Svetlana 3CX3000F7/8162 High-Mu Power Triode

The Svetlana™ 3CX3000F7/8162 is a high-performance ceramic/metal power triode designed for use in zero-bias, class AB, or class B RF or audio amplifiers. A modern mesh filament is used, replacing the old-fashioned hairpin construction. The improved mesh filament design ensures better mechanical rigidity and long lasting concentricity of the filament, providing enhanced linearity, less noise, reduced warm-up variation and longer life. The low-inductance, mesh-filament basket also forms a natural extension of the cylindrical stem geometry into the active area. The Svetlana 3CX3000F7/8162 utilizes flying leads precluding the need for a socket.

The Svetlana 3CX3000F7/8162 is manufactured in the Svetlana Electron Devices complex in St. Petersburg, Russia. Svetlana has achieved the improved performance described above with exact replacement compatibility with the 3CX3000F7/8162 manufactured in the United States.

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Svetlana 3CX3000F7/8162

General Characteristics

Electrical

Filament	Thoriated-tungsten mesh
Voltage	7.50 ±0.37V
Current @ 7.50V	51.5A
Amplification factor (average)	160
Direct interelectrode capacitances (grounded grid):	
Input	38.0pF
Output	24.0pF
Feedback	0.6pF
Direct interelectrode capacitances (grounded filament):	
Input	38.0pF
Output	0.6pF
Feedback	24.0pF
Maximum frequency for full ratings (CW)	75 MHz

Mechanical

Cooling	Forced air
Base	Coaxial with special leads
Operating position	Vertical, Base up or down
Maximum operating temperature	250˚ C
Maximum dimensions:	
Length	469 mm (18.4 in.)
Diameter	105.56 mm (4.156 in.)
Net weight	3.4 kg (7.5 lb)

Cathode-Driven Radio Frequency Linear Amplifier, Class AB_2

Maximum Ratings		
DC plate voltage	5000	V
DC plate current	2.5	A
Plate dissipation	4000	W
Grid dissipation	225	W

Typical Operation

(Frequencies to 30MHz)				
Plate Voltage	4000	4800	4800	V
Zero-signal plate current*	0.25	0.35	0.35	A
Single-tone plate current	2.00	1.68	2.00	A
Grid bias	0	0	0	V
Single-tone grid current*	0.61	0.46	0.60	A
Peak driving power	420	293	410	W
Plate dissipation	2285	2275	2775	W
Single-tone plate output power	6030	6000	7266	W
Resonant load impedance	1210	1720	1425	Ohms
Driving impedance	47.5	50.0	46.3	Ohms

*Approximate values

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Cathode-Driven Class C RF Amplifier, CW or FM

Maximum Ratings			
DC Plate voltage		*5000*	*V*
DC Plate current		*2.5*	*A*
Plate dissipation		*4000*	*W*
Grid dissipation		*225*	*W*
Typical operation			
(Frequencies to 110MHz)			
Plate voltage	*3500*	*4800*	*V*
Grid voltage	*-50*	*-60*	*V*
Plate current	*1.30*	*1.54*	*A*
*Grid current**	*0.42*	*0.48*	*A*
*Peak RF cathode voltage**	*220*	*267*	*V*
*Calculated driving power**	*310*	*435*	*W*
Plate dissipation	*985*	*1480*	*W*
Useful output power	*3300*	*5500*	*W*

Audio Frequency Amplifier or Modulator, Class AB_2 Grid Driven

Maximum Ratings (per tube)		
DC plate voltage	*5000*	*V*
DC plate current	*2.5*	*A*
Plate dissipation	*4000*	*W*
Grid dissipation	*225*	*W*
Typical Operation *(two tubes, sinusoidal waveform)*		
Plate voltage	*4000*	*V*
*Zero-signal plate current**	*0.50*	*A*
Maximum-signal plate current	*3.58*	*A*
*Maximum-signal grid current**	*0.58*	*A*
*Peak AF grid voltage***	*190*	*V*
Peak driving power	*115*	*W*
Maximum-signal plate dissipation	*1850*	*W*
Plate output power	*10,500*	*W*
Load resistance (plate-to-plate)	*2720*	*Ohms*

