3DG4

Full-Wave Vacuum Rectifier

GENERAL DATA

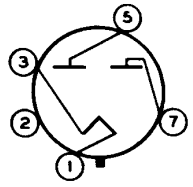
Electrical:

Filament, Coated:		
Voltage (AC or DC)	3.3 ± 10%	volts
Current at 3.3 volts	3.8	amp

Mechanical:

Operating Position	Any
Maximum Overall Length	4-5/8"
Maximum Seated Length	4-1/16"
Diameter	1.438" to 1.562"
Bulb	T12
Base	Short Medium-Shell Octal 5-Pin with External Barriers, Style A (JEDEC Group 1, No. B5-234) or Short Medium-Shell Octal 5-Pin with External Barriers, Style B (JEDEC Group 1, No. B5-239)
Basing Designation for BOTTOM VIEW	5DE

Pin 1 - Filament
Pin 2 - Internal Connection—Do Not Use



Pin 3 - Filament
Pin 5 - Plate No.2
Pin 7 - Plate No.1

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Maximum Values:*

PEAK INVERSE PLATE VOLTAGE	1050 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS)	See *Rating Chart I*	
PEAK PLATE CURRENT PER PLATE	1.2 max.	amp
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE[a]	6.5 max.	amp
DC OUTPUT CURRENT	See *Rating Chart I*	
BULB TEMPERATURE (At hottest point on bulb surface)	200 max.	°C

Typical Operation:

With capacitor input to filter

AC Plate-to-Plate Supply Voltage (RMS)	550	volts
Filter-Input Capacitor[b]	40	μf
Total Effective Plate Supply Impedance Per Plate	32	ohms
DC Output Voltage (Approx.) at input to filter at full-load current of 350 ma	300	volts

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Characteristics:

Tube-Voltage Drop for plate ma.
= 350 (Per plate). . . . . 25 volts

[a] Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of rectifier tubes. If capacitor-input circuits are to be used, protect the circuits against the adverse effects of possible hot-switching, and do not exceed a hot-switching transient plate current per plate of 6.5 amperes during the initial cycles of the hot-switching transient. If hot-switching is required in operation, the use of choke-input circuits is recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current.

[b] Values of capacitance higher than those indicated may be used, provided the effective plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

RATING CHARTS and OPERATION CHARACTERISTICS

Rating Chart I represents graphically the relationships between maximum ac voltage input and maximum dc output current derived from the fundamental ratings for conditions of capacitor input and choke input to filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

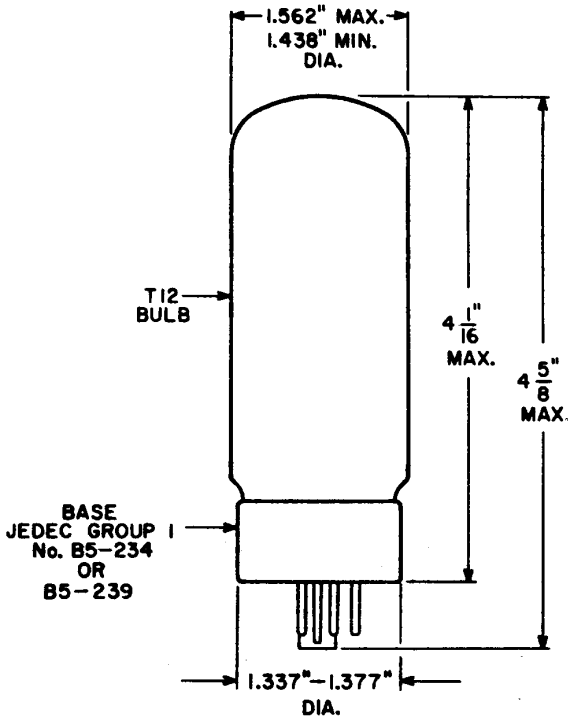
Rating Chart II represents graphically the relationship between maximum rectification efficiency and maximum dc output current per plate for conditions of capacitor input to filter.

