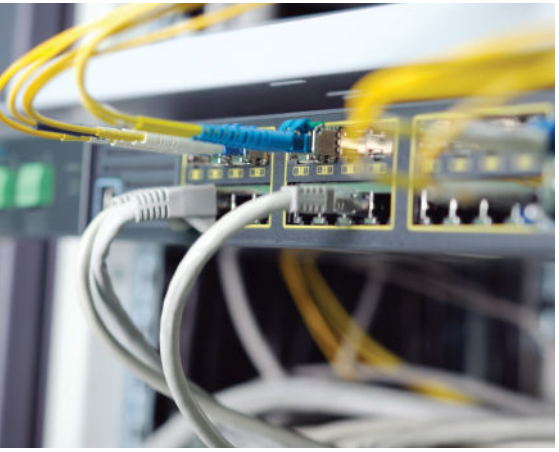
Silicon MEMS Timing Solutions

Product Selector 2018



NETWORKING, SERVER, STORAGE & TELECOM

MOBILE, WEARABLE & IOT

INDUSTRIAL & AUTOMOTIVE

CONSUMER

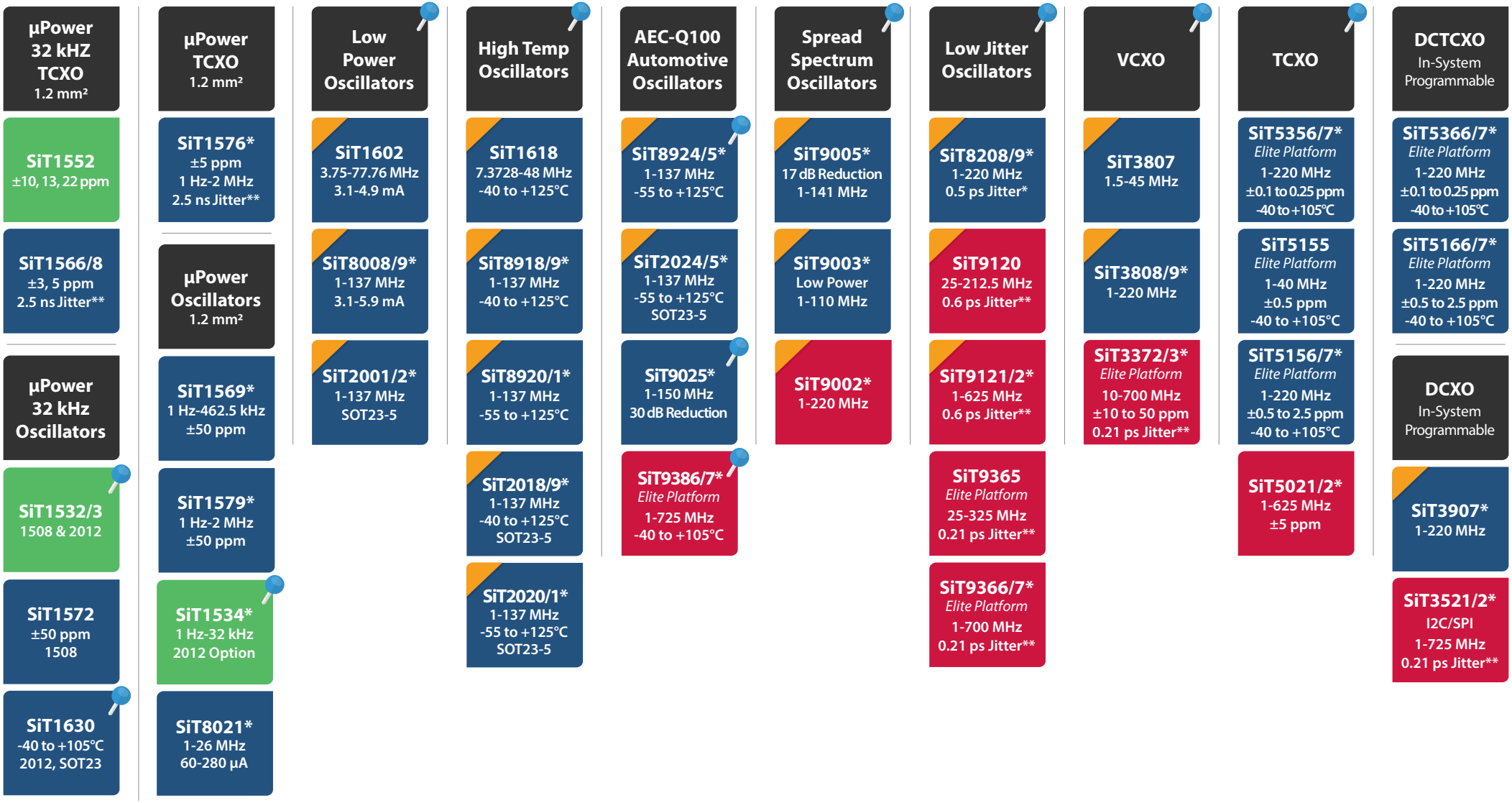
- More features
- Highest performance
- Smallest size
- Lowest power
- Best reliability

