

E2V Technologies

FX2505

Hydrogen Thyatron

The data to be read in conjunction with the Hydrogen Thyatron Preamble.

ABRIDGED DATA

Hydrogen-filled triode thyatron, positive grid, for pulse operation. A hydrogen reservoir is incorporated. Electrically superior to 4C35A.

| | | |
|--------------------------------------|-------------------|-----------|
| Peak forward anode voltage | 10 | kV max |
| Peak anode current | 100 | A max |
| Average anode current | 125 | mA max |
| Anode heating factor | 2.8×10^9 | VApps max |
| Peak output power | 0.5 | MW max |

GENERAL

Electrical

| | |
|---|---|
| Cathode (connected internally to one end of heater) | oxide coated |
| Heater voltage | 6.3 $\begin{matrix} + 5\% \\ - 10\% \end{matrix}$ V |
| Heater current | 6.1 A |
| Tube heating time (minimum) | 3.0 min |

Mechanical

| | |
|--|-----------------------------|
| Overall length | 174.6 mm (6.875 inches) max |
| Overall diameter | 65.1 mm (2.562 inches) max |
| Net weight | 260 g (9 ounces) approx |
| Mounting position (see note 1) | any |
| Base | B4D, bayonet |
| Top cap | BS 448-CT3 |

Cooling natural

PULSE MODULATOR SERVICE MAXIMUM AND MINIMUM RATINGS (Absolute values)

| | Min | Max | |
|--|-----|-------------------|------------|
| Anode | | | |
| Peak forward anode voltage (see note 2) | - | 10 | kV |
| Peak inverse anode voltage (see note 3) | - | 10 | kV |
| Peak anode current | - | 100 | A |
| Average anode current | - | 125 | mA |
| Rate of rise of anode current (see note 4) | - | 1500 | A/ μ s |
| Anode heating factor | - | 2.8×10^9 | VApps |

| | Min | Max | |
|--|-----|------|------------|
| Grid | | | |
| Unloaded grid drive pulse voltage (see note 5) | 175 | - | V |
| Grid pulse duration | 2.0 | - | μ s |
| Rate of rise of grid pulse (see note 4) | 160 | - | V/ μ s |
| Peak inverse grid voltage | - | 200 | V |
| Loaded grid bias voltage | 0 | -120 | V |
| Forward impedance of grid drive circuit | - | 1500 | Ω |

Cathode

| | | | |
|-----------------------------|-----|---|-----|
| Heater voltage | 6.3 | $\begin{matrix} + 5\% \\ - 10\% \end{matrix}$ | V |
| Tube heating time | 3.0 | - | min |

Environmental

| | | | |
|-------------------------------|-----|--------|--------------|
| Ambient temperature | -50 | +90 | $^{\circ}$ C |
| Altitude | - | 3 | km |
| | - | 10 000 | ft |

CHARACTERISTICS

| | Min | Typical | Max | |
|---|------------------------|---------|-----|---------|
| Critical DC anode voltage for conduction (see note 6) | - | 0.3 | 1.0 | kV |
| Anode delay time (see notes 6 and 7) | - | 0.35 | 0.6 | μ s |
| Anode delay time drift (see notes 6 and 8) | - | 0.03 | 0.1 | μ s |
| Time jitter (see notes 6 and 9) | - | 3.0 | 5.0 | ns |
| Recovery time | see note 10 and curves | | | |
| Heater current (at 6.3 V) | 5.5 | 6.1 | 6.7 | A |

NOTES

1. The tube should preferably be clamped by the base only. Any clamps used on the bulb must not extend beyond 63.5 mm (2 1/2 inches) above the top of the base and should be made from material of low thermal conductivity.
2. For instantaneous starting applications the maximum permissible peak forward voltage is 8.0 kV and there must be no overshoot.
3. In pulsed operation the peak inverse anode voltage, exclusive of a spike of 0.05 μs duration, must not exceed 2.5 kV during the first 25 μs after the pulse.
4. This rate of rise refers to that part of the leading edge of the pulse between 25% and 75% of the pulse amplitude.
5. Measured with respect to cathode potential.
6. The typical figures are obtained on test using conditions of minimum grid drive. Improved performance can be expected by increasing the grid drive.
7. The time interval between a point on the leading edge of the unloaded grid pulse at 25% of the pulse amplitude and the point where anode conduction takes place.
8. Normally taken as the drift in delay time over a 5-minute run at full ratings between the second and seventh minutes of operation.
9. The variation of firing time measured at 50% of current pulse amplitude.
10. The recovery characteristics are controlled on a sampling basis.

HEALTH AND SAFETY HAZARDS

E2V Technologies hydrogen thyratrons are safe to handle and operate, provided that the relevant precautions stated herein are observed. E2V Technologies does not accept responsibility for damage or injury resulting from the use of electronic devices it produces. Equipment manufacturers and users must ensure that adequate precautions are taken. Appropriate warning labels and notices must be provided on equipments incorporating E2V Technologies devices and in operating manuals.



High Voltage

Equipment must be designed so that personnel cannot come into contact with high voltage circuits. All high voltage circuits and terminals must be enclosed and fail-safe interlock switches must be fitted to disconnect the primary power supply and discharge all high voltage capacitors and other stored charges before allowing access. Interlock switches must not be bypassed to allow operation with access doors open.

