5U4-GB

TWIN DIODE
FOR FULL-WAVE POWER RECTIFIER APPLICATIONS

DESCRIPTION AND RATING

The 5U4-GB is a filamentary twin diode designed for use as a full-wave rectifier in the power supply of television receivers or other equipment which have high direct-current requirements. The 5U4-GB employs a straight-sided T-12 envelope and may be used as a replacement for either the 5U4-G or 5U4-GA.

GENERAL

ELECTRICAL
Cathode—Coated Filament
Filament Voltage, AC or DC ........................................... 5.0 Volts
Filament Current ...................................................... 3.0 Amperes

MECHANICAL
Mounting Position—Vertical*
Envelope—T-12, Glass
Base—B5-121 or B5-113, Short Medium Shell Octal 5-Pin
or B5-127, Flared Medium Shell Octal 5-Pin
or B8-118, Short Medium Shell Octal 8-Pin

MAXIMUM RATINGS
RECTIFIER SERVICE—DESIGN-CENTER VALUES†
Peak Inverse Plate Voltage ........................................... 1550 Volts
AC Plate-Supply Voltage per Plate—See Rating Chart ‡
Steady-State Peak Plate Current per Plate ..................... 1000 Milliamperes
Transient Peak Plate Current per Plate,
Maximum Duration 0.2 Second .................................... 4.6 Amperes
DC Output Current—See Rating Chart ‡

CHARACTERISTICS AND TYPICAL OPERATION
FULL-WAVE RECTIFIER WITH CAPACITOR-INPUT FILTER
AC Plate-Supply Voltage per Plate, RMS ....................... 300 450 Volts
Filter Input Capacitor .............................................. 40 40 Microfarads
Total Plate-Supply Resistance per Plate ....................... 21 67 Ohms
DC Output Current .................................................. 300 275 Milliamperes
DC Output Voltage at Filter Input .............................. 290 460 Volts

FULL-WAVE RECTIFIER WITH CHOKE-INPUT FILTER
AC Plate-Supply Voltage per Plate, RMS ....................... 550 Volts
Filter Input Choke .................................................. 10 Henrys
DC Output Current .................................................. 275 Milliamperes
DC Output Voltage at Filter Input .............................. 440 Volts
Tube Voltage Drop
\[ I_b = 275 \text{ Milliamperes DC per Plate} \] .................................. 50 Volts

GENERAL ELECTRIC
Horizontal operation is permitted if pins 1 and 4 are in a vertical plane.

† To simplify the application of the maximum ratings to circuit design, the electrical design-center maximum ratings are also presented in chart form as Rating Charts I, II, and III. Rating Chart I presents the maximum ratings for a-c plate supply voltage and d-c output current. Rating Chart II provides a convenient method for checking conformance with the maximum steady-state peak-plate-current rating. Rating Chart III offers a convenient method for checking conformance with the maximum transient peak-plate-current rating. With a capacitor-input filter, the conditions of each of Rating Charts I, II, and III must be satisfied; with a choke-input filter, operation must be within the indicated boundary of Rating Chart I.

‡ The maximum ratings for a-c plate supply voltage and d-c output current are interrelated and are also dependent on whether a choke- or capacitor-input filter is employed. This relationship is shown in Rating Chart I. With a capacitor-input filter, the operating point of d-c output current and a-c supply voltage must fall within the curve FAEDG. With a choke-input filter, the operating point must fall within the curve FABCDG.

NOTE: The indicated values of a-c plate-supply voltage shown throughout the data are measured without load.
RATING CHART II

FOR CAPACITOR-INPUT FILTER
THE BOUNDARY CURVE IS BASED ON A STEADY-STATE PEAK PLATE CURRENT OF 1.0 AMPERE MAXIMUM PER PLATE.
RECTIFICATION EFFICIENCY = \( \frac{E}{1.41 E_s} \)
WHERE \( E \) = DC OUTPUT VOLTAGE AT FILTER INPUT IN VOLTS
\( E_s \) = RMS SUPPLY VOLTAGE PER PLATE IN VOLTS

AREA OF PERMISSIBLE OPERATION

RATING CHART III

FOR CAPACITOR-INPUT FILTER
THE VALUES OF \( R_s \) ARE BASED ON A TRANSIENT (NOT SWITCHING) PEAK PLATE CURRENT OF 4.6 AMPERES MAXIMUM PER PLATE.
IF SERIES INDUCTANCE IS PRESENT IN THE PLATE SUPPLY, IT IS PERMISSIBLE TO USE A SMALLER-THAN-INDICATED VALUE OF \( R_s \) PROVIDING THE RATED MAXIMUM VALUE OF TRANSIENT PEAK PLATE CURRENT IS NEVER EXCEEDED.

MINIMUM PLATE SUPPLY RESISTANCE PER PLATE \( (R_s) \) IN OHMS

AC PLATE SUPPLY VOLTAGE PER PLATE (RMS) IN VOLTS
OPERATION CHARACTERISTICS
FULL-WAVE RECTIFIER WITH CHOKE-INPUT FILTER

$E_f = 5.0 \text{ VOLTS}$
(BOUNDARY LINE CBA IS SAME AS SHOWN ON RATING CHART 1)

DC OUTPUT VOLTAGE AT INPUT TO FILTER IN VOLTS

DC OUTPUT CURRENT IN MILLIAMPERES

550 VOLTS (DCS) PER PLATE
500
450
400
350
300
250
200
100
0
100
200
300
400