

- High output power
- Digital/Electrical Frequency control
- High power and frequency stability
- Digital/Electrical control of output power level
- Ability of long-term frequency stability
- Stable spectrum
- Ability of remote control/diagnostics through internet
- Long life time

## Applications

- Laboratory measurement and test equipment
- Mm-wave source of high power
- EPR spectrometer bridge
- DNP polarizer source
- Plasma diagnostics
- FMCW radar module



## Description

Millimeter-wave oscillators of VCOM-XX series originally was designed for purposes of EPR spectroscopy and plasma diagnostics. It provides electromagnetic energy within some range around central frequency with high output power. The original design uses low frequency stable voltage-controlled oscillator and frequency multiplier. To increase output power an IMPATT mm-wave power amplifier can be used. The max value of the output power level depends on the requested frequency range. It can be 200 mW at 94 GHz, 50 mW at 140 GHz and 10 mW at 170 GHz.

Output power and frequency are controlled by means of digital code signal (symbol D at end of p/n: VCOM-...-DD, VCOM-...-DA, VCOM-...-DP models) or with external DC or pulse voltages (VCOM-...-T, VCOM-...-DA, VCOM-...-DP models). Digital control models of VCOM-XX have built-in frequency counter that allows for providing high long-term stability of output frequency. Also, remote control and diagnostics of operation through the internet are admissible.

The stable operation of **VCOM-XX** oscillators allows them to be used in scientific experiments that last for a long time, many months and years. Models with the D index can track and adjust their frequency automatically, keeping its set value indefinitely.

There are set of standard models of the **VCOM-XX** oscillators now.

- T – analogue control of frequency and power level
- TV – is based on the -T model. But -TV is customized to the customer's requirements and differs from the standard -T model:
  - the presence of the indicator
  - the presence of a potentiometer for manual adjustment of frequency
  - the presence of a power output +12 V to connect the frequency doubler.
- DD – digital control of frequency and power level
- DA – analogue and digital control (switchable modes)
- DP – digital control of output frequency, digital and analogue control of power level (up to 5kHz pulse modulation of power level available).

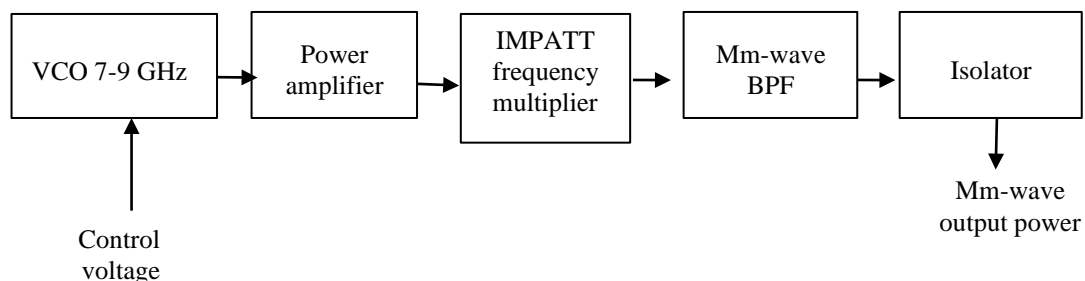
Custom designed VCOM models can be produced by special order.

