Abracon has introduced its new series of watch-MEMS® kHz MEMS oscillators, featuring the World’s Smallest CSP (1.5x0.8mm) & SMD (2.0x1.2 mm) packages. This series is based on a proprietary MEMS resonator technology, yielding best-in-class kHz timing reference. These devices are ideally suited for tuning fork crystal replacement in space constrained designs. Optimized for the Wearable, IoT & Consumer solutions, these devices provide temperature stabilized alternative to tuning fork crystal based timing, while eliminating the oscillator loop capacitors, saving significant surface area, complexity & frequency variation over temperature.

Offered with both temperature stabilized (±75ppm or ±100ppm over -40°C to +85°C) version and temperature compensated (±5ppm, ±10ppm or ±20ppm over -40°C to +85°C) version; this series offers designers great flexibility to replace a typical tuning fork watch crystal with a precise 32.768kHz clocking solution.

<table>
<thead>
<tr>
<th>Series</th>
<th>Description</th>
<th>Package Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM7XK</td>
<td>Temperature compensated, 1.54 x 0.84 x 0.6mm</td>
<td></td>
</tr>
<tr>
<td>ASTMKJ</td>
<td>Low-power, 1.54 x 0.84 x 0.6mm</td>
<td></td>
</tr>
<tr>
<td>ASTMKH</td>
<td>Low-power, 2.0 x 1.2 x 0.6mm</td>
<td></td>
</tr>
<tr>
<td>ASTMK</td>
<td>Low-power, 1.54 x 0.84 x 0.6mm</td>
<td></td>
</tr>
<tr>
<td>ASTMK 06</td>
<td>Low-power, 2.0 x 1.2 x 0.6mm</td>
<td></td>
</tr>
</tbody>
</table>

Vdd = 3.63V
Vdd = 1.5 - 1.8V
Why should designers consider watch-MEMS® for RTC Timing!!

Typical Pierce Oscillator Loop for RTC applications

- Uses a Tuning Fork Quartz Crystal
- Requires (2) oscillator loop capacitors
- Set-tolerance is contingent upon accurately matching the crystal plating load to the capacitance of the oscillator loop, best-case ±10 ppm
- Frequency stability over -40°C to +85°C is worse than ±175 ppm
- Total solution consumes the following surface area:

Pierce Oscillator Loop using watch-MEMS®

- No oscillator loop capacitors are needed
- No by-pass capacitor is needed
- Set-tolerance is typically better than ±5 ppm for temperature stabilized version and better than ±2.5 ppm for TCXO version
- Frequency stability over -40°C to +85°C is typically better than ±50ppm for temperature stabilized version and ±5 pp maximum for TCXO version
- ASTMK series is available with Factory Programmable Output Swing, enabling it to be the drop-in replacement for Tuning Fork Crystals
- Total solution consumes the following surface area: