6350

MEDIUM-MU TWIN TRIODE

For Computer Service and Other "On-Off" Control Applications

TENTATIVE DATA

RCA-6350 is a medium-mu twin triode of the 9-pin miniature type designed for use in electronic computers and other "on-off" control applications involving long periods of operation under cutoff conditions. It is particularly useful in pulse-amplifier, inverter, frequency-divider, cathode-follower, and multivibrator circuits of high-speed digital-type electronic computers.

Actual Size

In such service, the 6350 maintains its emission capabilities even after long standby periods and will supply a high minimum value of plate current during its "on" cycles. Furthermore, consistency of cutoff bias is maintained because of the stable cutoff characteristic of the 6350 and its freedom from grid emission.

The design of the 6350 includes a cathode made of special alloy material to minimize cathode interface, a protective shield to prevent deposition of getter material on micas and electrodes to minimize interelectrode leakage, radiating fins on the grids to increase the tubes dissipation capabilities, and a carbonized pure-nickel plate to minimize gas evolution. In addition, the 6350 utilizes a pure-tungsten, mid-tapped heater to permit operation from a 6.3-volt or 12.6-volt supply, and separate cathodes with individual base-pin connections to permit flexibility of circuit connections.

The 6350 is manufactured under rigid controls and undergoes rigorous tests as follows: (1) extreme care in the selection and inspection of materials, and close gauging of parts, (2) factory controls and design tests under typical computer operating conditions, (3) tests for cathode interface, interelectrode leakage, high resistance and intermittent shorts, and (4) conduction and standby life performance tests in addition to those for stability and survival rate. These tests and controls insure dependable performance for the 6350 both initially and throughout life.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

	Series	*Parallel*	
Heater Arrangement			
Voltage (AC or DC)	12.6 ± 5%	6.3 ± 5%	volts
Current	0.3	0.6	amp

Direct Interelectrode Capacitances (Approx., without external shield):

Grid to plate (Each Unit)	3.2	μμf
Grid to cathode and heater (Each Unit)	3.6	μμf
Plate to cathode and heater (Each Unit)	0.6	μμf
Grid to grid	0.042 max.	μμf
Plate to plate	1 max.	μμf
Heater to cathode (Each Unit)	4.6	μμf

Mechanical:

Mounting Position	Vertical preferred, or horizontal with pins 1 and 4 in vertical plane, but any permissible.
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length from Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	150	volts
Grid Voltage	-5	volts
Plate Current	11	ma
Transconductance	4600	μmhos
Amplification Factor	18	
Plate Resistance (Approx.)	3900	ohms
Grid Voltage (Approx.) for plate voltage of 150 volts and plate current of 100 microamperes	-11	volts
Grid Voltage (Approx.) for plate voltage of 200 volts and plate current of 1 milliampere	-12	volts

COMPUTER SERVICE AND "ON-OFF" CONTROL SERVICE

Values Are For Each Unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE:		
DC	330 max.	volts
Peak positive pulse*	1000 max.	volts
GRID VOLTAGE:		
DC negative	82 max.	volts
DC positive	3.8 max.	volts
Peak negative-pulse*	440 max.	volts
Peak positive-pulse*	14.3 max.	volts
GRID CURRENT:		
DC	5.5 max.	ma
Peak*	110 max.	ma
CATHODE CURRENT:		
DC	27.5 max.	ma
Peak*	333 max.	ma

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

PLATE DISSIPATION:		
For either plate alone	3.85 max.	watts
For both plates with both units operating	7.7 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	220 max.	volts
Heater positive with respect to cathode	220† max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	120 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For cathode-bias operation	0.5 max.	megohm
For fixed-bias operation	0.1 max.	megohm

* Under the following conditions: Rectangular pulse; pulse duration, 0.08 microsecond; pulse repetition rate, 1 x 10^6 pps; and duty factor, 0.08.

† The dc component must not exceed 110 volts.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Values Are For Each Unit, Unless Otherwise Specified Each unit is tested separately. Electrodes of unit not under test are grounded.

	Note	Min.	Max.	
Heater Current	1	0.275	0.325	amp
Plate Current (1)	1,3	6	16	ma
Plate Current (2)	1,4	-	1	ma
Plate Current (3)	1,5	-	100	μamp
Transconductance	1,3	3200	6000	μmhos
Amplification Factor	1,3	15	21	
Reverse Grid Current	1,6	-	2.5	μamp
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode	1,7	-	15	μamp
Heater positive with respect to cathode	1,7	-	15	μamp
Grid-Voltage Difference Between Units For Plate Current of 1 milliampere	1,8	-	2.5	volts
Leakage Resistance:				
Between plate and all other electrodes tied together	1,9	100	-	megohms
Between grid and all other electrodes tied together	1,10	100	-	megohms

Note 1: With 12.6 volts ac or dc on heater (series connection).

Note 2: Without external shield.

Note 3: With plate voltage of 150 volts and grid voltage of -5 volts.

Note 4: With plate voltage of 200 volts and grid voltage of -15 volts.

Note 5: With plate voltage of 150 volts and grid voltage of -15 volts.

Note 6: With plate voltage of 180 volts, grid voltage of -5 volts, and grid resistor of 0.1 megohm. Both units connected in parallel.

Note 7: With 100 volts dc between heater and cathode.

Note 8: With plate voltage of 200 volts and grid voltage varied for plate current of 1 milliampere.

Note 9: With plate 300 volts negative with respect to all other electrodes tied together.

Note 10: With grid 100 volts negative with respect to all other electrodes tied together.

SPECIAL RATINGS AND PERFORMANCE DATA

Heater-Cycling Life Performance:

Cycles of intermittent operation. 2000 min. cycles

Under the following conditions: Heater voltage of 7.5 volts cycled one minute on-four minutes off, heater 180 volts rms with respect to cathode, and all other elements grounded.

OPERATING CONSIDERATIONS

The *maximum ratings* in the tabulated data for the 6350 are limiting values above which the serviceability of the 6350 may be impaired from the viewpoint of life and satisfactory performance. Therefore, in order not to exceed these absolute ratings, the equipment designer has the responsibility of determining an average design value below each absolute rating by an amount such that the absolute values will never be exceeded under any usual conditions of supply-voltage variation, load variation, or manufacturing variation in the equipment itself.

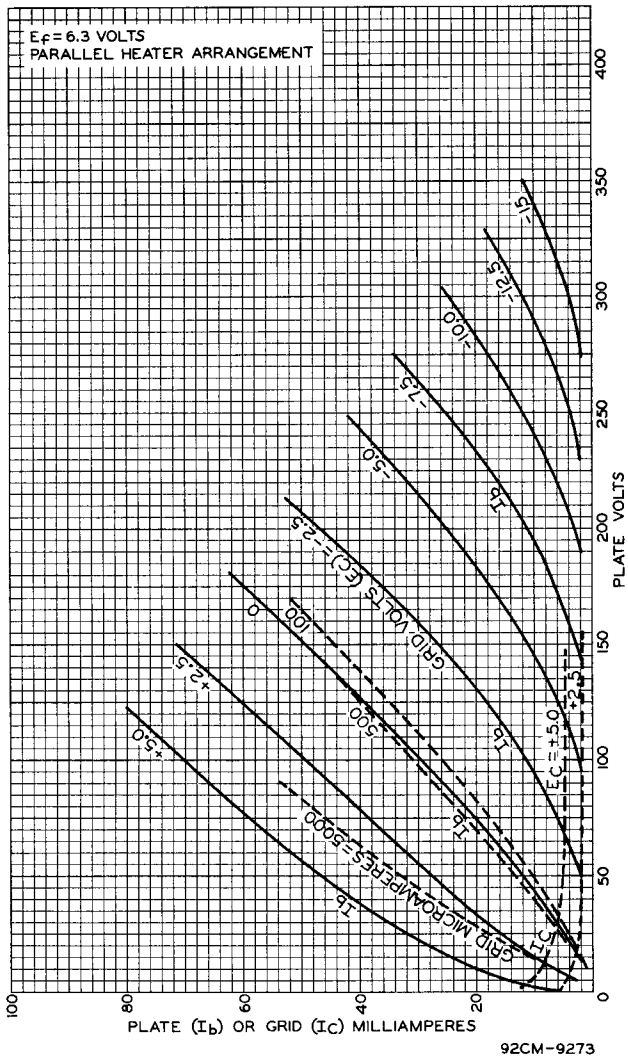


Fig. 1 - Average Characteristics for Each Unit of Type 6350.

