MEDIA ALERT: SiTime Endura Super-TCXO Delivers 100x Higher System Reliability for Aerospace and Defense

Highlights:

- MEMS-based SiT5543 Super-TCXO delivers 100x higher reliability, 2x power reduction and 40% smaller size compared to OCXOs and 20x better stability than conventional TCXOs
- Enables faster, low-latency data transmission and reductions in bit error rates in dynamic environments
- Eliminates the need for costly, bulky, custom-made OCXOs, which are highly sensitive to acceleration, shock, and vibration

SiTime Corporation, the precision timing company, today introduced a new member to its field-proven Endura™ MEMS ruggedized Super-TCXO® family—the SiT5543. This temperature-controlled oscillato redefines the TCXO landscape for aerospace and defense systems with unmatched stability in challenging environments. SiTime's new, ruggedized SiT5543 Super-TCXO offers an unprecedented ±5 ppb frequency stability over temperature from -40 °C to 95 °C, even during fast temperature transients and under vibration. The SiT5543 delivers an impressive 20x improvement in stability over existing open-market, quartz-based TCXOs, which are unable to provide stability better than ±100 ppb.

Prior to the advent of SiTime's Super-TCXOs, designers had to use oven-controlled crystal oscillators (OCXOs) to achieve ±5 ppb stability in aerospace and defense systems. However, quartz-based OCXOs pose several drawbacks. They are notoriously expensive, bulky, fragile and power hungry. The SiT5543 overcomes these challenges and offers designers of ruggedized systems a remarkably better option that matches the temperature stability of conventional OXCOs. It provides 100x higher reliability, 2x lower power consumption and 40 percent smaller size than quartz OCXOs, making the SiT5543 an ideal replacement for OCXOs in demanding applications such as high-speed data communications, military networks, electronic systems and avionics.

The SiT5543 Super-TCXO significantly reduces bit error rate, system size and power consumption while enhancing reliability and operational performance in harsh operating conditions. The technical specifications of this MEMS-based Super-TCXO enable a new level of secure, timing-dependent encryption technology to protect military radios, GPS receivers, navigation and guidance systems from jamming events. This new Endura Super-TCXO provides the stability over temperature and under vibration required for high-speed networks that form the backbone of today's aerospace and defense systems. The SiT5543 reduces risk, cycle time and cost in meeting tough operational requirements due to the superior robustness of MEMS technology over legacy quartz alternatives.

The SiT5443 Super-TCXO reduces design cost and complexity due to its small 7 mm x 5 mm surface-mount footprint, low power requirements and unique ability to mitigate the effects of harsh operating conditions. Since it is factory-programmable to support output frequencies ranging from 1 to 60 MHz, it eliminates the high cost, risks, and delays of custom oscillators. The SiT5543 is available with I2C digital control for on-the-fly frequency tuning or for advanced user-defined compensation. Digital control provides noise-insensitive frequency adjustment with smooth frequency shifts.

The SiT5543 MEMS Super-TCXO is manufactured using world-class semiconductor processes with statistical process control and 6-sigma specification limits to ensure each device operates reliably out of the box and meets specification in the lab and in real-world operating conditions.

Endura SiT5543 Super-TCXO Highlights

- 1 to 60 MHz programmable output frequency
- ±5 ppb stability over -40 °C to +95 °C temperature range
- ±0.3 ppb/°C stability over temperature slope
- 0.01 ppb/g acceleration sensitivity
- 0.5 ppb/day daily aging
- Low ±150 ppb aging over 20 years, eliminating the need for system-level aging compensation
- 2 seconds to final stability over temperature
- Optional ±3200 ppm digital control with I2C
- 20,000 g shock survivability
- 110 mW typ. power consumption at 2.5V supply
- 2.5 to 3.3V supply
- 7.0 mm x 5.0 mm ceramic surface-mount package
- Additional details on product page

Availability

Samples of the SiT5543 Super-TCXOs are available now for qualified customers. Volume production is expected in early 2024. Contact SiTime for ordering information.

Additional Resources

Download the SiT5543 image
Read blog: New Endura Super-TCXO rearchitects precision timing for aerospace and defense, delivering 100x higher reliability

About SiTime

SiTime Corporation is the precision timing company. Our programmable solutions offer a rich feature set that enables customers to differentiate their products with higher performance, smaller size, lower power, and better reliability. With over 3 billion devices shipped, SiTime is changing the timing industry. For more information, visit www.sitime.com.

Note on Forward-Looking Statements

This media alert may contain forward-looking statements regarding future events. These forward-looking statements are intended to qualify for the safe harbor from liability established by the Private Securities Litigation Reform Act of 1995. Readers are cautioned that these forward-looking statements involve risks and uncertainties that could cause our actual results and the timing of events to differ materially from those anticipated in such forward-looking statements, including, but not limited to: our ability to ship products and other risks and uncertainties described more fully in our documents filed with or furnished to the Securities and Exchange Commission. More information about these and other risks that may impact our business is set forth in our more recent Form 10-Q filed with the Securities and Exchange Commission. All forward-looking statements in this press release are based on information available to us as of the date hereof and qualified in their entirety by this cautionary statement, and we assume no obligation to revise or update these forward-looking statements.