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

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 of central frequency with high output power. 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. Max value of output power level depends on 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 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 what allows providing high long-term stability of output frequency. Also remote control and diagnostics of operation through internet is admissible.
Reliable work of VCOM-XX oscillators allows using them in scientific experiments which last for long time, a few weeks or even months.

There are set of standard models of the VCOM-XX oscillators now.
- T- analogue control of frequency and power level
- 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

<table>
<thead>
<tr>
<th>MODEL</th>
<th>VCOM-10/94/0.5/200-XX</th>
<th>VCOM-06/140/2/20-XX</th>
<th>VCOM-06/170/2/10-XX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central frequency</td>
<td>94 GHz</td>
<td>140 GHz</td>
<td>170 GHz</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>500 MHz</td>
<td>2 GHz</td>
<td>2 GHz</td>
</tr>
<tr>
<td>Frequency Range (controlled)</td>
<td>93.75-94.25 GHz</td>
<td>139-141 GHz</td>
<td>169-171 GHz</td>
</tr>
<tr>
<td>Output power (controlled)</td>
<td>0-200 mW</td>
<td>0-20 mW</td>
<td>0-10 mW</td>
</tr>
<tr>
<td>Spectrum line width at -3dBc</td>
<td>100 kHz max</td>
<td>100 kHz max</td>
<td>100 kHz max</td>
</tr>
<tr>
<td>Control attenuation</td>
<td>0…50 dB</td>
<td>0…50 dB</td>
<td>0…40 dB</td>
</tr>
<tr>
<td>Operating Humidity at Temp range +10 to +40 deg°C</td>
<td>&lt; 70% (non-condensing)</td>
<td>&lt; 70% (non-condensing)</td>
<td>&lt; 70% (non-condensing)</td>
</tr>
</tbody>
</table>

**For models with digital control:**

- Frequency Step (max): 250kHz, 350kHz, 500kHz
- Power Level Step: <1mW, <0.1mW, 0.05mW
- Absolute accuracy of set Frequency: within +10 to +40deg°C: <0.5MHz, <0.7MHz, <1MHz
- Settling time to major frequency step within 0.5MHz: less than or equal to 500 msec (max)
- Long term stability of reference crystal oscillator: at constant temperature: +/- 1 ppm per month
- Remote Diagnostic Protocol: Ethernet/SNMP v1, Ethernet/SNMP v1, Ethernet/SNMP v1
- Ethernet port: RG-45 Socket, RG-45 Socket, RG-45 Socket

Basic block- schemes of VCOM oscillator:

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

```
VCO 7-9 GHz  | Power amplifier | IMPATT frequency multiplier | Mm-wave BPF | Isolator
```

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

```
VCO 7-9 GHz  | Power amplifier | IMPATT frequency multiplier | Mm-wave BPF | Isolator
  | Control board | Frequency divider and counter |
  | MOXA NE-4110S board |
```

Digital code:

Internet or local network:

Mm-wave output power

//www.elva-1.com e-mail: sales@elva-1.com
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).