THE 6205 IS A SHARP-CUTOFF PENTODE IN THE 8 PIN SUBMINIATURE CONSTRUCTION. IT IS DESIGNED FOR USE IN HIGH-FREQUENCY CIRCUITS. IN ON-OFF CONTROL APPLICATIONS, THE TUBE WILL MAINTAIN ITS EMISSION CAPABILITIES AFTER LONG PERIODS OF OPERATION UNDER CUTOFF CONDITIONS. EXCEPT FOR THE INCORPORATION OF AN EXTERNAL CONNECTION FOR THE SUPPRESSOR GRID, THE 6205 IS IDENTICAL TO THE 5840.

DIRECT INTERELECTRODE CAPACITANCES

<table>
<thead>
<tr>
<th>WITH SHIELD</th>
<th>WITHOUT SHIELD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRID #1 TO PLATE, MAX.</td>
<td>0.015</td>
</tr>
<tr>
<td>INPUT</td>
<td>4.2</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>3.4</td>
</tr>
</tbody>
</table>

A WITH EXTERNAL SHIELD OF 0.405 INCH INSIDE DIAMETER CONNECTED TO CATHODE

RATINGS

**ABSOLUTE MAXIMUM VALUES**

- **HEATER VOLTAGE**: 6.3±5% VOLTS
- **MAXIMUM PLATE VOLTAGE**: 165 VOLTS
- **MAXIMUM SCREEN VOLTAGE**: 155 VOLTS
- **MAXIMUM SUPPRESSOR VOLTAGE**: 22 VOLTS
- **MAXIMUM POSITIVE DC GRID #1 VOLTAGE**: 0 VOLTS
- **MAXIMUM NEGATIVE DC GRID #1 VOLTAGE**: 55 VOLTS
- **MAXIMUM PLATE DISSIPATION**: 1.1 WATTS
- **MAXIMUM SCREEN DISSIPATION**: 0.55 WATTS
- **MAXIMUM DC CATHODE CURRENT**: 16.5 MA.
- **MAXIMUM HEATER=CATHODE VOLTAGE**: 200 VOLTS
- **HEATER POSITIVE WITH RESPECT TO CATHODE**: 200 VOLTS
- **MAXIMUM GRID #1 CIRCUIT RESISTANCE**: 1.1 MEGOHMS
- **MAXIMUM BULB TEMPERATURE AT HOTTEST POINT**: 220 C

INDICATES A CHANGE. CONTINUED ON FOLLOWING PAGE
# TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

**CLASS A₁ AMPLIFIER**

- **HEATER VOLTAGE**: 6.3±5% VOLTS
- **HEATER CURRENT**: 0.15 AMP.
- **PLATE VOLTAGE**: 100 VOLTS
- **SUPPRESSOR, CONNECTED TO CATHODE AT SOCKET**: 100 VOLTS
- **SCREEN VOLTAGE**: 150 OHMS
- **CATHODE-BIAS RESISTOR**: 0.26 MEG.
- **PLATE RESISTANCE, APPROX.**: 5000 /μHOS
- **TRANS CONDUCTANCE**: 7.5 MA.
- **PLATE CURRENT**: 2.4 MA.
- **SCREEN CURRENT**: -9.0 VOLTS
- **GRID #1 VOLTAGE, APPROX.**: Ib = 10 μAMPS.

