

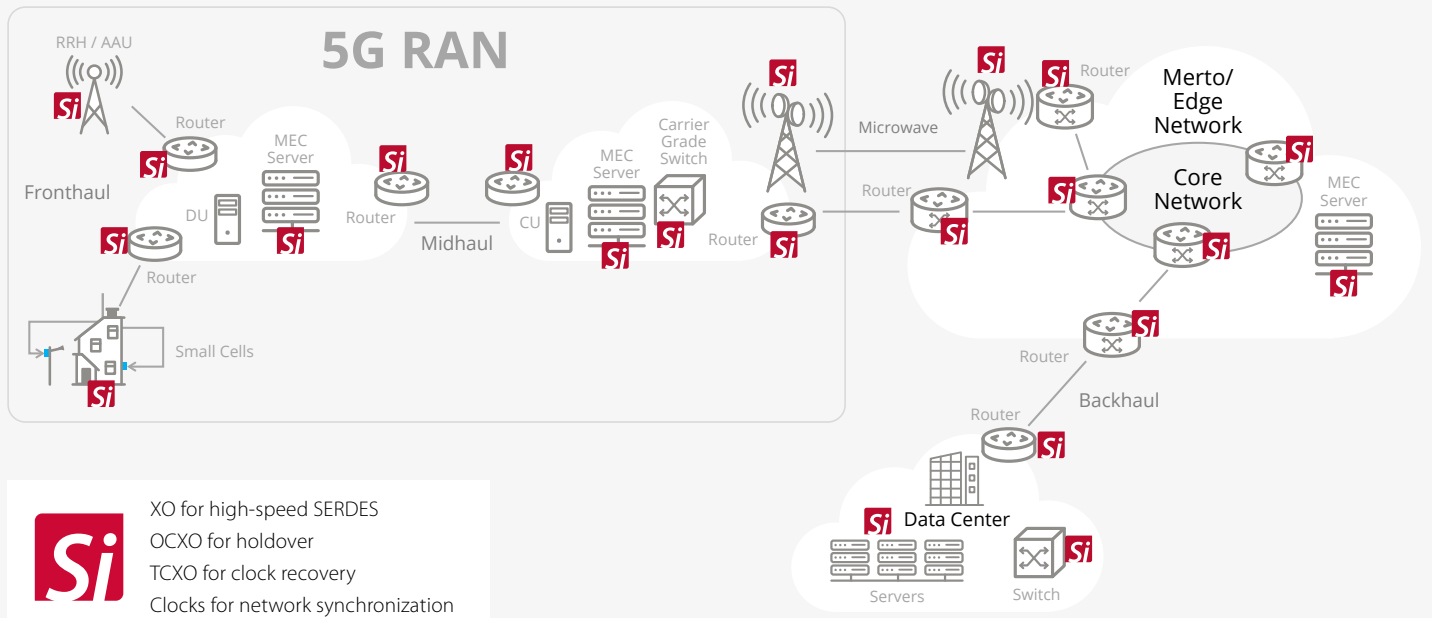


MEMS Timing Solutions for **Communications & Enterprise**

- Extensive portfolio for synchronization and wireless
- Environmental resilience for network densification
- Highest reliability and quality

The heartbeat of 5G™

Full Product Portfolio for Every Network Node



Higher Performance, Environmentally Resilient, Smaller Size

- 4x higher precision under temp
- 20x better stability under vibration
- 2x more resistant to supply noise
- 3x lower power consumption
- 4x smaller size
- 30x better reliability



5G RRU, SMALL CELL



MICROWAVE BACKHAUL



EDGE SERVER, DU



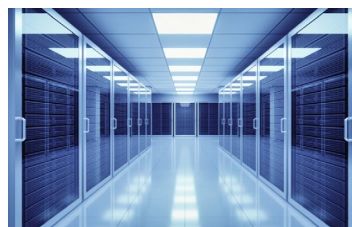
GNSS TIMING



CARRIER GRADE ETHERNET



OPTICAL COMMUNICATIONS

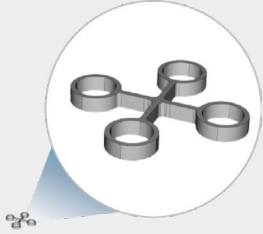


HYPERSCALE SERVERS



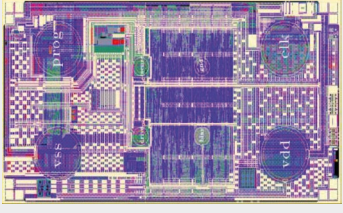
DATACENTER SWITCH

SiTime is the industry's only pure play timing supplier with expertise in silicon MEMS, analog and packaging. We have shipped over 1.5 billions units of MEMS timing devices to over 10,000 customers. Our scalable, geographically diverse semiconductor supply chain ensures the most reliable delivery and highest quality.



