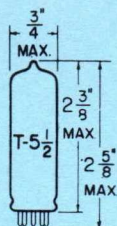


## TUNG-SOL

DOUBLE DIODE  
MINIATURE TYPE

GLASS BULB

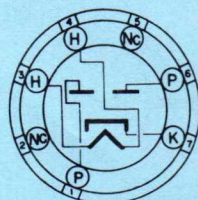
COATED UNIPOTENTIAL CATHODE

HEATER

6.3 VOLTS 0.6 AMP.

AC OR DC

ANY MOUNTING POSITION

BOTTOM VIEW  
MINIATURE BUTT  
7 PIN BASE

585

THE 6X4W IS A RUGGEDIZED HEATER-CATHODE TYPE DOUBLE DIODE USING THE SEVEN PIN MINIATURE CONSTRUCTION. IT IS SUITABLE FOR USE IN HALF OR FULL WAVE RECTIFIER APPLICATIONS, SUCH AS ENCOUNTERED WHEN USED IN CONJUNCTION WITH VIBRATOR-TYPE INVERTERS. SINCE IT MUST BE ABLE TO WITHSTAND SEVERE MECHANICAL TESTS TO MEET TEST SPECIFICATIONS, THE 6X4W IS ALSO SUITED FOR USE IN INDUSTRIAL AND MILITARY EQUIPMENT WHICH MAY BE SUBJECTED TO SEVERE SHOCK AND VIBRATION.

## RATINGS

ABSOLUTE MAXIMUM VALUES

|                                    |         |       |
|------------------------------------|---------|-------|
| HEATER VOLTAGE                     | 6.3±10% | VOLTS |
| MAXIMUM PEAK INVERSE PLATE VOLTAGE | 1375    | VOLTS |
| MAXIMUM DC PLATE CURRENT           | 230     | mA.   |
| MAXIMUM DC OUTPUT CURRENT          | 75      | mA.   |
| MAXIMUM SURGE CURRENT              | 750     | mA.   |
| MAXIMUM HEATER-CATHODE VOLTAGE     | 450     | VOLTS |
| MAXIMUM ALTITUDE                   | 10 000  | FEET  |
| MAXIMUM SHOCK                      | 700     | G     |

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS  
FULL-WAVE RECTIFIER

|                                                                     | INPUT TO FILTER<br>CAPACITOR | CHOKE |         |
|---------------------------------------------------------------------|------------------------------|-------|---------|
| HEATER VOLTAGE                                                      | 6.3                          | 6.3   | VOLTS   |
| HEATER CURRENT                                                      | 0.6                          | 0.6   | AMP.    |
| AC PLATE SUPPLY VOLTAGE (EACH PLATE)                                | 325                          | 450   | VOLTS   |
| INPUT CONDENSER <sup>A</sup>                                        | 10                           | ---   | μfd     |
| INPUT CHOKE                                                         | ---                          | 10    | HENRYS  |
| TOTAL EFFECTIVE PLATE SUPPLY IMPEDANCE <sup>B</sup><br>(EACH PLATE) | 525                          | ---   | OHMS    |
| DC OUTPUT CURRENT                                                   | 70                           | 70    | mA.     |
| DC OUTPUT VOLTAGE AT INPUT TO FILTER (APPROX.)                      |                              |       |         |
| AT HALF-LOAD CURRENT (35 mA)                                        | 365                          | 395   | VOLTS   |
| AT FULL-LOAD CURRENT (70 mA)                                        | 310                          | 385   | VOLTS   |
| DIFFERENCE (VOLTAGE REGULATION)                                     | 55                           | 10    | VOLTS   |
| PERCENTAGE REGULATION                                               | 15                           | 2.5   | PERCENT |

CONTINUED ON FOLLOWING PAGE

## TUNG-SOL

CONTINUED FROM PRECEDING PAGE

## CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

 $E_f=6.3V$ ,  $E_{pp}/p=400Vac$ ,  $R_L=5700\ \Omega$ ms,  $C_L=8\mu f$ 

EXCEPT AS MODIFIED BELOW

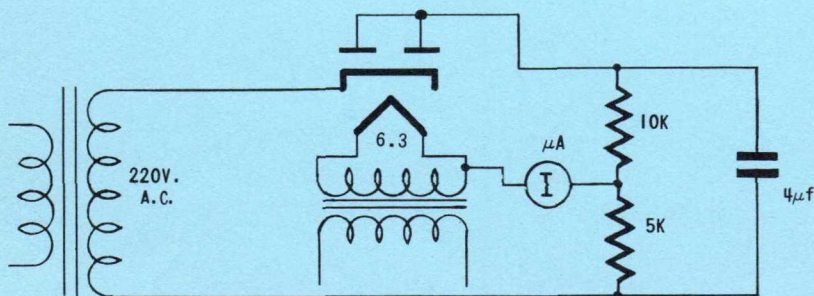
|                                                                  | INITIAL<br>MIN. | INDIVIDUAL<br>MAX. |                  |
|------------------------------------------------------------------|-----------------|--------------------|------------------|
| HEATER CURRENT                                                   | 540             | 660                | mA.              |
| HEATER-CATHODE LEAKAGE<br>( $E_{hk}=E_o$ )                       | 0               | 150                | $\mu A_{dc}$     |
| HEATER-CATHODE LEAKAGE <sup>B</sup><br>OPERATION <sup>CD</sup>   | -150            | +150               | $\mu A_{dc}$     |
| GRID EMISSION (1) <sup>E</sup><br>( $E_2b=O$ , $E_1b=50V_{dc}$ ) | 140             | ---                | mA <sub>dc</sub> |
| GRID EMISSION (2) <sup>E</sup><br>( $E_1b=O$ , $E_2b=50V_{dc}$ ) | 140             | ---                | mA <sub>dc</sub> |