GREEN SOLUTIONS

INSTANT SAMPLES

LIFETIME WARRANTY

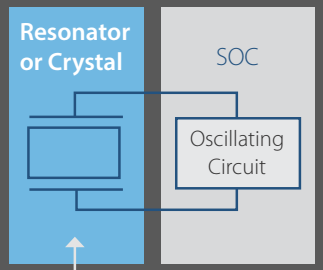
MEMS Oscillator Product Portfolio



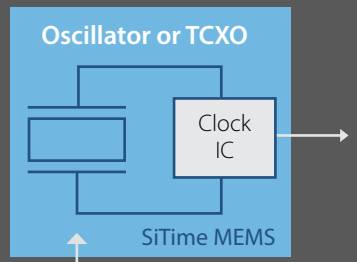
* Any frequency programmable within the frequency range with 6 decimals of accuracy
** Integrated RMS phase jitter, see datasheet for integration range
Elite Platform families use DualMEMS™ technology for best dynamic performance

NanoDrive™ output for lowest power
LVPECL, LVDS, HCSL output
LVCMOS output
Pin-to-pin compatible with quartz devices
Available as field programmable for use with Time Machine II Programmer

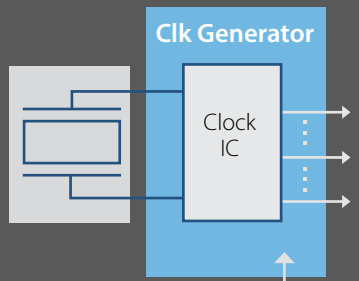
SiTime's Analog Expertise Enables Unique Features



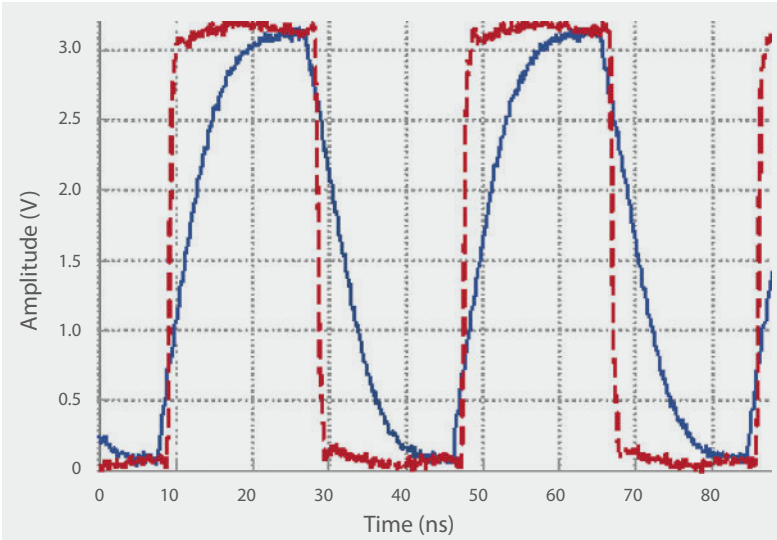
Passive Device
Needs ext. oscillating circuit
2 terminals used



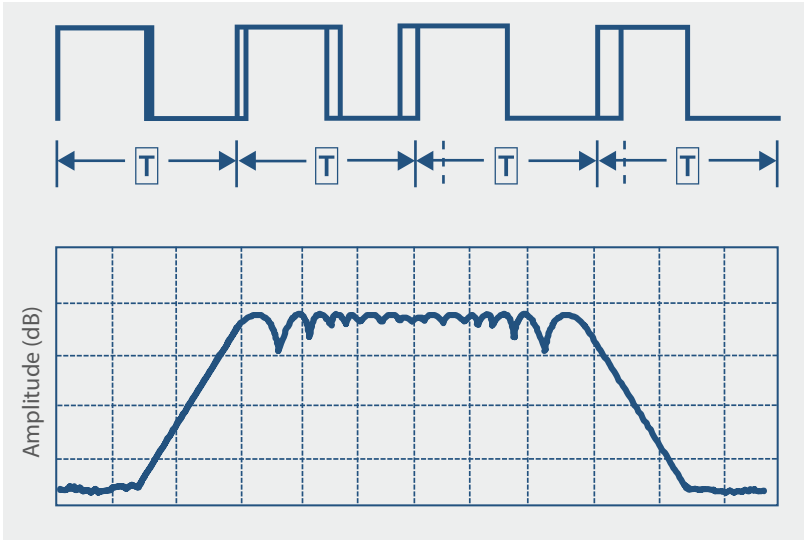
Active Device
2 chips in package
4, 6, 10 terminals



