

Silicon MEMS Timing Solutions



COMMUNICATIONS & ENTERPRISE

4x better frequency slope ($\Delta F/\Delta T$)

10x higher reliability and environmental resilience Clock-System-on-a-Chip—smaller, simpler design



MOBILE & IOT

35% smaller footprint

Maintains stability under 10°C/s temperature ramp

30x better quality and reliability



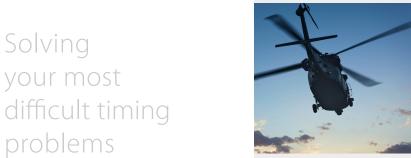
AUTOMOTIVE

Best stability over -55 to +125°C 50x to 500x better quality, 50x better reliability 20x better shock and g-sensitivity performance



INDUSTRIAL

Programmable, qualify once—multiple parts 30x better quality and reliability 20x better shock survivability, 4x better vibration



AEROSPACE & DEFENSE

20x better shock survivability, 4x better vibration 50x better g-sensitivity Wide operating temperature range -55 to +125°C



CONSUMER

Immediate availability Virtually unlimited capacity Programmable 1 Hz to 725 MHz









MEMS Timing Solutions Portfolio



Automotive Aerospace & Defense Mobile & IoT Industrial & Consumer Communications & Enterprise Network **uPower** TCXO/ uPower Low Spread TCXO/ **High Temp** High Temp Low litter Synch / **High Temp** 32 kHZ VCTCXO/ ocxo VCTCXO/ **Power** Spectrum **TCXO** Oscillators **Oscillators Oscillators** litter **Oscillators TCXO** Oscillators **DCTCXO DCTCXO** Oscillators 1.2 mm² Cleaner 1.2 mm² SiT9025* SiT5348/9* SiT9501* SiT1576* SiT5358/9* SiT5711* SiT95145 SiT1602 SiT1618 SiT8924/5* SiT8944/5* 1-150 MHz 1-220 MHz SiT1552 1-220 MHz 4 inputs ±5 ppm 25-644.5313MHz 1-60 MHz 7.3728-48 MHz 1-137 MHz 1-137 MHz 3.75-77.76 MHz -55 to +125°C ±0.05-0.1 ppm ±5, 10, 20 ppm 1 Hz-2.5 MHz 70 fs Jitter** ±0.05-0.1 ppm ±5, ±8 ppb 10 outputs -40 to +125°C -55 to +125°C 3.1-4.9 mA 30 dB -40 to +105°C -55 to +125°C 2.5 ns Jitter* -40 to +105°C -40 to +85°C **FlexSwing** 1 clk domain Reduction 0.004 ppb/g SiT5346/7* SiT2024/5³ SiT5356/7* SiT95147 SiT2044/5* SiT1566/8 SiT8008/9* SiT8918/9* SiT9365 1-220 MHz 1-137 MHz 4 inputs **uPower** 1-220 MHz 1-137 MHz 25-325 MHz ±3, 5 ppm 2.5 ns Jitter** 1-137 MHz 1-137 MHz Low Jitter ±0.1-0.25 ppm -55 to +125°C 8 outputs -55 to +125°C ±0.1-0.25 ppm **Oscillators DCOCXO** 3.1-5.9 mA -40 to +125°C 0.21 ps Jitter* -40 to +105°C **Oscillators** SOT23-5 4 clk domains SOT23-5 -40 to +105°C 1.2 mm² 0.004 ppb/g SiT5146/7* SiT5155/6/79 SiT95148 SiT9346/7* SiT9366/7* SiT1580* SiT2001/2* SiT8920/1* SiT5721* 1-220 MHz 4 inputs TCXO/ 1-220 MHz SiT1569* SiT9386/79 1-725 MHz +0.5-2.5 ppm 1-137 MHz 1-137 MHz ±5 ppm 1-60 MHz 1-725 MHz 11 outputs ±0.5-2.5 ppm 1-725 MHz VCTCXO/ 2.5 ns litter* Hz-462.5 kH 0.21 ps Jitter SOT23-5 -55 to +125°C ±5, ±8 ppb 40 to +105°C -40 to +105°C -40 to +105°C 4 clk domains 0.004 ppb/g -40 to +105°C **DCTCXO** ±50 ppm -40 to +85°C Program via I²(SiT2018/9* SiT9375 SiT5021/2* SiT5186/7 Spread μPower 1-137 MHz Spread SiT1579* 25-644.5313MHz **DCXO** 1-625 MHz Clock 1-220 MHz 40 to +125°C 200 fs Jitter* 32 kHz Spectrum **DCXO** Spectrum 1 Hz-2.5 MHz ±5 ppm In-System SOT23-5 ±0.5-2.5 ppm FlexSwing Generator Programmable Oscillators ±50 ppm Oscillators Oscillators In-System -40 to +105°C Programmable SiT2020/19 SiT9120 SiT3541/2* SiT1581* SiT5386/7⁹ SiT95141 1-137 MHz SiT9005* SiT9045* 25-212.5 MHz SiT1532/3 1 Hz-2.5 MHz 1-220 MHz 4 inputs I²C/SPI -55 to +125°C **VCXO** 1-141 MHz 0.6 ps Jitter* 1-150 MHz SiT3907* 10 outputs 1508 & 2012 ±0.1-0.25 ppm ±30, 50 ppm SOT23-5 1-725 MHz 30dB Reduction 30 dB Reduction 2.5 ns Jitter* -40 to +105°C 1-220 MHz 1 clk domain 0.21 ps Jitter* SiT9121/2* SiT1572 SiT95143 SiT1534 SiT9003* uPower 1-625 MHz SiT3807/8/99 SiT3521/2* 4 inputs ±50 ppm 1 Hz-32 kHz 1-110 MHz 0.6 ps Jitter* Oscillators 11 outputs 1-220 MHz I2C/SPI **VCXO** 2012 Option Low Power 2.5 ns Jitter* 1-725 MHz 4 clk domains 0.21 ps Jitter* SiT1630 SiT8208/9³ SiT3372/3* SiT1573 SiT8021* SiT3342/3* 16.384 kHz & 1-220 MHz SiT9002* 1-725 MHz 1-26 MHz ±100 ppm 32.768 kHz 0.5 ps Jitter* 1-725 MHz 1-220 MHz ±10-50 ppm 1508 60-280 μΑ -40 to +105°C ±10 to 50 ppm 0.21 ps Jitter* 2012, SOT23 0.21 ps Jitter*

