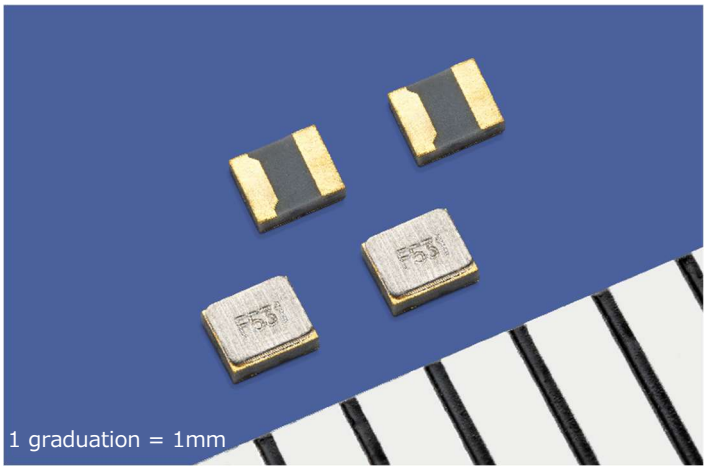
News Release
Seiko Instruments Inc.

December 9th, 2025

SII Begins Mass Production of the World's Smallest (1.0 × 0.8 × 0.32mm) Tuning-Fork Crystal Resonator "SC-10S" Achieving Both a 33% Reduction in Mounting Area and Low ESR



Seiko Instruments Inc. (President: Yoichi Endo; Headquarters: Chiba City, Chiba Prefecture; hereinafter "SII") will begin mass production of the "SC-10S" (32.768kHz), the world's smallest* tuning-fork crystal resonator measuring 1.0 × 0.8mm, starting in April 2026.
*Based on SII research as of November 2025.

[Background of Development]
SII has already been mass-producing the "SC-12S" (32.768kHz), one of the world's smallest tuning-fork crystal resonators at 1.2 × 1.0mm. As wearable devices such as smart rings and smartwatches, as well as IoT devices, continue to become smaller, the electronic components built into these devices are increasingly required to support high-density mounting, low power consumption, and high performance. To meet these needs, SII leveraged its proprietary photolithography technology to develop and mass-produce the world's smallest tuning-fork crystal resonator, the "SC-10S," which achieves a 33% reduction in mounting area compared to existing models (1.0 × 0.8 × 0.32mm).

[Main Features]
1. World's Smallest Size
Using SII's proprietary photolithography technology, which forms fine patterns on quartz wafers, the SC-10S achieves high-precision processing at the world's smallest size for a 32.768kHz tuning-fork crystal resonator: 1.0 × 0.8 × 0.32mm.

2. Low ESR (90 kΩ max.)
Miniaturization typically leads to an increase in ESR (Equivalent Series Resistance). However, through SII's proprietary design and manufacturing technologies, the SC-10S maintains a low ESR of 90kΩ max., equivalent to that of existing models.

3. High Shock Resistance and Frequency Stability
The SC-10S ensures excellent frequency stability even in environments subjected to shock or vibration, delivering highly reliable operation.

[Main specifications]

Item	Specification
Dimensions	1.0 x 0.8 x 0.32mm
Nominal Frequency	32.768kHz
Frequency Tolerance	$\pm 20 \times 10^{-6}$
Turnover Temperature	+25±5°C
Parabolic Coefficient	$(-0.036 \pm 10\%) \times 10^{-6}/°C^2$
Load Capacitance	4pF, 6pF, 7pF, 9pF, 12.5pF
Motional Resistance (ESR)	90kΩ max.
Absolute Maximum Drive Level	0.3μW max.
Recommended Drive Level	0.1μW typ.
Shunt Capacitance	1.1pF
Frequency Ageing	$\pm 5 \times 10^{-6}$/year
Operating Temperature Range	-40 to +85°C
Storage Temperature Range	-55 to +125°C

[Main Applications]
Smart rings, smartwatches, smart tags , hearing aid
Communication modules such as Bluetooth and LPWA
Clock frequency source for RTCs (Real-Time Clocks)
Sub-clock for various microcontrollers

[Production Schedule]
Sample Shipments Begin: December 2025
Mass Production Start: April 2026

[Contact Information]
<Media Relations>
Seiko Instruments Inc.
Corporate Planning Division, Public Relations Section
Contact Form: https://www.sii.co.jp/en/contact/sii_inquiry

<Customer>
Seiko Instruments Inc.
Electronic Devices Business Promotion Division, Sales Promotion Department
Contact Form: https://www.sii.co.jp/en/quartz/contact
TEL: +81-43-211-1207