing	G-5T
Mounting Position	Vertical or Horizontal
	with Pins 2 and 4 in Vertical Plane

RECTIFIER SERVICE

MAXIMUM RATINGS

Design Center Values

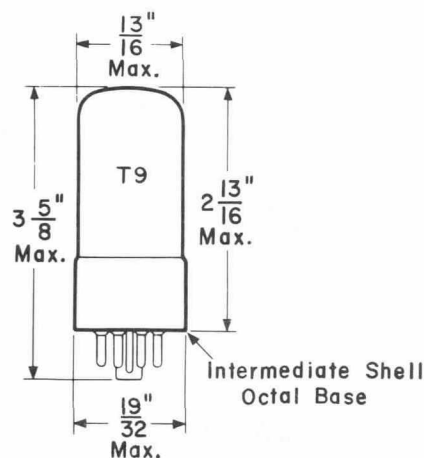
Peak Inverse Plate Voltage	1400 max.	Volts
AC Plate Supply Voltage		
Each Plate (RMS)	See Rating Chart I	
DC Output Current Each Plate	See Rating Chart I	
Steady-State Peak Plate Current		
Each Plate (See Rating Chart II)	440 max.	Ma.
Transient Peak Plate Current		
Each Plate (See Rating Chart III)	2.5 max.	Ampere

TYPICAL OPERATION AS FULL-WAVE RECTIFIER

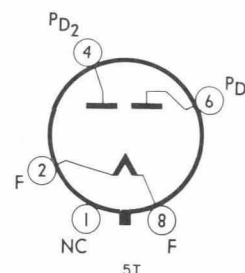
	Input to Filter	
	Capacitor	Choke
AC Plate Supply Voltage		
Each Plate (RMS)	350	500 Volts
Input Capacitor	20	— μ f.
Input Choke	—	10 Henrys
Effective Plate Supply		
Resistance Each Plate	50	— Ohms
DC Output Current	125	125 Ma.
DC Output Voltage at Filter Input	360	380 Volts

AVERAGE CHARACTERISTICS

Tube Voltage Drop (Measured with	
Tube Conducting 125 Ma. Each Plate)	50 Volts



9-13



APPLICATION NOTES

The application of maximum ratings to practical circuit design is clarified by the use of Rating Charts I, II, III. These charts present limiting conditions beyond which operation of the tube is not permitted. The charts together with laboratory measurements provide analysis of rectifier circuit operation.

The maximum ratings for ac plate supply voltage and dc output current are interdependent, and they are related to the type of filter circuit. The boundaries in Chart I for capacitor-input and for choke-input operation are based on limits of supply voltage, output current and plate dissipation. With capacitor-input filter, operation is permissible within the area bounded by points F A E D G; with choke-input filter, operation is permissible within the area bounded by points F A B C D G.

Chart II defines the permissible area of operation based on the maximum steady-state peak plate current. The rectification efficiency is defined by the equation:

$$\text{Rectification Efficiency} = \frac{\bar{E}}{\sqrt{2} E_s}$$

where $\bar{E}$ is the dc output voltage at input to filter and E_s is the rms plate supply voltage per plate.

Chart III defines the minimum value of effective plate-supply resistance per plate for specific plate supply voltages such that the transient peak plate current per plate will be within the required maximum rating. This resistance consists of:

$$R_s = N^2 R_{PRI} + R_{SEC} + R_A$$

where N is the voltage step-up ratio of the plate transformer, R_{PRI} is the dc resistance of the transformer primary, R_{SEC} is the average dc resistance of each transformer secondary section, and R_A is the additional resistance required.

In these considerations, dc output voltage is measured at the input to the filter, and plate supply voltage is measured under no-load conditions.

