



E I M A C

Division of Varian

SAN CARLOS

CALIFORNIA

8158
3CX10,000A1

LOW-MU
POWER TRIODE

The Eimac 8158/3CX10,000A1 is a ceramic and metal power triode intended primarily for use as an audio amplifier or modulator. This tube is also recommended for voltage-regulator applications where high current capability and low tube drop are important. Up to 12 kilowatts of plate power can be dissipated on its air-cooled anode. A water-cooled version, the 3CW20,000A1, is available with a 20 kw dissipation rating.

CHARACTERISTICS

ELECTRICAL

Filament: Thoriated-Tungsten	Min.	Nom.	Max.
Voltage		7.5	V
Current	94		104 A
Amplification Factor	5.5		7.0
Interelectrode Capacitances:			
Grid-Filament	45		57 pF
Output	3.4		4.2 pF
Grid-Plate	25		32
Transconductance (I _b = 2.0 amps, E _b = 3000 volts)	20,000		umhos

MECHANICAL

Base	Coaxial
Recommended Socket	Eimac SK-1300
Recommended Chimney	Eimac SK-1306
Operating Position	Vertical, base up or down
Cooling	Forced air
Maximum Operating Temperatures:	
Anode Core	250 °C
Ceramic-to-Metal Seals	250 °C
Maximum Dimensions:	
Height	8.75 in
Diameter	7.0 in
Net Weight	12 lbs



AUDIO-FREQUENCY AMPLIFIER OR MODULATOR CLASS-AB₁

MAXIMUM RATINGS (Per Tube)

DC Plate Voltage	7000	volts
DC Plate Current	5.0	amps
Plate Dissipation	12	kW
Grid Dissipation	100	watts

*Adjust for zero-signal plate current

**At max-signal without negative feedback

Effective grid circuit resistance must not exceed
200,000 ohms

TYPICAL OPERATION, Two Tubes, Sinusoidal Wave

DC Plate Voltage	7000	7000	volts
DC Grid Voltage*	-1300	-1300	volts
Zero-Sig DC Plate Current	1.5	1.5	amps
Max-Sig DC Plate Current	5.8	7.0	amps
Load Resistance,			
Plate-to-Plate	2460	1720	ohms
Peak AF Grid Driving Voltage (Per Tube)	1300	1300	volts
Max-Sig Driving Power	0	0	watts
Max-Sig Plate			
Output Power	24,400	29,100	watts
Total Harmonic Distortion**	2.9	3.6	percent

**AUDIO-FREQUENCY AMPLIFIER OR MODULATOR**

Class-A

TYPICAL OPERATION**MAXIMUM RATINGS**

DC Plate Voltage	7000 volts
DC Plate Current	See Class-A derating table on Page 3
Plate Dissipation	12,000 watts

*Adjust to give listed zero-signal DC plate current

DC Plate Voltage	2500 volts
DC Grid Voltage *	-290 volts
DC Plate Current	4.0 amps
Peak AF Grid Driving Voltage . .	290 volts
Load Resistance	2120 ohms
Plate Output Power	1800 watts

VOLTAGE REGULATOR SERVICE

Class-A

TYPICAL OPERATION**MAXIMUM RATINGS**

DC Plate Voltage	10,000 volts
DC Plate Current	See Class-A derating table on Page 3
Plate Dissipation	12,000 watts
Grid Dissipation	100 watts

DC Plate Voltage (tube drop) . . .	0-5000 volts
DC Plate Current	0-5 amps

(These values are chosen according to Class-A derating table on Page 3)

Note: "TYPICAL OPERATION" data are obtained by calculation from published characteristic curves. No allowance for circuit losses, either input or output, has been made.

APPLICATION

Cooling — The maximum temperature rating for the external surfaces of the 3CX10, 000A1 is 250°C. Sufficient forced-air cooling must be provided to keep the temperature of the anode core and the temperature of the ceramic-metal seals below 250°C. Tube life is usually prolonged if these areas are maintained at temperatures below this maximum rating. Minimum air-flow requirements to maintain anode-core and seal temperatures below 225°C with an inlet-air temperature of 50°C are tabulated. The use of these air-flow rates through the recommended socket/chimney and tube combination in the base-to-anode direction provides effective cooling of the tube.