**Approximate values **Per tube*

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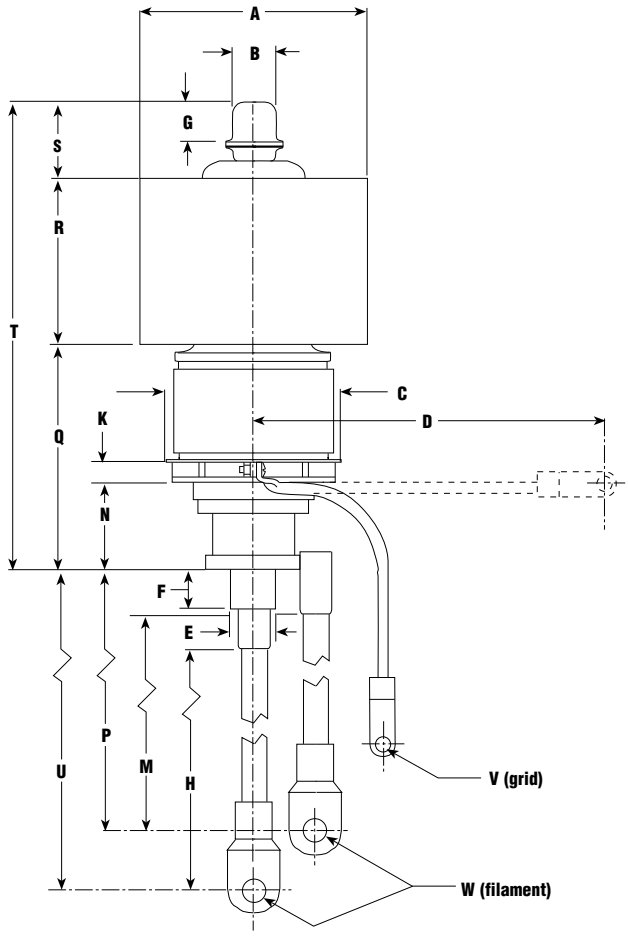
Range Values for Equipment Design

	Min.	Max.	
Filament current at 7.5V	*48.0*	*54.0*	*A*
Interelectrode capacitances (Grounded-Grid Connection)			
Input	*30.0*	*45.0*	*pF*
Output	*20.0*	*28.0*	*pF*
Feedback	*—*	*1.0*	*pF*
Interelectrode capacitances (Grounded-Filament Connection)			
Input	*30.0*	*45.0*	*pF*
Output		*1.0*	*pF*
Feedback	*20.0*	*28.0*	*pF*
Zero-Bias plate current (E_b = 5000V)	*0.36*	*0.52*	*A*
Cut-off bias (E_b = 5000V, I_b = 1.0 mA)	*—*	*-45*	*V*

Svetlana 3CX3000F7/8162 Outline Drawing



Dimensional Data				
Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	103.99	105.56	4.094	4.156
B	19.84	21.44	0.781	0.844
C	–	92.08	–	3.625
D	161.93	168.28	6.375	6.625
E	21.82	22.61	0.859	0.890
F	20.62	23.80	0.812	0.937
G	17.45	20.65	0.687	0.813
H	177.80	190.50	7.000	7.500
K	9.53	11.10	0.375	0.437
M	177.80	190.50	7.000	7.500
N	34.93	41.28	1.375	1.625
P	201.60	214.30	7.937	8.437
Q	98.43	107.95	3.875	4.250
R	201.60	214.30	2.937	3.063
S	30.15	42.85	1.187	1.687
T	203.20	228.60	8.000	9.000
U	227.00	239.70	8.937	9.437
V	4.93	5.08	0.194	0.200
W	9.78	10.03	0.385	0.395

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Electrical Application

Filament Operation The rated filament voltage for the 3CX3000F7/8162 is 7.50 volts. Filament voltage, as measured at the filament collets, should be maintained within 5% of this value to obtain maximum tube life.

Input Circuit A resonant tank circuit is recommended for grounded-grid operation. In a single-ended circuit the loaded "Q" should be at least 3. This technique increases linearity and output power.

Mechanical Application

Mounting The 3CX3000F7/8162 must be mounted with its axis vertical. The base of the tube may be up or down.

Filament Connections The Svetlana 3CX3000F7/8162 filament connections require spring collets designed for a contact surface temperature of 250˚C and with adequate symmetrical contact surface area for the filament and RF current.

Cooling Sufficient forced-air circulation must be provided to keep the temperature of the anode core and the temperatures of the ceramic/metal seals below 250˚C. Airflow requirements to maintain these temperatures below 225˚C with an inlet-air temperature of 40˚C are tabulated. At frequencies above 30 MHz or at higher inlet-air temperatures, more airflow will be required.

