THE 5829WA IS A CATHODE-TYPE DOUBLE DIODE IN THE SUBMINIATURE CONSTRUCTION, CAPABLE OF OPERATION UP TO ABOUT 400 MC. AN INTERNAL SHIELD IS CONSTRUCTED BETWEEN THE TWO DIODE SECTIONS AND BROUGHT OUT ON A SEPARATE LEAD SO THAT ELECTRICALLY INDEPENDENT OPERATION CAN BE ASSURED. PRODUCT AVERAGE CONTROLS ON SUCH CHARACTERISTICS AS EMISSION AND FULL WAVE OPERATIONAL LOAD CURRENT ASSURE THAT THESE CRITICAL CHARACTERISTICS WILL REMAIN WELL CENTERED. SINCE IT MUST BE ABLE TO WITHSTAND SEVERE MECHANICAL TESTS TO MEET TEST SPECIFICATIONS, THE 5829WA IS ESPECIALLY SUITABLE FOR USE IN MILITARY AND INDUSTRIAL EQUIPMENT WHICH MAY BE SUBJECTED TO SEVERE SHOCK AND VIBRATION SUCH AS AIRBORNE COMMUNICATIONS EQUIPMENT.

DIRECT INTERELECTRODE CAPACITANCES

<table>
<thead>
<tr>
<th>Description</th>
<th>Without Shield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate #1 to All Other Elements (Rated)</td>
<td>2.6 μF</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.5 μF</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.9 μF</td>
</tr>
<tr>
<td>Plate #2 to All Other Elements (Rated)</td>
<td>2.3 μF</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.3 μF</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.7 μF</td>
</tr>
<tr>
<td>Cathode #1 to All Other Elements (Rated)</td>
<td>3.9 μF</td>
</tr>
<tr>
<td>Maximum</td>
<td>4.2 μF</td>
</tr>
<tr>
<td>Minimum</td>
<td>2.4 μF</td>
</tr>
<tr>
<td>Cathode #2 to All Other Elements (Rated)</td>
<td>3.9 μF</td>
</tr>
<tr>
<td>Maximum</td>
<td>4.6 μF</td>
</tr>
<tr>
<td>Minimum</td>
<td>2.8 μF</td>
</tr>
<tr>
<td>Plate #1 to Plate #2 (Rated)</td>
<td>0.1 μF</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.12 μF</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.06 μF</td>
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</tbody>
</table>

CONTINUED ON FOLLOWING PAGE
### DIRECT INTERELECTRODE CAPACITANCES — CONT’D.

<table>
<thead>
<tr>
<th>Without Shield</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CATHODE #1 TO HEATER (RATED)</strong></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>2.0 μf</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.1 μf</td>
</tr>
<tr>
<td><strong>CATHODE #2 TO HEATER (RATED)</strong></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>2.0 μf</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.3 μf</td>
</tr>
</tbody>
</table>

### RATINGS

**Absolute Maximum Values**

- **HEATER VOLTAGE**: 6.3±5% VOLTS
- **MAXIMUM DC PLATE SUPPLY VOLTAGE (EACH SECTION)**: 130 VOLTS
- **MAXIMUM PEAK PLATE INVERSE VOLTAGE**: 360 VOLTS
- **MAXIMUM HEATER CATHODE VOLTAGE**: ±360 VOLTS
- **MAXIMUM DC OUTPUT CURRENT (EACH SECTION)**: 5.5 mA
- **MAXIMUM PEAK PLATE CURRENT (EACH SECTION)**: 33 mA
- **MAXIMUM SURGE CURRENT (EACH SECTION)**: 175 mA
- **MAXIMUM BULB TEMPERATURE**: 220 °C
- **MAXIMUM ALTITUDE**: 6000 FEET

### TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

**Half-Wave Rectifier**

- **HEATER VOLTAGE**: 6.3 VOLTS
- **HEATER CURRENT**: 0.15 AMP.
- **MINIMUM TOTAL EFFECTIVE PLATE SUPPLY IMPEDANCE PER PLATE**: 400 OHMS
- **DC OUTPUT CURRENT PER PLATE**: 5 mA
- **AVERAGE TUBE VOLTAGE DROP @ 15 mA PER PLATE**: 5 VOLTS

### CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

*Ef = 6.3V, Epp/p = 117Vdc, Emk = 0V, RL = 14000 Ohms, CL = 8 μf*

**Except as Modified Below**

<table>
<thead>
<tr>
<th>Initial</th>
<th>500 Hour Life Test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MIN.</strong></td>
<td><strong>MAX.</strong></td>
</tr>
<tr>
<td><strong>HEATER CURRENT</strong></td>
<td>138</td>
</tr>
<tr>
<td><strong>HEATER—CATHODE LEAKAGE</strong></td>
<td>---</td>
</tr>
<tr>
<td><strong>(Ehk±100 Vdc)</strong></td>
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<tr>
<td><strong>INSULATION OF ELECTRODES</strong></td>
<td>100</td>
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<tr>
<td><strong>(Ep TO ALL = 300 Vdc)</strong></td>
<td>---</td>
</tr>
<tr>
<td><strong>PLATE CURRENT</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>(Ebb = O, Rp = 400)</strong></td>
<td>---</td>
</tr>
<tr>
<td><strong>PLATE CURRENT</strong></td>
<td>5.0</td>
</tr>
<tr>
<td><strong>DIFFERENCE BETWEEN SEC.</strong></td>
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</tr>
<tr>
<td><strong>GRID EMISSION</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>(Es=6.5 Vdc)</strong></td>
<td>---</td>
</tr>
</tbody>
</table>