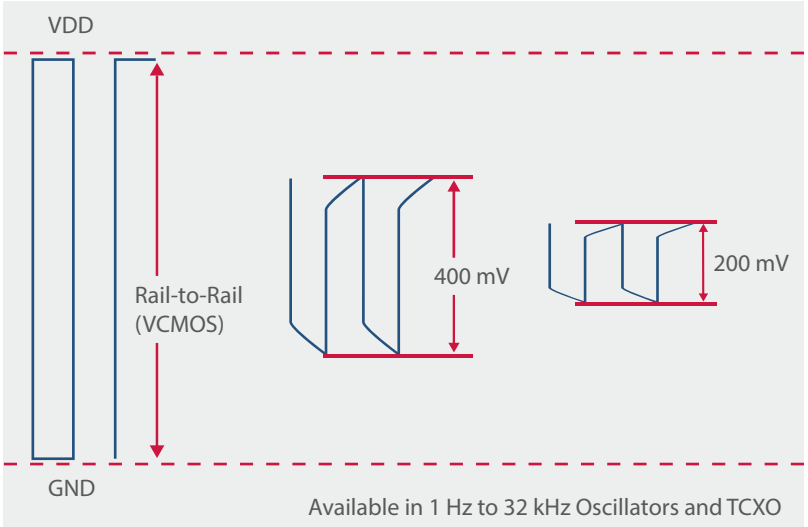
Active IC
Needs ext. clock reference
Many terminals/outputs



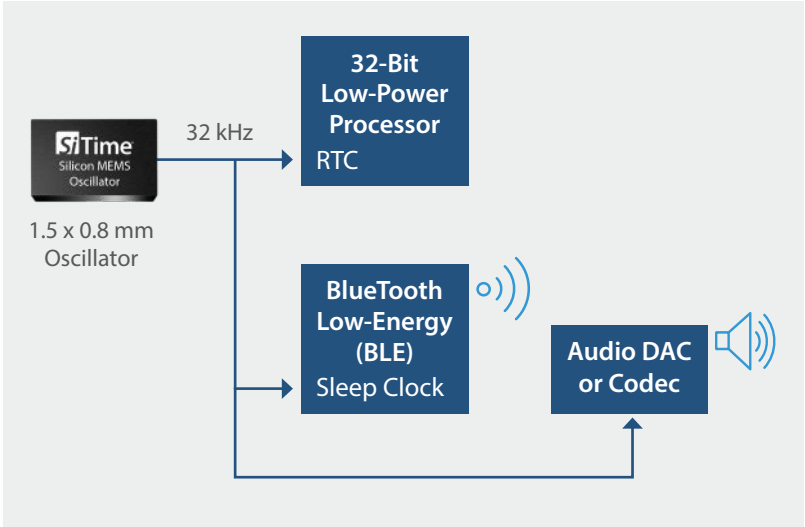
Configurable Rise/Fall Time to Reduce EMI



Spread Spectrum to Reduce EMI



NanoDrive™ Output to Optimize Swing and Lower Power



Drive Multiple Loads to Minimize BOM and Board Space

SiTime oscillators comprise a resonator and oscillator IC in one active device as shown in the middle diagram on the left. As a MEMS and analog company, SiTime has combined man-decades of MEMS expertise with analog CMOS circuit design, resulting in flexible products with the most features and highest performance.

