

## ADVANCE DATA

### MECHANICAL DATA

|                   |                       |
|-------------------|-----------------------|
| Bulb              | T-6 $\frac{1}{2}$     |
| Base              | E9-1 Miniature Button |
| Outline           | JEDEC 6-2             |
| Basing            | 9PY                   |
| Cathode           | Coated Unipotential   |
| Mounting Position | Any                   |

### RATINGS<sup>1</sup>

|                                                  |                      |
|--------------------------------------------------|----------------------|
| Bulb Temperature (Measured per JEDEC pub. JO-HL) | +180 °C              |
| Operational Altitude                             | 80,000 Ft.           |
| Radiation Environment                            |                      |
| Total Dosage - (Neutrons/Sq. Cm)                 | 10 <sup>16</sup> nvt |
| Dose Rate - (Neutrons/Sq. Cm/Sec.)               | 10 <sup>12</sup> nv  |

### DURABILITY CHARACTERISTICS<sup>2</sup>

|                                                            |       |
|------------------------------------------------------------|-------|
| Impact Acceleration <sup>3</sup>                           | 500 G |
| Vibration Acceleration for an Extended Period <sup>4</sup> | 10 G  |
| On - Off Heater Cycles <sup>5</sup>                        | 2000  |

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

|                                       | Parallel <sup>13</sup> | Series <sup>14</sup> |
|---------------------------------------|------------------------|----------------------|
| Heater Voltage                        | 6.3                    | 12.6 Volts           |
| Heater Current                        | 460                    | 230 mA               |
| Maximum Heater-Cathode Voltage (Peak) |                        | 200 Volts            |

#### CONTROLLED DETRIMENTS

|                                                                  |                |
|------------------------------------------------------------------|----------------|
| Minimum Interelectrode Insulation <sup>6</sup>                   | 100 Megohms    |
| Maximum Total Grid Current <sup>7</sup>                          | -0.5 $\mu$ Adc |
| Maximum Vibration Output as Equivalent Grid Voltage <sup>8</sup> | 7.9 mVac       |
| Maximum Heater-Cathode Leakage <sup>9</sup>                      | 5.0 $\mu$ Adc  |

#### DIRECT INTERELECTRODE CAPACITANCES

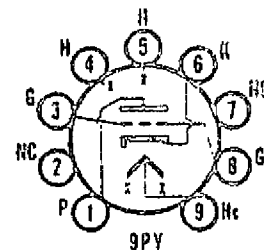
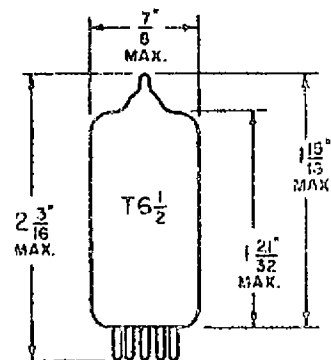
#### Unshielded

|                    |         |
|--------------------|---------|
| Grid to Plate      | 2.9 pf  |
| Input: g to (h+k)  | 10.0 pf |
| Output: p to (h+k) | 1.2 pf  |

### QUICK REFERENCE DATA

The Type 8212 is a miniature medium mu triode intended primarily for cathode follower applications. It is characterized by long life and stable performance under conditions of high altitude, severe shock, vibration and high temperature.

The 8212 is manufactured and inspected to meet the applicable MIL-E-1 specification.



### SYLVANIA ELECTRONIC TUBES

A Division of  
Sylvania Electric Products Inc.

RECEIVING TUBE  
OPERATIONS  
EMPORIUM, PA.