^{*}Any frequency, programmable within range out to 6 decimals

^{**}Integrated RMS phase jitter; See datasheet for integration range

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NanoDrive[™] programmable ultra-low-power output

LVPECL, LVDS, HCSL output

LVPECL, CML, HCSL, LVDS or LVCMOS output

LVCMOS output

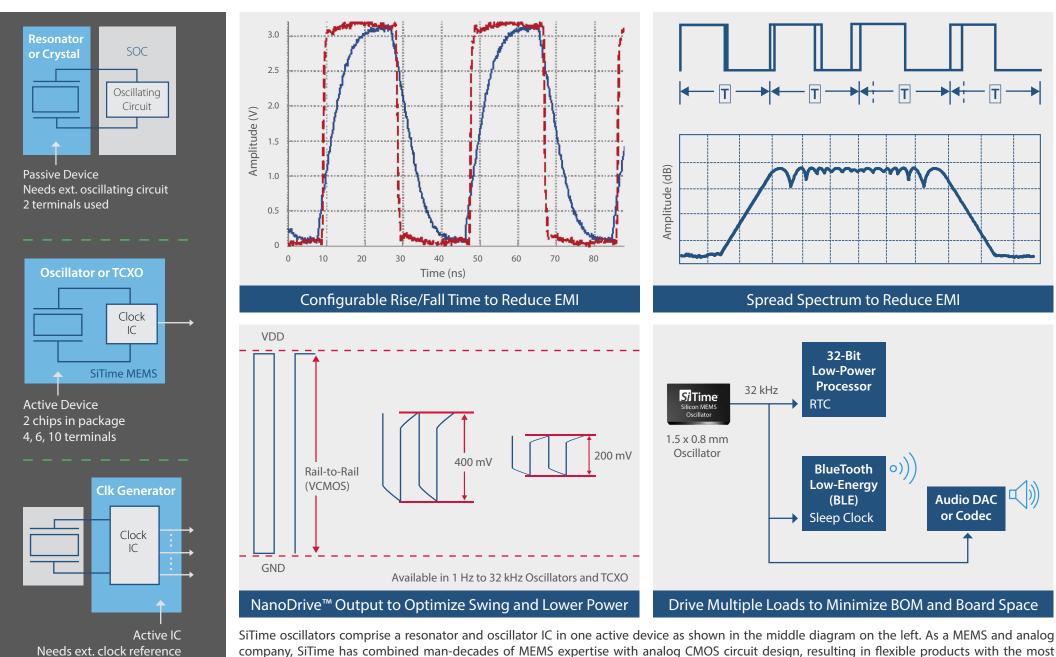
Pin compatible with guartz devices

Available as field programmable with Time Machine II

SiTime's Analog Expertise Enables Unique Features

Many terminals/outputs





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	22762111	75, 100, 250 over temp (10, 20 room temp)	1.2 to 3.63	0.90 μΑ	1508, 2012	NanoDrive, LVCMOS	Smart meters	Smallest XO
SiT1572		±50	1.62 to 3.63	4.5 μΑ	1508	LVCMOS	Health & wellness monitors RTC reference clock	Smallest XO
SiT1630		75, 100, 150 over temp (20 room temp)	1.5 to 3.63	1.0 μΑ	2012, SOT23-5	LVCMOS	 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 	-40 to +105°C
SiT1552 TCXO	32.768 kHz	$\pm 10, \pm 13, \pm 22$, all-inclusive	1.5 to 3.63	0.99 μΑ	1508	NanoDrive, LVCMOS		Smallest TCXO
SiT1566 Super-TCXO		±3, ±5, all-inclusive	1.62 to 3.63	4.5 μA		LVCMOS		Smallest XO,
SiT1568 Super-TCXO		±5 all-inclusive (after overmold/underfill)	1.8	4.5 μΑ			• Connectivity modules	2.5 ns rms phase jitter
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 μΑ	1508, 2012	NanoDrive, LVCMOS		Smallest XO
SiT1569	1 Hz to 462.5 kHz	±50	1.62 to 3.63	2.0 μA (100 kHz)	1508 LVCMOS	Health & wellness monitorsIndustrial data loggers & sensor interface	Smallest XO	
SiT1576 Super-TCXO	1 Hz to 2.5 MHz	±5 all inclusive	1.62 to 3.63	8.0 μA (100 kHz)		Wenes	 loT beacons Smart pens	Smallest XO,
SiT1579	1 Hz to 2.5 MHz	±50	1.62 to 3.63	8.0 μA (100 kHz)			2.5 ns rms phase jitter	
SiT8021	1 MHz to 26 MHz	±100	1.8, 2.5V to 3.3V	60 to 280 μA (0.7 μA stby)			Wearables & IoTPortable audioIndustrial & medical sensors	Smallest XO
Low-Power O	scillators Best	reliability Pin-compati	ble QFN or SOT-	-23 package for be	est solder-joint reliability			
SiT1602	52 standard freq.			3.1 to 5.5 mA (0.6 - 1.0 μA stby)	2016, 2520, 3225, 5032, 7050 LVCMOS SOT23-5 LVCMOS	LVCMOS	 Consumer, industrial and audio video equipment Networking, storage & servers Industrial sensors, PLC & motor server 	
SiT8008/09	1 MHz to 137 MHz	±20, ±25, ±50	1.8, 2.5 to 3.3					FP*
SiT2001/02	1 MHz to 137 MHz			3.6 to 5.4 mA (1.0 µA stby)		Microprocessor & FPGA clocking		
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
SiT9366/67**	1 MHz to 725 MHz							phase jitter
SiT9120	31 standard freq.		2.5 to 3.3	54 to 69 mA	3225, 5032, 7050	LVPECL, LVDS		0.5/0.6 ps rms
SiT9121/22	1 MHz to 625 MHz							phase jitter,
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		FP*