MEMS Oscillator Product Selector

SiTime Base Part No.	Output Freq.	Frequency Stability (ppm)	Supply Volt. (V)	Supply Current (Typical)	Package	Output Logic	Target Applications	Features
µPower 32 kHz Oscillators & TCXOs | Replace XTAL, XO, TCXO | Smallest size | Drive two or more loads | Best accuracy (stability) | Best reliability								
SiT1532/33	32.768 kHz	75, 100, 250 over temp (10, 20 room temp)	1.2 to 3.63	0.90 µA	1508, 2012	NanoDrive, LVCMOS	• Smart meters • Health & wellness monitors • RTC reference clock • Industrial timekeeping & battery management • Multi-drop 32 kHz clock distribution • Bluetooth & WiFi modules • Internet of Things (IoT), cellular connectivity • Smart utility water, gas & electricity meters (AMR) • Connectivity modules	Smallest XO
SiT1572		±50	1.62 to 3.63	4.5 µA	1508	LVCMOS		Smallest XO
SiT1630		75, 100, 150 over temp (20 room temp)	1.5 to 3.63	1.0 µA	2012, SOT23-5	LVCMOS		-40 to +105°C
SiT1552 TCXO		±10, ±13, ±22, all-inclusive	1.5 to 3.63	0.99 µA	1508	NanoDrive, LVCMOS		Smallest TCXO
SiT1566 Super-TCXO		±3, ±5, all-inclusive	1.62 to 3.63	4.5 µA		LVCMOS		Smallest XO, 2.5 ns RMS phase jitter
SiT1568 Super-TCXO		±5 all-inclusive (after overmold/underfill)	1.8					
µPower Oscillators & TCXOs | Smallest size | Lowest power | Lightest weight | Drive two or more loads | Best accuracy (stability) | Best reliability								
SiT1534	1 Hz to 32.768 kHz	75, 100, 250 over temp (20 room temp)	1.2 to 3.63	0.90 µA	1508, 2012	NanoDrive, LVCMOS	• Health & wellness monitors • Industrial data loggers & sensor interface • IoT beacons • Smart pens	Smallest XO
SiT1569	1 Hz to 462.5 kHz	±50	1.62 to 3.63	2.0 µA (100 kHz)	1508	LVCMOS		
SiT1576 Super-TCXO	1 Hz to 2.5 MHz	±5 all inclusive	1.62 to 3.63	8.0 µA (100 kHz)				Smallest XO, 2.5 ns RMS phase jitter
SiT1579	1 Hz to 2.5 MHz	±50	1.62 to 3.63	8.0 µA (100 kHz)				
SiT8021	1 MHz to 26 MHz	±100	1.8, 2.5V to 3.3V	60 to 280 µA (0.7 µA stby)			• Wearables & IoT • Industrial & medical sensors • Portable audio	Smallest XO
Low-Power Oscillators | Best reliability | Pin-compatible QFN or SOT-23 package for best solder-joint reliability								
SiT1602	52 standard freq.	±20, ±25, ±50	1.8, 2.5 to 3.3	3.1 to 5.5 mA (0.6 - 1.0 µA stby)	2016, 2520, 3225, 5032, 7050	LVCMOS	• Consumer, industrial and audio video equipment • Networking, storage & servers • Industrial sensors, PLC & motor server • Microprocessor & FPGA clocking	FP*
SiT8008/09	1 MHz to 137 MHz							
SiT2001/02	1 MHz to 137 MHz			3.6 to 5.4 mA (1.0 µA stby)	SOT23-5	LVCMOS		
Low-Jitter Oscillators | 0.1 ppb/g (g-sensitivity, vibration immunity) | Best reliability								
SiT9365**	32 standard freq.	±10, ±20, ±25, ±50	2.5 to 3.3	76 to 84 mA	3225, 5032, 7050	LVPECL, LVDS, HCSL	• Computing • Networking, storage, servers, & telecom • Optical modules • Industrial control • Instrumentation • FPGA clocking	0.21 ps RMS phase jitter
SiT9366/67**	1 MHz to 725 MHz							
SiT9120	31 standard freq.		2.5 to 3.3	54 to 69 mA	3225, 5032, 7050	LVPECL, LVDS		0.5/0.6 ps RMS phase jitter, FP*
SiT9121/22	1 MHz to 625 MHz							
SiT8208/09	1 MHz to 220 MHz		1.8, 2.5 to 3.3	29 to 36 mA (10 µA stby)	2520, 3225, 5032, 7050	LVCMOS		
SSXO (Spread Spectrum Oscillators) | ±0.125 to ±2.0% center spread, -0.25% to -4.0% down spread, Lowest cycle-cycle jitter								
SiT9005	1 MHz to 141 MHz	±20, ±25, ±50	1.8, 2.5 to 3.3	4.0 to 5.6 mA	2016, 2520, 3225 (SiT9003 for 5032, 7050)	LVCMOS	• Printers & flat panels • IP cameras • PCI Express • Microprocessors	Smallest SSXO, FP*
SiT9002	1 MHz to 220 MHz	±25, ±50	1.8, 2.5, 3.3	48 to 75 mA	5032, 7050	LVPECL, CML, LVDS, HCSL		FP*

