**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>f0</td>
<td>12 MHz to 52MHz</td>
<td></td>
<td>Standard frequency</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>Vcc</td>
<td>12MHz, 16MHz, 24MHz, 25MHz, 26MHz, 27MHz, 32MHz, 36MHz, 38.4MHz, 39MHz and 40MHz</td>
<td></td>
<td>Supply voltage range: 2:375 V to 3:63 V</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>T_stg</td>
<td>-40 °C to +90 °C</td>
<td></td>
<td>Storage as single product.</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>T_use</td>
<td>G: -40 °C to +85 °C</td>
<td></td>
<td>After reflow, +25 °C</td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>f_tol</td>
<td>±2.0 × 10^-6 Max.</td>
<td></td>
<td>Standard stability version</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>±0.3 × 10^-6 Max.</td>
<td>Vcc ± 5 %</td>
<td></td>
</tr>
<tr>
<td>Frequency aging</td>
<td>f_age</td>
<td>±1.0 × 10^-6 Max.</td>
<td>+25 °C, First year, 12 MHz ≤ f0 ≤ 20 MHz</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>Icc</td>
<td>12 MHz ≤ f0 ≤ 26 MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input resistance</td>
<td>Rin</td>
<td>500 kΩ Min.</td>
<td>-</td>
<td>Vcc - GND (DC)</td>
</tr>
<tr>
<td>Frequency control range</td>
<td>f_cont</td>
<td>±8.0 × 10^-6 to ±15.0 × 10^-6</td>
<td>-</td>
<td>C: Vcc = 1.4 V ±1.0 V (Vcc ≥ 2.8 V) or</td>
</tr>
<tr>
<td>Symmetry</td>
<td>SYM</td>
<td>50 % to 55 %</td>
<td>50 % Vcc level, L_CMOS ≤ 15 pF</td>
<td></td>
</tr>
<tr>
<td>Output voltage</td>
<td>Vcc</td>
<td>90 % Vcc Min.</td>
<td></td>
<td>D: Vcc = 1.5 V ±1.0 V (Vcc ≥ 3.0 V) or</td>
</tr>
<tr>
<td>Start-up time</td>
<td>t_stt</td>
<td>2.0 ms Max.</td>
<td></td>
<td>E: Vcc = 1.65 V ±1.0 V (Vcc ≥ 3.3 V)</td>
</tr>
<tr>
<td>Rise time / Fall time</td>
<td>t/ tr</td>
<td>8.0 ns Max.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output load condition</td>
<td>Load</td>
<td>15 pF</td>
<td>15 pF ±10 %</td>
<td></td>
</tr>
</tbody>
</table>

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

**External dimensions**

(Unit:mm)

**Footprint (Recommended)**

(Unit:mm)

1) Please keep “N.C.” pin OPEN condition or GND connection. “N.C.” pin doesn’t work as a ground pin.

For stable operation, please add a bypass capacitor (0.01μF to 0.1μF) between Vcc and GND. Please place it as close to TCXO as possible.

**Product Number (Please contact us)**

TG3225CEN: X1G005101xxxxxx
TG2520CEN: X1G005161xxxxx

**Crystal oscillator**

**VC-TCXO/TCXO**

HIGH STABILITY, CMOS OUTPUT

TG3225CEN
TG2520CEN

- **Output frequency**: 12 MHz to 52MHz
- **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
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At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard. All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

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ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

► Explanation of the mark that are using it for the catalog

►Pb free.

►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.)

►Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.

►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc ).

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