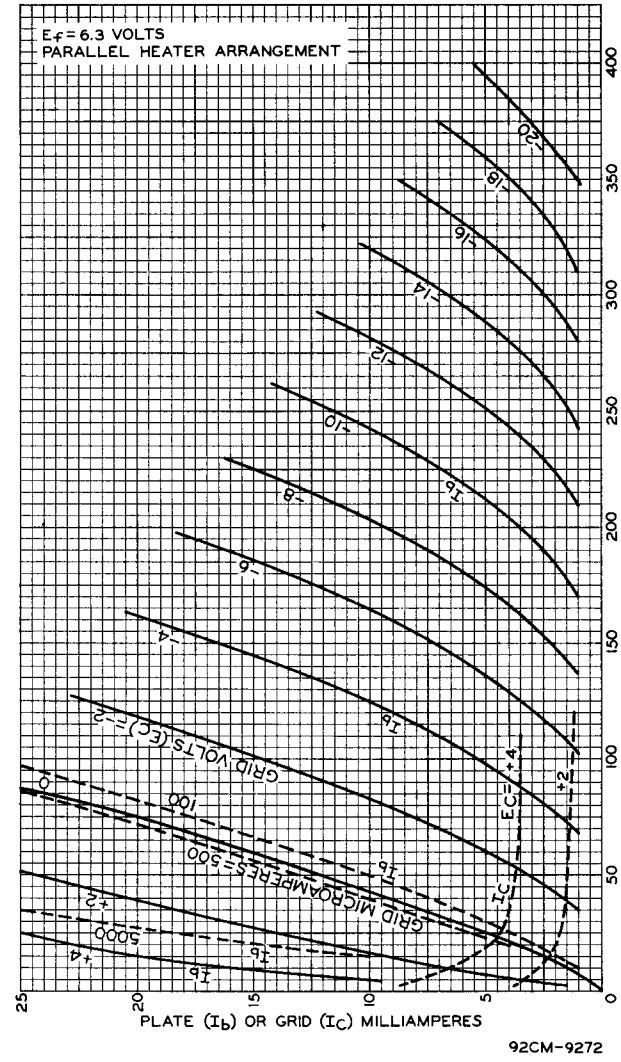


Fig. 2 - Average Characteristics for Each Unit of Type 6350.

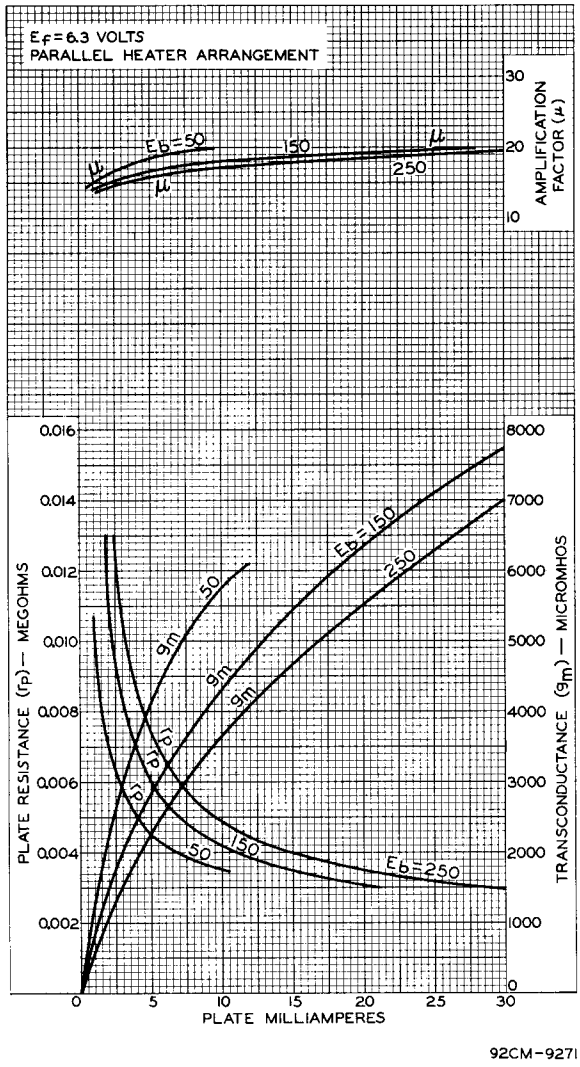
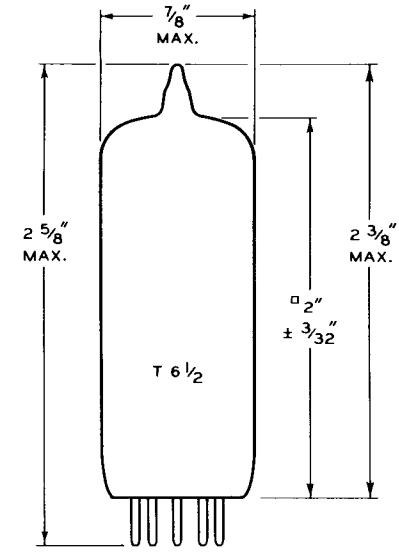


Fig. 3 - Average Characteristics for Each Unit of Type 6350.

DIMENSIONAL OUTLINE

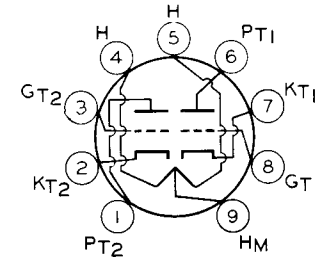


-SMALL-BUTTON NOVAL
9-PIN BASE
JETEC NºE9-1

□ MEASURED FROM BASE SEAT TO BULB TOP LINE AS DETERMINED BY RING GAUGE OF 7/16" I.D.

SOCKET CONNECTIONS

Bottom View



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PIN 1: PLATE OF TRIODE UNIT NO.2
PIN 2: CATHODE OF TRIODE UNIT NO.2
PIN 3: GRID OF TRIODE UNIT NO.2
PINS 4 & 9: HEATER OF UNIT NO.2
PINS 5 & 9: HEATER OF UNIT NO.1
PIN 6: PLATE OF TRIODE UNIT NO.1
PIN 7: CATHODE OF TRIODE UNIT NO.1
PIN 8: GRID OF TRIODE UNIT NO.1
PIN 9: HEATER MID-TAP