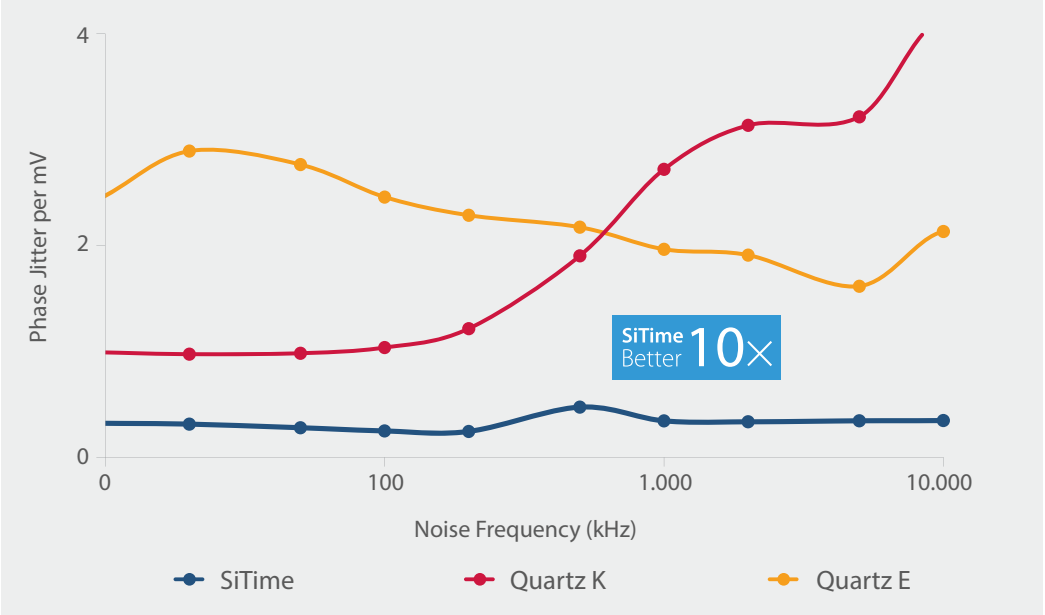
SiTime Base Part No.	Output Freq.	Frequency Stability (ppm)	Supply Volt. (V)	Supply Current (Typical)	Package	Output Logic	Target Applications	Features
High-Temperature and Automotive Oscillators | 0.1 ppb/g (g-sensitivity, vibration immunity) | Best reliability | Pin-compatible QFN or SOT-23 package for best solder-joint reliability								
SiT1618	33 standard freq.	±20, ±25, ±30, ±50	1.8, 2.5 to 3.3	3.6 to 5.4 mA (1.0 µA stby)	2016, 2520, 3225, 5032, 7050	LVCMOS	• High-temp industrial equipment such as industrial control systems & industrial sensors • Servo motor, PLC & high-temp networking gears • Outdoor systems (medical & health monitoring) • Asset tracking systems	FP*, -40 to +125°C
SiT8918/19	1 MHz to 137 MHz				2016, 2520, 3225, 5032, 7050			
SiT2018/19	1 MHz to 137 MHz				SOT23-5			
SiT8920/21	1 MHz to 137 MHz				2016, 2520, 3225, 5032, 7050	LVCMOS	• Ruggedized applications in harsh environments • Applications in extreme temperature conditions • Avionics equipment	FP*, -55 to +125°C
SiT2020/21	1 MHz to 137 MHz				SOT23-5			
SiT8924/25/26	1 MHz to 150 MHz				2016, 2520, 3225, 5032, 7050	LVCMOS	• AEC-Q100 automotive applications • ADAS, camera modules, Radar & Lidar • Automotive Ethernet • Infotainment • LED headlights • ECUs (engine & transmission control units)	
SiT2024/25	1 MHz to 137 MHz				SOT23-5			
SiT9025	1 MHz to 150 MHz	±25, ±50		0.6 to 7.9 mA (0.7 to 2.6 µA stby)	2016, 2520, 3225			EMI reduction, -55 to +125°C
SiT9386/87**	1 MHz to 725 MHz	±20, ±25, ±50	2.5, 2.8, 3.0, 3.3	70 to 82 mA	3225, 7050	LVPECL, LVDS, HCSL		-40 to +105°C
VCXO (Voltage Controlled Oscillators) | ±25 to ±3200 ppm pull range, <1% linearity | 0.1 ppb/g (g-sensitivity, vibration immunity) | Best reliability								
SiT3372/73**	10 MHz to 700 MHz	±15, ±25, ±30, ±50	2.5 to 3.3	76 to 84 mA	3225, 5032, 7050	LVPECL, LVDS, HCSL	• Audio/video • Wireless & telecom equipment • Instrumentation	0.21 ps RMS phase jitter
SiT3807	31 standard freq.	±10, ±25, ±50	1.8, 2.5 to 3.3	29 to 34 mA (10 to 70 µA stby)	2520, 3225, 5032, 7050	LVCMOS		0.5 ps RMS phase jitter, FP*
SiT3808/09	1 MHz to 220 MHz							
TCXO/VCTCXO | ±6.25 ppm pull range | 0.1 ppb/g (g-sensitivity, vibration immunity) | Best reliability								
SiT5356/57 Super-TCXO**	1 MHz to 220 MHz	±0.1, ±0.2, ±0.25	2.5, 2.8, 3.0, 3.3	40 to 45 mA	5032	LVCMOS, Clipped Sinewave	• High-reliability telecom & networking • Broadband satellite, Industrial, test & instrumentation	1 ppb/°C slope, -40 to +105°C
SiT5155 Super-TCXO**	13 standard freq.	±0.5, ±1, ±2.5					• High-reliability networking, server, storage, & telecom • Industrial/automotive/telecom GNSS	
SiT5156/57 Super-TCXO**	1 MHz to 220 MHz							
SiT5021/22	1 MHz to 625 MHz	±5	2.5, 3.3, 2.25 to 3.63	55 to 69 mA	3225, 5032, 7050	LVPECL, LVDS	• Instrumentation & networking • Embedded systems	0.6 ps RMS phase jitter
DCTCXO (In-System Programmable) | ±6.25 to ±3200 ppm pull range | 5 ppt resolution frequency control | 0.1 ppb/g (g-sensitivity, vibration immunity) | Best reliability								
SiT5366/67 Super-TCXO**	1 MHz to 220 MHz	±0.1, ±0.2, ±0.25	2.5, 2.8, 3.0, 3.3	40 to 45 mA	5032	LVCMOS, Clipped Sinewave	• High-reliability telecom & networking • Broadband satellite, Industrial, test & instrumentation	I2C programmable, -40 to +105°C
SiT5166/67 Super-TCXO**		±0.5, ±1, ±2.5					• High-reliability networking, server, storage, & telecom • Industrial/automotive/telecom GNSS	
DCXO (In-System Programmable) | Digital pull for lowest noise | Up to ±3200 ppm pull range, 5 ppt pull resolution, <1% linearity								
SiT3521/22**	1 MHz to 725 MHz	±20, ±25, ±50	2.5 to 3.3	70 to 82 mA	5032	LVPECL, LVDS, HCSL	• Communication & broadcasting • Test & measurement equipment	I2C programmable, 0.21 ps jitter
SiT3907	1 MHz to 220 MHz	±10, ±25, ±50	1.8, 2.5, 2.8, 3.3	32 mA	3225, 5032, 7050	LVCMOS	• Instrumentation & audio/video • Phase locked loops (PLL) & FPGA data recovery	0.5 ps RMS phase jitter, FP*

