AEC-Q100 Automotive Oscillators

for ADAS Sensors, in-Vehicle Networking & Self-Driving Computer

- ±20 ppm stability from -55 to 125 °C
- Best-in-class quality – less than 0.1 DPPM
- 17 dB EMI reduction without PCB change

SiTime's AEC-Q100 automotive oscillators deliver the highest performance, reliability and robustness, making them ideal for replacing legacy quartz oscillators in ASIL (Automotive Safety Integrity Level) compliant automotive systems. Our MEMS solutions are engineered to guarantee the best frequency stability, jitter and power supply noise rejection under environmental stressors such as rapid temperature changes, airflow, shock, vibration, and noisy power supplies.

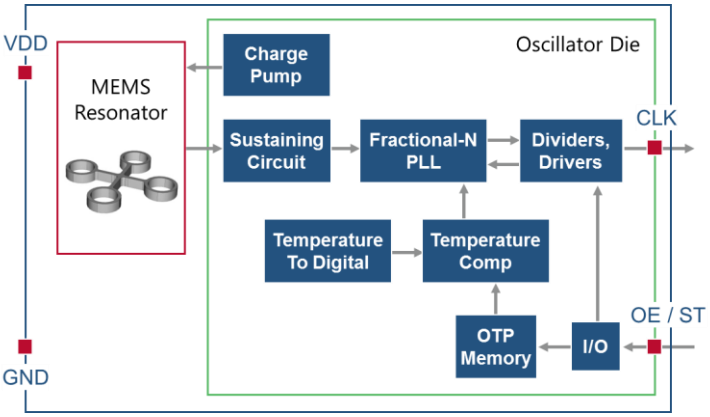
Benefits

- Increase system quality and reliability
- Maintain performance in harsh and noisy environments
- Eliminate overtone and start-up issues of quartz oscillators
- Reduce EMI without component re-qualification
- Minimize size with smaller packages
- Optimize design with programmable frequencies

Applications

- Automotive cameras
- Lidar/Radar
- Infotainment systems
- Precision GNSS
- Self-driving computer
- Electronic control units (ECUs)
- In-vehicle Ethernet/PCIe
- In-car telematics

Architecture



Features

- AEC-Q100 Grade 1 to 4 compliant
- Best-in-class quality with less than 0.1 DPPM
- Highest reliability at over 1.9 billion hours MTBF (0.5 FIT)
- ±20 ppm frequency stability from -55°C to +125°C
- Any output frequency between 1 to 725 MHz, or 32.768 kHz
- LVCMOS, LVPECL, LVDS and HCSL output types
- Configurable rise/fall time and drive strength to reduce EMI or drive multiple loads
- Programmable spread spectrum to reduce EMI
- Industry best acceleration sensitivity of 0.1 ppb/*g*
- Best-in-class shock resistance at 10,000*g*
- Best-in-class vibration resistance at 70*g*
- Low power consumption of 3.8 mA typ. at 1.8V
- RoHS and REACH compliant, Pb-free, Halogen-free and Antimony-free

Package Options (shown actual size)

Leaded packages for best solder joint reliability — SOT23

Chip-scale packages for small size (32 kHz) — 1508

Pin-compatible QFN oscillator packages

2016 2520 3225 5032 7050

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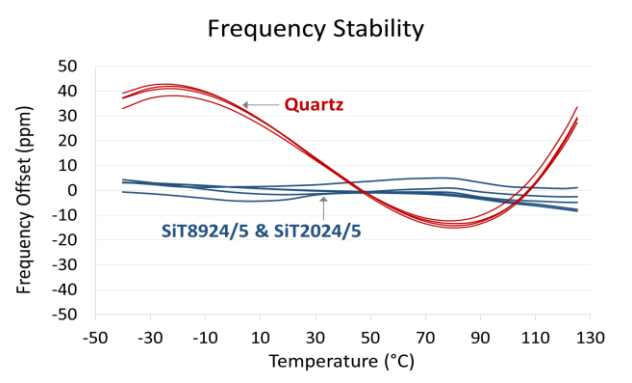