## SPECIAL REQUIREMENTS

|                                                                                     | MIN. | MAX. |                  |
|-------------------------------------------------------------------------------------|------|------|------------------|
| VARIABLE FREQUENCY VIBRATION <sup>F</sup><br>(NO VOLTAGES)                          | ---  | ---  |                  |
| LOW FREQUENCY VIBRATION <sup>G</sup><br>(NO VOLTAGES)                               | ---  | ---  |                  |
| SHOCK <sup>HJ</sup><br>(HAMMER ANGLE = $48^\circ$ )                                 | ---  | ---  |                  |
| VIBRATIONAL FATIGUE <sup>K</sup>                                                    | ---  | ---  |                  |
| POST SHOCK AND VIBRATIONAL FATIGUE TEST END POINTS<br>OPERATION                     | 65   | ---  | mA <sub>dc</sub> |
| HEATER-CATHODE LEAKAGE                                                              | 0    | 150  | mA <sub>dc</sub> |
| MECHANICAL RESONANCE <sup>L</sup>                                                   | ---  | ---  |                  |
| LIFE TEST (1) <sup>M</sup>                                                          | 500  | ---  | HOURS            |
| HEATER CYCLING LIFE TEST <sup>N</sup><br>( $E_f=7.5Vac$ , $E_{hk}=100V$ , $E_p=O$ ) | 2000 | ---  | CYCLES           |
| LIFE TEST END POINT (1) <sup>P</sup><br>OPERATION                                   | 60   | ---  | mA <sub>dc</sub> |
| LIFE TEST END POINT (2) <sup>R</sup>                                                | ---  | ---  |                  |

## NOTES

<sup>A</sup> HIGHER VALUES OF CAPACITANCE THAN INDICATED MAY BE USED, BUT THE EFFECTIVE PLATE-SUPPLY IMPEDANCE MAY HAVE TO BE INCREASED TO PREVENT EXCEEDING THE MAXIMUM RATING FOR HOT-SWITCHING TRANSIENT PLATE CURRENT.

<sup>B</sup>

## TUNG-SOL

CONTINUED FROM PRECEDING PAGE

## NOTES - CONT'D.

C SEE MIL-E-1C 4.10.13

D IN A FULL-WAVE CIRCUIT ADJUST  $Z_p/p$  SUCH THAT A TUBE HAVING  $E_{td}=22$  Vdc AT 70 mAdc PER PLATE GIVES  $I_o=75$  mAdc. THE TUBE MAY BE PREHEATED PRIOR TO THIS TEST PROVIDED TEST 4.11 IS CONDUCTED ACCORDING TO 4.11.5.

E SEE MIL-E-1C 4.10.1.1

F SEE MIL-E-1C 4.9.20.3

G SEE MIL-E-1C 4.9.20.4

H SEE MIL-E-1C 4.9.20.5

J AFTER SHOCK TESTS, THE TUBES SHALL MEET POST-SHOCK AND FATIGUE TEST END POINT REQUIREMENTS. IN ADDITION, THE TUBES SHALL NOT SHOW PERMANENT SHORTS OR OPEN CIRCUITS WHEN TESTED PER 4.7 (F-1e) AFTER SHOCK TESTS.

K SEE MIL-E-1C 4.9.20.6

L THE MOUNT SHALL EXHIBIT NO PRONOUNCED MECHANICAL RESONANCE BELOW 100 CPS.

M IN LIFE TEST CONDITIONS THE VALUES OF  $R_L$  AND  $C_L$  GIVEN IN TEST CONDITIONS MAY BE CONSIDERED APPROXIMATE AND SHALL BE ADJUSTED INITIALLY TO GIVE  $I_o = 75$  mAdc WITH  $I_b$  GREATER THAN 205 mA;  $E_{hk} = E_o$ .

N SEE MIL-E-1C 4.11.7

P SEE MIL-E-1C 4.11.4

R AN OPEN HEATER OR A HEATER-CATHODE SHORT CONSTITUTES A TUBE FAILURE. LOTS ARE ACCEPTABLE UNDER THIS TEST IF NO FAILURES OCCUR IN THE LIFE TEST SAMPLES, OR IF ONE TUBE FAILURE HAS OCCURED IN THE PREVIOUS TWENTY-FIVE (25) TUBES TESTED.

**6X4W**  
PREMIUM TUBE

TENTATIVE DATA

