

# Backward Wave Oscillator tubes for 33-170 GHz



- 33-170 GHz in seven bands
- Full waveguide operation
- Smooth power/frequency dependence
- High output power, 50 mW on 100 GHz typical
- Supplied packaged in a magnet
- Grid for power regulation
- Delivery from stock

## Applications

- Broadband sweepers
- Lower noise LO's
- Precision controllable mm-wave sources
- Spectrometry, plasma diagnostics, test and measurement equipment

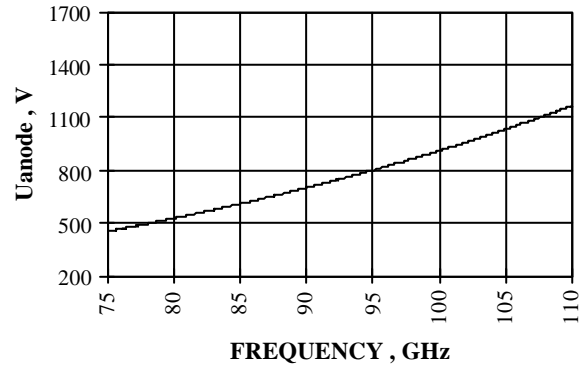
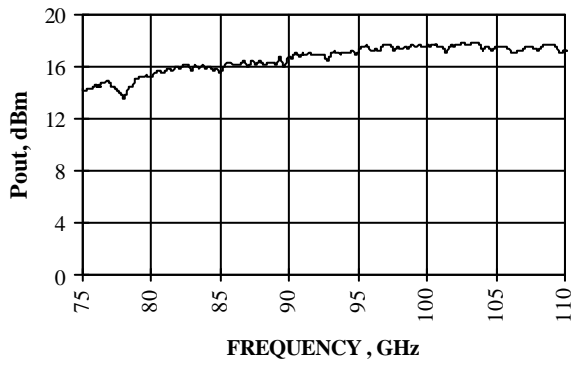
## Description

Main advantages of BWO tubes series **BWO-XX** are very smooth dependence of output power versus frequency and high output power. Unique technology applied for producing of tubes allows to obtain oscillations within a full waveguide frequency band without deep points. We supply each tube with a personal calibration for output power versus frequency and frequency versus high voltage dependencies. Operation frequency depends on high voltage applied on a deceleration system of the tube - anode voltage. Anode current can be controlled by means of a control electrode - the grid that allows to control the output millimeter wave power. The tube allows to change frequency and power independently and very fast - few microseconds for full band frequency sweep and about 10 ns for on/off power modulation.

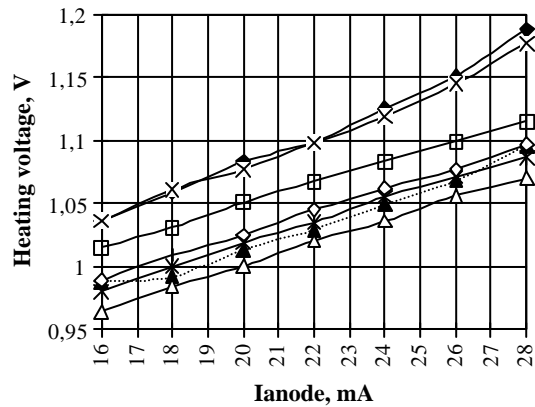
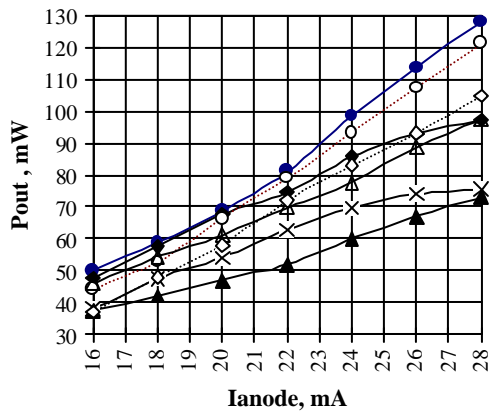
## Specifications

Model	<u>BWO-Q</u> (BWO6)	<u>BWO-U</u>	<u>BWO-V</u> (BWO4)	<u>BWO-E</u>	<u>BWO-W</u> (BWO3)	<u>BWO-F</u>	<u>BWO-D</u> (BWO2)
Operating range, GHz	33-50	40-60	50-75	60-90	75-110	90-140	110-170
Output power, min, mW	15-40	30-50	12-30	15-40	6-30	10-30	6-20
Power difference in the range, max, dB	3-5	3-6	3-5	3-6	3-6	3-6	3-6
Anode voltage, V	350-1200	700-1700	350-1200	700-1700	400-1500	800-2500	400-2500
Cathode current, mA	20-25	20-25	20-25	20-25	20-25	20-25	20-25
MTBF, h	2000	1500	2000	1500	1000	1000	1000

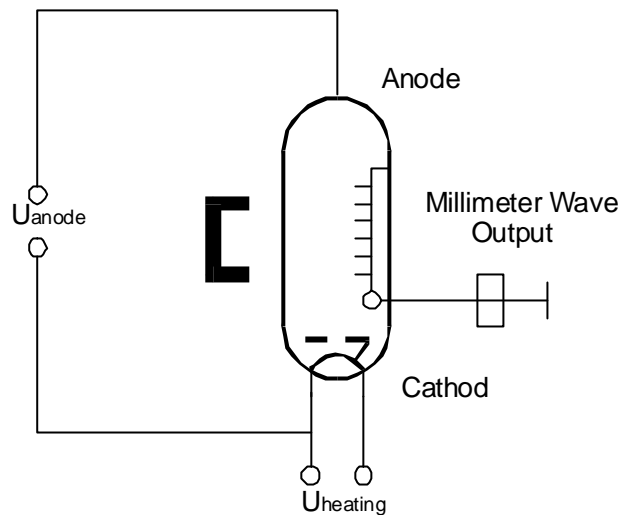
The typical power/frequency and frequency versus high voltage applied to deceleration system dependencies are shown on the plots below for BWO-W model:



The dependencies of output power versus anode current are presented for 7 tubes on left plot below. The power measured on 100 GHz frequency. On the right plot the dependencies of anode current versus heating voltage are shown.



Typical electrical scheme of BWO using:



$U_{anode}$  as mentioned in the table,  $U_{control} = +50 \div +200 \text{ VDC}$ ,  $U_{heating} = +1.0 \div +1.2 \text{ VDC}$ .

Power/frequency dependencies are available on our web site for tubes, which we have on stock.