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*

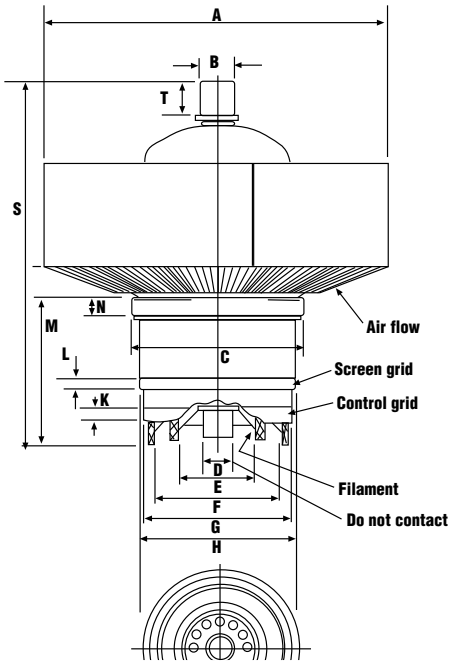
Mechanical

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	—

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Typical Operation (Frequencies to 110 MHz)

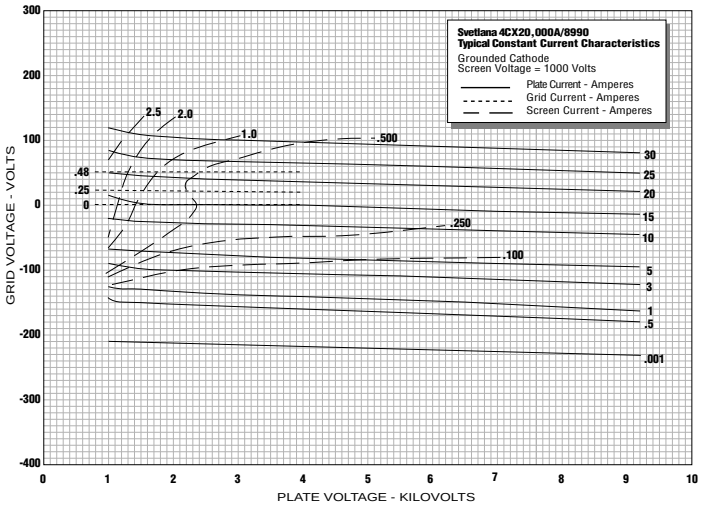
DC plate voltage	*9.0*	*10.0*	*kVdc*
DC screen voltage	*800*	*1000*	*Vdc*
DC grid voltage	*-300*	*-460*	*Vdc*
DC plate current	*4.15*	*4.65*	*Adc*
DC screen current	*0.2*	*0.25*	*Adc*
DC grid current	*38*	*59*	*mAdc*
Driving power	*360*	*375*	*W*
Plate dissipation	*8.5*	*11.3*	*kW*
Plate output power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

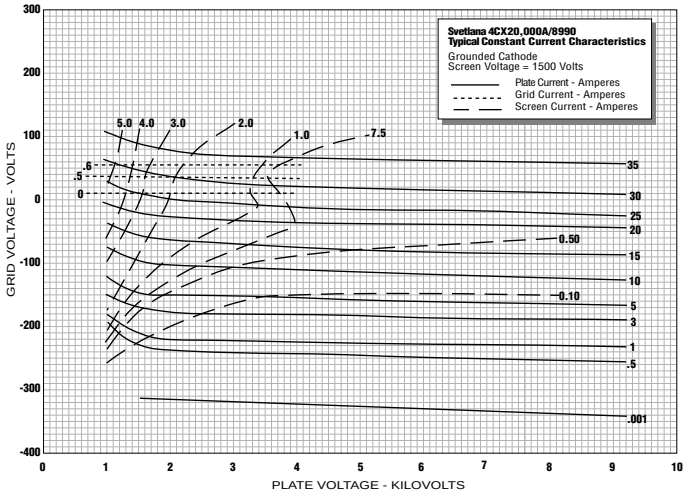
Audio Frequency Power Amplifier or Modulator, Grid Driven, Class AB1

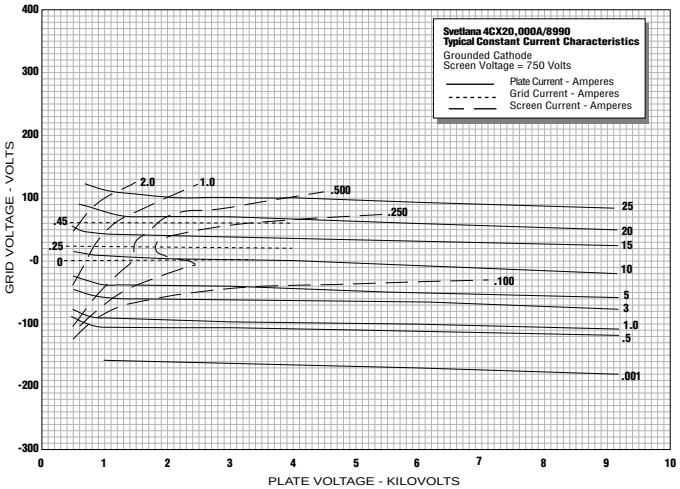
Absolute Maximum Ratings		
DC plate voltage	*10.0*	*kV*
DC screen voltage	*2500*	*V*
DC plate current	*6.0*	*A*
Plate dissipation	*20.0*	*kW*
Screen Dissipation	*450*	*W*
Grid Dissipation	*200*	*W*

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

1. Inlet air at 25˚. For each 10˚ increase in air temperature cooling, flow rate should be increased 20%

2. 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.

3. Minimum air flow requirements for a maximum anode temperature of 225˚C are shown in the table.

4. Air flow must be applied before or simultaneously with the applicaiton of power, including the tube filament, and should normally be maintained for several minutes after all power is removed from the tube.