Prepared and Released By The  
TECHNICAL PUBLICATIONS SECTION  
EMPORIUM, PENNSYLVANIA

RATINGS<sup>1</sup> (Absolute Values)

|                                  |            |
|----------------------------------|------------|
| Maximum Heater Voltage Variation | ±10% Volts |
| Maximum Plate Voltage            | 300 Vdc    |
| Maximum Cathode Current          | 75 mAdc    |
| Maximum Negative Grid Voltage    | -40 Volts  |
| Maximum Plate Dissipation        | 10.0 Watts |
| Maximum Grid Circuit Resistance  | 0.5 Meg    |

Pulse Service (See Chart)

|                                                           |            |
|-----------------------------------------------------------|------------|
|                                                           | +5.0       |
| Maximum Heater Voltage Variation                          | -0 Percent |
| Maximum Negative Grid Voltage                             | -40 Vdc    |
| Maximum Plate Dissipation                                 | 10.0 W     |
| Maximum Average Plate Voltage                             | 150 Vdc    |
| Maximum Instantaneous Forward Plate Voltage <sup>12</sup> | 300 v      |
| Maximum Instantaneous Heater to Cathode Voltage           | 100 v      |
| Maximum Grid Dissipation                                  | 0.6 W      |
| Maximum Instantaneous Grid to Cathode Voltage             | ±60 v      |

## AVERAGE CHARACTERISTICS

|                                          |                  |
|------------------------------------------|------------------|
| Heater Voltage                           | 12.6 V           |
| Plate Voltage                            | 105 Vdc          |
| Grid Voltage                             | 0 Vdc            |
| Cathode Resistor                         | 75 Ohms          |
| Plate Current                            | 25 mAdc          |
| Transconductance                         | 29,000 $\mu$ hos |
| Amplification Factor                     | 28               |
| Plate Resistance (approx.)               | 965 Ohms         |
| Grid Voltage for $I_b = 25 \mu A$ (Max.) | -7.5 Vdc         |

Plate Current<sup>10</sup>: With  $E_f = 12.6$  V;  $E_b = 105$  Vdc;  $E_c = -20$  Vdc;  
 $P_{rr} = 10,000$  pps;  $t_p = 10 \mu$ sec.;  $egk = 0$  V. 100 mAdc

Pulse Cathode Current: With  $E_f = 12.6$  V;  $E_b = 150$  Vdc;  
 $E_c = -30$  Vdc;  $egk = +30$  V (Measured between grid and cathode pins);  
 $t_p = 10 \mu$ sec.;  $prr = 2,000$  pps; duty cycle = 2.0%. 3000 ma

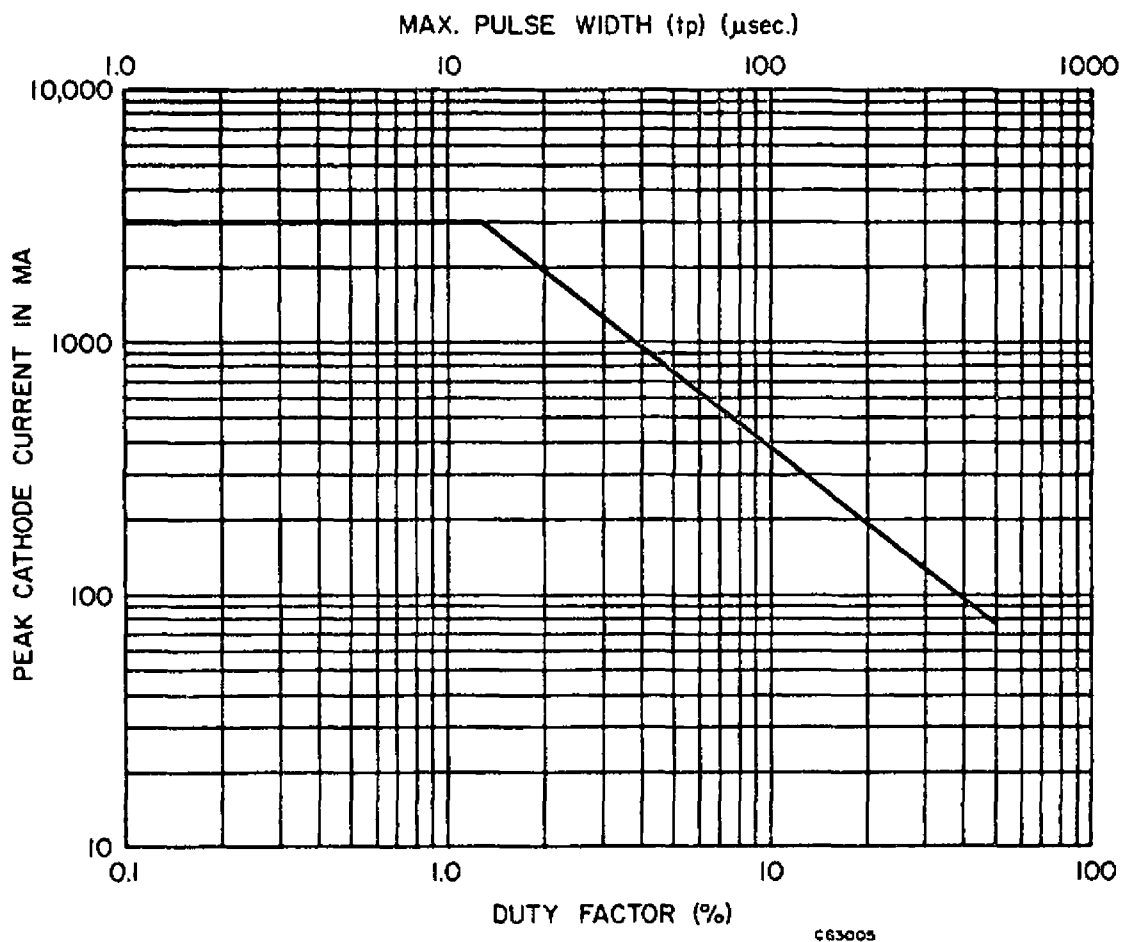
|                                                             |          |
|-------------------------------------------------------------|----------|
| Minimum Pulse Plate to Cathode Currents Ratio <sup>11</sup> | 0.7      |
| Equivalent Noise Resistance (at 50 Mc)                      | 200 Ohms |
| Hot Input Capacitance (at 50 Mc)                            | 20 pf    |