## CLASS A RESISTANCE COUPLED AMPLIFIER

**LOW IMPEDANCE DRIVE (APPROXIMATELY 200 OHMS)**

<table>
<thead>
<tr>
<th>( R_L )</th>
<th>( R_{gf} )</th>
<th>( R_k )</th>
<th>( R_{e₂} )</th>
<th>( E_b )</th>
<th>( G_{ol} )</th>
<th>( R_k )</th>
<th>( R_{e₂} )</th>
<th>( E_b )</th>
<th>( G_{ol} )</th>
<th>( R_k )</th>
<th>( R_{e₂} )</th>
<th>( E_b )</th>
<th>( G_{ol} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10</td>
<td>0.10</td>
<td>1000</td>
<td>0.2</td>
<td>13</td>
<td>50</td>
<td>500</td>
<td>0.3</td>
<td>19</td>
<td>83</td>
<td>400</td>
<td>0.3</td>
<td>29</td>
<td>110</td>
</tr>
<tr>
<td>0.10</td>
<td>0.24</td>
<td>1000</td>
<td>0.2</td>
<td>16</td>
<td>73</td>
<td>500</td>
<td>0.3</td>
<td>25</td>
<td>120</td>
<td>400</td>
<td>0.3</td>
<td>35</td>
<td>160</td>
</tr>
<tr>
<td>0.24</td>
<td>0.24</td>
<td>1700</td>
<td>0.5</td>
<td>13</td>
<td>72</td>
<td>1500</td>
<td>0.6</td>
<td>20</td>
<td>100</td>
<td>700</td>
<td>0.8</td>
<td>29</td>
<td>160</td>
</tr>
<tr>
<td>0.24</td>
<td>0.51</td>
<td>2000</td>
<td>0.6</td>
<td>15</td>
<td>89</td>
<td>1500</td>
<td>0.7</td>
<td>24</td>
<td>140</td>
<td>700</td>
<td>0.9</td>
<td>35</td>
<td>210</td>
</tr>
<tr>
<td>0.51</td>
<td>0.51</td>
<td>2500</td>
<td>1.3</td>
<td>11</td>
<td>93</td>
<td>2000</td>
<td>1.5</td>
<td>18</td>
<td>140</td>
<td>1000</td>
<td>1.7</td>
<td>28</td>
<td>200</td>
</tr>
<tr>
<td>0.51</td>
<td>1.0</td>
<td>3000</td>
<td>1.5</td>
<td>13</td>
<td>110</td>
<td>2000</td>
<td>1.7</td>
<td>20</td>
<td>180</td>
<td>1000</td>
<td>2.0</td>
<td>31</td>
<td>280</td>
</tr>
</tbody>
</table>

**HIGH IMPEDANCE DRIVE (APPROXIMATELY 100 K OHMS)**

<table>
<thead>
<tr>
<th>( R_L )</th>
<th>( R_{gf} )</th>
<th>( R_k )</th>
<th>( R_{e₂} )</th>
<th>( E_b )</th>
<th>( G_{ol} )</th>
<th>( R_k )</th>
<th>( R_{e₂} )</th>
<th>( E_b )</th>
<th>( G_{ol} )</th>
<th>( R_k )</th>
<th>( R_{e₂} )</th>
<th>( E_b )</th>
<th>( G_{ol} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10</td>
<td>0.10</td>
<td>1200</td>
<td>0.2</td>
<td>13</td>
<td>48</td>
<td>700</td>
<td>0.2</td>
<td>18</td>
<td>77</td>
<td>500</td>
<td>0.3</td>
<td>28</td>
<td>110</td>
</tr>
<tr>
<td>0.10</td>
<td>0.24</td>
<td>1300</td>
<td>0.2</td>
<td>16</td>
<td>70</td>
<td>800</td>
<td>0.3</td>
<td>24</td>
<td>110</td>
<td>500</td>
<td>0.3</td>
<td>37</td>
<td>150</td>
</tr>
<tr>
<td>0.24</td>
<td>0.24</td>
<td>2800</td>
<td>0.4</td>
<td>12</td>
<td>68</td>
<td>1700</td>
<td>0.6</td>
<td>20</td>
<td>100</td>
<td>1200</td>
<td>0.8</td>
<td>29</td>
<td>150</td>
</tr>
<tr>
<td>0.24</td>
<td>0.51</td>
<td>3000</td>
<td>0.5</td>
<td>15</td>
<td>82</td>
<td>1800</td>
<td>0.7</td>
<td>24</td>
<td>140</td>
<td>1300</td>
<td>0.8</td>
<td>35</td>
<td>190</td>
</tr>
<tr>
<td>0.51</td>
<td>0.51</td>
<td>5500</td>
<td>1.0</td>
<td>11</td>
<td>76</td>
<td>3500</td>
<td>1.3</td>
<td>18</td>
<td>120</td>
<td>2400</td>
<td>1.6</td>
<td>26</td>
<td>180</td>
</tr>
<tr>
<td>0.51</td>
<td>1.0</td>
<td>6200</td>
<td>1.2</td>
<td>12</td>
<td>92</td>
<td>3800</td>
<td>1.6</td>
<td>19</td>
<td>160</td>
<td>2500</td>
<td>1.8</td>
<td>31</td>
<td>230</td>
</tr>
</tbody>
</table>

1. \( E_o \) IS MAXIMUM RMS VOLTAGE OUTPUT FOR APPROXIMATELY 5% TOTAL HARMONIC DISTORTION.
2. GAIN IS MEASURED FOR AN OUTPUT VOLTAGE OF TWO VOLTS RMS.
3. \( R_k \) IS IN OHMS; \( R_{e₂}, R_L, \) AND \( R_{gf} \) ARE IN MEGOHMS.
4. COUPLING CAPACITORS (C) SHOULD BE SELECTED TO GIVE DESIRED FREQUENCY RESPONSE. \( R_k \) AND \( R_{e₂} \) SHOULD BE ADEQUATELY BY-PASSED.