Base-to-Anode Air Flow

*	Sea Level		5000 Feet	
Anode Dissipation Watts	Air Flow CFM	Pressure Drop Inches of Water	Air Flow CFM	Pressure Drop Inches of Water
2500	36	0.60	43	.72
4000	67	1.20	80	1.45

Anode-to-Base Air Flow[1]

*	Sea Level		5000 Feet	
Anode Dissipation Watts	Air Flow CFM	Pressure Drop Inches of Water	Air Flow CFM	Pressure Drop Inches of Water
2500	42	0.70	50	0.84
4000	84	1.70	100	2.00

** Because the power dissipated by the filament represents about 385 watts and because grid dissipation can, under some conditions, represent another 225 watts, allowance has been made in preparing this tabulation for an additional 610 watts.*

[1] *When air is supplied in the anode-to-base direction, a minimum of 3 cfm must be directed into the filament-stem structure between the inner and outer filament terminals to maintain the base seals below 250˚ C. A separate air system is not required with base-to-anode airflow.*

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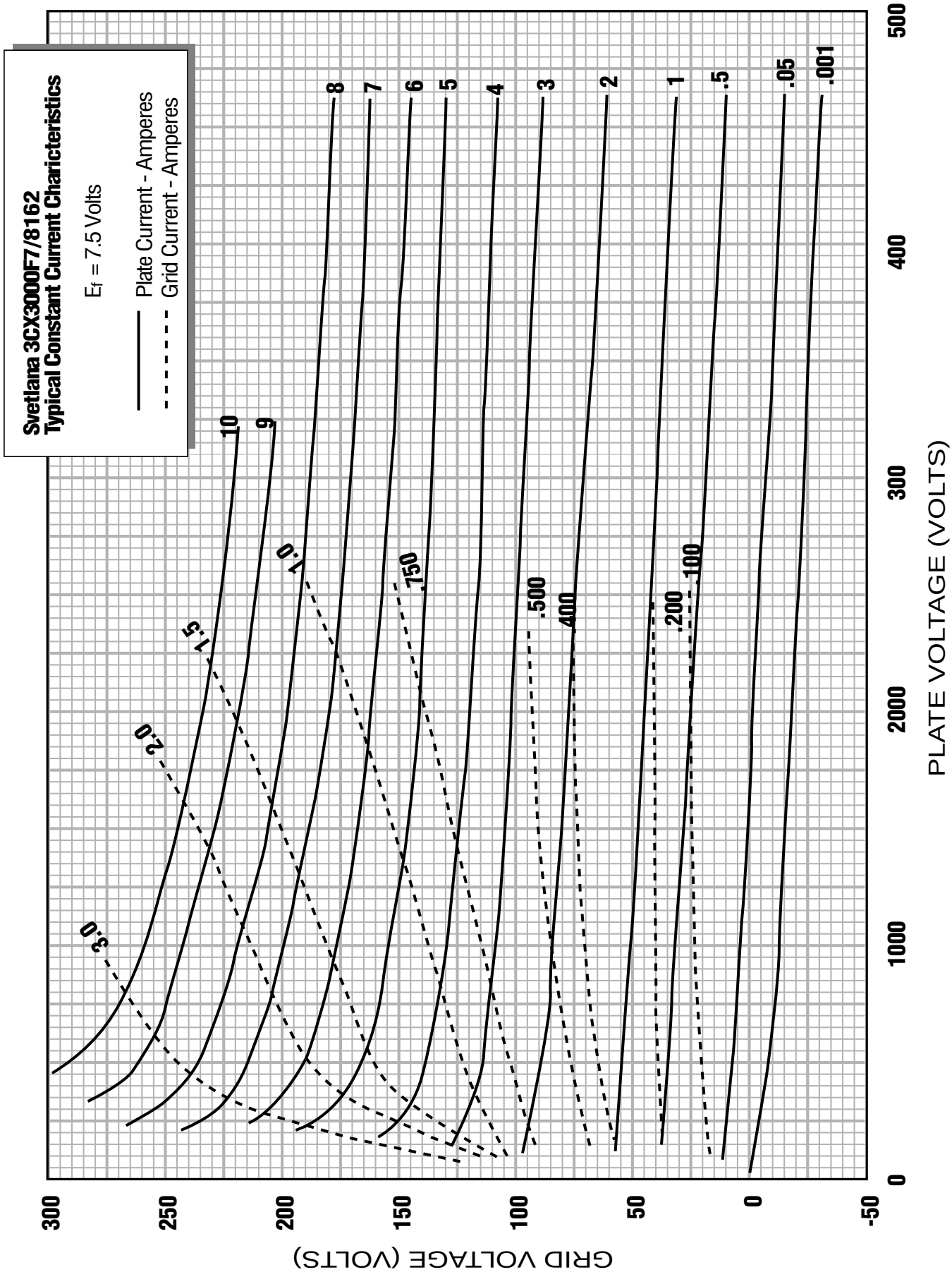

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