SILICON MEMS

- Ultra small
- No aging
- No activity dips
- No fatigue
- Vibration resistant



PROGRAMMABLE ANALOG

- Ultra low jitter
- Most stable
- Resistant to board noise
- Low power
- Programmable

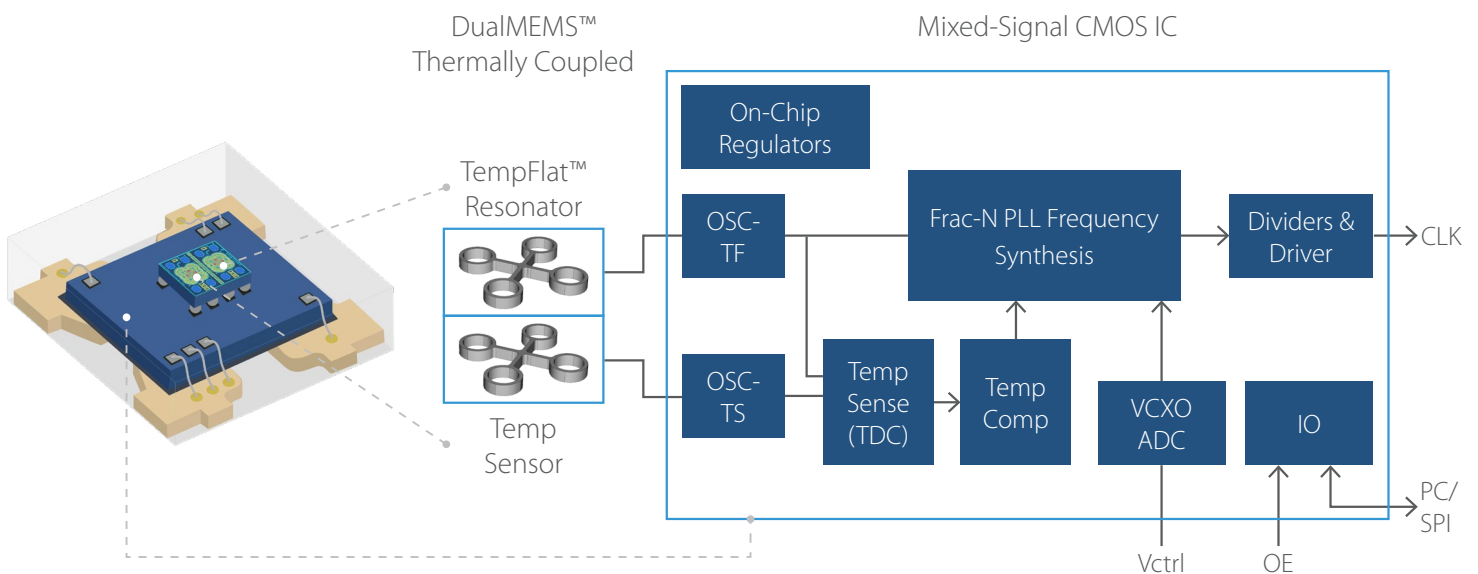


SYSTEMS & PACKAGING

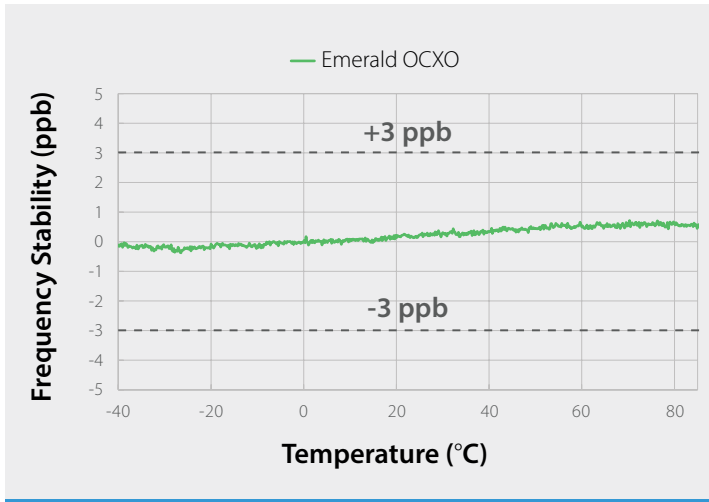
- Industry standard package
- Semiconductor supply chain
- High volume manufacturing
- Highest reliability
- Best quality

Elite Platform Architecture

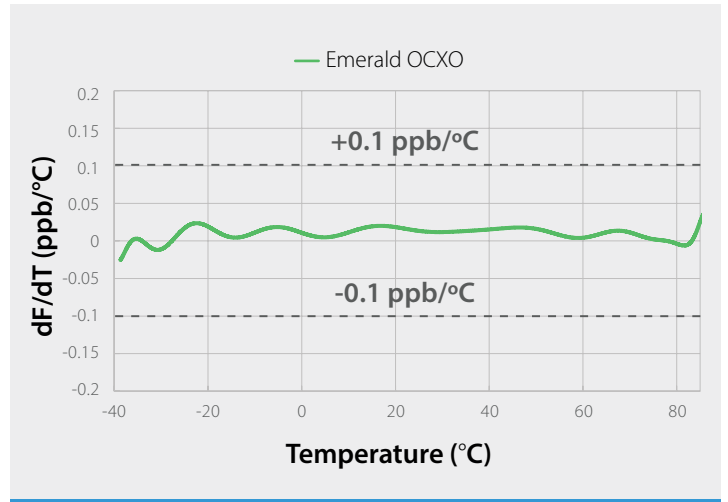
Environmentally resilient timing is imperative to deliver 130 ns time accuracy for 5G networks operating in uncontrolled environment. SiTime's precision oscillators achieve 10 times better environmental resilience by leveraging our unique Elite Platform® DualMEMS® architecture with 30 μ k temperature sensing accuracy and 40x faster tracking capability. [Learn more](#)



