**TWIN DIODE**
**SUBMINIATURE TYPE**

**COATED UNIPOTENTIAL CATHODE**

**HEATER**
6.3±5% VOLTS 0.3 AMP.
AC OR DC
ANY MOUNTING POSITION

**GLASS BULB**

THE 5896 IS A SUBMINIATURE TWIN DIODE IN WHICH SEPARATE CATHODES ARE PROVIDED FOR THE TWO SECTIONS. EACH DIODE CAN BE USED INDEPENDENTLY OF THE OTHER OR COMBINED IN PARALLEL OR FULL-WAVE ARRANGEMENTS. IT IS SUITED FOR A WIDE VARIETY OF APPLICATIONS INCLUDING SERVICE AS A DETECTOR, AN AUTOMATIC-CONTROL RECTIFIER, OR A LOW-CURRENT POWER RECTIFIER. THE RESONANT FREQUENCY OF EACH UNIT IS GREATER THAN 900 MEGACYCLES.

**DIRECT INTERELECTRODE CAPACITANCES**

<table>
<thead>
<tr>
<th></th>
<th>WITH SHIELD</th>
<th>WITHOUT SHIELD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE #1 TO CATHODE #1, HEATER AND INTERNAL SHIELD</td>
<td>3.0</td>
<td>2.4 µF</td>
</tr>
<tr>
<td>PLATE #2 TO CATHODE #2, HEATER, AND INTERNAL SHIELD</td>
<td>3.0</td>
<td>2.4 µF</td>
</tr>
<tr>
<td>CATHODE #1 TO PLATE #1, HEATER AND INTERNAL SHIELD</td>
<td>4.2</td>
<td>4.0 µF</td>
</tr>
<tr>
<td>CATHODE #2 TO PLATE #2, HEATER AND INTERNAL SHIELD</td>
<td>4.2</td>
<td>4.0 µF</td>
</tr>
<tr>
<td>PLATE #1 TO PLATE #2, MAXIMUM</td>
<td>0.026</td>
<td>0.15 µF</td>
</tr>
</tbody>
</table>

*A WITH EXTERNAL SHIELD OF 0.405 INCH INSIDE DIAMETER CONNECTED TO LEAD 3.*

**RATINGS**
**ABSOLUTE MAXIMUM VALUES**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HEATER VOLTAGE</td>
<td>63±5% VOLTS</td>
</tr>
<tr>
<td>MAXIMUM PEAK INVERSE PLATE VOLTAGE</td>
<td>460 VOLTS</td>
</tr>
<tr>
<td>MAXIMUM AC PLATE-SUPPLY VOLTAGE PER PLATE, RMS</td>
<td>165 VOLTS</td>
</tr>
<tr>
<td>MAXIMUM STEADY-STATE PEAK PLATE CURRENT PER PLATE</td>
<td>60 MA.</td>
</tr>
<tr>
<td>MAXIMUM TRANSIENT PEAK PLATE CURRENT PER PLATE, MAXIMUM DURATION 0.2 SECOND</td>
<td>350 MA.</td>
</tr>
<tr>
<td>MAXIMUM D.C. OUTPUT CURRENT PER PLATE</td>
<td>10 MA.</td>
</tr>
<tr>
<td>MAXIMUM HEATER-CATHODE VOLTAGE: HEATER POSITIVE WITH RESPECT TO CATHODE</td>
<td>360 VOLTS</td>
</tr>
<tr>
<td>HEATER NEGATIVE WITH RESPECT TO CATHODE</td>
<td>360 VOLTS</td>
</tr>
<tr>
<td>MAXIMUM BULB TEMPERATURE AT HOTTEST POINT</td>
<td>250 °C</td>
</tr>
</tbody>
</table>

CONTINUED ON FOLLOWING PAGE
TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

FULL-WAVE RECTIFIER WITH CAPACITOR-INPUT FILTER

HEATER VOLTAGE 6.3±5% VOLTS
HEATER CURRENT 0.3 AMPS.
AC PLATE-SUPPLY VOLTAGE PER PLATE, RMS 150 VOLTS
FILTER INPUT CAPACITOR 8 µFARADS
TOTAL EFFECTIVE PLATE-SUPPLY IMPEDANCE PER PLATE 300 OHMS
LOAD RESISTANCE 11000 OHMS
DC OUTPUT CURRENT 18 MA.
TUBE VOLTAGE DROP ib=18 MA. DC PER PLATE 4.5 VOLTS
RESONANT FREQUENCY (WITH SHORT AT TUBE BASE),MN. 900 MEGACY.

