## VC-TCXO/TCXO
### HIGH STABILITY, CMOS OUTPUT

**TG3225CEN**  
**TG2520CEN**

- **Output frequency**: 12 MHz to 52 MHz
- **Supply voltage**: 2.8 V Typ / 3.0 V Typ / 3.3 V Typ.
- **Frequency / temperature characteristics**: ±2.0 × 10⁻⁶ Max.
- **External dimensions**: 3.2 × 2.5 × 0.9 mm / 2.5 × 2.0 × 0.8 mm
- **Applications**: Reference clock for measurement machine, Wireless communication devices (Smart meter, Telemeter, other).
- **Features**: High stability, CMOS output

### Specifications (characteristics)

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>VC-TCXO</th>
<th>TCXO</th>
<th>Conditions / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output frequency range</td>
<td>fo</td>
<td>12MHz to 52MHz</td>
<td></td>
<td>Standard frequency</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>Vcc</td>
<td>2.8 V ± 5% / 3.0 V ± 5% / 3.3 V ± 5%</td>
<td>Supply voltage range: 2.375 V to 3.63 V</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>T_stg</td>
<td>-40 °C to +90 °C</td>
<td>Storage as single product.</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>T_use</td>
<td>G: -40 C to +85 C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>f_tol</td>
<td>±2.0 × 10⁻⁶ Max</td>
<td>After reflow, ±25 C</td>
<td></td>
</tr>
<tr>
<td>Frequency/temperature characteristics</td>
<td>f0-Tc</td>
<td>F: ±2.0 × 10⁻⁶ Max / G: ±40 C to +85 C</td>
<td>Standard stability version</td>
<td></td>
</tr>
<tr>
<td>Frequency/load coefficient</td>
<td>f0-Load</td>
<td>±0.2 × 10⁻⁶ Max</td>
<td>15 pF ± 10 %</td>
<td></td>
</tr>
<tr>
<td>Frequency/voltage coefficient</td>
<td>f0-Vcc</td>
<td>±3.0 × 10⁻⁶ Max</td>
<td>Vcc ± 5 %</td>
<td></td>
</tr>
<tr>
<td>Frequency aging</td>
<td>f_age</td>
<td>±1.0 × 10⁻⁴ Max</td>
<td>+25 °C, First year: 12 MHz &lt; fo &lt; 20 MHz 24 MHz &lt; fo &lt; 40 MHz 40 MHz &lt; fo &lt; 52 MHz</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>Icc</td>
<td>4.0 mA Max</td>
<td>12 MHz &lt; fo &lt; 26 MHz</td>
<td></td>
</tr>
<tr>
<td>Input resistance</td>
<td>Rin</td>
<td>500 kΩ Min.</td>
<td>Vcc - GND (DC)</td>
<td></td>
</tr>
</tbody>
</table>
| Frequency control range | f_cont | ±8.0 × 10⁻⁶ to ±15.0 × 10⁻⁶ | C: Vcc = 1.4 V ± 1.0 V (Vcc = 2.8 V) or  
D: Vcc = 1.5 V ± 1.0 V (Vcc = 3.0 V) or  
E: Vcc = 1.65 V ± 1.0 V (Vcc = 3.3 V) |
| Frequency change polarity | | Positive polarity | |
| Symmetry | SYM | 45 % to 55 % | 50 % Vcc level, L.CMOS ≤ 15 pF |
| Output voltage | Vos | 90 % of Vcc Min. | |
| Start up time | t_str | 2.0 ms Max | T=0 at 90 % Vcc |
| Rise time / Fall time | tr / tf | 8.0 ns Max | 10 % Vcc to 90 % Vcc level, Load 15 pF |
| Output load condition | I_load | 15 pF | 15 pF ± 10 % |

*Note: Please contact us for requirements not listed in this specification.*

### External dimensions

(Unit:mm)

#### TG3225CEN

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### Footprint (Recommended)

(Unit:mm)

For stable operation, please add a bypass capacitor (0.1μF to 0.1μF) between Vcc and GND. Please place it as close to TCXO as possible.
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  - Complies with EU RoHS directive.
    *About the products without the Pb-free mark.
    Contains Pb in products exempted by EU RoHS directive.
    (Contains Pb in sealing glass, high melting temperature type solder or other.)

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