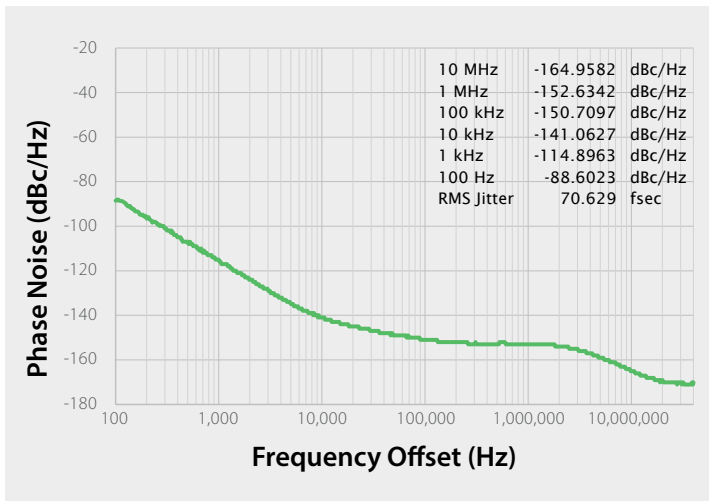
Better Stability



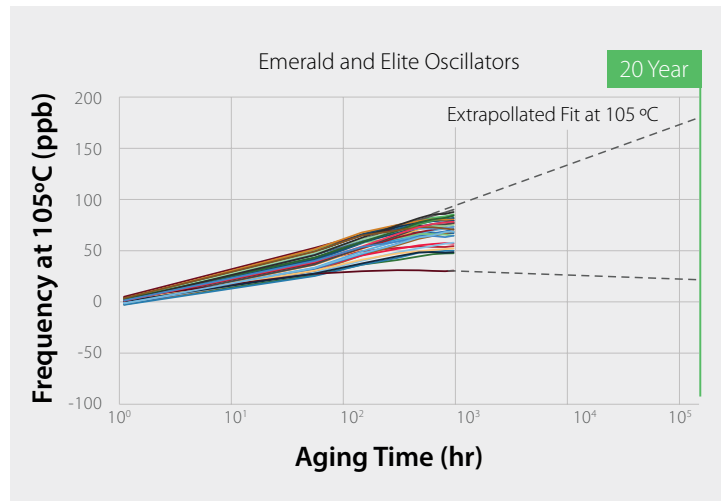
Better Frequency Slope



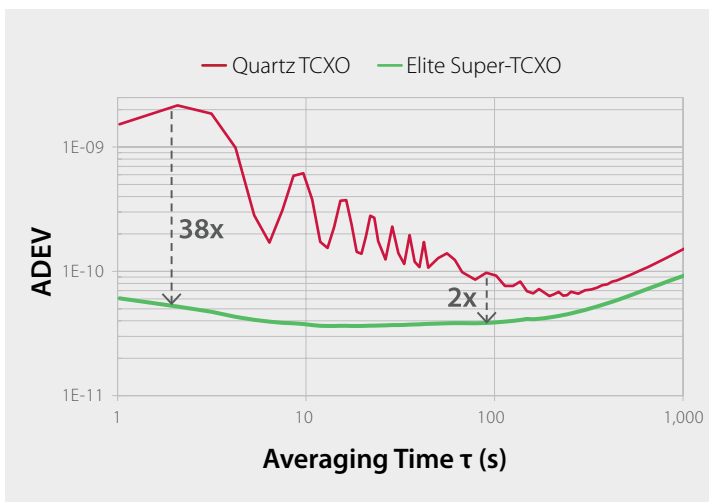
Ultra-Low Phase Noise, 156.25 MHz



Better Aging

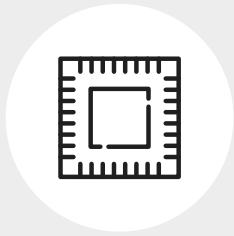


Better Allan Deviation



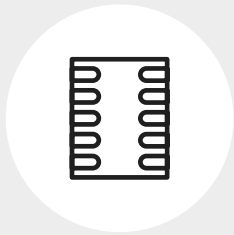
Better Vibration Resistance





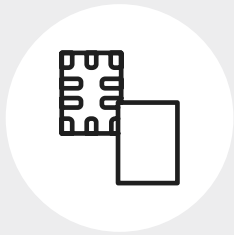
Jitter Cleaners, Network Synchronizers & Clock Generators

- Clock-SOC | Integrated MEMS, reduce BOM, simplify design
- Most resilient | Resistant to vibration, board bending, EMI, supply noise
- Best reliability | >1 billion hours MTBF, no quartz related failures
- Rich features | Up to 2.1 GHz, 4 clock domains, fast hitless switching



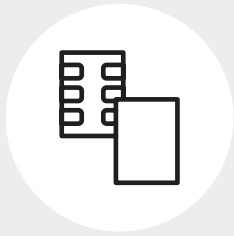
Stratum 3E OCXOs

- Resistant to airflow, thermal shock | ± 0.05 ppb/ $^{\circ}\text{C}$
- Programmable | 1 to 60 MHz, ± 5 to ± 8 ppb
- Resistant to board noise | On-chip LDO, I²C frequency tuning
- Smallest size | 9 x 7 mm²



