156.25 MHz, ±0.1 to ±0.25 ppm Elite RF™ Differential-Ended Precision Super-TCXO

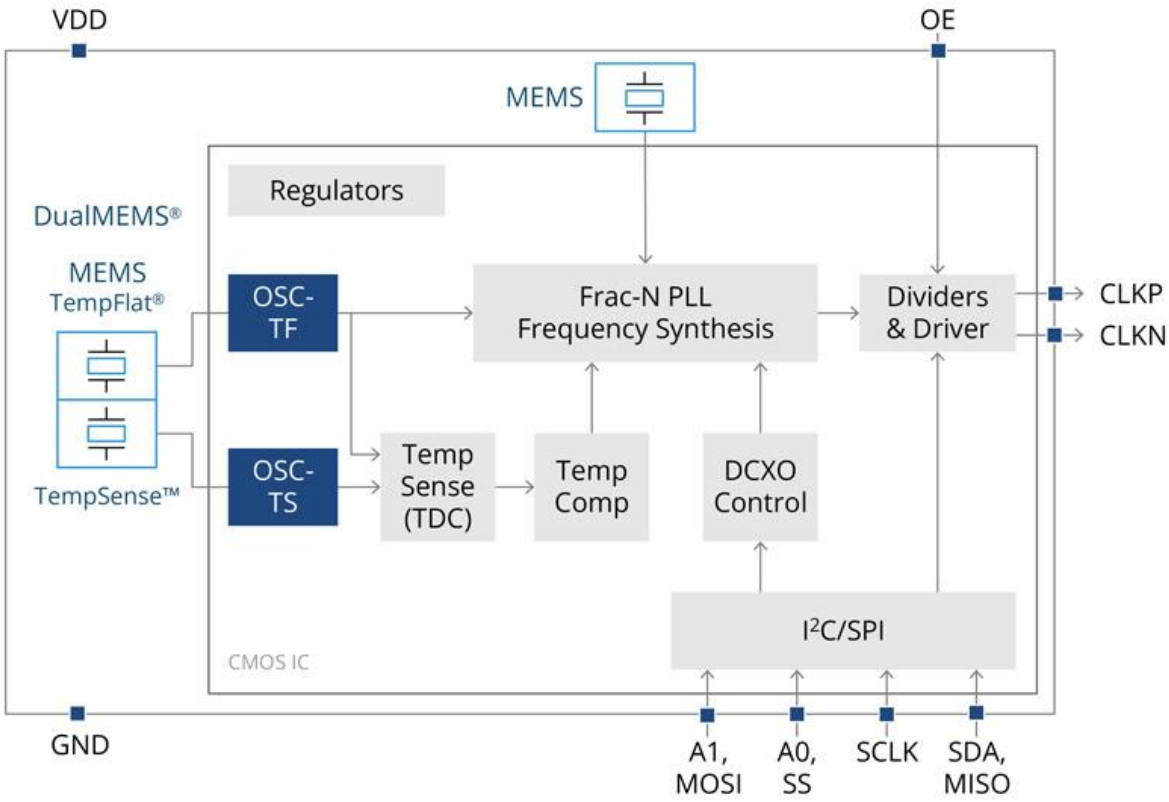
The SiT5977 is a differential ended ±100 ppb precision MEMS Super-TCXO® designed for high stability and low jitter applications, such as Smart NICs, acceleration cards, switches, and compute node applications.

Combining SiTime's DualMEMS® technology with a low-noise digital PLL, this chip delivers excellent jitter, dynamic stability in the presence of airflow and thermal excursions, and resistance to shock and vibration. Multiple on-chip regulators filter power supply noise, eliminating the need for an external LDOs.

The SiT5977 offers frequency control (DCTCXO) via an I2C/SPI interface with 0.05 ppt resolution and up to ±400 ppm pull range. This unique functionality, along with 80 fs phase jitter, can eliminate the need for a jitter cleaner and enable new architectural options.

"Specs"	"Value"
Frequency	156.25 MHz
Frequency Stability (ppm)	±0.1, ±0.2, ±0.25
Operating Temperature Range (°C)	-40 to +85
Package Type (mm^2)	5.0 x 3.5, 10-pin
Phase Jitter (rms)	80 fs
Pull Range (ppm)	±3.125, ±6.25, ±10, ±12.5, ±25, ±50, ±100, ±200, ±400
Voltage Supply (V)	3.3
Features	Best-in-class dynamic stability with ±1 ppb/°C frequency over temperature slope (dF/dT)
Availability	Pre-Production Sampling

- Environmentally robust with ±1 ppb/°C frequency slope (dF/dT) for optimum performance under airflow, thermal shock
- Capable of driving 800G and higher links via 80 fs phase jitter and LVDS differential output
- Enables embedded control loops with precise digital tuning of output frequency (DCTCXO)
    - Digital control via I2c/SPI
    - Up to ±400 ppm pull range
    - Frequency pull resolution down to 0.05 ppt (5e-14)
- Eliminates link flaps from activity dips or micro jumps associated with quartz devices
- Resistant to shock, vibration and board bending
- Eliminates external LDOs via on-chip voltage regulators
- ±100 ppb frequency stability over temperature with DualMEMS architecture
- 156.25 MHz output frequency enabling high-speed SerDes and 800G links
- Small 5.0 x 3.5 mm package (footprint compatible with 5.0 x 3.2 mm package)



The SiT5977 is the first TCXO to have a dedicated low phase noise MEMS resonator to drive the integrated PLL. This low-noise fractional PLL attenuates jitter from the DualMEMS® stability engine and delivers high a frequency differential-ended output with extremely low jitter. With DualMEMS® technology that combines a TempFlat® resonator with a TempSense™ resonator, along with advanced temperature compensation, the SiT5977 delivers the best dynamic stability in the presence of airflow and rapid temperature transients.

To support system level synchronization, this chip integrates digital control (DCTCXO) via a I2C/SPI interface to adjust the output frequency with a fine resolution. Additionally, multiple on-chip regulators filter power supply noise, eliminating the need for an external LDO (low-dropout) regulator.

Applications:

- Network Interface and Accelerator Cards
- Switches
- IEEE 1588 Boundary Clocks & Grandmasters
- SerDes
- 4G / 5G RRH, DU
- Small Cells
- RF Signal Chain
- Radar
- Satellite Base Station
- Microwave Backhaul
- Instrumentation
- Test & Measurement
- 5G Radios