Application Note

VTC4, Clipped Sine Wave TCXO

Typical Phase Noise Measurements

Phase Noise Results

Phase noise measurements were performed on an Agilent E5052A signal source analyzer (SSA). The E5052A has a phase noise to jitter integration calculation feature and devices were characterized in the 1kHz-5MHz band. Please contact Vectron for other offset integration bands.

[Graph showing phase noise measurements]

Carrier 9999998 MHz -82.122 dBc

1: 1 Hz -91.0139 dBc/Hz
2: 10 Hz -91.0139 dBc/Hz
3: 100 Hz -116.7491 dBc/Hz
4: 1 kHz -137.1816 dBc/Hz
5: 10 kHz -149.6046 dBc/Hz
>5: 5 MHz -154.8533 dBc/Hz

X: Start 1 kHz
Stop 5 MHz
Center 2.5 kHz MHz
Span 4.999 MHz

Noise:
Analysis Range X: Band Marker
Analysis Range Y: Band Marker
Inter Noise: -87.6433 dBc / 4.999 MHz
RMS Noise: 50.5611 µrad
RMS Jitter: 933.62 fsec
Residual FM: 168.994 Hz
Typical Phase Noise for the VTC4 Series

**VTC4-BOBE-10M245 Phase Noise test**

- Carrier 10.244995 MHz
- Phase Noise 10.00 dB/Ref -20.00 dBc/Hz
- Analysis Range: X: Band Marker
- Analysis Range Y: Band Marker
- Intg Noise: -88.2111 dBc / 4.999 MHz
- RMS Noise: 54.969 mrad
- RMS Jitter: 853.627 Fsec
- Residual FM: 158.676 Hz

**VTC4-B22E-12M800 Phase Noise test**

- Carrier 12.000000 MHz
- Phase Noise 10.00 dB/Ref -20.00 dBc/Hz
- Analysis Range: X: Band Marker
- Analysis Range Y: Band Marker
- Intg Noise: -88.3001 dBc / 4.988 MHz
- RMS Noise: 53.111 mrad
- RMS Jitter: 660.879 Fsec
- Residual FM: 151.776 Hz

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Typical Phase Noise for the VTC4 Series

VTC4-C12E-13M000 Phase Noise test

VTC4-BOCD-16M376 Phase Noise test

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Typical Phase Noise for the VTC4 Series

![Graph showing phase noise tests](image)

- **Carrier Frequency**: 24.575994 MHz
- **Reference Frequency**: -8.1847936 MHz

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Phase Noise (dBc/Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Hz</td>
<td>-44.6417 dBc/Hz</td>
</tr>
<tr>
<td>10 Hz</td>
<td>-61.3718 dBc/Hz</td>
</tr>
<tr>
<td>&gt;100 Hz</td>
<td>-105.9586 dBc/Hz</td>
</tr>
<tr>
<td>1 kHz</td>
<td>-133.6738 dBc/Hz</td>
</tr>
<tr>
<td>10 kHz</td>
<td>-145.5010 dBc/Hz</td>
</tr>
<tr>
<td>100 kHz</td>
<td>-152.5857 dBc/Hz</td>
</tr>
</tbody>
</table>

**Analysis Range**: X: 1 kHz  
**Stop**: 1 MHz  
**Center**: 2.5 MHz  
**Span**: 4,999 MHz

**Noise**
- **Intergliss Noise**: -86.3821 dBc/Hz  
- **RMS Noise**: 67,6279 μrad  
- **RMS jitter**: 433,256 fsec  
- **Residual FM**: 181,512 Hz

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