Plate** Dissipation (Watts)	SEA LEVEL		10,000 FEET	
	Air Flow (CFM)	Pressure Drop (Inches of Water)	Air Flow (CFM)	Pressure Drop (Inches of Water)
4000	85	0.18	125	0.25
6000	145	0.38	210	0.55
8000	215	0.68	315	0.99
10,000	295	1.08	430	1.60
12,000	390	1.62	565	2.35

**Since the power dissipated by the filament is about 750 watts and since grid dissipation can, under some circumstances, represent another 100 watts, allowance has been made in preparing this tabulation for an additional 850 watts dissipation.

APPLICATION

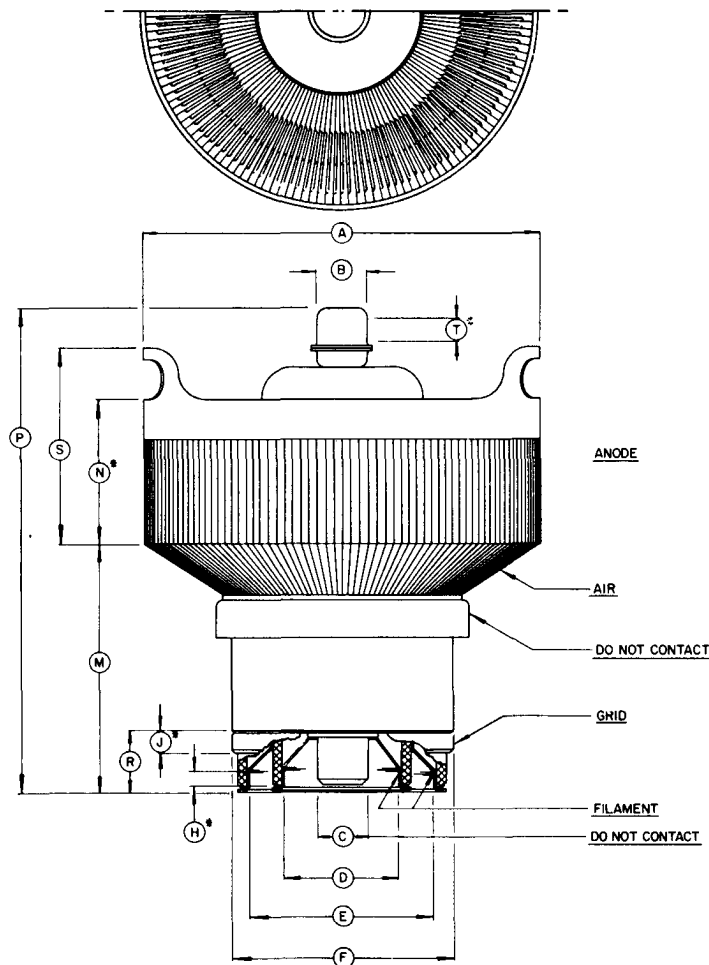
Voltage-Regulator Service — Maximum DC plate current and voltage are restricted according to the following table.

CLASS-A DERATING TABLE	
DC Plate Voltage (Volts)	Max. DC Plate Current (mA)
0 - 2400	5000
3000	4000
4000	3000
5000	2000
6000	1500
7000	1000
8000	700
9000	500
10,000	350

Filament Operation—The rated filament voltage for the 3CX10,000A1 is 7.5 volts. Filament voltage, as measured at the socket, should not be allowed to deviate from the rated value by more than plus or minus five percent.

Cooling—The maximum temperature rating for the external surfaces of the 3CX10,000A1 is 250°C. Sufficient forced-air cooling must be provided to maintain the temperature of the ceramic-metal seals and anode core below 250°C. Tube life is usually prolonged if these areas are maintained at temperatures below this maximum rating. Minimum air-flow requirements to maintain anode-core and seal temperatures below 225°C with an inlet-air temperature of 50°C are tabulated. The use of these air-flow rates provides effective cooling of the tube. When air-flow is in the anode-to-base direction, special care must be taken to insure adequate cooling of the filament stem structure. A separate supply of air may have to be directed into the area between the filament contact areas to maintain safe seal temperatures.

Special Applications—If it is desired to operate this tube under conditions widely different from those given here, write to Power Grid Tube Marketing, EIMAC, Division of Varian, 301 Industrial Way, San Carlos, Calif., for information and recommendations.



* CONTACT SURFACE
ALL DIMENSIONS IN INCHES

DIMENSION DATA

REF.	NOM.	MIN.	MAX.
A		6.928	7.050
B		.855	.895
C		.720	.760
D		1.896	1.936
E		3.133	3.173
F		3.792	3.832
H		.188	
J		.188	
M		3.950	4.300
N		2.412	2.788
P		8.250	8.750
R		.986	1.050
S		3.412	3.788
T		.375	



3CX10,000A1