All families have programmable frequency within the output frequency range with 6 decimals of accuracy, except 32.768 kHz products and those indicated as having standard frequencies. All families are available in -40 to +85°C unless otherwise noted.
*Field programmable with Time Machine II Programmer
**Elite Platform products with DualMEMS™ technology for best dynamic performance

Application Examples and Benefits

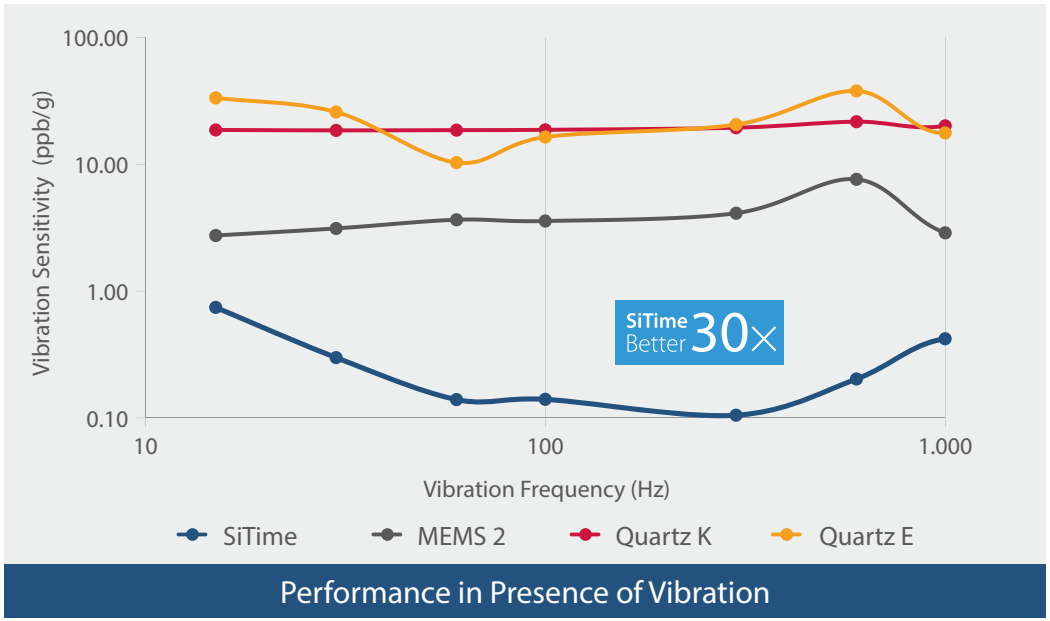
Segment	Application	SiTime Benefits	SiTime Oscillator Family
Networking, Servers, Storage & Telecom	4G/5G RRH, small cells, microwave backhaul, other RF systems	Best dynamic stability 1ppb/°C, resistant to airflow and rapid thermal transients Most robust against shock/vibration, no activity dips	SiT5356/57, SiT5366/67, SiT5155/56/57, SiT5166/67
	Carrier-grade routers & switches, SyncE, IEEE 1588	Best dynamic stability 1ppb/°C, resistant to airflow and rapid thermal transients Best resilience (EMI susceptibility, PSRR), no activity dips	SiT5356/57, SiT5366/67, SiT9121/22, SiT9365/66/67
	Servers, storage, SATA, SAN, PCIe, Fibre channel	±10 to 25 ppm stability over industrial temperature Best resilience (EMI susceptibility, PSRR)	SiT9120, SiT9365/66/67, SiT8008
	100/200/400G ONT, SFP & optical modules	Smallest package (3.2 x 2.5 mm) for LVPECL/LVDS Best dynamic stability, no activity dips	SiT9365/66/67, SiT5356/57, SiT5366/67
	G.fast, DOCSIS 3.1, cable modems	High frequencies with 6 digits of accuracy Best PSRR, shock/vibration resistance	SiT5356/57, SiT5366/67, SiT3521/22, SiT9365/66/67
Automotive	ADAS and around view cameras	Smallest package (2.0 x 1.6 mm) EMI reduction up to 17 dB	SiT8924/25, SiT9025
	ADAS computer, connected car	Ultra-low jitter under harsh condition (0.215 ps) Best stability under high temperature (±20 ppm at 105°C)	SiT9386/87
	Infotainment	Reliable startup at -40°C EMI reduction up to 17 dB	SiT8924/25, SiT9025
	LED headlights	Best stability under high temperature Best EMI control	SiT8924/25
	Wireless charger	Programmability for short lead times, even for custom frequencies	SiT8924/25
	Post-solder optical inspection	SOT23 leaded (not QFN) package ensures easy post-solder optical inspection	SiT2024/25
Industrial	Precision GNSS	Best location accuracy under shock, vibration, rapid thermal transients, & EMI	SiT5155/56/57, SiT5166/67, SiT5356/57, SiT5366/67
	Multi-function printers	Reduce EMI in system Customizable frequencies with 6 digits of accuracy	SiT9002/03/05, SiT8008
	IP camera, security/CCTV system, VoIP camera	Smallest packages (2.0 x 1.6 mm, 2.5 x 2.0 mm) Best resilience (shock, vibration, EMS immunity) Customizable frequencies with 6 digits of accuracy	SiT8008, SiT1602
	FPGA subsystem	Customizable frequencies with 6 digits of accuracy	SiT8008/09, SiT9121/22
	Industrial computers, PLCs, motor control	Best stability under high temperature (+125°C) 30 times better reliability, best resilience	SiT2018/19/20, SiT8008
Mobile, Wearables, & IoT	Activity tracker, smartwatch	80% smaller than quartz Drive 2 to 3 loads with one chip	SiT1532, SiT1566/68/69, SiT1572
	Activity tracker, smartwatch	20 to 40% longer battery life Most accurate time reference	SiT1552, SiT1569, SiT1572
	Activity tracker, smartwatch, IoT	Up to 3 times faster startup than quartz (0.5s vs. 1.5s for quartz)	SiT1532/52, SiT1569, SiT1579
	Bluetooth headset	Best resilience (shock, vibration, EMS immunity)	SiT1532/52, SiT1566/68/69
	Medical electronics	Most accurate 32 kHz for time-stamping 80% smaller than quartz	SiT1552, SiT1566/68/69
Consumer	DSC, DVR, DSLR, IP camera, 100M to 10G Ethernet	Smallest package (2.0 x 1.6 mm) ±20 ppm stability over industrial temperature	SiT8008, SiT1602
	Wearables, health monitors, mobile phones, ultra-small notebook PCs	Drive 32 kHz to multiple loads with one chip	SiT1532/33, SiT1566/68/69, SiT1572/76/79