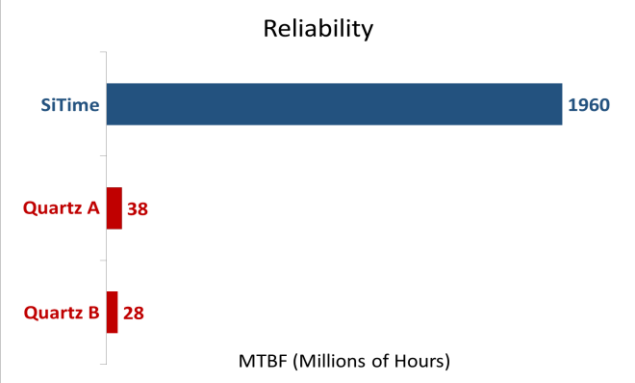

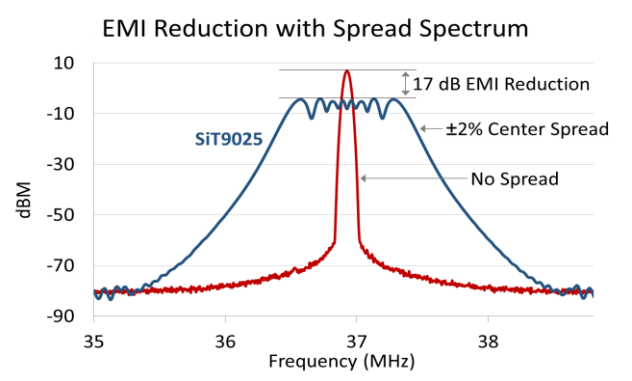

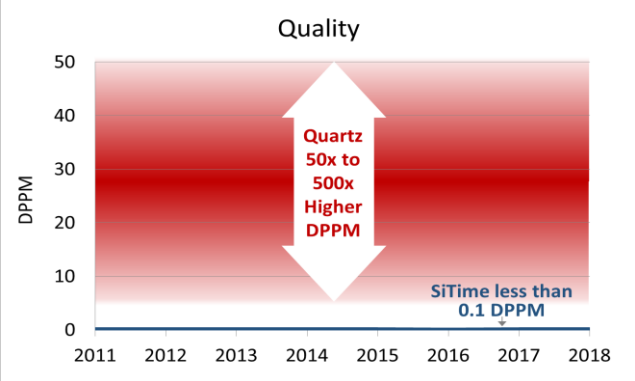

Device Type	Device	Frequency	Temp. Range (°C)	Stability (ppm)	Output Type	EMI Reduction Feature	Package Size (mm)
kHz Oscillators	SiT1680[1]	32.768 kHz	-40 to 85, -40 to 105	±3, ±5, ±10, ±20, ±100, ±150	LVCMOS, NanoDrive™	-	CSP: 1.5 x 0.8
MHz Oscillators	SiT8924/5	1 MHz to 137 MHz	-40 to 85, -40 to 105, -40 to 125, -55 to 125	±10[2], ±20, ±25, ±30, ±50	LVCMOS	Configurable rise/fall time to reduce harmonics	QFN: 2.0 x 1.6, 2.5 x 2.0, 3.2 x 2.5, 5.0 x 3.2, 7.0 x 5.0
	SiT2024/5	1 MHz to 137 MHz					SOT23-5: 2.9 x 2.8
	SiT8934/5	1 MHz to 150 MHz					Wettable flank QFN: 2.0 x 1.6, 2.5 x 2.0[3]
Differential Oscillators	SiT9386/7	1 MHz to 725 MHz	-20 to 70, -40 to 85, -40 to 105	±10[2], ±25, ± 50	LVPECL, LVDS, HCSL	-	Wettable flank QFN[3]: 3.2 x 2.5, 7.0 x 5.0
Spread Spectrum Oscillators	SiT9025	1 MHz to 150 MHz	-40 to 85, -40 to 105, -40 to 125, -55 to 125	±10[2], ±20, ±25, ±30, ±50	LVCMOS	Configurable spread amplitude and profile	QFN[3]: 2.0 x 1.6, 2.5 x 2.0, 3.2 x 2.5
MHz Precision Super-TCXOs	SiT5386/7, SiT5186/7	1 MHz to 220 MHz	-40 to 85, -40 to 105	±0.1, ±0.2, ±0.25, ±0.5, ±1, ±2.5	LVCMOS, Clipped Sinewave	-	QFN[3]: 5.0 x 3.2

1. Contact SiTime for availability. 2. Contact SiTime for ≤±10 ppm stability options. 3. Contact SiTime for other wettable flank package options

SiTime is a leader in MEMS timing solutions. We combine innovative MEMS and programmable analog technologies with our systems expertise to industry-best products that overcome the limitations of legacy quartz products. Our configurable products provide ultra-stable timing that enables customers to differentiate their systems with higher performance, small size, and better reliability.