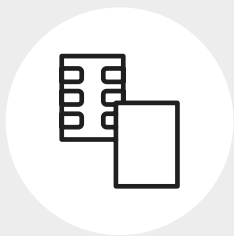
Precision Super TCXOs

- Resistant to airflow, thermal shock | ± 1 ppb/ $^{\circ}\text{C}$
- Most stable at high temp | ± 100 ppb up to 105 $^{\circ}\text{C}$
- Resistant to vibration | 0.1 ppb/g
- No activity dips or micro-jumps



Ultra Low Jitter Oscillators

- Ultra-low phase noise | 70 fs jitter
- Best PSRN | 0.1 ps/mV, eliminates external LDOs
- Smallest size | Differential or LVCMOS in 2.0 x 1.6 mm²
- Most flexible | 1 to 725 MHz, up to 105 $^{\circ}\text{C}$, ± 10 to ± 50 ppm



I²C/SPI Oscillator & VCXO

- In-system programmable | 1 to 725 MHz, up to ± 3200 ppm pull
- Precise frequency steering | 0.005 ppb resolution
- Best pulling linearity | 0% (DCXO via I2C or SPI), 1% (VCXO)
- Best stability at high temperature | ± 10 ppm at 105 $^{\circ}\text{C}$

Enhance your system robustness and reduce your BOM with SiTime's Cascade Platform™ SiT9514x Clock-SoCs with an integrated MEMS resonator that eliminates external quartz references and all quartz related issues.

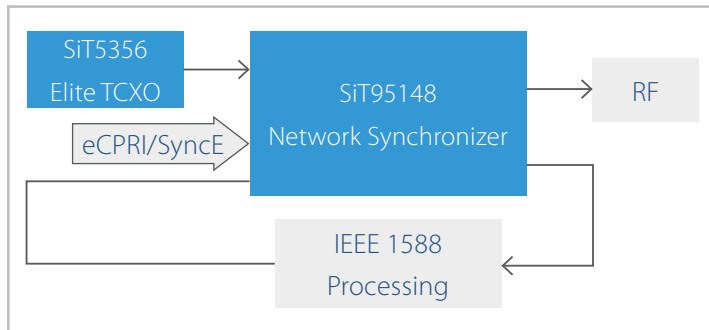
Benefits

- Enhance system timing redundancy
 - Ultra fast hitless switching
 - Flexible, simultaneous monitoring of all inputs
 - Holdover support
- Deliver 10 times better vibration resistance
- Eliminate quartz issues
 - No inaccurate clock due to xtal capacitive mismatch
 - No jitter degradation due of noise coupling
 - No activity dips/frequency jumps inherent to xtal

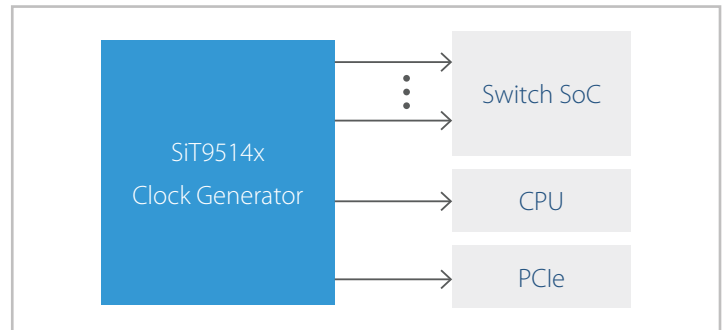
Features

- Up to 4 independent clock domains
- Flexible input and output planning
- Programmable output signal types
- Synchronized, holdover, or free run
- Fastest 26-ps phase build-out in hitless switching
- Low loop bandwidth (1 MHz) for optimal wander
- DCO mode with 0.005 ppb frequency resolution
- Programmable output delay
- 125 fs typical rms phase jitter at 156.25 MHz

RRU and Fronthaul Switch



Top of the Rack Datacenter Switch



Device Type	Part Number	# of Inputs	# of Outputs	Max Output Frequency	# of Clock Domains	Package (mm x mm)	EVB
Clock Generator	SiT95141	4	10	2.1 GHz	1	9 x 9, 64-pin	SiT6503EB
	SiT95143	4	11	2.1 GHz	4	9 x 9, 64-pin	SiT6503EB
Jitter Cleaner	SiT95145	4	10	2.1 GHz	1	9 x 9, 64-pin	SiT6503EB
Network Synchronizer	SiT95147	4	8	2.1 GHz	4	9 x 9, 64-pin	SiT6502EB
	SiT95148	4	11	2.1 GHz	4	9 x 9, 64-pin	SiT6503EB

Simplify your design and enhance environmental resilience with SiTime Emerald Platform™ OCXOs that deliver the most stable timing under environmental stressors such as under airflow, thermal shock, vibration, shock, and EMI.

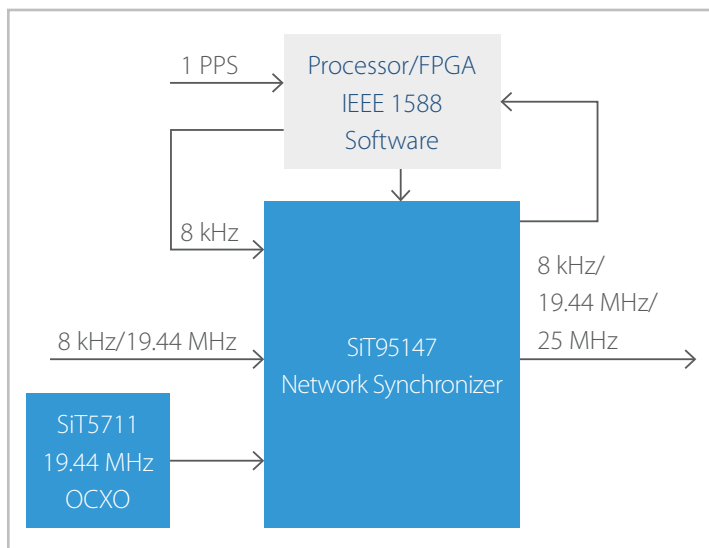
Benefits

- Simplify board designs
 - No placement restrictions
 - No dedicated LDO required
- Enhance environmentally resilience
 - Resistant to airflow
 - Resistant to rapid temp change
 - Resistant to vibration, board bending
 - No activity dips or frequency jumps
- Deliver best reliability

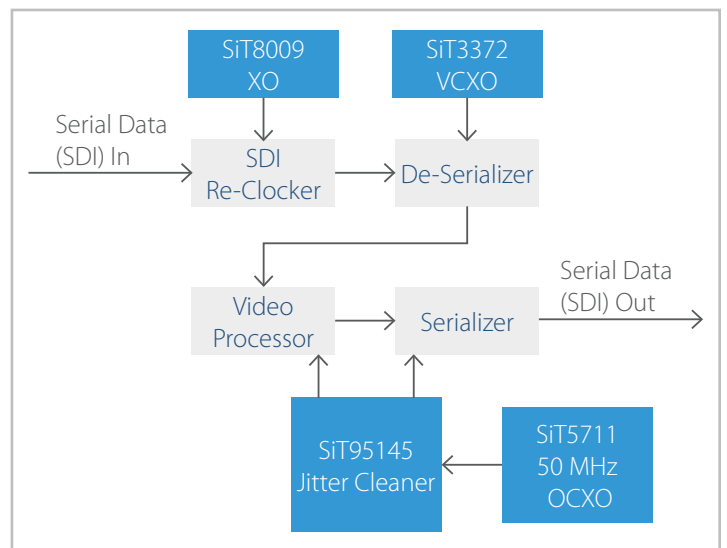
Features

- Exceptional dynamic stability
 - ± 0.05 ppb/°C frequency slope (dF/dT)
 - $1.5e-11$ ADEV @ 10 sec under airflow
- Digital frequency pulling with I²C, 5 ppb resolution
 - Eliminate sensitivity to board noise
- Smallest size, 9 x 7 mm footprint
- 0.2 ps/mV PSNR, immune to power supply noise
- Any frequency from 1 to 220 MHz
- LVCMOS or clipped sinewave output

Optical Transport



Video Serializer for IP Transport



Device Type	Part Number	Output (MHz)	Stability (ppm)	Voltage (V)	Package (mm x mm)	Output Types	Feature
OCXO	SiT5711	1 to 60	±5 ±8	3.3	9 x 7	LVCMOS, Clipped Sinewave	–
DCOCXO	SiT5721						I ² C Temp Redout

Improve time synchronization and IEEE1588 performance by replacing quartz OCXOs with SiTime Elite Platform Super-TCXOs® that deliver the best resilience under environmental stressors—airflow, thermal shock, vibration, shock, and EMI.

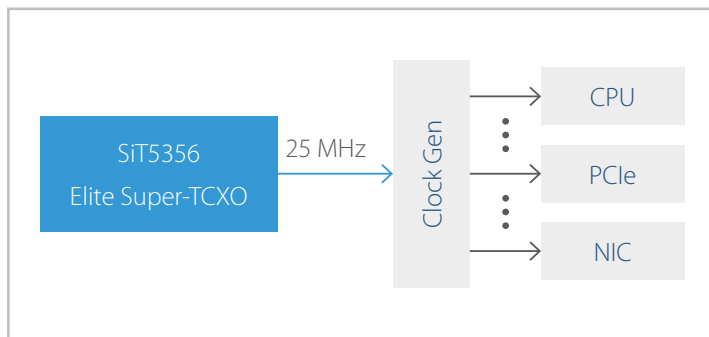
Benefits

- Eliminate bulky, unreliable OCXOs
 - 4x smaller, 3x lower power vs. 9 x 7 mm OCXO
- Enhance environmentally resilience
 - Resistant to airflow
 - Resistant to rapid temperature change
 - Resistant to vibration, board bending
 - No activity dips or frequency jumps
- Simplify board designs
 - No placement restrictions
 - No dedicated LDO required

Features

- Exceptional dynamic stability
 - ± 1 ppb/°C dF/dT, 10°C/min ramp
 - $1.5e-11$ ADEV @ 10, under airflow
- Up to 105°C operating temperature
- Digital frequency pulling with I²C, 5 ppb resolution
 - Eliminate external DAC, sensitivity to board noise
- No activity dips or micro-jumps
- 0.1 ppb/g vibration resistance
- 0.2 ps/mV PSNR, immune to power supply noise
- Any frequency from 1 to 220 MHz

Time Synchronization for Servers



IEEE 1588-Enabled Smart NIC



Device Type	Part Number	Output Freq (MHz)	Stability (ppm)	dF/dT (ppb/°C)	Temp. (°C)	Package (mm x mm)	Output
Precision Super-TCXO	SiT5358	1 to 60	± 0.05	± 1	-20 to +70 -40 to +85 -40 to 105	5.0 x 3.2	LVCMOS, Clipped Sinewave
	SiT5359	60 to 220					
	SiT5356	1 to 60	± 0.1 to ± 0.25				
	SiT5357	60 to 220					
Super-TCXO	SiT5155	12 Std Freq	± 0.5 to ± 2.5	± 15			
	SiT5156	1 to 60					
	SiT5157	6 to 220					
Differential TCXO	SiT5021	1 to 220	± 5	-	-40 to 85	3.2 x 2.5 5.0 x 3.2 7.0 x 5.0	LVPECL, LVDS
	SiT5022	220 to 625					

Accelerate your design and ensure supply continuity with SiTime’s complete portfolio of programmable oscillators, designed to improve reliability, shorten lead time, and solve unique timing problems such as EMI.

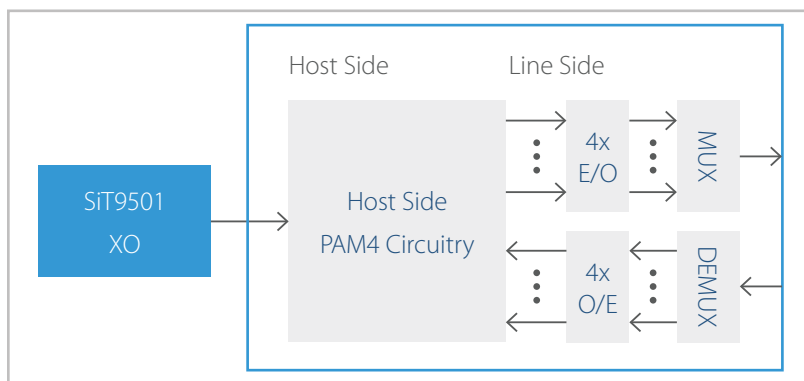
Benefits

- One-stop-shop for all oscillator needs
- Ultra small (2.0 x 1.6 mm) differential oscillator for small form factor designs (e.g. 400G/800G QSFP)
- Spread spectrum for EMI reduction
- Environmentally resilient
 - Resistant to airflow, thermal shock
 - Resistant to vibration, board bending
 - Immune to power supplier noise
- 48-hour availability, all configurations
- Instant samples with [Time Machine II programmer](#)

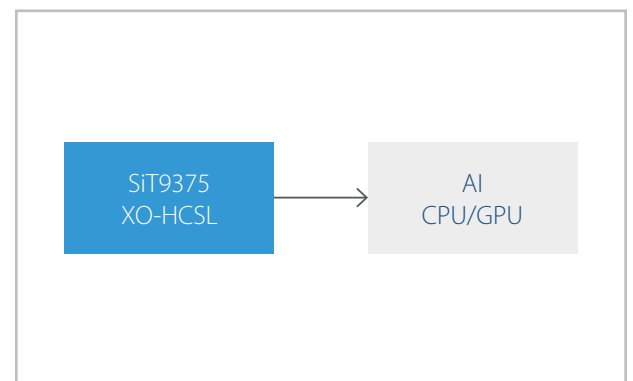
Features

- Any frequency from 1 to 725 MHz
- 3 jitter grades – 0.07 ps, 0.25 ps and 0.6 ps
- Frequency stability from ± 10 to ± 50 ppm
- Operating temperature up to 125°C
- PSNR as low as 0.05 ps/mV
- Programmable spread % for best EMI reduction
- FlexEdge™ configurable rise/fall time to reduce clock harmonics
- 10 standard footprints for drop-in replacement of quartz oscillators

800G PAM4 Optical Module



Server/AI



Device Type ^[1]	Part Number	Output Freq (MHz)	Stability (ppm)	Jitter (ps)	Voltage (V)	Package ^[3] (mm x mm)	Output Types	Features
DE-XO	SiT9501^[2]	14 std freq	± 20	0.07	1.8	2.0 x 1.6	LVPECL, LVDS, HCSL	FlexSwing, LP HCSL
	SiT9375	31 std	± 25	0.17	2.5 to 3.3			
	SiT9366/67	1 to 725	± 10	0.23	2.5 to 3.3	2.5 x 2.0	-	
	SiT9120/21/22	1 to 625		0.5		3.2 x 2.5		
SE-XO	SiT8208/09	1 to 220	± 20	0.5	1.8 2.5 to 3.3	5.0 x 3.2	LVCMOS	16 spread options
	SiT8008/09	1 to 137	± 25	1.3		7.0 x 5.0		
SSXO	SiT9005	1 to 141	± 50	1.3				

[1] DE-XO = differential oscillators; SE-XO = single-ended oscillators.

[2] FlexSwing LVPECL enables non-standard LVPECL swing to reduce power. LP or lower power HCSL eliminates passives.

[3] 2.0 x 1.6 package is available for [SiT9501](#), [SiT9375](#), [SiT8008](#), [SiT8009](#), [SiT9005](#).

Enable multiple video/audio standards and frequency margining with SiTime’s in-system programmable oscillators that allow designers to digitally reprogram output frequencies in real time. SiTime also offers a family of VCXOs in industry standard footprints.

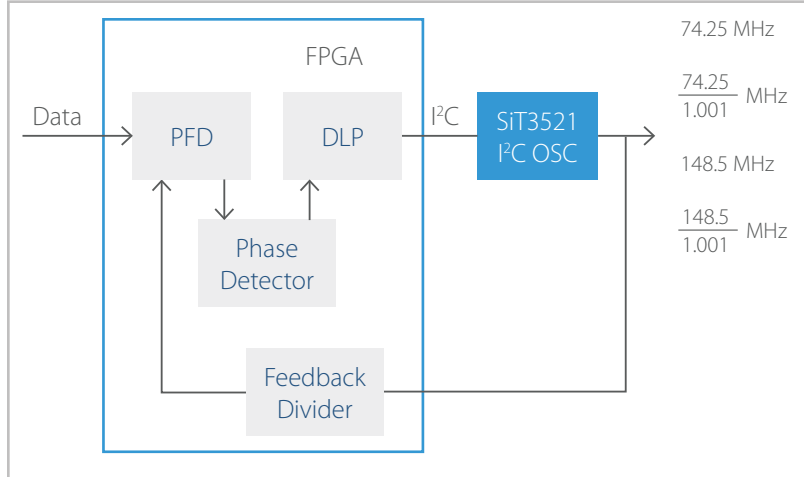
Benefits

- Reduce clock design complexity by replacing multiple oscillators with a single I²C device
- Stress-test system by re-programming output frequency in real time
- Reduce sensitivity to board-level noise with digital programming interface
- Environmentally resilient
 - Resistant to airflow
 - Resistant to rapid temperature change
 - Resistant to vibration, board bending
 - Immune to power supplier noise

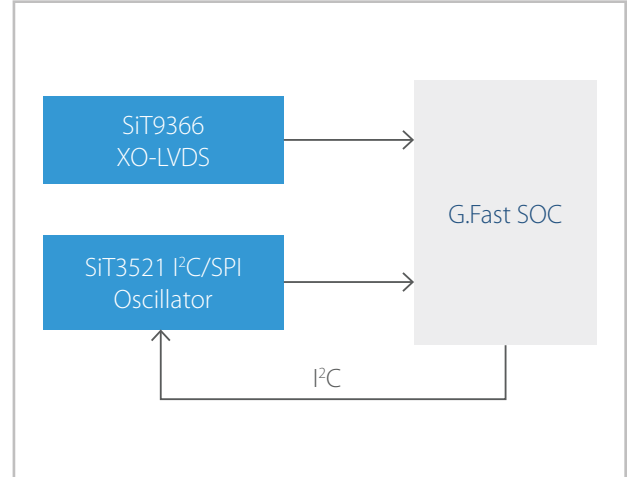
Features

- 1 to 725 MHz, I²C/SPI programmable
- Digital frequency pulling (DCO) via I²C/SPI
 - 5 ppt (0.0005 ppb) pull resolution
 - Up to ±3200 ppm pull-range
 - 0% (perfect) pull linearity
- Analog pull (VCXO) with 0.1% linearity (typ)
- 0.21 ps typical RMS jitter under vibration
- Frequency stability from ±10 to ±50 ppm
- 0.05 ps/mV power supply noise rejection (PSNR)
- LVCMOS, LVPECL, LVDS, HCSL single types
- 9 industry standard packages

Video Broadcasting

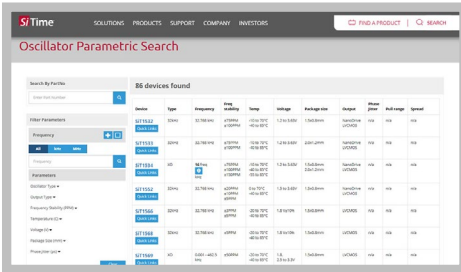


G.Fast MDU



Device Type	Part Number	Output Freq (MHz)	Stability (ppm)	Voltage (V)	Temp. (°C)	Packages (mm x mm)	Output	Features
DCXO	SiT3521	1 to 340	±10, ±20, ±25	2.5 to 3.3	-20 to 70 -40 to 85 -40 to 105	5.0 x 3.2	LVPECL, LVDS, HCSL	I ² C programmable
	SiT3522	340 to 725						
VCXO	SiT3372	1 to 220	±15, ±25, ±30			3.2 x 2.5		0.1% pull linearity (typ)
	SiT3373	220 to 725				5.0 x 3.2 7.0 x 5.0		

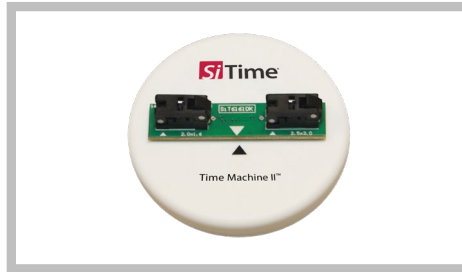
Find the Right Part



PARAMETRIC SEARCH

Find products fast based on your search criteria

Program & Test the Part



TIME MACHINE II PROGRAMMER

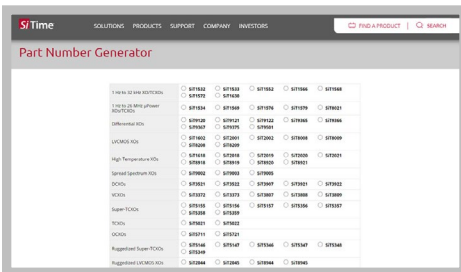
Instantly program oscillator frequency, voltage, stability & more

