

# SVETLANA TECHNICAL DATA

## 4CX20,000C

### Radial Beam Power Tetrode



**T**he Svetlana™ 4CX20,000C 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 4CX20,000C has a directly-heated thoriated tungsten mesh filament for mechanical ruggedness and good VHF electrical performance.

The Svetlana 4CX20,000C is manufactured in the Svetlana factory in St. Petersburg, Russia, and is a direct replacement for the 4CX20,000C 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                                                    | 195                     | pF  |
| Cout                                                   | 22.7                    | pF  |
| Cgp                                                    | 0.6                     | pF  |
| Direct interelectrode capacitance (grounded grid):     |                         |     |
| Cin                                                    | 87.4                    | pF  |
| Cout                                                   | 23.1                    | pF  |
| Cpk                                                    | 0.08                    | pF  |
| Maximum frequency for full ratings (CW)                | 110                     | MHz |

##### Mechanical

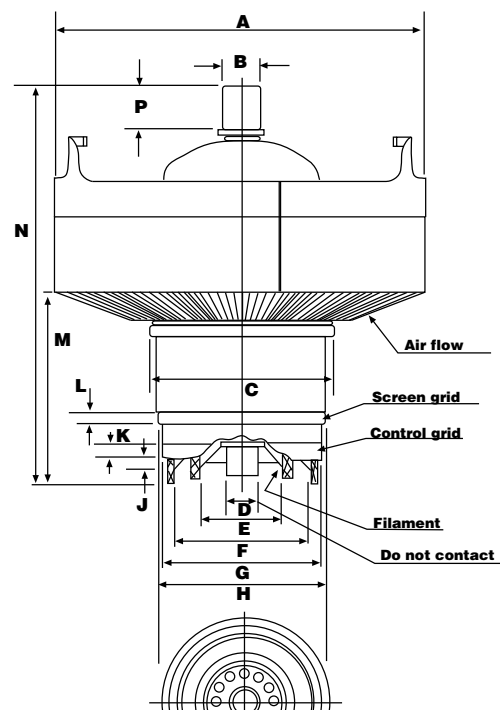
|                                                                |                                              |  |
|----------------------------------------------------------------|----------------------------------------------|--|
| Maximum overall dimensions:                                    |                                              |  |
| Length                                                         | 25 cm (9.84 in.)                             |  |
| Diameter                                                       | 22.4 cm (8.80 in.)                           |  |
| Net weight                                                     | 9.06 kg (20.0 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 socket |  |

##### Radio Frequency Power Amplifier Class C FM

###### Absolute Maximum Ratings:

|                    |        |    |
|--------------------|--------|----|
| DC plate voltage   | 12,500 | 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 | 221.74      | 225.04 | 8.730  | 8.860 |
| 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 | 123.01      | 124.61 | 4.843  | 4.906 |
| N | 240.41      | 249.94 | 9.465  | 9.840 |
| P | 12.70       | —      | .500   | —     |



**Svetlana**  
ELECTRON DEVICES

#### Headquarters:

8200 South Memorial Parkway  
Huntsville, AL 35802  
USA  
Phone: 205 882 1344  
Fax: 205 880 8077

#### Marketing & Engineering:

3000 Alpine Road  
Portola Valley, CA 94028  
USA  
Phone: 415 233 0429  
Fax: 415 233 0439

[www.svetlana.com](http://www.svetlana.com)

# Svetlana 4CX20,000C

## Radial Beam Power Tetrode



**Svetlana**  
ELECTRON DEVICES

### Typical Operation (Frequencies to 110 MHz)

|                    |      |      |      |
|--------------------|------|------|------|
| DC plate voltage   | 9.0  | 12.0 | kVdc |
| DC screen voltage  | 800  | 1000 | Vdc  |
| DC grid voltage    | -300 | -500 | Vdc  |
| DC plate current   | 4.15 | 3.55 | Adc  |
| DC screen current  | 0.2  | 0.25 | Adc  |
| DC grid current    | 38   | 53   | mAdc |
| Driving power      | 360  | 340  | W    |
| Plate dissipation  | 8.5  | 8.1  | kW   |
| Plate output power | 30   | 34.5 | kW   |
| Power Gain         | 19   | 20   | dB   |

### 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                    | 257          | 0.6                           | 377          | 0.7                           |
| 15.0                    | 367          | 1.0                           | 537          | 1.2                           |
| 17.5                    | 498          | 1.5                           | 730          | 1.9                           |
| 20.0                    | 652          | 2.4                           | 955          | 3.0                           |

1. Air flow for inlet air at 25°C. 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 application of power, including the tube filament, and should normally be maintained for several minutes after all power is removed from the tube.

