

NOVAR



6AY3, 12AY3, 17AY3

HALF-WAVE VACUUM RECTIFIERS

Novar Types
For Television Damper Service

RCA-6AY3, 12AY3, and 17AY3 are half-wave vacuum rectifier tubes designed specifically for use as damper diodes in horizontal-deflection circuits of black-and-white television receivers. These tubes feature the new small-button novar 9-pin base. The short, large-diameter internal leads to the bases of these tubes assure an exceptionally firm support for the mount structure. These short heavy leads also facilitate electrode cooling by providing very good heat conduction. Two base-pin connections to the plate, in addition to the low heater power, contribute to cool operation. The relatively large pin-circle diameter (0.687 inch) and long pins of the novar base insure firm seating of the tube in its socket.

Rated to withstand a maximum peak-inverse plate voltage of 5000 volts, the 6AY3, 12AY3, and 17AY3 can supply a maximum peak plate current of 1100 milliamperes and a maximum dc plate current of 175 milliamperes. Designed with insulation between heater and cathode to withstand negative peak pulses between heater and cathode of as much as 5000 volts with a dc component up to 900 volts, these tubes provide flexibility in choice of deflection circuits.

In addition, these tubes utilize a cathode with a special low-impedance coating to withstand high-voltage pulses encountered in TV damper service. This coating not only minimizes sputtering, but also assures uniform emission over the cathode surface. In addition, specially designed micas together with a plate structure having rounded contours to reduce voltage gradients, insure against high-voltage breakdown.

Slots in the plate surface surrounding the cathode permit the escape of gas which may be released under abnormal operating conditions and thereby minimize the danger of sustained arcs.

The 12AY3 and 17AY3 are like the 6AY3 except that they are designed, respectively, with 600- and 450-milliamper heaters having a controlled warmup time for use in series-heater-string arrangements.

GENERAL DATA

Electrical:

	6AY3	12AY3	17AY3	
Heater, for				
Unipotential Cathode:				
Voltage (AC or DC) . .	6.3 ± 10%	12.6	16.8	volts
Current	1.2	0.6 ± 6%	0.45 ± 6%	amp
Warmup time (Average).	—	11	11	sec

Direct Interelectrode Capacitances (Approx. without external shield):			
Plate to cathode and heater . .	6.5	μμf	
Cathode to plate and heater . .	9.0	μμf	
Heater to cathode	2.8	μμf	

Mechanical:

Operating Position	Any
Maximum Overall Length	3.84"
Maximum Sealed Length	3.46"
Length, Base Seat to Bulb Top (Excluding tip).	2.90" ± 0.09"
Diameter:	
Maximum	1.188"
Minimum	1.062"
Bulb	T9
Base	Small-Button Novar 9-Pin (JEDEC No. E9-75)

DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:^a

For operation in a 525-line, 30-frame system^b

PEAK INVERSE PLATE VOLTAGE	5000 ^c max.	volts
PEAK PLATE CURRENT	1100 max.	ma
DC PLATE CURRENT	175 max.	ma
PLATE DISSIPATION	6.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	5000 ^d max.	volts
Heater positive with respect to cathode	300 ^e max.	volts

^a See RCA Application Note AN-174, "Design-Maximum System for Rating Electron Tubes", available on request from Commercial Engineering, Radio Corporation of America, Harrison, New Jersey.

^b As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

^c This rating is applicable where the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

^d The dc component must not exceed 900 volts.

^e The dc component must not exceed 100 volts.

OPERATING CONSIDERATIONS

The base pins of the 6AY3, 12AY3, and 17AY3 fit the Cinch Mfg. Co. socket No. 149-19-00-024 or equivalent. The socket may be mounted to hold the tube in any position. Socket terminals for pins 1, 3, 6, and 8 should not be used for tie points. It is also recommended that socket clips for these pins be removed to minimize the possibility of arc-over and to minimize leakage.

In television receivers employing series-heater strings, a resistor in series with the string of tubes will minimize voltage surges across any individual tube during starting. The resistor should preferably have a negative temperature characteristic.

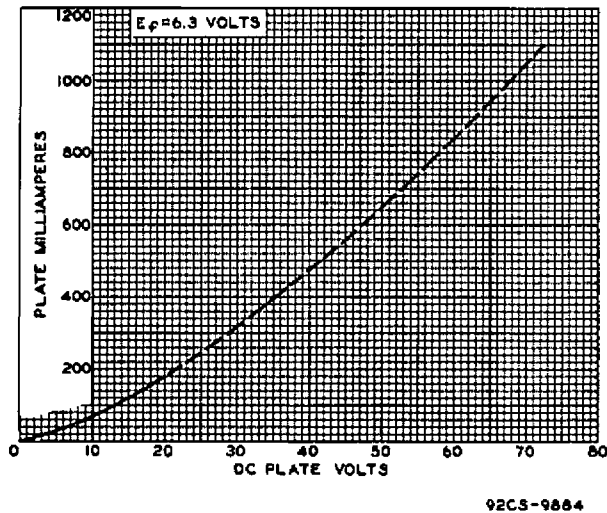
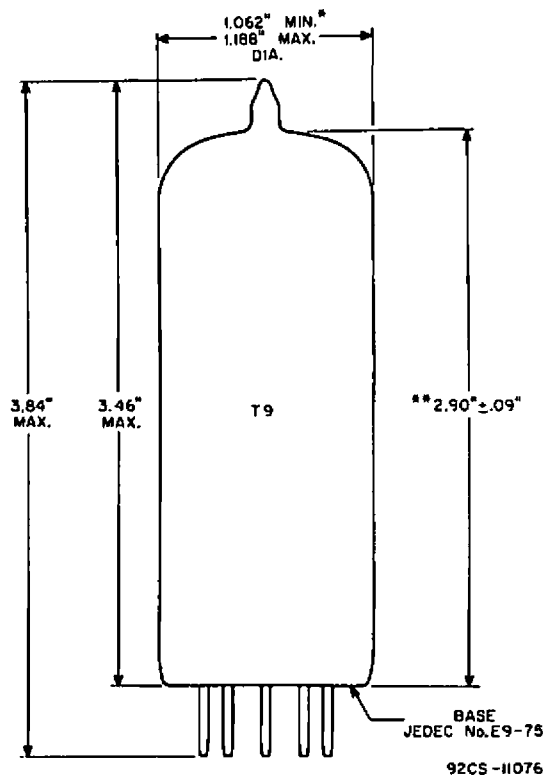


Fig. 1 - Average Plate Characteristic for Type 6AY3 and for Types 12AY3 and 17AY3 Except for Heater Voltage.

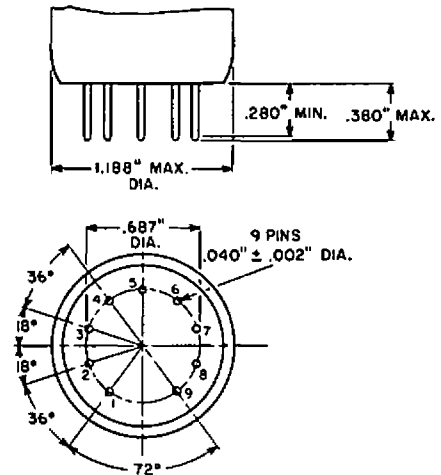
DIMENSIONAL OUTLINE



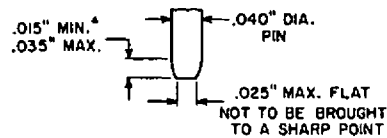
* Applies in zone starting 0.375" from base seat.

** Measured from base seat to bulb-top line as determined by a ring gauge of 0.600" I.D.

SMALL-BUTTON NOVAR 9-PIN E9-75



PIN CONTOUR



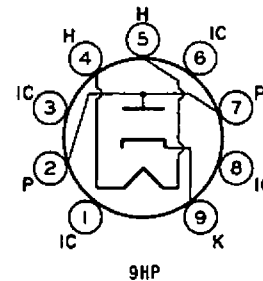
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▲ This dimension may vary within the limits shown around the periphery of any individual pin. The surface of the pin shall be convex or conical in shape and not brought to a sharp point.

PIN ALIGNMENT GAUGE

Base pin positions shall be held to tolerances such that the base will fit a flat-plate gauge having a thickness of 0.350" and ten equally spaced holes of 0.0520" $\pm$ 0.0005" diameter located on a 0.6870" $\pm$ 0.0005" diameter circle that the distance along the chord between any two adjacent hole centers is 0.2123" $\pm$ 0.0005". Pin fit in the gauge shall be such that the entire length of pins will, without undue force, enter into and disengage from the gauge.

BASING DIAGRAM Bottom View



- | | |
|--|-----------------------|
| PIN 1 - INTERNAL CONNECTION - DO NOT USE | PIN 5 - HEATER |
| PIN 2 - PLATE | PIN 6 - SAME AS PIN 1 |
| PIN 3 - SAME AS PIN 1 | PIN 7 - PLATE |
| PIN 4 - HEATER | PIN 8 - SAME AS PIN 1 |
| | PIN 9 - CATHODE |

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