Get Performance Data



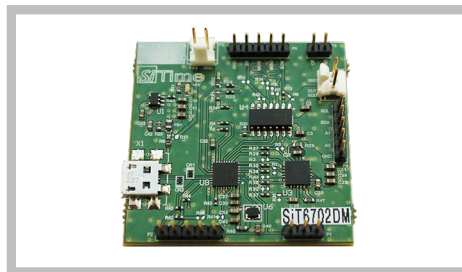
JITTER CALCULATOR & PLOTS

Convert phase noise to phase jitter (rms) and find phase noise plots



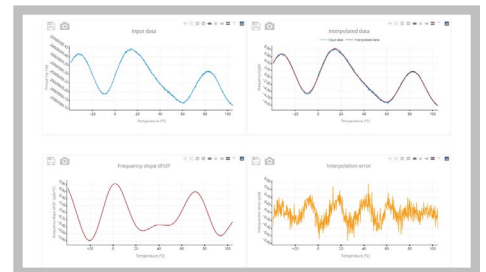
PART NUMBER GENERATOR

Configure your oscillator to your exact requirements



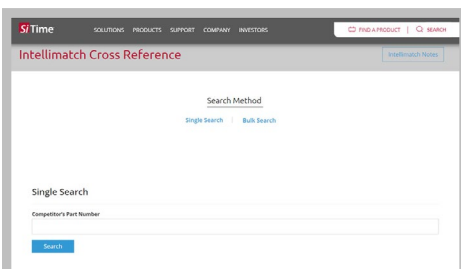
EVALUATION BOARDS

Find the right evaluation board to reduce your design time



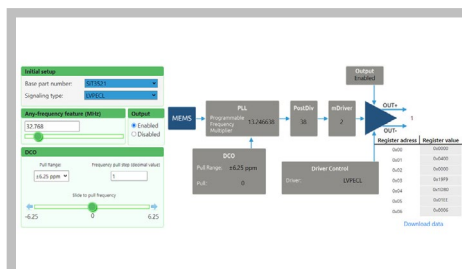
FREQUENCY SLOPE DF/DT CALCULATOR

Instantly calculate frequency slope by inputting your data



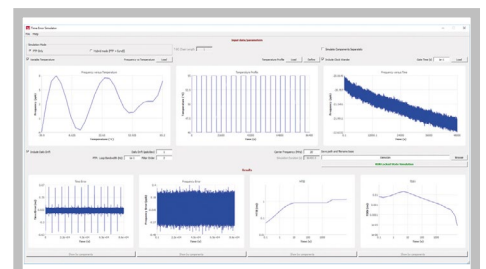
CROSS REFERENCE

Find SiTime alternatives with SiTime's Intellimatch™



TIME MASTER DEVICE CONFIGURATION SOFTWARE

Easily evaluate SiTime oscillators configured via I²C/SPI interfaces



TIME ERROR SIMULATOR SOFTWARE

Quickly simulate and analyze the impact of the local oscillator

App Notes and Papers - Technology and Industry Standards

[SiTime's MEMS First™ and EpiSeal™ Processes](#)

[DualMEMS and TurboCompensation Temperature Sensing Technology](#)

[AN10052 IEEE 1588 Precision Time Protocol \(PTP\) in ITU-T Standards](#)

App Notes and Papers - Performance and Reliability

[AN10025 Reliability Calculations for SiTime Oscillators](#)

[AN10063 TCXO and OCXO Stability and System Impact Beyond Rated Temperature](#)

[Synchronization System Performance Benefits of Precision MEMS TCXOs under Environmental Stress Conditions](#)

App Notes and Papers - Design and Measurement

[AN10006 Best Design and Layout Practices](#)

[AN10039 TCXO Frequency Stability and Frequency Accuracy Budget](#)

[AN10041 Designing with the SiT39xx Family of DCXOs \(Digitally Controlled Oscillators\)](#)

[AN10050 I²C/SPI Programmable Oscillators](#)

[AN10062 Phase Noise Measurement Guide for Oscillators](#)

[AN10064 Improved System Performance with Digital Frequency Tuning in Precision Super-TCXOs](#)

[AN10066 LVDS Output with 600 mV to 1200 mV Swing](#)

[AN10067 Considerations for Measuring Phase Noise in Differential Oscillators](#)

[AN20003 SiT9514x Power Supply Noise Rejection](#)

[AN20011 SiT9514x Dynamic Control of Outputs](#)

[Adaptive Drift Compensation for Holdover Oscillators](#)

[Time Error Simulation - Software and Models](#)

Application Briefs

[5G New Radio \(NR\) – RRU, AAU, Massive MIMO](#)

[Fronthaul and IP RAN Switches](#)

[Microwave Outdoor Units \(ODU\)](#)

[Open RAN \(ORAN\) – Macro and Small Cells](#)

[Servers Load Balancing and IEEE1588 Support](#)

[Smart Network Interface Card \(NIC\) and IEEE1588](#)

Videos

[How to Design with SiTime TCXOs and OCXOs](#)

[SiTime Elite Super-TCXO Dynamic Performance vs. Quartz TCXO](#)

[Elite Super-TCXO Improves GNSS Robustness](#)

[SiTime MEMS Timing Solutions for 5G RRU](#)

[SiTime MEMS Timing Solutions for Open RAN](#)

[SiTime MEMS Timing Solutions for Optical Module](#)

[SiTime's Time Machine II - Part 1: How to Install Oscillator Programming Software](#)

[SiTime's Time Machine II - Part 2: How to Program Field Programmable Oscillators](#)