## NOTES:

1. Limiting values beyond which normal tube life and normal tube performance may be impaired.
2. Tests performed as a measure of the mechanical durability of the tube structure.
3. Force as applied in any direction by the Navy Type High Impact (Flyweight) Shock Machine for Electronic Devices. Shock duration =  $3/4$  milliseconds.

4. Vibrational forces applied in any direction for a period of 6 hours over the range 30 cps to 3000 cps.
5. One cycle consists of the application of  $E_f = 15$  V for one minute and interruption of the filament voltage for four minutes. A voltage of  $E_{hk} = 140$  Vac is applied continuously.
6. Measure with  $E_f = 12.6$  V;  $E_g\text{-all} = -100$  Vdc;  $E_p\text{-all} = -300$  Vdc; Cathode is positive so that no cathode emission occurs.
7. Measure with  $E_f = 12.6$  V;  $E_c = 0$  Vdc;  $E_b = 105$  Vdc;  $R_k = 75$  Ohms.
8. Test with  $E_f = 12.6$  V;  $E_b = 150$  Vdc;  $E_c = 0$  Vdc;  $R_k = 75$  Ohms;  $R_p = 2000$  Ohms;  $F = 40$  cps;  $Acc = 10$  g;  $C_k = 1000$   $\mu$ f.
9. Measure with  $E_f = 12.6$  V;  $E_{hk} = \pm 100$  Vdc.
10. Measured by method using recurrent wave form. Grid pulse is square wave producing specified egk directly at grid terminal with respect to cathode. Plate current is measured by high impedance oscilloscope or equivalent device connected across 1 ohm resistor in plate circuit.
11. Grid pulse is square wave. Peak currents measured using high impedance oscilloscope or equivalent device connected across a cathode or plate resistor of 1.0 ohms.
12. Applies only to the spike occurring at the leading edge of the plate waveform. The spike duration must be limited to 0.1 of  $t_p$ .
13. Heaters paralalled connected, tie pins 4 and 5 together, use center tap pin 9.
14. Heater series connected, use pins 4 and 5.

## RATING CHART



## RATING CHART INTERPRETATION

The area below and to the left of the line establishes permissible peak cathode current for duty factors up to 50 percent. At duty factors greater than 50 percent the maximum average DC current of 75 milliamperes shall be the rating. Three thousand milliamperes is the maximum peak cathode current rating at any duty factor below 1.3 percent. Duty factor is defined as the ratio of the average current to the maximum peak current occurring in any 1000 micro-second period.