

SVETLANA TECHNICAL DATA

4CX20,000A/8990 Radial Beam Power Tetrode



The Svetlana™ 4CX20,000A/8990 is a high-performance ceramic/metal power tetrode designed for audio and radio frequency applications. It is particularly well-suited for use in VHF FM broadcast transmitters in the Band II 88-108 MHz frequency range. The Svetlana 4CX20,000A/8990 has a directly-heated thoriated tungsten mesh filament for mechanical ruggedness and good VHF electrical performance.

The Svetlana 4CX20,000A/8990 is manufactured in the Svetlana factory in St. Petersburg, Russia, and is a direct replacement for the 4CX20,000A/8990 manufactured in the United States.

Characteristics

Electrical

Filament	Thoriated-tungsten mesh
Voltage	10.0 ± 0.5 V
Current @ 10.0V	140 A
Amplification factor (average):	
Grid to screen	6.7
Direct interelectrode capacitances (grounded cathode):	
Cin	190 pF
Cout	23.5 pF
Cgp	1.5 pF
Direct interelectrode capacitance (grounded grid):	
Cin	83 pF
Cout	24.5 pF
Cgk	0.2 pF
Maximum frequency for full ratings (CW)	110 MHz

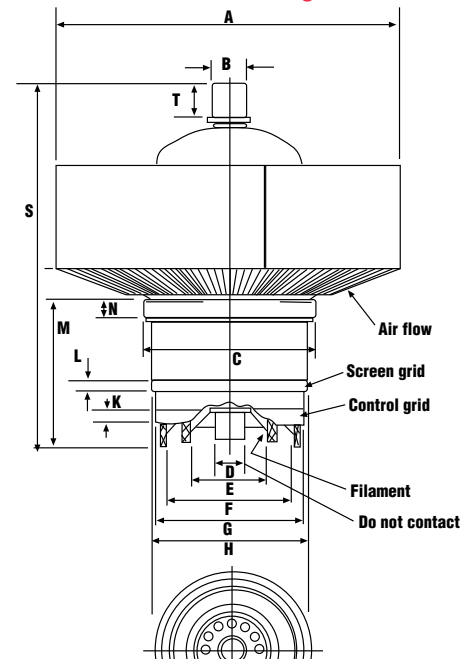
Mechanical

Maximum overall dimensions:	
Length	25 cm (9.84 in.)
Diameter	22.4 cm (8.80 in.)
Net weight	6.35 kg (14.0 lb.)
Operating position	Axis vertical, base up or down
Maximum operating temperature, ceramic/metal seals or envelope	250° C
Cooling	Forced air
Base	Coaxial, for use with Svetlana SK300A (HF) socket

Radio Frequency Power Amplifier Class C FM

Absolute Maximum Ratings:		
DC plate voltage	10,000	V
DC screen voltage	2,000	V
DC plate current	5.0	A
Plate dissipation	20	kW
Screen dissipation	450	W
Grid dissipation	200	W

Svetlana Outline drawing



Dimensional Data

	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	220.22	223.52	8.670	8.800
B	21.72	22.73	.855	.895
C	111.91	113.49	4.406	4.468
D	15.24	19.30	.600	.760
E	48.16	49.17	1.896	1.936
F	79.58	80.59	3.133	3.173
G	96.32	97.33	3.792	3.832
H	101.09	102.11	3.980	4.020
K	4.78	—	.188	—
L	4.78	—	.188	—
M	94.44	96.04	3.718	3.781
N	5.56	—	.219	—
S	240.41	249.94	9.465	9.840
T	12.70	—	.500	—



Svetlana
ELECTRON DEVICES

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ELECTRON DEVICES

Typical Operation (Frequencies to 110 MHz)

DC plate voltage	9.0	10.0	kVdc
DC screen voltage	800	1000	Vdc
DC grid voltage	-300	-460	Vdc
DC plate current	4.15	4.65	Adc
DC screen current	0.2	0.25	Adc
DC grid current	38	59	mAdc
Driving power	360	375	W
Plate dissipation	8.5	11.3	kW
Plate output power	28.9	35.2	kW

