

BWO-Powered mm-Wave Generator with Fast Sweep



- 37-180GHz in seven bands
- <0.1 ms Full waveguide sweep time
- <0.01 ms impulse response function
- Smooth power/frequency dependence
- Fully packaged
- Frequency accuracy 0.01%
- High output power

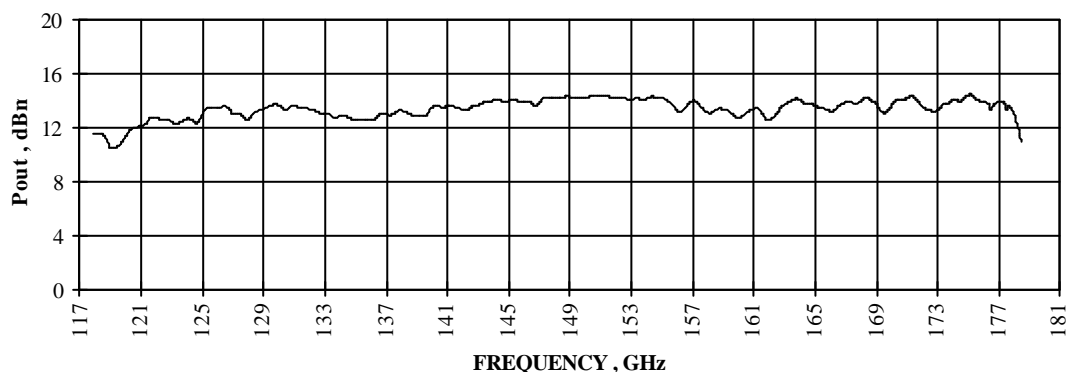
Applications

- LO for sweeping receivers
- Laboratory measurement and test equipment
- Plasma diagnostics: ECE, ECA radiometers, broadband sweeping interferometers
- Spectrometry

Description

ELVA-1 series **G4-141x/142x** is a sweeper with extreme fast frequency sweep. Powerful High Voltage power supply is specially designed for the fast change of a voltage of BWO deceleration system. Special attention have paid to provide a good Impulse Response Function - the reaction of HV output on a very short input pulse.

We supply each device with a personal calibration for output power versus frequency and frequency/control_voltage dependence. The typical power dependence is shown on the plot below for 120-180 GHz model:



The device contains all the electronic circuitry and power supplies required to provide the operation of BWO. BWO tube is fully protected against mistake of all operation voltages applications. State-of-the-art BWO tube with a control electrode for power manipulation is used, so different amplitude modulation modes are available also including a control of the output power by means of an external voltage. Output power and operation frequency can be changed independently.

Specifications

MODEL NUMBER	G4-141	G4-141a	G4-141b	G4-141c	G4-141d	G4-142b	G4-142c
Frequency Range, GHz	37-54	40-60	53-80	60-90	75-120	118-150	118-180
Output waveguide size, mm	5.69x2.84 WR22	4.8x2.6 WR19	3.76x1.88 WR15	3.1x1.5 WR12	2.54x1.27 WR10	1.65x0.83 WR7	1.65x0.83 WR7
Waveguide Flange	UG-383/U	UG-383/U-M	UG-385/U	UG-387/U	UG-387/U-M	UG-387/U-M	UG-387/U-M
Minimum power in the CW mode, mW	10,0	10,0	10,0	10,0	10,0	10,0	5

Common Specifications

Frequency accuracy in the CW mode, %	±0.01
Fullband Sweep Time, ms	0.2
Duration of Impulse Response Function (IRF) on the 3 dB level, ms	<0.01
Delay to the peak of IRF, ms	<0.003
Ringing of the amplitude of IRF, %	±
Maximum CW frequency stability for 15 min	±2·10 ⁻⁴
Residual FM	±5·10 ⁻⁵
Output VSWR	1.5
Interval square-wave modulation frequencies, kHz	1
External square-wave modulation frequencies, kHz	1-100
Voltage for External Power Control, V	50-200
Operating temperature range, C°	5-40
AC Input Voltages:	220 V, 50 Hz
Consumed power, VA	400
Size, mm	495x180x480
Weight, kg	23

All devices would be supplied with a transformer for 110VAC/60Hz AC Input Voltages. The selection of the most powerful BWO tube is available upon request. Normally the output power of selected BWO in two times higher than one mentioned in the specification. Warranty is 1 year. An ADC card and software for PC microcomputer operation are available at extra cost. Delivery can be implemented within 10-12 weeks ARO.

Many devices operate in so famous laboratories as JET (Joint European Torus) - largest tokamak in the world (UK), FOM Institute RIJNHUIZEN in the Netherland, Tore-Supra - the tokamak in France Centre de Cadarache, HL-1M tokamak in Southwestern Institute of Physics in China and so on.