

## AEC-Q100 AUTOMOTIVE MEMS OSCILLATORS



SiTime introduced two families of ultra-robust AEC-Q100-qualified MEMS oscillators. The **SiT2024/25** and **SiT8924/25** oscillators deliver the highest performance and best robustness and are designed for ASIL (Automotive Safety Integrity Level) compliant automotive applications such as advanced driver assistance systems (ADAS), in-vehicle Ethernet, powertrain and electronic control units (ECUs).

“The automotive industry is going through a massive transformation, with new features such as advanced safety and driver assistance systems, electrification, automation and real-time big data analytics. The usage of electronic components in automobiles is increasing rapidly and requires stringent levels of quality, reliability and performance,” said Piyush Sevalia, executive vice president of marketing at SiTime. “MEMS technologies are playing a significant role in this transformation. SiTime is leveraging our revolutionary silicon MEMS, advanced analog technology and standard semiconductor packaging to provide unique timing solutions that deliver the highest reliability and dynamic performance under extreme temperatures, shock and vibration.”

SiTime’s new automotive product families offer a unique combination of the widest frequency range, tightest stability at  $\pm 20$  ppm and the best reliability. The SiT2024/25 oscillators are optimized for under-the-hood systems such as engine control, transmission control, active suspension control, electronic steering and other ECUs. These oscillators are available in a SOT23-5 leaded package to enable visual inspection and the best solder joint reliability, especially in hot and cold environments. The SiT8924/25 oscillators, available in industry-standard QFN footprints as small as 2.0 x 1.6 mm, are ideal for camera modules and other small form factor systems.

### About the SiT2024/2025 and SiT8924/8925 Oscillators

SiTime’s automotive oscillators are 30 times more robust than quartz oscillators and deliver the following features and benefits.

### FEATURES

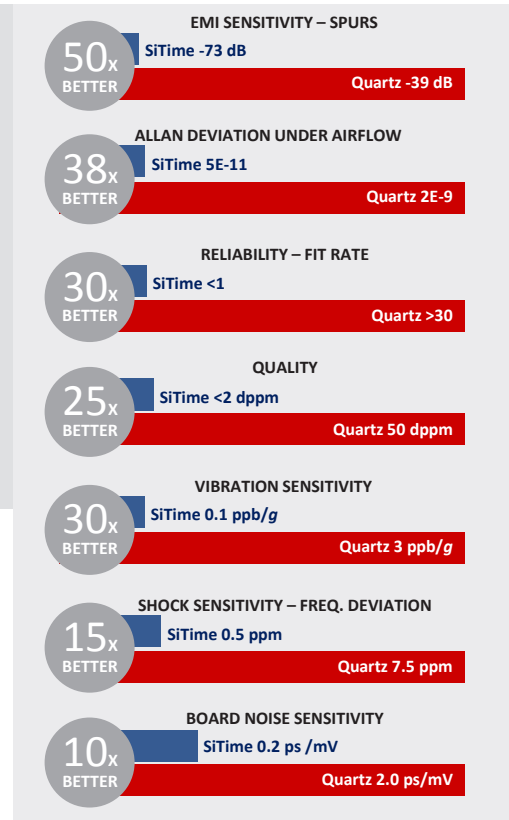
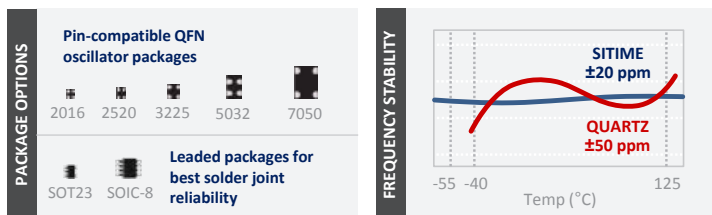
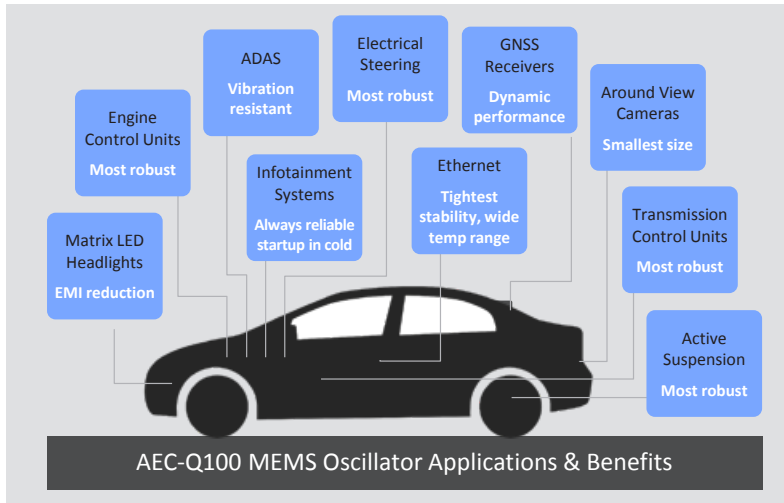
- AEC-Q100 qualified, Grade 1 ( $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ ), Grade 2 ( $-40^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$ ) and extended temperature range ( $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ ) 3-wire version with a short-circuit protected open-drain output
- SiT2024/2025: SOT23-5 leaded package for best board-level solder-joint reliability and ease-of-use in manufacturing and test Low current consumption of typ. 1.6 mA
- SiT8924/8925: Five package options in industry-standard oscillator footprint
- Excellent frequency stability at  $\pm 20$  ppm for best timing margin
- Highest reliability at over 1 billion hours MTBF ( $< 1$  FIT)
- Best shock resistance at 50,000 g
- Best vibration resistance at 70 g
- Lowest vibration sensitivity (g-sensitivity) at 0.1 ppb/g
- Widest frequency range of 1 to 137 MHz with 6 decimal places of accuracy
- Unique, programmable output drive strength for EMI reduction
- Supply voltage options of 1.8 V, 2.5 to 3.3 V