CHARACTERISTICS LIMITS

<table>
<thead>
<tr>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>INITIAL 275</td>
<td>325 MA.</td>
</tr>
</tbody>
</table>

HEATER CURRENT:
Ef = 6.3 VOLTS

OPERATION CURRENT:
(DC OUTPUT CURRENT FROM FW RECTIFIER)
Ef = 6.3 VOLTS, Eb=0 PER PLATE = 165 VOLTS
RMS, CL = 8 µF., P= AND Rs PER PLATE ADJUSTED WITH A TUBE HAVING A 10-VOLT DROP AT 50 ma. PER PLATE FOR Io = 18 ma. AND PEAK
ib ≈ 50 ma APPROXIMATELY

EMISSION CURRENT, EACH SECTION
Ef=6.3 VOLTS Eb =10 VOLTS

PLATE CURRENT, EACH SECTION:
Ef = 6.3 VOLTS, Eb=0 VOLTS
R L = 40000 OHMS (INCLUDING METER RESISTANCE)

PLATE CURRENT DIFFERENCE BETWEEN SECTIONS:
DIFFERENCE BETWEEN PLATE CURRENTS
FOR EACH SECTION AT Ef =6.3 VOLTS, Eb=0 VOLTS, R L = 40000 OHMS (INCLUDING METER RESISTANCE)

INTERELECTRODE CAPACITANCES:

PLATE INPUT (P TO KH, IS.) EA. SECTION
CATHODE INPUT (K TO PH, IS.) EA. SECT.
PLATE TO PLATE (P TO P)

(MEASURED WITH EXTERNAL SHIELD OF 0.405 INCH INSIDE DIAMETER CONNECTED TO LEAD J.)

HEATER-CATHODE LEAKAGE CURRENT, EA. SEC. Ef =6.3 VOLTS, Eb= 360 VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE
HEATER NEGATIVE WITH RESPECT TO CATHODE
INTERELECTRODE LEAKAGE RESISTANCE:
$E_I = 6.3$ VOLTS, POLARITY OF APPLIED
DC INTERELECTRODE VOLTAGE IS SUCH
THAT NO CATHODE EMISSION RESULTS
PLATE (EACH SECTION) TO ALL
AT 300 VOLTS DC

<table>
<thead>
<tr>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

MEGOMHS

A. CONDITIONS OF LIFE-TEST OPERATION AS A FULL-WAVE RECTIFIER ARE $E_I = 6.3$ VOLTS, $E_b$ PER
PLATE $= 165$ VOLTS RMS, $C_I = 8 \mu F$, $R_I$ AND $R_b$ PER PLATE ADJUSTED WITH A TUBE HAVING A 10-VOLT
DROP AT 50 MA PER PLATE FOR $I_0 = 18$ MA AND PEAK $I_B = 50$ MA APPROXIMATELY, $E_{hk} = E_a + 117$
VOLTS RMS SO PHASED THAT THE 117 VOLTS AND $E_I$ SUBTRACT, AND AMBIENT TEMPERATURE $= 175^\circ C$.

SPECIAL TESTS AND RATINGS

INOPERATIVES CONTROL:
MINIMUM CONTINUOUS OPERATING TIME UNDER LIFE-TEST
CONDITIONS OR EQUIVALENT FOR ALL TUBES PRIOR TO
CHARACTERISTICS TESTING

46 HOURS

HEATER-CYLING RATING:
CYCLES OF INTERMITTENT OPERATION, MINIMUM
$E_I = 7.0$ VOLTS CYCLED FOR ONE MINUTE ON AND FOUR MINUTES OFF.
$E_b = 0$ VOLTS. $E_{hk} = 140$ VOLTS RMS.

2500 CYCLES

SHOCK RATING:
IMPACT ACCELERATION IN ANY DIRECTION
FORCES AS APPLIED BY THE NAVY-TYPE, HIGH IMPACT (FLYWEIGHT)
SHOCK MACHINE FOR ELECTRONIC DEVICES OR ITS EQUIVALENT

450 G

FATIGUE RATING:
VIBRATIONAL ACCELERATION IN ANY DIRECTION
VIBRATIONAL FORCES FOR A PERIOD OF AT LEAST 100 HOURS AT A
FREQUENCY OF 60 CYCLES PER SECOND.

2.5 G

UNIFORM ACCELERATION RATING
UNIFORM ACCELERATION IN ANY DIRECTION
FORCES APPLIED GRADUALLY AS IN A CENTRIFUGE

1000 G

NOTE:
THE CONDITIONS FOR SOME OF THE INDICATED TESTS HAVE DELIBERATELY BEEN SELECTED TO
AGGRAVATE TUBE FAILURES FOR TEST AND EVALUATION PURPOSES, IN NO SENSE SHOULD THESE
CONDITIONS BE INTERPRETED AS SUITABLE CIRCUIT OPERATING CONDITIONS.

IN THE DESIGN OF MILITARY EQUIPMENT EMPLOYING THIS TUBE, REFERENCE SHOULD BE MADE TO
APPROPRIATE MIL-E-1 SPECIFICATION.