



3C45

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HYDROGEN THYRATRON

POSITIVE-CONTROL, TRIODE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ^{+5%}_{-10%} ac or dc volts

Current at 6.3 volts:

Minimum 2.0 amp

Average 2.3 amp

Maximum 2.5 amp

Minimum Heating Time 2 minutes

Direct Interelectrode Capacitances (Approx.):

Grid to Anode 3.9 μ fGrid to Cathode 8.6 μ fIonization Time (Approx.)[□] 0.6 μ secDeionization Time (Approx.) 25 μ sec

Anode-Cathode Voltage Drop (Approx.):

At middle of pulse duration 150 volts

Maximum Variation in Firing Time (Jitter) 0.06 μ sec

Mechanical:

Operating Position Any

Overall Length 4-3/4" $\pm$ 1/4"Seated Length 4-1/8" $\pm$ 1/4"

Maximum Diameter 1-9/16"

Bulb T-12

Cap Small (JETEC No.C1-1)

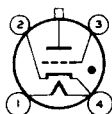
Base Medium-Shell Small 4-Pin, Micanol (JETEC No.A4-9)

BOTTOM VIEW

Pin 1-Heater

Pin 2-Cathode

Pin 3-Grid



Pin 4-Heater,

Cathode

Cap-Anode

Cooling Natural

PULSE MODULATOR SERVICE

Maximum and Minimum CCS[•] Ratings, Absolute Values:

DC ANODE-SUPPLY VOLTAGE 800 min. volts

[□] Defined as the time interval between the point on the rising portion of the grid pulse which is 26% of the peak unloaded pulse amplitude and the point on the anode-current pulse which is 26% of its peak amplitude. The anode-current pulse has a time rise of 0.05 microsecond maximum. The grid pulse has a peak amplitude of 130 volts minimum, has a rise time of 0.5 microsecond maximum, and is supplied by a driver having 1500 ohms maximum internal impedance.

[•] Continuous Commercial Service.

SEPT. 1, 1952

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TENTATIVE DATA 1

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PEAK ANODE VOLTAGE:

Forward (E_{bm}) [*]	3000 max.	volts
Inverse	5% of E_{bm} min.	volts
After anode-current pulse: [▲]		
During first 25 μ sec	1500 max.	volts
After first 25 μ sec	3000 max.	volts

GRID VOLTAGE:

Negative (DC or Peak), before conduction	200 max.	volts
Peak Positive Pulse	175 min.	volts

ANODE CURRENT:

Peak	35 max.	amp
Average [◊]	0.045 max.	amp
Rate of Rise	750 max.	amp/ μ sec

OPERATION FACTOR† 3×10^8 max.PULSE DURATION^{*} 6 max. μ sec

AMBIENT TEMPERATURE -50 to +90 °C

Typical Operation[▲] at 2000 pps in Circuit of Fig.1:Pulse Duration
of 0.5 μ sec

DC Anode-Supply Voltage 1250 volts

Peak Anode Voltage:

Forward	3000	volts
Inverse: Immediately after anode- current pulse	530	volts

Grid Voltage:

Negative, before conduction	0	volts
Peak Positive Pulse (Unloaded)	175	volts

Effective Grid-Circuit Resistance 1000 ohms

Anode Current:

Peak	35	amp
Average [◊]	0.035	amp

Operation Factor† 2.1×10^8

Peak Power Output to

Pulse Transformer (T) 43000 watts

Maximum Circuit Values:

Effective Grid-Circuit Resistance 1500 max. ohms

* In applications where the anode voltage is applied instantaneously, the power-supply filter should be designed so that the peak forward anode voltage is applied at a rate not to exceed 75000 volts per second.

▲ Exclusive of spike not having more than 0.05 microsecond duration.

◊ operation with a bulb temperature within the approximate range of 600 to 900°C measured on the bulb directly opposite the anode is recommended for longest life. To attain this temperature under operating conditions involving low ambient temperature, the use of a heat-conserving enclosure for the tube may be necessary.

◊ Averaged over any cycle.

†,*: See next page.

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† Defined as *Peak Forward Anode Volts* $\times$ *Pulse Repetition Rate (pps)* $\times$ *Peak Anode Amperes* (excluding spike).

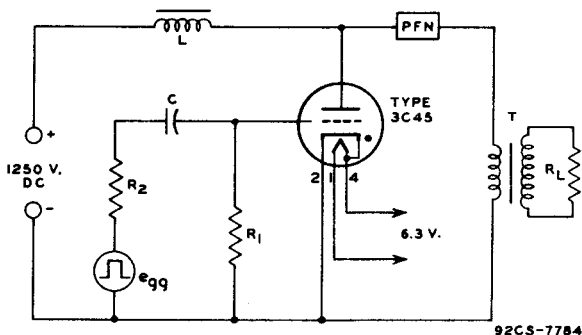
* Pulse duration is defined as the time interval between points on the pulse envelope at which instantaneous amplitudes are equal to 70.7% of the maximum amplitude excluding spike.

OPERATING CONSIDERATIONS

The *ambient-temperature operating range* for the 3C45 extends from -50° to $+90^{\circ}\text{C}$ (-58° to $+194^{\circ}\text{F}$). Within this range, there is no appreciable effect on the electrical characteristics of the tube. However, for longest life, it is recommended that the tube be operated with a *bulb temperature* within the approximate range of 60° to 90°C (140° to 194°F). Under no circumstances should a stream of cooling air be applied to the glass envelope.

The *Connector* for the anode cap should be of the heat-radiating type and should have ample current-carrying capability for the operating requirements.

Fig. 1 - Typical Pulse-Modulator Circuit
Operating at 2000 pps.



C: Blocking Capacitor, 0.001 μf

egg: Pulse Generator supplying peak positive pulse grid voltage of 175 volts (unloaded)

L: Charging Choke, 5 henries

PFN: Pulse-Forming Network with iterative impedance of 50 ohms, and a two-way transmission time of 0.5 microsecond

R_1 : Grid Resistor, 30000 ohms

R_2 : Effective Resistance of grid circuit, 1000 ohms

R_L : Load Resistance. Value reflected into primary of transformer (T) is 35 ohms.

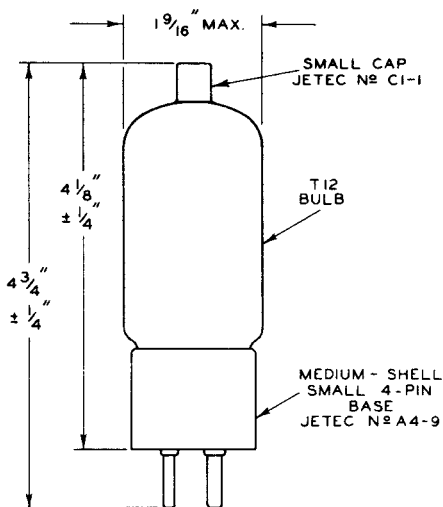
T: Matching Pulse Transformer

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92CS-7757

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