

# Svetlana 3CX2500H3 Medium-Mu Power Triode



**T**he Svetlana™ 3CX2500H3 is a high-performance ceramic/metal power triode designed for use in amplifier, oscillator, or modulator service. The ceramic is glazed to facilitate cleaning when used in an industrial environment. 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, contributing to longer life. Flexible leads connect to the filament terminals and a flange is connected to the grid. The flange provides a convenient way to mount the tube.

The Svetlana 3CX2500H3 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 3CX2500H3 manufactured in the United States.



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ELECTRON DEVICES

# Svetlana 3CX2500H3

## General Characteristics

### Electrical

Filament	Thoriated-tungsten mesh
Voltage	7.50 ±0.37 V
Current @ 7.50V	51.5 A
Amplification factor (average)	22
Direct interelectrode capacitances (grounded filament):*	
Input	36.0 pF
Output	0.9 pF
Feedback	20 pF
Maximum frequency for full ratings (CW)	75 MHz

### Mechanical

Cooling	Forced air
Base	Flying leads/flange
Socketing	None. Mounting flange
Operating position	Vertical, Base up or down
Maximum operating temperature	250° C
Maximum operating temperature- Filament leads/tube base joints	150° C
Maximum dimensions:	
Length	46.83 cm (18.44 in.)
Diameter	10.79 cm (4.25 in.)
Net weight	2.9 kg (6.5 lb)

\* Capacitance values are for a cold tube measured in a shielded fixture

## RF Power Amplifier or Oscillator, Class C, FM or CW

Maximum Ratings	
DC plate voltage	6000 V
DC plate current	2.5 A
Plate dissipation	4000 W
Grid dissipation	150 W
DC grid voltage	-1000 V
DC grid current	0.4 A

### Typical Operation

(Frequencies to 30MHz)				
DC plate voltage	4000	5000	6000	V
DC plate current	2.5	2.5	2.08	A
DC grid voltage*	-300	-450	-500	V
DC grid current*	245	265	180	mA
Peak RF grid voltage*	580	750	765	V
Driving Power*	142	197	136	W
Grid dissipation*	68	78	46	W
Plate input power	10,000	12,500	12,500	W
Plate dissipation	2500	2500	2500	W
Plate output power	7500	10,000	10,000	W

\*Approximate values

# Medium-Mu Power Triode

## Plate-Modulated RF Amplifier, Class C Telephony

Maximum Ratings			
DC plate voltage		5500	V
DC plate current		2.0	A
Plate dissipation		2670	W
Grid dissipation		150	W
DC grid voltage		-1000	V

## Typical Operation

(Frequencies to 110MHz)

DC plate voltage	4000	4500	5000	V
DC plate current	1.67	1.47	1.25	A
DC grid voltage	-450	-500	-550	V
DC grid current*	180	140	150	mA
Peak RF grid voltage*	685	715	760	V
Driving power	125	100	115	W
Grid dissipation*	43	30	32	W
DC plate input power	6670	6615	6250	W
Plate dissipation	1670	1315	950	W
Plate output power	5000	5300	5300	W

## Audio Frequency Amplifier or Modulator, Class A or B

Maximum Ratings (per tube)

DC plate voltage		6000	V
DC plate current		2.5	A
Plate dissipation		4000	W
Grid dissipation		150	W
DC grid voltage		-1000	V

## Typical Operation (two tubes sinusoidal waveform)

DC plate voltage	4000	5000	6000	V
Zero-signal DC plate current*	0.6	0.5	0.4	A
Maximum-signal DC plate current	4.0	3.2	3.0	A
DC grid voltage **	-150	-190	-240	V
Peak AF grid voltage (per tube)*	340	360	390	V
Maximum-signal peak driving power*	340	230	225	W
Maximum-signal nominal driving power*	170	115	113	W
Load resistance, plate-to-plate	2200	3600	4650	Ohms
Maximum-signal plate output power	11,000	11,000	13,000	W

\* Approximate values \*\* Adjust to give stated zero-signal plate current

## Range Values for Equipment Design

	Min.	Max.	
Filament current at 7.5V	48.0	54.0	A
Interelectrode capacitances (Grounded-Filament Connection)*			
Input	29.2	40.2	pF
Output	0.6	1.2	pF
Feedback	16.8	23.2	pF
DC grid bias for $E_b=3000$ , $I_b=0.83A$	-67	-100	V

\*Capacitance values are for a cold tube in a shielded fixture.

# Svetlana 3CX2500H3

## Electrical Application

**Filament Operation** The rated filament voltage for the 3CX2500H3 is 7.50 volts. Filament voltage, as measured at the filament seals, should be maintained within 5% of this value to obtain maximum tube life.