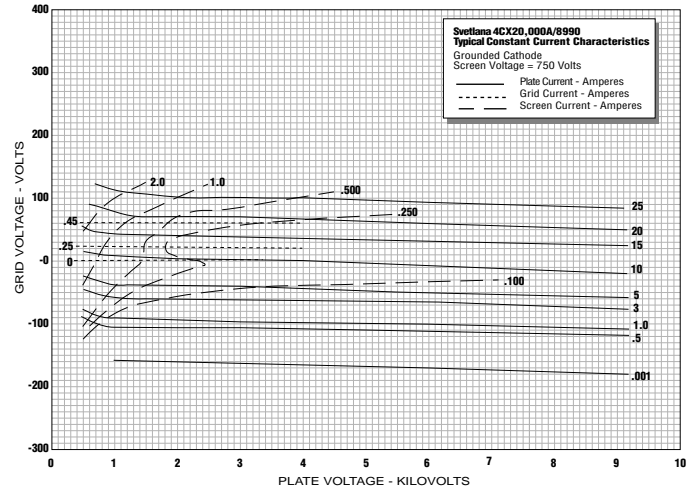
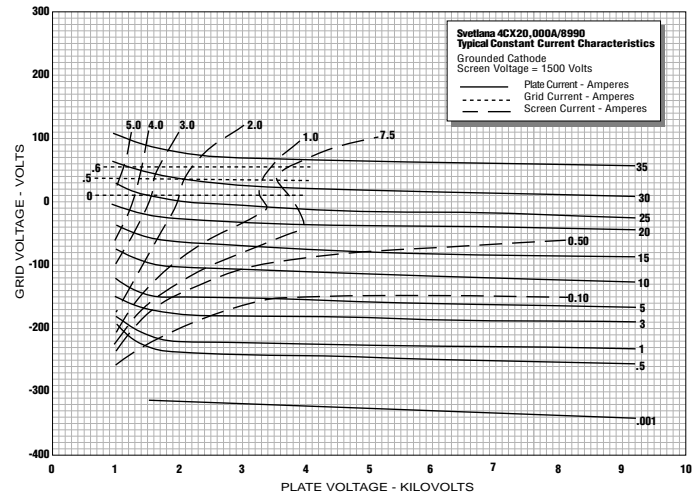
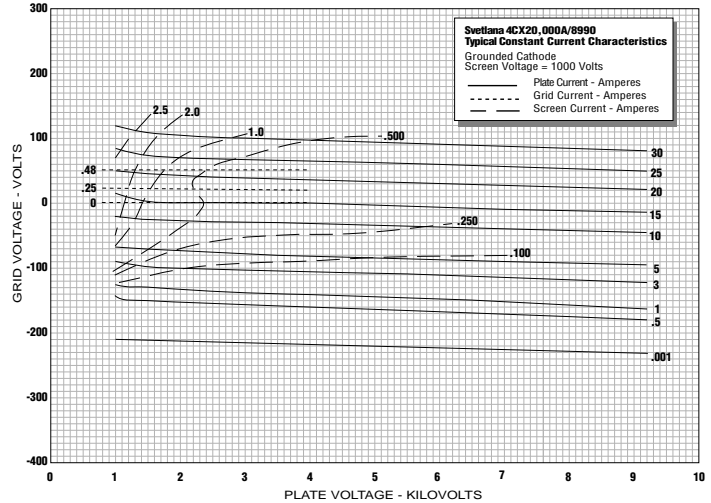
Audio Frequency Power Amplifier or Modulator, Grid Driven, Class AB1

Absolute Maximum Ratings

DC plate voltage	10.0	kV
DC screen voltage	2500	V
DC plate current	6.0	A
Plate dissipation	20.0	kW
Screen Dissipation	450	W
Grid Dissipation	200	W

Typical Operation (two tubes)

DC plate voltage	7800	7800	7800	kVdc
DC screen voltage	500	750	1500	Vdc
DC grid voltage	-70	-125	-250	Vdc
Zero-signal plate current	0.75	0.75	1.0	Adc
Maximum signal plate current	3.4	5.2	9.2	Adc
Maximum signal screen current	0.09	0.22	0.6	Adc
Peak AF grid voltage	65	115	200	V
Driving Power	0	0	0	W
Load resistance plate-to-plate	6300	3500	1600	Ohms
Maximum signal plate dissipation	6.0	7.0	13.5	kW
Plate output power	14.5	26.0	44.0	kW



Cooling

Base-to-Anode Air Flow

Sea Level			10,000 Feet	
Plate Dissipation Watts	Air Flow CFM	Pressure Drop Inches of Water	Air Flow CFM	Pressure Drop Inches of Water
12.5	255	0.6	375	0.7
15.0	365	1.0	535	1.2
17.5	500	1.5	730	1.9
20.0	650	2.4	955	3.0

- Inlet air at 25°. For each 10° increase in air temperature cooling, flow rate should be increased 20%
- Air must be passed around the base of the tube and through the socket, to assure adequate cooling of the tube base and the socket contacts.
- Minimum air flow requirements for a maximum anode temperature of 225°C are shown in the table.
- Air flow must be applied before or simultaneously with the application of power, including the tube filament, and should normally be maintained for several minutes after all power is removed from the tube.