SiTime Base Part No.	Output Freq.	Frequency Stability (ppm)	Supply Volt. (V)	Supply Current (Typical)	Package	Output Logic	Target Applications	Features
High-Temper	ature and Autom	otive Oscillators 0).1 ppb/g (g-sen	sitivity, vibration ir	nmunity) Best reliabili	ty Pin-compatible QF	N or SOT-23 package for best solder-joint reliability	
SiT1618 SiT8918/19	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*,
SiT2018/19	1 MHz to 137 MHz				SOT23-5			-40 to +125°C
SiT8920/21	1 MHz to 137 MHz				2016, 2520, 3225, 5032, 7050	LVCMOS	 Ruggedized applications in harsh environments Applications in extreme temperature conditions 	
SiT2020/21					SOT23-5		Avionics equipment	FP*,
SiT8924/25	1 MHz to 137 MHz				2016, 2520, 3225, 5032, 7050		 AEC-Q100 automotive applications ADAS, camera modules, Radar & Lidar Automotive Ethernet Infotainment LED headlights 	-55 to +125°C
SiT2024/25	1 MHz to 137 MHz				SOT23-5	LVCMOS		
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	ECUs (engine & transmission control units)	-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	0.21 ps rms phase jitter
SiT3807 SiT3808/09	31 standard freq. 1 MHz to 220 MHz	±10, ±25, ±50		29 to 34 mA (10 to 70 μA stby)	2520, 3225, 5032, 7050 LVCMOS	Wireless & telecom equipment Instrumentation	0.5 ps rms phase jitter, FP*	
TCXO/VCTCX	0/DCTCX0 ±6.2	5 to ±3200 ppm pull ra	ange 5 ppt res	olution frequency	control 0.1 ppb/a (a-	sensitivity, vibration im	munity) Best reliability	
SiT5358/59		±0.05	alige 5 ppries	40 to 45 mA	5032	LVCMOS, Clipped Sinewave	 High-reliability telecom & networking Broadband satellite, Industrial, test & instrumentation 	I2C, 1 ppb/°C slope,
SiT5356/57 Super-TCXO**	1 MHz to 220 MHz	±0.03 ±0.1, ±0.2, ±0.25	2.5, 2.8, 3.0, 3.3					0 to +70°C
SiT5155 Super-TCXO** SiT5156/57 Super-TCXO**	13 standard freq. 1 MHz to 220 MHz	±0.5, ±1, ±2.5					 High-reliability networking, server, storage, & telecom Industrial/automotive/telecom GNSS 	12C programmable, 1 ppb/°C slope, -40 to +105°C
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 & networkingEmbedded systems	0.6 ps rms phase jitter
DCXO (In-Sys	tem Programmab	ole) Digital pull for lo	west noise Up	o to ±3200 ppm p	ull range, 5 ppt pull resc	lution, <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 & broadcastingTest & measurement equipment	I2C programmable, 0.21 ps rms phase 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/videoPhase locked loops (PLL) & FPGA data recovery	0.5 ps rms phase jitter, FP*
SSXO (Spread	d Spectrum Oscil	lators) ±0.125 to ±2	2.0% center spre	ead, -0.25% to -4.09	% 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	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	PCI ExpressMicroprocessors	FP*

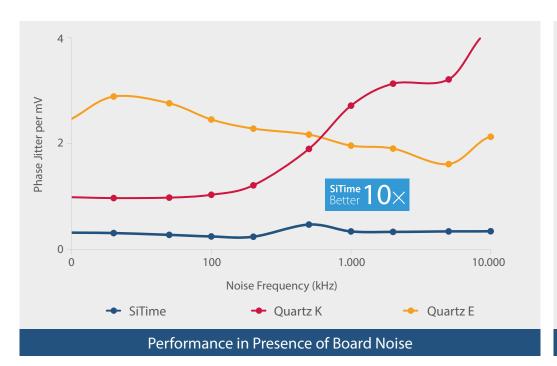
All families have programmable frequency within the output frequency range with occe *Field programmable with Time Machine II Programmer **Elite Platform products with DualMEMS™ technology for best dynamic performance

