

ELECTRONIC TUBE REFERENCE

ZZ1000

Voltage Regulator electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
VOLTAGEREGULATOR

Long-life subminiature cold-cathode reference tube providing approximately 81 V for regulated supplies, DC amplifiers, and oscilloscope calibrators.

GENERAL CHARACTERISTICS

BASE DESIGNATION	T2	BASE PINS	2
NOMINAL HEATER	– / –	PARALLEL HEATER	– / –
HEATING	Indirect; cold cathode	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Voltage Regulator	
REGULATOR VOLTAGE	81 V
MINIMUM REGULATOR CURRENT	0.5 mA
MAXIMUM REGULATOR CURRENT	3.5 mA
STARTING VOLTAGE	115 V
MAINTAINING VOLTAGE	81 V
DYNAMIC IMPEDANCE	200 Ω
Gas-discharge device.	

Subminiature cold-cathode voltage reference tube for stable regulated power supplies, DC amplifiers, and oscilloscope calibrators; specified for minimum 30,000-hour life.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1953 Amperex

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

1953 AMPEREX

Section 1 · Voltage Regulator

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Starting voltage minimum	115 V	—
Operating cathode current minimum	0.5 mA	—
Operating cathode current maximum	3.5 mA	—
Operating voltage typical	82 V	At 2 mA
AC resistance maximum	500 ohm	At 2 mA, 1000 cps



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1971 Mullard Gas Filled Tubes

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

1971 MULLARD GAS FILLED TUBES

Section 1 · Voltage Regulator

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maintaining voltage	81 V	—
Incremental resistance	200 ohm	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition/striking voltage	115 V	—

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1999 Philips E-Z

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

1999 PHILIPS E-Z

Section 1 · Voltage Regulator

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Subminiature 81 volts, long life, shock and vibration resistant, gas	81	Subminiature 81 volts, long life, shock and vibration resistant, gas
Preferred cathode current	3.2	Preferred cathode current $I_x = 3.2\text{mA}$
Incremental resistance	200	Incremental resistance $r_{ag} = 200$
Thermal equilibrium is reached within 2 minutes after ignition of the	2	Thermal equilibrium is reached within 2 minutes after ignition of the
Ignition voltage	115	Ignition voltage $V_{ign} < 115\text{V}$
Maintaining voltage at $I_j = 3.2\text{ mA}$	3.2 mA	Maintaining voltage at $I_j = 3.2\text{ mA}$ $V_{ay} < ggé x$
Incremental resistance at $I_y = 3.2\text{ mA}$	400 mA	Incremental resistance at $I_y = 3.2\text{ mA}$ $T_y < 400\text{ Q}$
Voltage jumps at $I = 2\text{ to }4\text{ mA}$	1 mA	Voltage jumps at $I = 2\text{ to }4\text{ mA}$ $V_{ay} < 100\text{mV}$ $1y$
Vibration noise voltage at $I_y = 3.2\text{ mA}$,	3.2 mA	Vibration noise voltage at $I_y = 3.2\text{ mA}$,
voltage at $I_y = 3.2\text{ mA}$	3.2 mA	voltage at $I_y = 3.2\text{ mA}$
1) To avoid voltage jumps over life, current variations around the	1	1) To avoid voltage jumps over life, current variations around the
preferred current should be limited to 0.3 mA.	2414 mA	preferred current should be limited to 0.3 mA. 772 2414
Shock resistance	500	Shock resistance 500 g
Vibration resistance	2.5	Vibration resistance 2.5 g peak
Vibrational forces for a period of 32 hours at a frequency of 50 ϕ/s	50 a	Vibrational forces for a period of 32 hours at a frequency of 50 ϕ/s

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode current	221	Cathode current i_c : : :?r} :.' '218 221)
Voltage necessary for ignition	120 v	Voltage necessary for ignition V_y = min. 120 v
between 2 and 8 mA voltage jumps of 0.5 V may occur.	0.5 mA	between 2 and 8 mA voltage jumps of 0.5 V may occur.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
The tube may be dip-soldered at a solder temperature of max. 2400C	2400 a	The tube may be dip-soldered at a solder temperature of max. 2400C
duration 20 sec.	20 mA	duration 20 sec. I_{kp} = max. 20 mA
Peak negative anode voltage	100	Peak negative anode voltage $\sim V_{ap}$ = max. 100 Vv
1) For use as a stabilizer tube I_x = max. 8 mA. At cathode currents	8 a	1) For use as a stabilizer tube I_x = max. 8 mA. At cathode currents

TUBE TINKER

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