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## Advanced microcontrollers

The ST7FL family of 8-bit microcontrollers from **STMicroelectronics** provides flexibility and reliability for cost-sensitive car body applications including wipers, climate control, door locking, sunroof, and window lift. The family features an embedded electrically erasable programmable read-only memory for parameter storage, a code storage area from 1.5 to 8 Kbytes, and an internal RC oscillator. Some devices within the family add embedded peripherals such as a local interconnect network (LIN) serial communication interface. The LIN interface can work using an internal RC oscillator as a clock source, thus reducing the need for external components. Development utilities include automotive evaluation kit for networking, starter kits, and SW drivers for LIN implementation. Flash technology allows devices to be fast programmed at the end of the assembly line, ensuring flexible stock management for end users.



## HEV power module

The HybridPACK1 and HybridPACK2 power modules from **Infineon** reduce the cost and complexity of hybrid electric vehicle (HEV) inverter system design by using up to 30% less semiconductor area to achieve the required power rating. The HybridPACK1 is designed for mild HEV vehicles. The module contains all power semiconductors for the inverter and a negative temperature coefficient resistor for temperature measurement. It improves life span related to thermal cycling by a factor of 3 and life span related to power cycling reliability by a factor of 2. For applications in full hybrids, the HybridPACK2 offers a footprint of 9.2 x 20.2 cm (3.6 x 8.0 in) for an 800 A/600 V six-pack module. The pin-finned aluminum silicon carbide base plate enhances thermal performance as well as increases reliability for automotive under-hood applications.



## Embedded flash technology

The SH7147F 32-bit RISC microcontroller from **Renesas Technology** is specialized for controlling the electric motors used in automotive chassis, safety, and hybrid electric systems. The device uses metal oxide nitride oxide silicon (MONOS) embedded flash technology for speed, size, and reliability advantages. The 256 Kbyte on-chip flash memory is implemented by a 0.15  $\mu\text{m}$  (5.90  $\mu\text{in}$ ) process and has a full-time single-cycle random access capability. It requires almost 60% less chip area than the same amount of flash built with floating-gate NOR flash technology. Peripherals built into the unit include eight channels of 16-bit pulse width modulated timers and a 16-channel A/D converter with sample-and-hold circuits.



## Digital accelerometer

**VTI Technologies'** automotive digital accelerometer and inclinometer platform is intended for single- and multiple-axis applications. The 2.6 x 2.0 x 1.6 mm (0.10 x 0.08 x 0.06 in) 3D-MEMS sensing elements feature the same PCB design for all versions from one to three axis and perform continuous self testing. Multiple options for each car platform can be covered with one electronic control unit or sensor cluster design. They are suited for electronic stability control, hill start assistant, electronic parking brake, roll stability, rollover, and electrically controlled suspension applications.



## High-resolution display drivers

**Texas Instruments**

has expanded its 32-bit TMS470 microcontroller platform, offering new devices for instrument cluster host controller applications. The TMS470PLFx MCUs are targeted for systems with up to six stepper motors and are tightly coupled with the firm's OMAP33x and DaVinci TMS320DM64x based graphics controller to drive high-resolution LCD and thin-film transistor displays. The MCUs can directly drive small-segment LCDs through its embedded 128-segment LCD controller, while the use of peripheral modules such as the high-end timer, direct memory access controller, and multi-buffered serial peripheral interface allow the instrument cluster MCU family to drive other types of digital displays directly with no CPU load impact.



## FRAM device

**Ramtron's** FM24CL16 is a 16-Kb, 3-V serial FRAM (ferroelectric random access memory) device that has



been qualified to the AEC-Q100 stress test qualification. The device's NoDelay writes, high endurance, and low power consumption are suited for high-content applications such as intelligent airbags, occupant sensors, infotainment systems, anti-pinch/trap sunroofs, automatic transmission, adaptive cruise control, and steer-by-wire. It is pin-compatible with comparable electrically erasable programmable read-only memory devices yet is superior with the ability to read and write at bus speeds up to 1 MHz with virtually unlimited endurance, 45 years of data retention, and operation at -40 to +85°C (-40 to +185°F).