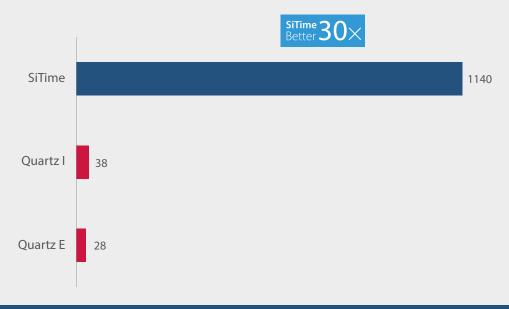
Application Examples and Benefits

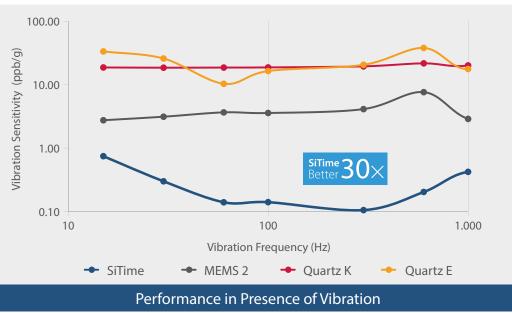


Segment	Application	SiTime Benefits	SiTime Oscillator Family	
	4G/5G RRH, small cells, macro cells, microwave backhaul, other RF systems	Best dynamic stability 1ppb/°C, resistant to airflow and rapid thermal transients Most robust against shock/vibration, no activity dips	SiT5356/57/58/59, SiT5155/56/57	
Networking,	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	SiT5356/57/58/59, SiT9121/22, SiT9365/66/67	
Servers, Storage & Telecom	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	
Telecolli	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, SiT5356/57/58/59	
	G.fast, DOCSIS 3.1, cable modems	High frequencies with 6 digits of accuracy Best PSRR, shock/vibration resistance	SiT5356/57/58/59, SiT3521/22, SiT9365/66/67	
	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	
Automotive	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	
	Precision GNSS	Best location accuracy under shock, vibration, rapid thermal transients, & EMI	SiT5155/56/57, SiT5356/57/58/59	
	Multi-function printers	Reduce EMI in system Customizable frequencies with 6 digits of accuracy	SiT9002/03/05, SiT8008	
Industrial	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	
	Activity tracker, smartwatch	80% smaller than quartz Drive 2 to 3 loads with one chip	SiT1532, SiT1566/68/69, SiT1572	
Makila Wassakia	Activity tracker, smartwatch	20 to 40% longer battery life Most accurate time reference	SiT1552, SiT1569, SiT1572	
Mobile, Wearables, & IoT	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	
Consumer	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	

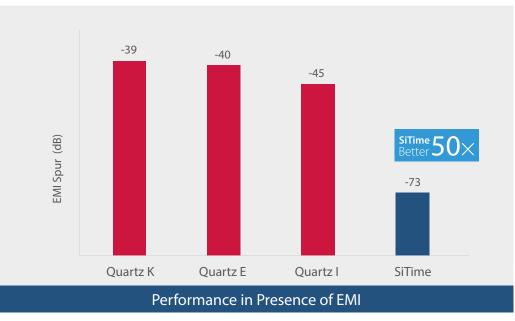








Reliability (Million Hours)







Silicon MEMS Timing Solutions

Field Programmable Oscillators and Time Machine II Programmer

Instant Oscillators



Any Frequency

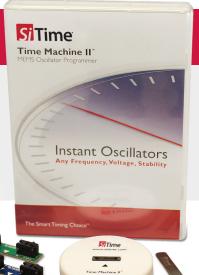


Any Voltage



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 $\pm 2.0\%$ 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

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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