6BK4A

Beam Triode

High Voltage (Max. DC Plate Volts = 27000), Low Current Type. Especially Useful as a Shunt Voltage-Regulator Tube in High-Voltage Power Supply Circuits in Color TV Receivers.

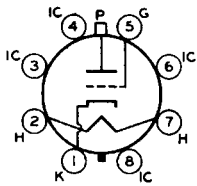
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	0.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	Not Recommended	
Direct Interelectrode Capacitances (Approx.):[a]		
Grid to plate	0.03	pf
Grid to cathode and heater	2.6	pf
Plate to cathode and heater	1.0	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	5"
Seated Length	4-1/4" ± 3/16"
Maximum Diameter	1-23/32"
Bulb	T12
Cap	Small (JEDEC No.C1-1 or C1-34)
Bases (Alternates):	
Short Jumbo-Shell Octal with External Barriers: 8-Pin (JEDEC Group 1, No.B8-71)	
Short Medium-Shell Octal with External Barriers: 8-Pin, Style B (JEDEC Group 1, No.B8-118)	
Basing Designation for BOTTOM VIEW	8GC

Pin 1 – Cathode
Pin 2 – Heater
Pin 3 – Do Not Use
Pin 4 – Do Not Use
Pin 5 – Grid



Pin 6 – Do Not Use
Pin 7 – Heater
Pin 8 – Do Not Use
Cap – Plate

SHUNT VOLTAGE-REGULATOR SERVICE

Maximum Ratings, *Design-Maximum Values:*

DC Plate Voltage	27000 max.	volts
Unregulated DC Supply Voltage	60000 max.	volts
Grid Voltage:		
Peak[b]	-440 max.	volts
DC	-135 max.	volts

DC Plate Current	1.6 max.	ma
Plate Dissipation	30 max.	watts

Typical Operation:

As shunt voltage-regulator tube—See Accompanying Circuit

Unregulated Supply:		
DC voltage	36000	volts
Equivalent resistance	11	megohms
Voltage-Divider Values:		
R_1 (5 watts)	220	megohms
R_2 (2 watts)	1	megohm
R_3 (1/2 watt)	0.82	megohm
Reference-Voltage Supply:		
DC value	200	volts
Equivalent resistance	1000	ohms
Effective Grid-Plate Transconductance	200	μmhos
DC Plate Current:		
For load current of 0 ma.	1000	μa
For load current of 1 ma.	45	μa
Regulated DC Output Voltage:		
For load current of 0 ma.	25000	volts
For load current of 1 ma.	24500	volts

Maximum Circuit Values:

Grid-Circuit Resistance	3 max.	megohms

[a] Without external shield.

[b] For 20 seconds maximum duration during equipment warm-up period.

CHARACTERISTICS RANGE VALUES

	Note	*Min.*	*Max.*	
Grid Voltage (1)	1	−7	-	volts
Grid Voltage (2)	2	-	−40	volts
Grid-Voltage Change	3	-	9	volts

Note 1: With dc plate voltage of 30000 volts and dc plate current of 1 ma.

Note 2: With dc plate voltage of 30000 volts and dc plate current of 0.1 ma.

Note 3: Difference between grid voltage (1) and grid voltage (2).

OPERATING CONSIDERATIONS

The *base pins* of the 6BK4A fit the standard octal socket. Socket terminals for pins 3,4,6, and 8 *should not be used for tie points.* If this precaution is not followed, tube performance may be adversely affected.

The high voltages at which the 6BK4A is operated may be extremely dangerous to the user. Great care should be taken during adjustment of circuits. The tube and its associated apparatus, especially those parts which may be at high potential with respect to ground, should be housed in a protective enclosure. The protective housing should contain interlocks so that personnel cannot possibly come in contact with any high

potential point in the electrical system. The interlocks should break the primary circuit of the high-voltage supply when any gate or door on the protective housing is opened, and should prevent the closing of this primary circuit until the door is locked again.

It should be noted that *high voltages* may appear at normally low-potential points in the circuit as a result of capacitor breakdown or incorrect circuit connections. Therefore, before any part of the circuit is touched, the power-supply switch should be turned off and both terminals of the circuit capacitors should be grounded.