MEMS Oscillators Outperform Quartz

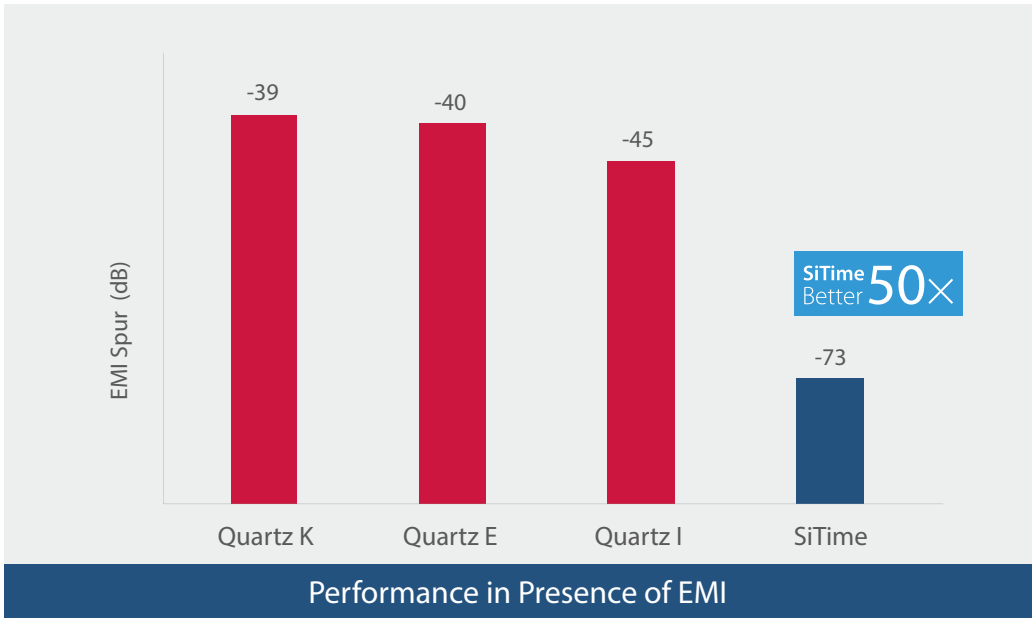


Performance in Presence of Board Noise

Reliability (Million Hours)



Performance in Presence of Vibration



Performance in Presence of EMI

Silicon MEMS Timing Solutions

Field Programmable Oscillators and
Time Machine II Programmer

Instant Oscillators

Any Frequency **Any Voltage** **Any Stability**

Complete easy-to-use programming kit for SiTime's field programmable oscillators

Programmable Features

Customizable Frequency	1 to 625 MHz, 6 decimals of accuracy
Frequency Stability	±20 to ±50 PPM
Supply Voltage	1.8V, 2.5 to 3.3V
Pull Range	±25 to ±1600 ppm in VCXO and DCXO
Drive Strength Control	25 to 40 ns rise/fall time for low to high output drive
Spread Spectrum	±0.125 to ±2.0% center spread and -0.25 to -4.0% down spread

Additional Options

Packages	QFN: 2016, 2520, 3225, 5032, 7050; SOT23-5: 2928
Temperature Range	-20 to +70°C, -40 to +85°C, -40 to +105°C, -40 to +125°C, or -55 to +125°C
Output Signaling	Differential: LVPECL, LVDS or HCSL, Single-ended: LVCMOS

Don't waste time searching and waiting for oscillators

- Reduce design time with always-in-stock field programmable oscillators
- Optimize system performance with custom frequencies
- Reduce EMI with programmable drive strength

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