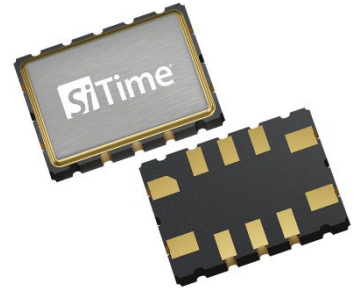




1 to 60 MHz, Elite X Stratum 3E Super-TCXO

The Elite X™ SiT5501 is a ± 10 ppb Stratum 3E precision oscillator. Engineered for exceptional dynamic performance, this MEMS-based Super-TCXO is ideal for replacing larger and less robust quartz mini-OCXOs in edge networks. The SiT5501 is 2x smaller, 4x lower power, and 30x more reliable than comparable mini-OCXOs while being fully compliant to the GR-1244 Stratum 3E oscillator specifications. By leveraging SiTime's unique DualMEMS® and TurboCompensation® temperature sensing technology, the SiT5501 delivers the most stable timing in the presence of environmental stressors – airflow, temperature perturbation, vibration, shock, and electromagnetic interference (EMI).



The SiT5501 can be factory-programmed to any combination of frequency, voltage, and pull range. This programmability enables designers to optimize the clock configuration while eliminating the long lead time and customization costs associated with quartz TCXOs where each frequency is custom built.

Oscillator Type	TCXO-SE
Frequency	1 to 60 MHz
Frequency Stability (ppm)	± 0.01 (± 10 ppb), ± 0.02 (± 20 ppb)
Output Type	LVC MOS, Clipped sinewave
Operating Temperature Range (°C)	-40 to +85, -40 to +105
Pull Range (ppm)	± 6.25 , ± 10 , ± 12.5 , ± 25 , ± 50 , ± 80 , ± 100 , ± 125 , ± 150 , ± 200 , ± 400 , ± 600 , ± 800 , ± 1200 , ± 1600 , ± 3200
Voltage Supply (V)	2.5, 2.8, 3.0, 3.3
Package Type (mm²)	7.0 x 5.0 10-pin
Features	Precision TCXO with ± 0.5 ppb/°C frequency slope, 0.5 ppb/day aging, 110 mW typical (2.5V)
Availability	Sampling

Features:

Exceptional dynamic stability under airflow, fast temp. ramp

- ± 10 ppb over-temp. stability from -40 to 105°C
- ± 0.5 ppb/ $^{\circ}\text{C}$ frequency slope ($\Delta F/\Delta T$), $10^{\circ}\text{C}/\text{min}$ ramp
 - Ensures system-level quality of service for telecom and networking equipment in hostile environments
- ± 0.5 ppb/day aging
- $2\text{e-}11$ ADEV at 10 second averaging time

4x lower power and 2x smaller for compact edge devices

- 110 mW typical power consumption (2.5V)
- Robust 7.0 mm x 5.0 mm package

20x better phase noise under vibration

- Minimizes call and/or link drops in high-vibration environments

No activity dips or microjumps

- Eliminates any need for costly screening or burn-in tests

0.2 ps/mV power supply noise rejection (PSNR)

- Reduces BOM by eliminating a dedicated LDO for TCXO

LVCMOS or clipped sinewave output

- Optimizes for best balance between EMI and jitter

Rich programmable features

- Any frequency between 1 to 60 MHz
- 2.25 to 3.63 V
- Large pull range from ± 6.25 to ± 3200 ppm
 - Customize TCXO specifications for optimal system performance

Digital frequency tuning through I2C

- Eliminate frequency shift caused by board noise

Superior reliability – reduces field failures and repair costs due to clock components

- 1 billion hours MTBF
- Lifetime warranty

Applications:

- SONET/SDH Stratum 3E
- Small cells
- IEEE 1588 boundary clocks and grandmasters
- Synchronous Ethernet (G.8262, options 1 and 2)
- Core and edge routers
- Carrier class switches
- Wireless & backhaul
- Optical transport (OTN, OLT, etc.)
- Cable model termination system (CMTS)
- Precision GNSS
- Broadband satellite
- Instrumentation
- COSPAS/SARSAT
- GPS/GNSS modules
- Power & energy
- Asset tracking
- Long-range communications
- Smart farming
- Smart city
- Indoor positioning
- Defense & aerospace



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