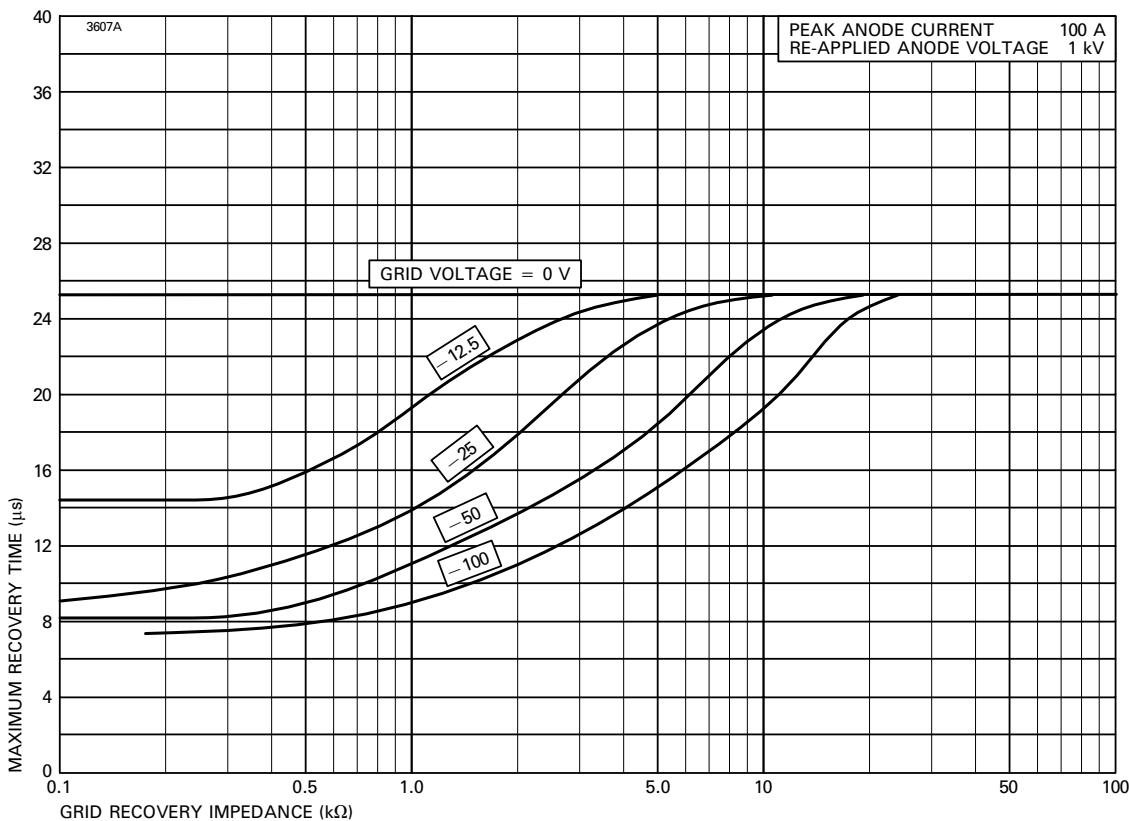


X-Ray Radiation

All high voltage devices produce X-rays during operation and may require shielding. The X-ray radiation from hydrogen thyratrons is usually reduced to a safe level by enclosing the equipment or shielding the thyratron with at least 1.6 mm (1/16 inch) thick steel panels.

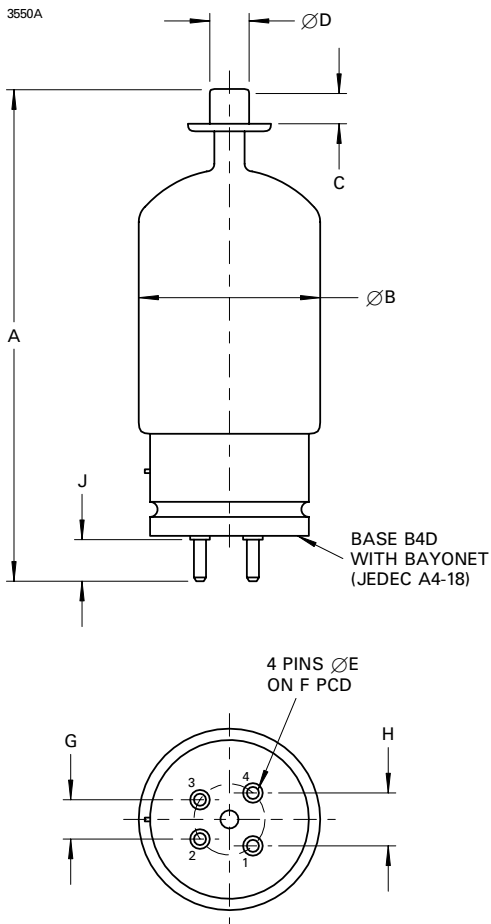
Users and equipment manufacturers must check the radiation level under their maximum operating conditions.

MAXIMUM RECOVERY CHARACTERISTICS



OUTLINE

(All dimensions without limits are nominal)



| Ref | Millimetres | Inches |
|-----|---------------|---------------|
| A | 174.6 max | 6.875 max |
| B | 65.1 max | 2.563 max |
| C | 9.53 min | 0.375 min |
| D | 14.38 ± 0.18 | 0.566 ± 0.007 |
| E | 4.750 ± 0.076 | 0.187 ± 0.003 |
| F | 25.4 | 1.000 |
| G | 14.27 | 0.562 |
| H | 19.05 | 0.750 |
| J | 15.88 | 0.625 |

Inch dimensions have been derived from millimetres.

| Pin | Element |
|---------|-----------------|
| 1 | Grid |
| 2 | Heater, Cathode |
| 3 | Heater |
| 4 | Cathode |
| Top cap | Anode |

Whilst E2V Technologies has taken care to ensure the accuracy of the information contained herein it accepts no responsibility for the consequences of any use thereof and also reserves the right to change the specification of goods without notice. E2V Technologies accepts no liability beyond that set out in its standard conditions of sale in respect of infringement of third party patents arising from the use of tubes or other devices in accordance with information contained herein.