






SiTime Enters the \$2B Precision Resonator Market with Third-Generation MEMS

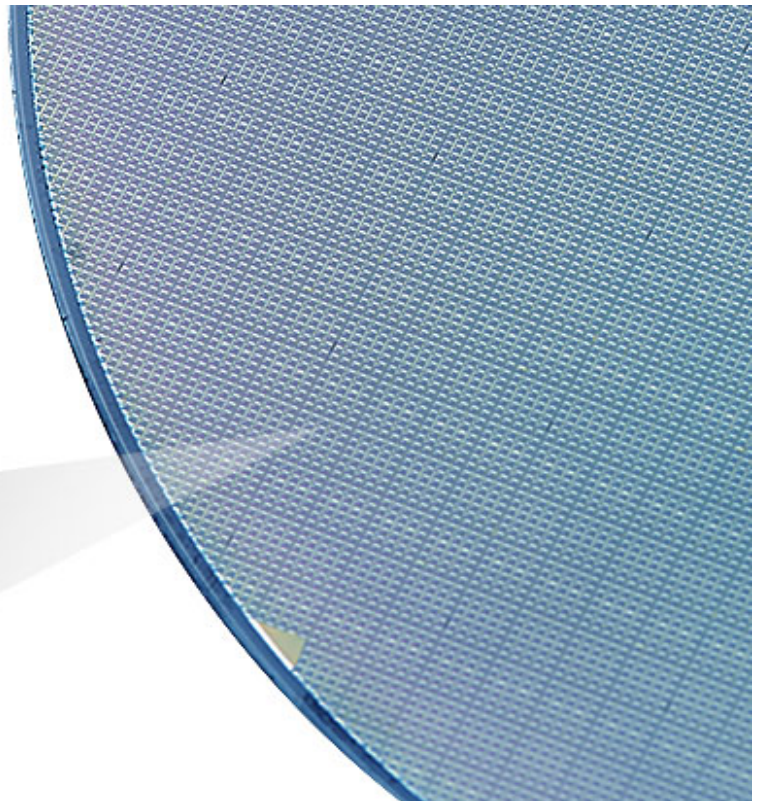
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Only Company to Offer MEMS Resonators, Oscillators and Clocks to Cover Entire Timing Market

SANTA CLARA, Calif.--(BUSINESS WIRE)--Oct. 28, 2020-- [SiTime Corporation](#) (NASDAQ: SITM), a market leader in MEMS timing, today announced that it has entered the \$2 billion precision resonator market with the ApexMEMS™ family of MHz resonators. These new devices are the third-generation of SiTime silicon MEMS technology and are available in a variety of MHz frequencies for high volume electronics. Mobile and IoT applications such as Bluetooth hearables and wearables, high-speed connectivity interfaces, asset-tracking, as well as microcontrollers, can take advantage of the 85% space savings, integration, consistent performance, resilience, and reliability that are offered by ApexMEMS resonators.

ApexMEMS™ Silicon Resonator

-  85% smaller
-  Integrated load capacitors
-  Higher reliability



“SiTime continues to lead the timing industry with our unique expertise in MEMS, mixed-signal, analog and systems,” said Rajesh Vashist, CEO of SiTime. “By shipping almost 2 billion oscillators to date to thousands of customers, we have learned to manufacture MEMS resonators in high volume, while continuously delivering excellent quality, reliability, and performance. Our knowledge and experience enables us to deliver better MEMS resonators that customers can depend on.”

“ApexMEMS resonators were developed to deliver breakthrough system performance and integration as shown by their usage in the [SiT9501 oscillator](#) and the [Cascade ClockSoC™](#),” continued Vashist. “The SiT9501 is a game-changer for the 100-800G optical module market as it delivers the highest performance at the lowest power in the smallest package. Our combined understanding of the resonator, analog, materials, and thermal challenges both solves difficult system problems and benefits our resonator customers. These groundbreaking

ApexMEMS resonators are available for integration or as standalone devices, and customers are now designing with them. With ApexMEMS, SiTime is the only company to offer MEMS resonators, oscillators, and clocks for the \$8 billion timing market.”

Market Overview

According to estimates by Dedalus Consulting and SiTime, the resonator market is \$3 billion in size and consists of three product categories – approximately \$2 billion of precision resonators, \$400 million of ceramic resonators, and \$600M of SAW resonators. By 2024, industry analysts and SiTime estimate that 25 to 30 billion precision resonators will be sold, driven by the growth of connectivity in mobile-IoT, industrial-IoT, automotive, and industrial electronics. It is expected that up to 30% of these resonators will need to be very small, offer higher performance, and be easily integrated into system-in-packages and modules. This high-value market is one use case for ApexMEMS resonators.

Solving Difficult Timing Challenges

For integration into standard IC packages and modules, ApexMEMS resonators are available as silicon die. Co-packaging these resonators with high performance semiconductors such as Bluetooth chips and microcontrollers gives customers a significant system and development advantage.

When using a quartz resonator, engineers face numerous challenges. Significant effort goes into matching the oscillator circuit with the resonator in the presence of unknown board parasitics. Without proper matching, performance may be suboptimal, and device startup at cold temperatures may be impacted. This situation gets even more complicated due to performance variations that are inherent in quartz resonators. An integrated ApexMEMS solution solves these challenges, reduces development time, simplifies manufacturing, and boosts system performance, reliability, and resilience.

ApexMEMS resonators offer similar advantages in standalone applications. Integrated load capacitors help reduce the system size through elimination of discrete passive components. Board layout and routing is simplified considerably, especially in space-constrained mobile-IoT applications. With closer placement of the resonator to the semiconductor device, system performance is greatly improved.

Key Specifications and Availability

ApexMEMS-based timing solutions deliver up to seven times better phase noise performance at half the power than our previous generation. At a tiny 0.42 mm x 0.42 mm size, the ApexMEMS resonators are 85% smaller than a typical quartz resonator, and also integrate the load capacitors. These new resonators provide stability as good as ± 20 ppm while delivering superior reliability and best-in-class environmental resilience, like other SiTime devices. ApexMEMS resonators operate reliably at temperatures as high as 125°C, a useful feature when integrated inside plastic packages.

ApexMEMS resonators are sampling now to select high-volume customers. For more information, visit www.sitime.com/products/resonators.

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About SiTime

SiTime Corporation is a market leader in silicon MEMS timing. Our programmable solutions offer a rich feature set that enables customers to differentiate their products with high performance, small size, low power, and high reliability. With almost 2 billion devices shipped, SiTime is changing the timing industry. www.sitime.com



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