CONTINUED ON FOLLOWING PAGE
HEATER CURRENT:
EF = 6.3 VOLTS
INITIAL 140 160 MA.
500-HR. 138 164 MA.

PLATE CURRENT:
EF = 6.3 VOLTS, Eb = 100 VOLTS, Ec2 =
100 VOLTS, Rk = 150 OHMS (BYPASSED),
g3 TIED TO k
INITIAL 5.5 9.5 MA.

SCREEN CURRENT:
EF = 6.3 VOLTS, Eb = 100 VOLTS, Ec2 =
100 VOLTS, Rk = 150 OHMS (BYPASSED),
g3 TIED TO k
INITIAL 1.5 3.3 MA.

TRANSCONDUCTANCE (1):
EF = 6.3 VOLTS, Eb = 100 VOLTS, Ec2 = 100
VOLTS, Rk = 150 OHMS (BYPASSED),
g3 TIED TO k
INITIAL 4200 5800 µMHOS

TRANSCONDUCTANCE CHANGE WITH
HEATER VOLTAGE
DIFFERENCE BETWEEN TRANSCONDUCTANCE
(1) AND TRANSCONDUCTANCE AT EF = 5.7
VOLTS (OTHER CONDITIONS THE SAME)
EXPRESSED AS A PERCENTAGE OF TRAN-
CONDUCTANCE (1)
INITIAL --- 10 PERCENT
500-HR. --- 15 PERCENT

TRANSCONDUCTANCE CHANGE WITH OPERATION:
DIFFERENCE BETWEEN TRANSCONDUCT-
ANCE (1) INITIALLY AND AFTER OPER-
ATION EXPRESSED AS A PERCENTAGE
OF INITIAL VALUE
500-HR. --- 20 PERCENT

AVERAGE TRANSCONDUCTANCE CHANGE
WITH OPERATION:
AVERAGE OF VALUES FOR "TRANSCON-
DUCTANCE CHANGE WITH OPERATION"
500-HR. --- 15 PERCENT

PLATE RESISTANCE:
EF = 6.3 VOLTS, Eb = 100 VOLTS, Ec2 =
100 VOLTS, Rk = 150 OHMS (BYPASSED),
g3 TIED TO k
INITIAL 0.175 --- MEGOHMS

PLATE CURRENT CUTOFF:
EF = 6.3 VOLTS, Eb = 100 VOLTS, Ec2 =
100 VOLTS, Ec1 = 9.0 VOLTS, g3
TIED TO k
INITIAL 50 µAMPS.

INTERELECTRODE CAPACITANCES:
GRID #1 TO PLATE (G1 TO P)
INITIAL --- 0.015 µF
INPUT (G1 TO H, K, G2, G3)
INITIAL 3.5 4.9 µF
OUTPUT (P TO H, K, G2G3)
INITIAL 2.9 3.9 µF

(MEASURED WITH EXTERNAL SHEILD OF 0.405-INCH INSIDE DIAMETER CONNECTED
to cathode.

NEGATIVE GRID #1 CURRENT:
EF = 6.3 VOLTS, Eb = 100 VOLTS, Ec2 =
100 VOLTS, Rk = 150 OHMS (BYPASSED)
Rg1 = 1.0 MEG., g3 TIED TO k
INITIAL 0 0.3 µAMPS.
500-HR. 0 0.8 µAMPS.
**Continued from preceding page**

**Characteristics Limits – cont’d.**

<table>
<thead>
<tr>
<th>HEATER-CATHODE LEAKAGE CURRENT:</th>
<th>MIN.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF=6.3 VOLTS, EHk=100 VOLTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HEATER POSITIVE WITH RESPECT TO</td>
<td>INITIAL</td>
<td>5.0</td>
</tr>
<tr>
<td>CATHODE</td>
<td>500-HR.</td>
<td>10</td>
</tr>
<tr>
<td>HEATER NEGATIVE WITH RESPECT TO</td>
<td>INITIAL</td>
<td>5.0</td>
</tr>
<tr>
<td>CATHODE</td>
<td>500-HR.</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTERELECTRODE LEAKAGE RESISTANCE:</th>
<th>MIN.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF=6.3 VOLTS, POLARITY OF APPLIED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC INTERELECTRODE VOLTAGE IS SUCH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THAT NO CATHODE EMISSION RESULTS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRID #1 TO ALL AT 100 VOLTS DC</td>
<td>INITIAL</td>
<td>100</td>
</tr>
<tr>
<td>PLATE TO ALL AT 300 VOLTS DC</td>
<td>500-HR.</td>
<td>50</td>
</tr>
<tr>
<td>VIBRATIONAL NOISE OUTPUT VOLTAGE,</td>
<td>INITIAL</td>
<td>100</td>
</tr>
<tr>
<td>RMS: EF=6.3 VOLTS, Eb=100 VOLTS,</td>
<td>500-HR.</td>
<td>50</td>
</tr>
<tr>
<td>Ec=100 VOLTS, Rk=150 OHMS (BYPASSED)</td>
<td>RL=10,000 OHMS.</td>
<td></td>
</tr>
<tr>
<td>g3 TIED TO k, VIBRATION ACCELERATION =</td>
<td>INITIAL</td>
<td>60</td>
</tr>
<tr>
<td>15 G AT 40 cps</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GRID #1 EMISSION CURRENT:</th>
<th>MIN.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF=7.5 VOLTS, Eb=100 VOLTS, Ec2=100</td>
<td>INITIAL</td>
<td>0</td>
</tr>
<tr>
<td>VOLTS, Ec1=-9.0 VOLTS, Rg1=1.0 MEG.</td>
<td>500-HR.</td>
<td>0.5</td>
</tr>
<tr>
<td>g3 TIED TO k</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The indicated 500-hour values are life-test end points for the following conditions of operation: EF=6.3 VOLTS, Ec=100 VOLTS, Ec2=100 VOLTS, Rk=150 OHMS; g3 tied to k, Rg1=1.0 MEG, Eb=200 VOLTS with heater positive with respect to cathode, and bulb temperature=220 C.

**Special Tests and Ratings**

**Stability Life Test**
Statistical sample operated for one hour to evaluate and control initial variations in transconductance.

**Survival Rate Life Test**
Statistical sample operated for one hundred hours to evaluate and control early-life electrical and mechanical inoperatives.

**Heater-Cycling Life Test**
Statistical sample operated for 2000 cycles minimum to evaluate and control heater-cathode defects. Conditions of test include EF=7.0 VOLTS cycled for one minute on and four minutes off, E3=Ec3=Ec2=Ec1=0 VOLTS, and EHk=140 VOLTS RMS.

**Shock Rating=450 G**
Statistical sample subjected to five impact accelerations of 450 G in each of four different positions. The accelerating forces are applied by the Navy-type high impact (flyweight) shock machine for electronic devices or its equivalent.

**Continued on following page**
SPECIAL TESTS AND RATINGS

FATIGUE RATING - 2.5 G
STATISTICAL SAMPLE SUBJECTED TO VIBRATIONAL ACCELERATION OF 2.5 G FOR 32 HOURS MINIMUM IN EACH OF THREE DIFFERENT POSITIONS. THE SINUSOIDAL VIBRATION IS APPLIED AT A FIXED FREQUENCY BETWEEN 35 AND 60 CYCLES PER SECOND.

ALTITUDE RATING - 60,000 FEET
STATISTICAL SAMPLE SUBJECTED TO PRESSURE OF 55 MILLIMETERS OF MERCURY TO EVALUATE AND CONTROL ARCING AND CORONA.

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 THE APPROPRIATE MIL-E-1 SPECIFICATION.
6205

$E_f = 6.3$ Volts
$E_{c3} = 0$ Volts
$E_{c4} = 0$ Volts

PLATE MILLIAMPERES

PLATE VOLTS

$E_{c2} = 140$ Volts

$E_{c3} = 140$ Volts

GRID #1 VOLTS

PLATE MILLIAMPERES
6205

$E_f = 6.3$ Volts
$E_b = 150$ Volts
$E_{c3} = 0$ Volts

GRID #1 VOLTS

GRID #2 MILLIAMPERES

TRANSCONDUCTANCE - MICROMOS