## Specifications

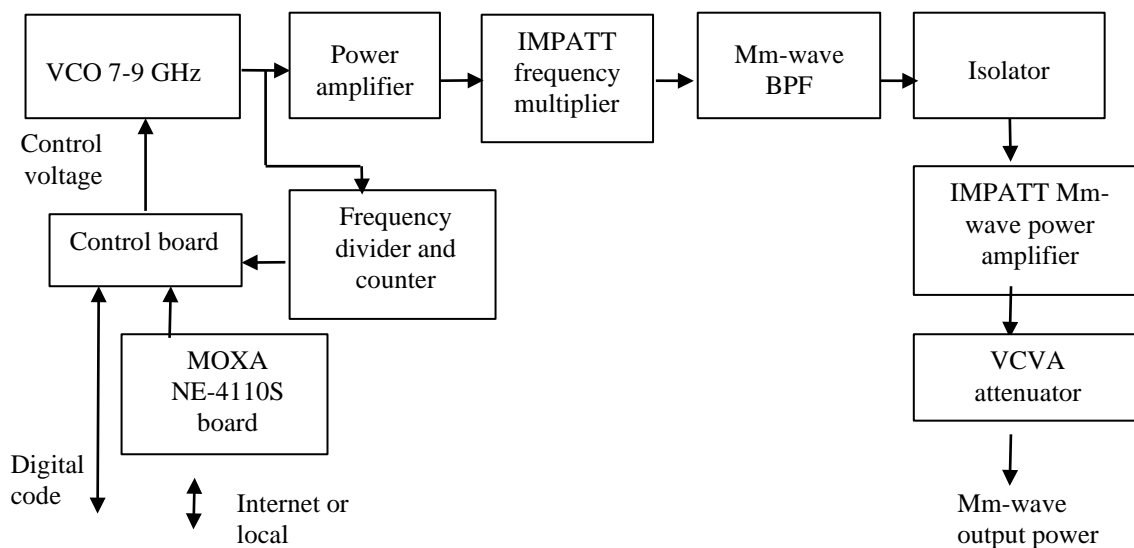
MODEL	VCOM-10/94/0.5/200-XX	VCOM-06/140/2/20-XX	VCOM-06/170/2/10-XX
Central frequency	94 GHz 500 MHz	140 GHz 2 GHz	170 GHz 2 GHz
Bandwidth	93.75-94.25 GHz	139-141 GHz	169-171 GHz
Frequency Range (controlled)	0- 200 mW 100	0- 20 mW	0-10 mW 100
Output power (controlled)	kHz max 0...50	100 kHz max	kHz max
Spectrum line width at -3dBc	dB	0...50 dB	0...40 dB
Control attenuation	UG-387/U-M /WR-10	UG-387/U-M /WR-06	UG-387/U-M /WR-06
Flange/ Waveguide	< 70% (non-condensing)	< 70% (non-condensing)	< 70% (non-condensing)
Operating Humidity at Temp range +10 to +40deg°C			
<b>For models with digital control:</b>	250kHz	350kHz	500kHz
Frequency Step (max)	< 1mW	< 0.1mW	0.05mW
Power Level Step	<0.5MHz	<0.7MHz	<1MHz
Absolute accuracy of set Frequency: within +10 to +40deg°C	less than or equal to 500 msec (max)	less than or equal to 500 msec (max)	less than or equal to 500 msec (max)
Settling time to major frequency step within 0.5MHz	+/- 1 ppm per month	+/- 1 ppm per month	+/- 1 ppm per month
Long term stability of reference crystal oscillator: at constant temperature	RS232/DB-9 Plug	RS232/DB-9 Plug	RS232/DB-9 Plug
Output Frequency/Power Control connector	Ethernet/SNMP v1	Ethernet/SNMP v1	Ethernet/SNMP v1
Remote Diagnostic Protocol	RG-45 Socket	RG-45 Socket	RG-45 Socket
Ethernet port:			

Basic block- schemes of VCOM oscillator:

**A. Wideband VCOM...-T (does not have powerful output power amplifier which limits operating bandwidth):**



**B. High power VCOM...-DD with digital control and remote control/diagnostics:**





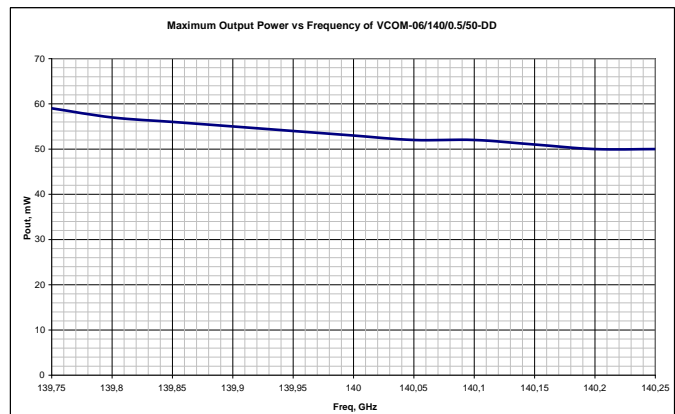
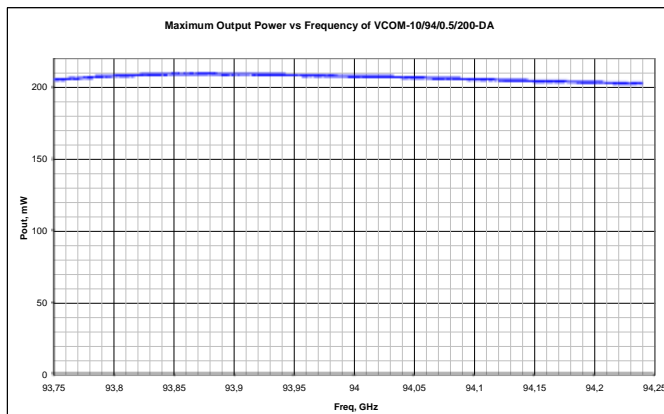
a)



b)

Control panel of VCOM-10/94/0.5/200-DA (a) and VCOM-06/140/0.5/50-DD oscillators (b)

Typical measured data of W- and D- band VCOM-XX oscillators:



## How to Order

Specify Model Number VCOM-XX/CF/BW/P-AB, where

- **XX** – number of waveguide standard (Ex. 10 for WR-10 and 06 for WR-06)
- **CF** – central operating frequency in GHz
- **BW** – operating bandwidth, GHz
- **P** – output power (nom), mW
- **AB** type of output frequency and power control: **-T** or **-DD**, or **-DA** or **-DP**

Standard flange is **UG-XXX/U-M** round

## Example

**VCOM-10/94/0.5/200-DD** ( W-band oscillator, WR-10 waveguide, Central frequency **94** GHz, Bandwidth **0.5** GHz, Output power **200** mW (typ), Digital control of output power and frequency).