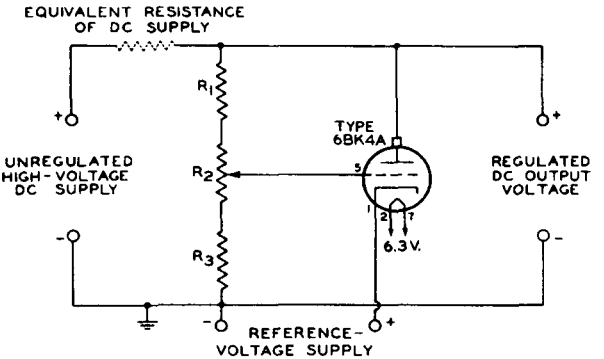
The *bulb* of the 6BK4A becomes hot during operation. To insure adequate cooling, it is essential that free circulation of air be provided around the 6BK4A. The bulb will eventually darken during service. This darkening is normal and has no effect on tube performance.

The *plate* of the 6BK4A shows a dull red color when the tube is operated at maximum plate dissipation. Connection to the plate cap should be made by a suitable connector with flexible lead to prevent any strain on the seal of the cap.

Operation of the 6BK4A with a plate voltage above approximately 16000 volts (absolute value) results in the production of X-Rays which can constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

The 6BK4A may exhibit a blue glow on the upper half of the inner surface of the bulb wall under normal operating conditions. This effect is caused by fluorescence and is not to be mistaken for gas.

SHUNT VOLTAGE-REGULATOR CIRCUIT



Typical performance data for this basic circuit with certain characteristics of the unregulated dc supply and related voltage-divider values are given in the tabulated data. Other combinations are feasible within the maximum ratings and the maximum circuit values for the 6BK4A.

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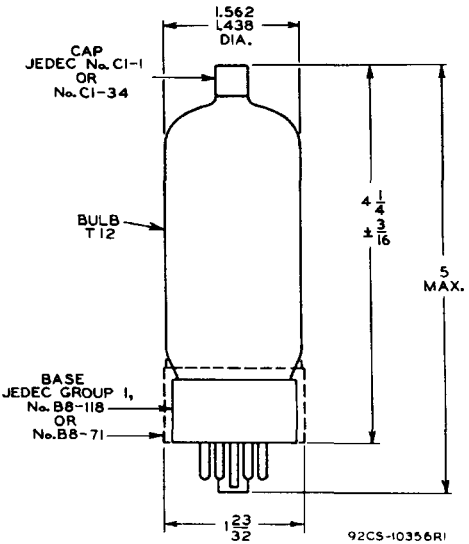
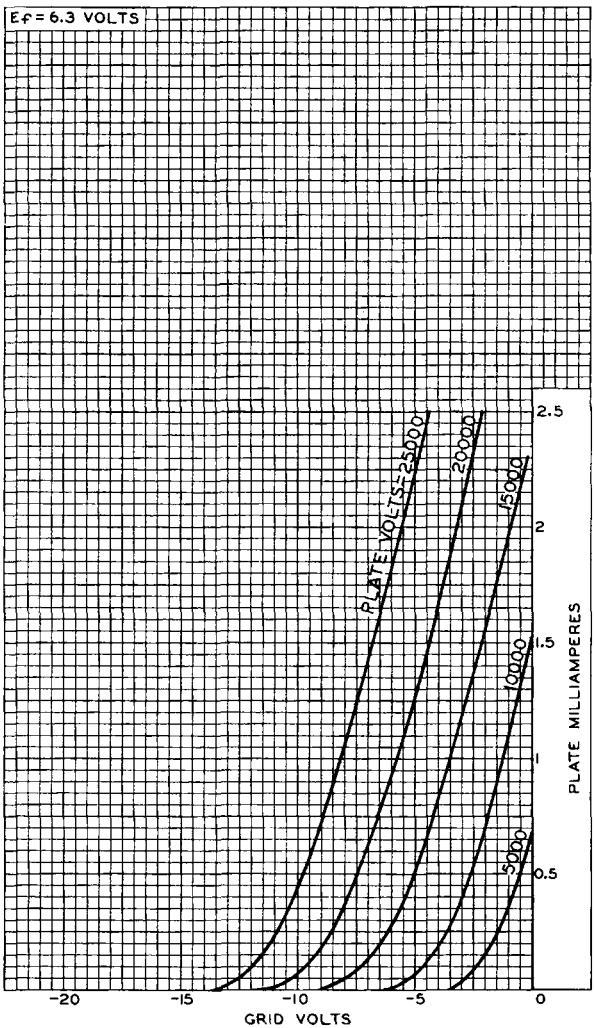


DIMENSIONS IN INCHES

6BK4A

AVERAGE TRANSFER CHARACTERISTICS



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