USB Frequency Synthesizer PLL (Phase Locked Loop), Operating From 25 MHz to 6 GHz With SMA Output

FMSN3901 is a Frequency Synthesizer Module that covers a wide frequency band from 25 MHz to 6 GHz with exceptional spurious rejection and phase noise performance. Attenuation range up to 50 dB is adjustable in 1 dB steps across the entire frequency band. This high quality signal source has several outstanding features including a USB 2.0 interface that is powered and command controlled directly by a host PC and a Female SMA output connector, and is VISA compliant which enables seamless cross platform use. The synthesizer can be GUI controlled via Windows®, Macintosh®, or Linux® platforms, or with SCPI compliant VISA commands (downloadable user manual), or with other system design software such as LabVIEW®. The compact size makes it ideal for bench top test and measurement use or for radar and communication systems. Frequency resolution of the FMSN3901 is available in integer and fractional operating modes and the User can select between an internal reference (capable of phase locking) or externally applied reference. The module supports integrated phase locked loop (PLL) circuitry that the User can select between an internal reference (capable of phase locking) or externally applied reference. The RF Synthesizer Module comes complete with a USB 2.0 A extension and an SMA male to MMCX plug cable.

### Electrical Specifications (TA= 25°C)

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>0.025</td>
<td>6</td>
<td>6</td>
<td>GHz</td>
</tr>
<tr>
<td>Phase Locked Speed</td>
<td>1</td>
<td></td>
<td></td>
<td>ms</td>
</tr>
<tr>
<td>Phase Noise @100kHz Offset</td>
<td>-86</td>
<td></td>
<td></td>
<td>dBC/Hz</td>
</tr>
<tr>
<td>2nd Harmonic</td>
<td>-24.66</td>
<td></td>
<td></td>
<td>dBC</td>
</tr>
<tr>
<td>3rd Harmonic</td>
<td>-10.66</td>
<td></td>
<td></td>
<td>dBC</td>
</tr>
<tr>
<td>4th Harmonic</td>
<td>-34.5</td>
<td></td>
<td></td>
<td>dBC</td>
</tr>
<tr>
<td>Reference Frequency</td>
<td>5</td>
<td>20</td>
<td>100</td>
<td>MHz</td>
</tr>
<tr>
<td>Reference Power (CW)</td>
<td>+0</td>
<td>+20</td>
<td>+15</td>
<td>dBm</td>
</tr>
<tr>
<td>Internal Reference Frequency</td>
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<td></td>
<td></td>
<td>MHz</td>
</tr>
<tr>
<td>Internal Reference Accuracy</td>
<td>0.5</td>
<td></td>
<td></td>
<td>ppm</td>
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</table>

### Features:
- Wideband Output Frequency
- 25 MHz to 6 GHz
- Integer and Fractional operating modes
- Up to 50 dB Attenuation adjustable in 1 dB steps
- USB 2.0 Interface
- Female SMA output
- USBTMC VISA Compliant
- User Selectable internal reference or externally applied reference
- Small compact package size
- LED indicators
- downloadable User Manual
- Accessory cables included

### Applications:
- Signal Generators
- Test Equipment
- RF System Integration
- Communication Systems
- EW Systems
- UHF/VHF Systems
- Radar Systems
- Frequency Conversion
- SIGINT
### Performance by Frequency

<table>
<thead>
<tr>
<th>Description</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>0.05</td>
<td>3</td>
<td>6</td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Phase Noise @ 100 kHz Offset (with internal reference)</td>
<td>-104</td>
<td>-95</td>
<td>-86</td>
<td></td>
<td>dBC/Hz</td>
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<tr>
<td>2nd Harmonics</td>
<td>-24.66</td>
<td>-26.17</td>
<td>-28.5</td>
<td></td>
<td>dBC</td>
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<tr>
<td>3rd Harmonics</td>
<td>-10.66</td>
<td>-29</td>
<td>-47.5</td>
<td></td>
<td>dBC</td>
</tr>
<tr>
<td>4th Harmonics</td>
<td>-34.5</td>
<td>-46.83</td>
<td>&gt; -70</td>
<td></td>
<td>dBC</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>.025 to 1</td>
<td>1 to 1.5</td>
<td>1.5 to 3</td>
<td>3 to 6</td>
<td>GHz</td>
</tr>
<tr>
<td>Step Size (Integer Mode)</td>
<td>12.5</td>
<td>25</td>
<td>50</td>
<td>100</td>
<td>MHz</td>
</tr>
</tbody>
</table>

Electrical Specification Notes:
Step size specified under default conditions (a 50 MHz reference input with a reference divider of 1).

### Mechanical Specifications

**Size**
- Length: 4.1 in [104.14 mm]
- Width: 0.9 in [22.86 mm]
- Height: 0.645 in [16.38 mm]
- Weight: 0.2618 lbs [118.75 g]

**Configuration**
- Package Type: Connectorized
- Reference Connector: MMCX Female
- Output Connector: SMA Female
- Control Connector: USB Type A - Male
Reference Divider Out Connector  MMCX Female

Mechanical Specification Notes:
The USB Type A - Male connector is used for both Power and Control.

Environmental Specifications

**Temperature**
- Operating Range: 0 to +55 deg C
- Storage Range: -50 to +100 deg C

**Compliance Certifications** (visit www.FairviewMicrowave.com for current document)
- RoHS Compliant: Yes

**Plotted and Other Data**

Notes:
Typical Performance Data

3 GHz Phase Noise Comparison

Phase Noise - Carrier Frequency Comparison

Power (dBc/Hz)

Frequency Offset (Hz)

Frequency (GHz)

Power (dBm)

Frequency (GHz)

Frequency (Hz)
USB Frequency Synthesizer PLL (Phase Locked Loop), Operating From 25 MHz to 6 GHz With SMA Output from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Allen, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: USB Frequency Synthesizer PLL (Phase Locked Loop), Operating From 25 MHz to 6 GHz With SMA Output FMSN3901


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