



ELECTRONIC TUBE REFERENCE

5651A

Voltage Regulator electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

VOLTAGEREGULATOR

Miniature cold-cathode glow-discharge voltage-reference tube for precision regulated DC supplies, maintaining approximately 85-86 V.

GENERAL CHARACTERISTICS

BASE DESIGNATION	5B0	BASE PINS	7
NOMINAL HEATER	– / –	PARALLEL HEATER	– / –
HEATING	Indirect; cold cathode	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Voltage Regulator	
REGULATOR VOLTAGE	85.5 V
MINIMUM REGULATOR CURRENT	1.5 mA
MAXIMUM REGULATOR CURRENT	3.5 mA
STARTING VOLTAGE	107 V
MAINTAINING VOLTAGE	85.5 V
<i>Published maximum ratings and device-specific characteristics are promoted where schema-compatible; remaining switching/gauge/regulator electrical data is retained in section parameters.</i>	

Cold-cathode glow-discharge voltage-reference tube for stabilizing DC power supplies. Extracted from the supplied RCA Receiving Tube Manual excerpt.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1971 RCA HB3 Binder 2 of 7

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1971 RCA HB3 BINDER 2 OF 7

Section 1 · Voltage Regulator

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC OPERATING CURRENT (Continuous)	3.5 mA	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
value must be chosen so that (1) the maximum current rating of g.5 ma is – published value 1	1 mA	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
value must be chosen so that (1) the maximum current rating of g.5 ma is – published value 2	5 mA	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
DC operating current minimum	1.5 mA	Continuous operating range minimum.
DC operating current maximum	3.5 mA	Continuous operating range maximum.

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC OPERATING CURRENT (Continuous)	1.5 mA	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
AMBIENT TEMPERATURE RANGE – published value 1	-55 C	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
AMBIENT TEMPERATURE RANGE – published value 2	90 C	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
DC Starting Voltage – published value 1	107 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC Starting Voltage – published value 2	1158 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 1.5 ma – published value 1	1.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 1.5 ma – published value 2	83 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 1.5 ma – published value 3	85 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 1.5 ma – published value 4	87 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 2.5 ma – published value 1	2.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 2.5 ma – published value 2	83.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 2.5 ma – published value 3	85.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 2.5 ma – published value 4	87.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 3.5 ma – published value 1	3.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 3.5 ma – published value 2	84.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 3.5 ma – published value 3	86.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
At 3.5 ma – published value 4	88.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
Regulation (1.5 ma to 3.5 ma) – published value 1	1.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Regulation (1.5 ma to 3.5 ma) – published value 2	3.5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
Regulation (1.5 ma to 3.5 ma) – published value 3	3 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
Voltage after first 300	300 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
Fluctuation (Voltage jump)d	0.1 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
Shunt Capacitor	0.02	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
115 volts minimum should be provided to insure	115 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
e A 5e ties resistor must always be used with	5	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
the 5651A, The resistance	5651	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
not exceeded at the Highest anode-supply voltage employed, antl (2) the	2 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
minimum current rating of 1.5 ma is always exceeded when the anode-sup	1.5 mA	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
= 135, do operating mi l l iampere = 2.5, anode-circuit resistance – published value 1	135 A	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
= 135, do operating mi l l iampere = 2.5, anode-circuit resistance – published value 2	2.5 A	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
0. 1 per cent from the initial do operating voltage. At the – published value 1	0 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
0.1 per cent from the initial do operating voltage. At the – published value 2	1 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
do operating voltage greater than 0.1 per cent from the operat – published value 1	0 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
do operating voltage greater than 0.1 per cent from the operat – published value 2	1 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
ing voltage at 300 hours. During any 100-hour interval between – published value 1	300 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
ing voltage at 300 hours. During any 100-hour interval between – published value 2	100 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
in do operating voltage greater than 0.05 per cent from the	0.05 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
should be limited to 0.02 μ f	0.02	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
Using RCA-5651A as Voltage-Reference Tube	5651 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
line voltage of 117 volts and an output voltage of 250 volts – published value 1	1 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
line voltage of 117 volts and an output voltage of 250 volts – published value 2	17 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
line voltage of 117 volts and an output voltage of 250 volts – published value 3	250 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
is less than 0.2 volt over the current range of 0 to 225 – published value 1	0.2 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
is less than 0.2 volt over the current range of 0 to 225 – published value 2	0 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
is less than 0.2 volt over the current range of 0 to 225 – published value 3	225 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
at ion of ± 10 per cent in line voltage is less than 0.1 volt – published value 1	10 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
at ion of ± 10 per cent in line voltage is less than 0.1 volt – published value 2	0 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
at ion of ± 10 per cent in line voltage is less than 0.1 volt – published value 3	1 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
250 VOLTS °	250 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
C1 - 0.1 μ f, 400 volts – published value 1	400 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
C1 - 0.1 μ f, 400 volts – published value 2	5 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
C1 - 0.1 μ f, 400 volts – published value 3	-12000 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
C1 - 0.1 μ f, 400 volts – published value 4	2 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
R 1 - Plate current 'balance' – published value 1	1 ohm	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
R 1 - Plate current 'balance' – published value 2	68000 ohm	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
R 2 - 12000 ohms, 2 watts – published value 1	2 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
R 2 - 12000 ohms, 2 watts – published value 2	12000 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
R 2 - 12000 ohms, 2 watts – published value 3	2 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
~ 375 volts approx. at zero load current; 325 volts approx, at 225 milli – published value 1	375 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
~ 375 volts app ro x. at zero load current; 325 volts app rox, at 225 mill i – published value 2	325 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
~ 375 volts app ro x. at zero load current; 325 volts app rox, at 225 mill i – published value 3	225 V	Published datasheet value; multiple values on one row represent separate limits, service ratings, or operating conditions.
DC starting voltage average	107 V	Published average starting voltage.
DC starting voltage maximum	115.8 V	Published maximum starting voltage.
DC operating voltage at 2.5 mA average	85.5 V	Published average maintaining voltage at 2.5 mA.
Regulation from 1.5 mA to 3.5 mA	3 V	Maximum published regulation span.



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1975 RCA RC30

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1975 RCA RC30

Section 1 · Voltage Regulator

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Operating voltage at 1.5 mA	85 V	—
Operating voltage at 2.5 mA	85.5 V	—
Operating voltage at 3.5 mA	86.5 V	—
Regulation from 1.5 to 3.5 mA	3 V	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Shunt capacitor maximum	0.02 uF	—
Warm-up period	3 min	—



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