## Mechanical Application

**Mounting** The 3CX2500H3 must be mounted with its axis vertical. The base of the tube may be up or down.

**Filament Connections** The Svetlana 3CX2500H3 filament connections are made via the attached flexible leads.

**Grid Connection** The mounting flange is also the electrical connection to the grid.

**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. Adequate airflow must be directed over the lead-to-tube connections for the grid and filament leads. At frequencies above 30 MHz or at higher inlet-air temperatures or higher altitudes, more airflow will be required. The joints between the filament leads and the tube surfaces must be adequately cooled.

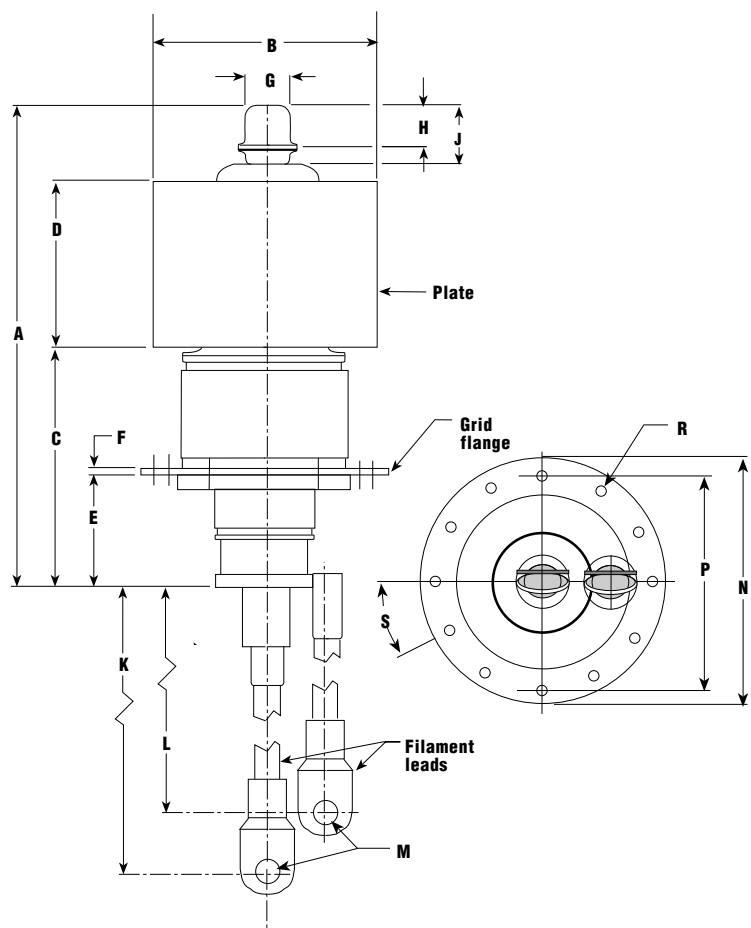
Dimensional Data						
Dim.	Millimeters			Inches		
	Min.	Max.	Nom.	Min.	Max.	Nom.
A	203.20	228.60	—	8.000	9.000	—
B	103.96	107.90	—	4.093	4.248	—
C	98.43	107.95	—	3.875	4.250	—
D	74.60	77.77	—	2.937	3.062	—
E	43.26	49.61	—	1.703	1.953	—
F	—	—	3.18	—	—	0.125
G	19.84	21.41	—	0.781	0.843	—
H	17.45	20.62	—	0.687	0.812	—
J	25.40	28.58	—	1.000	1.125	—
K	227.00	239.70	—	8.937	9.437	—
L	201.60	214.30	—	7.937	8.437	—
M	—	—	9.91	—	—	0.390
N	107.44	107.95	—	4.230	4.250	—
P	97.92	98.68	—	3.855	3.885	—
R	—	—	6.35	—	—	0.250
S	29°	31°	—	29°	31°	—

Base-to-Anode Air Flow				
Anode Dissipation Watts	Sea Level		5000 Feet	
	Air Flow CFM	Pressure Drop Inches of Water	Air Flow CFM	Pressure Drop Inches of Water
2500	36	0.6	43	0.72
4000	67	1.20	80	1.45

Anode-to-Base Air Flow <sup>1</sup>				
Anode Dissipation Watts	Sea Level		5000 Feet	
	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	101	2.00

<sup>1</sup> When air is supplied in the anode-to-base direction, a minimum of 5 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.

## Svetlana 3CX2500H3 Outline Drawing



## Notes:

1. There are 12 holes in grid flange.
2. Grid flange and filament leads are oriented as shown.

