

E2V Technologies

FX2505

Hydrogen Thyratron

The data to be read in conjunction with the Hydrogen Thyratron 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 $\begin{smallmatrix} + 5\% \\ - 10\% \end{smallmatrix}$ 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
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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 $\begin{smallmatrix} + 5\% \\ - 10\% \end{smallmatrix}$	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 μ s duration, must not exceed 2.5 kV during the first 25 μ s 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.

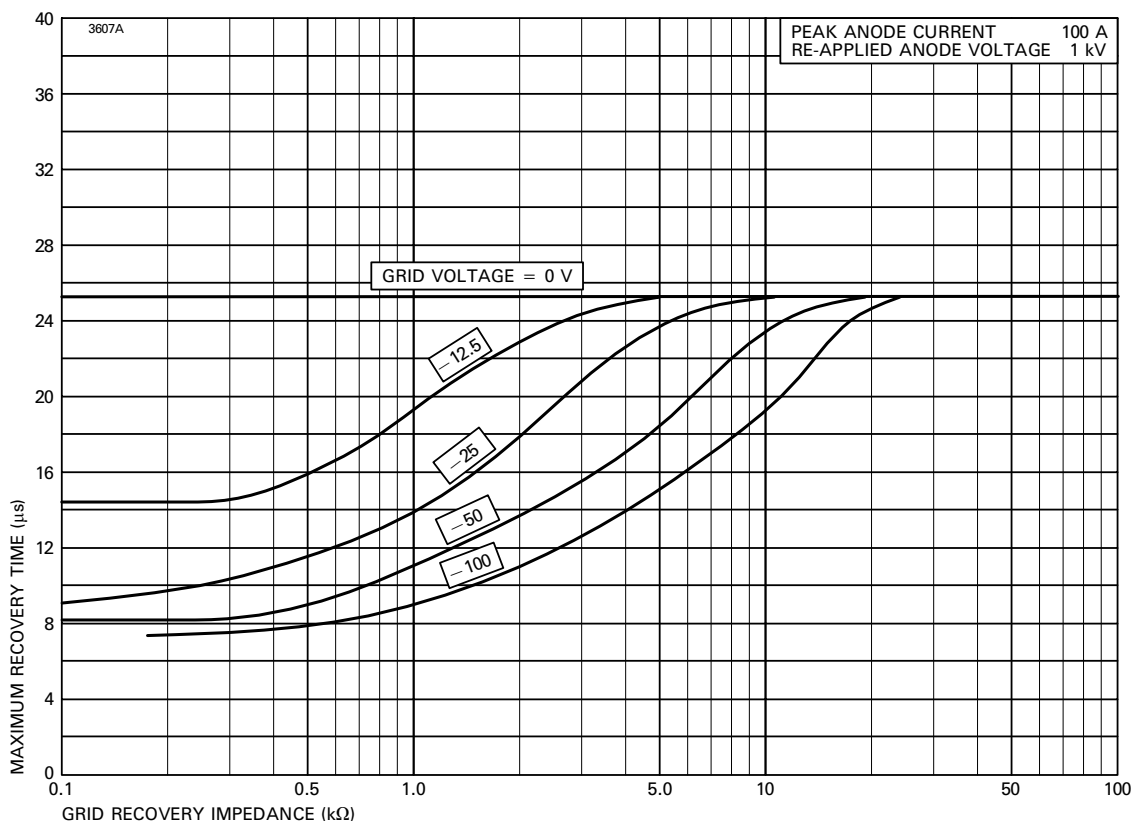


X-Ray Radiation

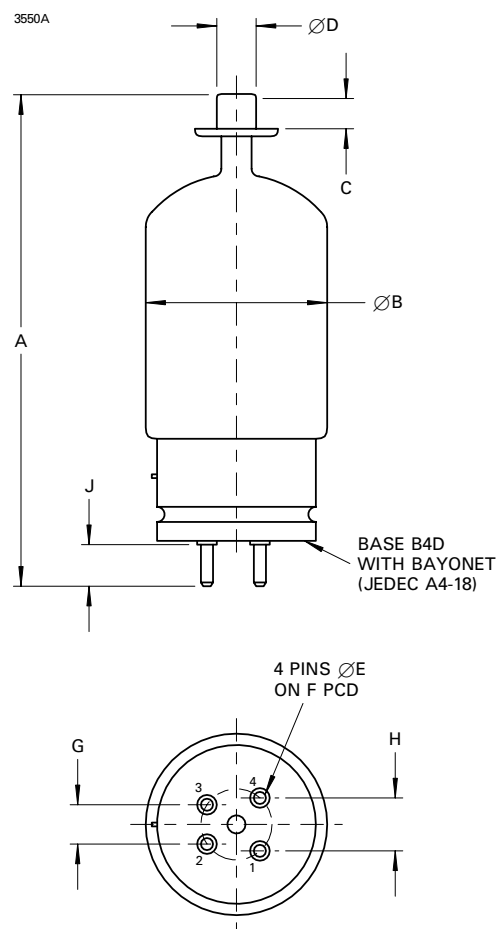
All high voltage devices produce X-rays during operation and may require shielding. The X-ray radiation from hydrogen thyratrons is usually reduced to a safe level by enclosing the equipment or shielding the thyatron with at least 1.6 mm (1/16 inch) thick steel panels.

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 $\pm$ 0.18	0.566 $\pm$ 0.007
E	4.750 $\pm$ 0.076	0.187 $\pm$ 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

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