The SiT2024, SiT2025, SiT8924 and SiT8925 oscillators are in production now. Pricing information and Production Part Approval Process (PPAP) documentation, compliant with the AIAG manual, is available upon request.

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## APPLICATIONS AND PERFORMANCE

MEMS automotive solutions are engineered to guarantee the best frequency stability, Allan deviation, jitter, and phase noise under environmental stressors such as rapid temperature changes, airflow, shock, vibration, and noisy power supplies.



Device Type	Device	Frequency (MHz)	Temp. Range (°C)	Stability (ppm)	Output Type	EMI Reduction Feature	Package Size (mm)				
QFN Oscillators	SiT8924 [1]	1 to 110	-40 to 85, -40 to 105, -40 to 125, -55 to 125	±20, ±25, ±30, ±50	LVCMOS	8 output drive strength options	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				
	SiT8925 [1]	115.2 to 137					SOT23-5: 2.9 x 2.8				
SOT23 Oscillators	SiT2024 [1]	1 to 110					-20 to 70, -40 to 85, -40 to 95	±10, ±20, ±25, ±50	LVPECL, LVDS, HCSL	-	QFN: 3.2 x 2.5, 7.0 x 5.0
	SiT2025 [1]	115.2 to 137									
Differential Oscillators	SiT9386 [1,2,3]	1 to 220									
Spread Spectrum Oscillators	SiT9025 [2]	1 to 144	-40 to 85, -40 to 105, -40 to 125, -55 to 125	±20, ±25, ±30, ±50	LVCMOS	48 spread options up to ±1.25%, down to -2.5%	QFN: 2.0 x 1.6, 2.5 x 2.0, 3.2 x 2.5, SOT23-5: 2.9 x 2.8				

1. Contact SiTime for ≤±10 ppm stability options. 2. Contact SiTime for AEC-Q100 compliance status. 3. Contact SiTime for 95°C & 105°C products.