A choice of operating values of dc output current per plate and rectification efficiency should be made such that they fall within the area of permissible operation to insure that the maximum peak-plate-current rating will not be exceeded. If the operating values chosen fall outside the permissible operating area, a different choice of parameters should be made. For a given value of ac voltage input and dc output current, it is possible to reduce the rectification efficiency either by increasing the plate supply resistance per plate or by using a smaller value of input filter capacitor.

Rating Chart III represents graphically the relationships between minimum effective plate supply resistance per plate and maximum ac plate supply voltage per plate under no-load conditions of capacitor input to filter when occasional hot-switching is employed.

If occasional hot-switching is required with capacitor-input circuits, it is important to protect the tube and the circuits against the flow of plate currents having magnitudes in excess of the maximum hot-switching-current rating of 6.5 amperes. To limit the hot-switching current, adequate series plate supply resistance per plate is necessary. This resistance value may be determined with the formula shown in legend of *Rating Chart III*. To insure that the maximum hot-switching current is not exceeded, a value of series plate supply resistance per plate should be chosen such that it is equal to or greater than the minimum value indicated by the curve.

If appreciable series inductance is present in the plate supply, a value of series plate supply resistance smaller than that indicated by the curve may be employed provided it is experimentally determined that the combined effect of inductance and plate supply resistance used are adequate to limit the hot-switching current to the indicated maximum-rated value.



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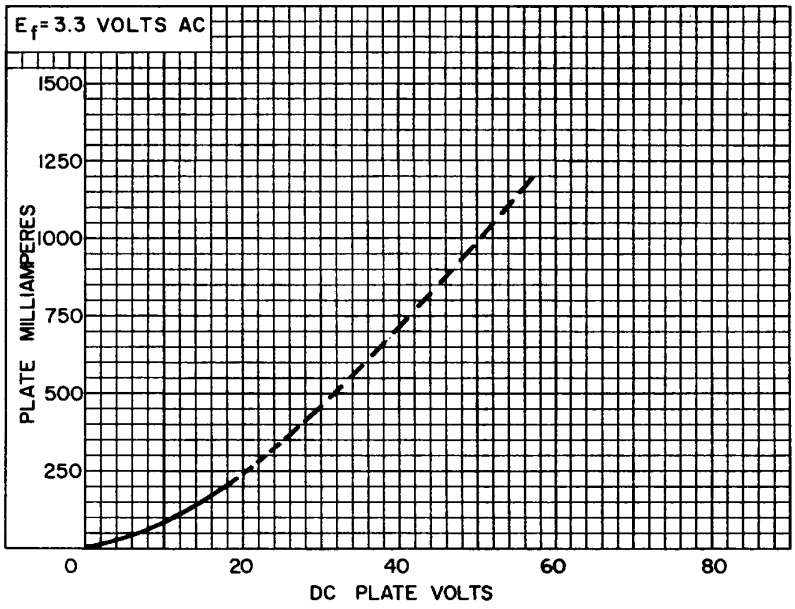
AVERAGE PLATE CHARACTERISTIC
Each Plate



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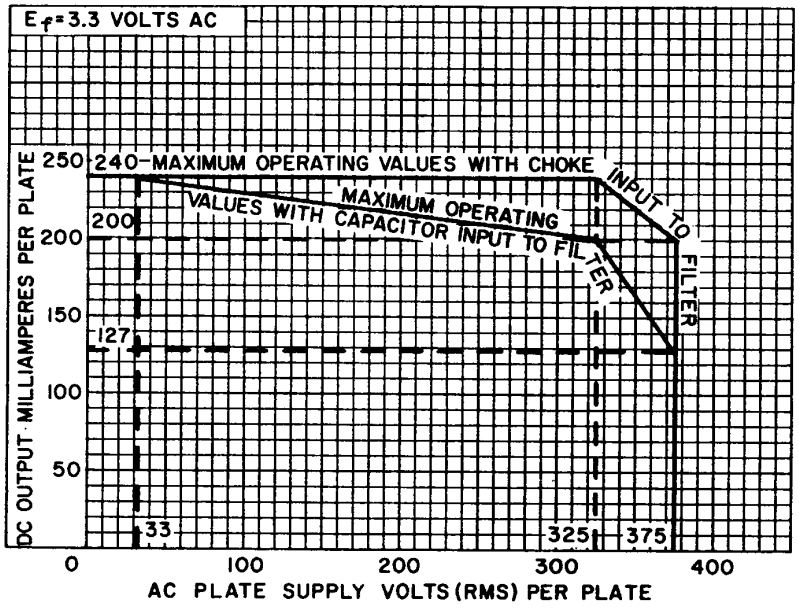
RATING CHART I