**Continued on following page**
### SPECIAL REQUIREMENTS

<table>
<thead>
<tr>
<th>Requirement</th>
<th>MIN.</th>
<th>MAX.</th>
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</thead>
<tbody>
<tr>
<td>LOW PRESSURE VOLTAGE BREAKDOWN</td>
<td></td>
<td></td>
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<tr>
<td>(PRESSURE = 55±5 mm Hg, VOLTAGE = 330 VAC)³</td>
<td></td>
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</tr>
<tr>
<td>VARIABLE FREQUENCY VIBRATION³</td>
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</tr>
<tr>
<td>(NO VOLTAGES, POST SHOCK AND VIBRATIONAL</td>
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<td></td>
</tr>
<tr>
<td>FATIGUE TEST END POINTS APPLY)</td>
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</tr>
<tr>
<td>SUBMINIATURE LEAD FATIGUE⁴</td>
<td>4</td>
<td>ARCS</td>
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<tr>
<td>SHOCK⁵</td>
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<td></td>
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<tr>
<td>(HAMMER ANGLE = 30°)</td>
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</tr>
<tr>
<td>VIBRATIONAL FATIGUE⁶</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(G=2.5, FIXED FREQUENCY; F=25MIN, 60MAX)</td>
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<tr>
<td>POST SHOCK AND VIBRATIONAL FATIGUE TEST END POINTS</td>
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</tr>
<tr>
<td>HEATER CATHODE LEAKAGE</td>
<td></td>
<td>±15  μAcd</td>
</tr>
<tr>
<td>OPERATION</td>
<td>7.0</td>
<td></td>
</tr>
<tr>
<td>SHORT AND CONTINUITY⁷</td>
<td></td>
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<tr>
<td>GLASS STRAIN</td>
<td></td>
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<tr>
<td>HEATER CYCLING LIFE TEST</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(E=7.6V, E=140VAC, 60MIN ON 4 MIN OFF)</td>
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<tr>
<td>HEATER CYCLING LIFE TEST END POINTS</td>
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</tr>
<tr>
<td>HEATER CATHODE LEAKAGE</td>
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<td>±20  μAcd</td>
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<tr>
<td>INTERMITTENT LIFE TEST</td>
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<tr>
<td>(T ENVIRONMENT= 220°C)</td>
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</tbody>
</table>

### NOTES

A. TUBE SHALL BE TESTED IN A CHAMBER UNDER THE CONDITIONS OF PRESSURE SPECIFIED. THE SPECIFIED VOLTAGE SHALL BE APPLIED BETWEEN THE LEADS OF ELEMENTS CARRYING THE VOLTAGE AND THE ADJACENT LEADS. VOLTAGE SHALL BE OF A SINEWAVE WAVE FORM WITH F=60 CYCLES. TUBE SHOWING EVIDENCE OF CORONA OR ARCING SHALL BE CONSIDERED DEFECTIVE.

B. SEE MIL-E-21C 4.9.20.3

C. SEE MIL-E-21C 4.9.5.3

D. SEE MIL-E-21C 4.9.20.5

E. SEE MIL-E-21C 4.7.5

F. GLASS STRAIN TEST PROCEDURE; ALL TUBES SUBJECTED TO THIS TEST SHALL HAVE BEEN SEALED A MINIMUM OF 48 HOURS PRIOR THERETO. ALL TUBES SHALL BE AT ROOM TEMPERATURE IMMEDIATELY PRIOR TO THIS TEST. THE ENTIRE TUBE SHALL BE IMMERSED IN WATER OF NOT LESS THAN 85°C FOR 25 SECONDS AND IMMEDIATELY THEREAFTER IMMERSED IN WATER OF NOT MORE THAN 5°C FOR 5 SECONDS. THE VOLUME OF WATER SHALL BE LARGE ENOUGH THAT THE TEMPERATURE WILL NOT BE APPRECIABLY EFFECTED BY THE TEST. THE METHOD OF SUBMERSION SHALL BE IN ACCORDANCE WITH DRAWING #245-JAN, AND SUCH THAT A MINIMUM OF HEAT IS CONDUCTED AWAY BY THE HOLDER USED. THE TUBES SHALL BE PLACED IN WATER SO THAT NO CONTACT IS MADE WITH THE CONTAINING VESSEL, NOR SHALL THE TUBES CONTACT EACH OTHER, AFTER THE 5-SECOND SUBMERSION PERIOD, THE TUBES SHALL BE REMOVED AND ALLOWED TO DRY AT ROOM TEMPERATURE ON A WOODEN SURFACE. AFTER DRYING AT ROOM TEMPERATURE FOR 48 HOURS, THE TUBES SHALL BE INSPECTED FOR EVIDENCE OF AIR LEAKS. ELECTRICAL REJECTS, OTHER THAN IMPERATIVES, MAY BE USED IN THE PERFORMANCE TEST.

H. ENVELOPE TEMPERATURE IS DEFINED AS THE HIGHEST TEMPERATURE INDICATED WHEN USING A THERMOCOUPLE OF 4005 OR SMALLER DIAMETER ELEMENTS WELDED TO A RING OF 0.025 INCH DIAMETER PHOSPHOR BRONZE PLACED IN CONTACT WITH THE ENVELOPE.

J. IN FULL-WAVE LIFE TEST CIRCUIT, THE VALUES OF RL AND CL GIVEN IN THE TEST CONDITIONS SHALL BE CONSIDERED AS APPROXIMATE AND SHALL BE ADJUSTED INITIALLY TO GIVE 10 MA RECIPROCAL TO OR GREATER THAN 10 MA WITH RH EQUAL TO OR GREATER THAN 25 MA. ENK = 117 VAC.

E. SEE MIL-E-21C 4.9.20.6
5829WA

$E_f = 6.3\ \text{Volts}$