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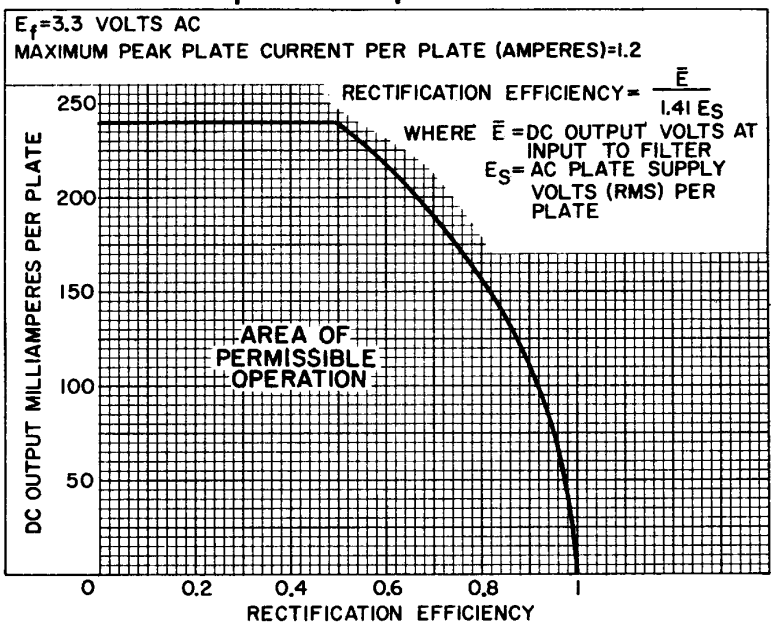
RATING CHART II
Capacitor Input to Filter



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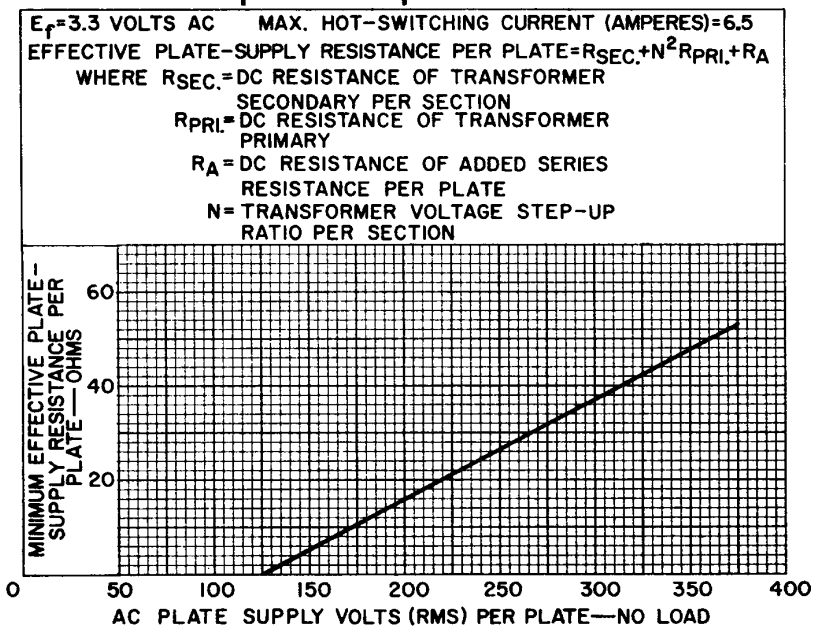
RATING CHART III
Capacitor Input to Filter



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