

Silicon Mobility

OLEA[®] T222

Hybrid and Electric Vehicles Control



- Electric motor control / Inverter control
- High Frequency DC/DC converter control
- High Frequency AC/DC converter control
- Transmission control
- Powertrain systems supervision
- Battery management system
- Internal combustion engine control

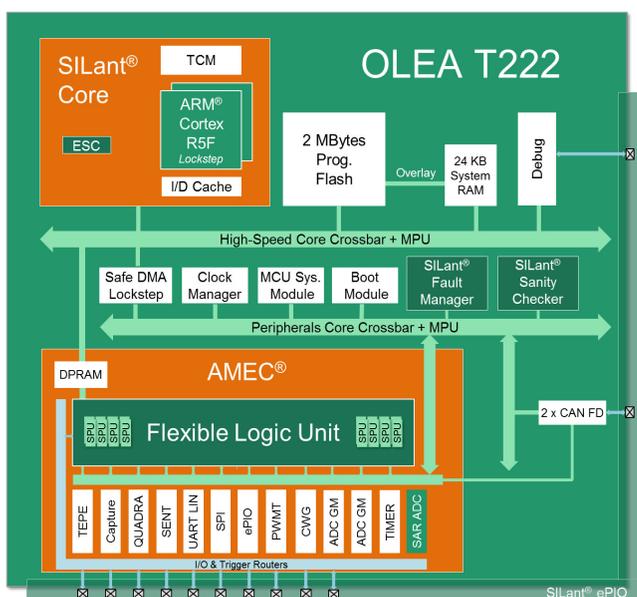
One of a kind

OLEA[®] T222 is a member of OLEA family, the 1st Field Programmable Control Unit (FPCU) automotive qualified solution. FPCU is a new semiconductor architecture defined as a combination of the hardware flexibility of the AMEC[®] real-time Control Unit with the software flexibility of a standard processor into a single chip.

AMEC[®] integrates parallel data paths between acquisition and actuation peripherals and the Flexible Logic Unit (FLU), an automotive specific and robust embedded programmable logic with DSP resources. OLEA[®] T222 also benefits from SILant[®], an ASIL-D functional safety integrated architecture. SILant[®] raises faults coverage and reliable countermeasures usually provided at chip level as high as application level and without compromising the performances.

FPCU removes software bottleneck by enabling software and hardware execution of high frequency and precise PWM control algorithm while limiting heat dissipation. Using Silicon Mobility's FPCU, user's control command can be programmed in hardware into FLU and deliver the following performances:

- 40 x acceleration of data processing capabilities
- Up to 20x faster hard-real time control loop
- Up to 180x power supply reduction



Unique Technologies

- AMEC[®] FLU: Real-time actuators/sensors control and processing unit based on programmable logic
- SILant[®]: ISO 26262 ASIL-D functional safety solution

Open Architecture

- ARM[®] Cortex-R5F in lockstep
- Embedded Flash
- CAN & LIN Communication ports

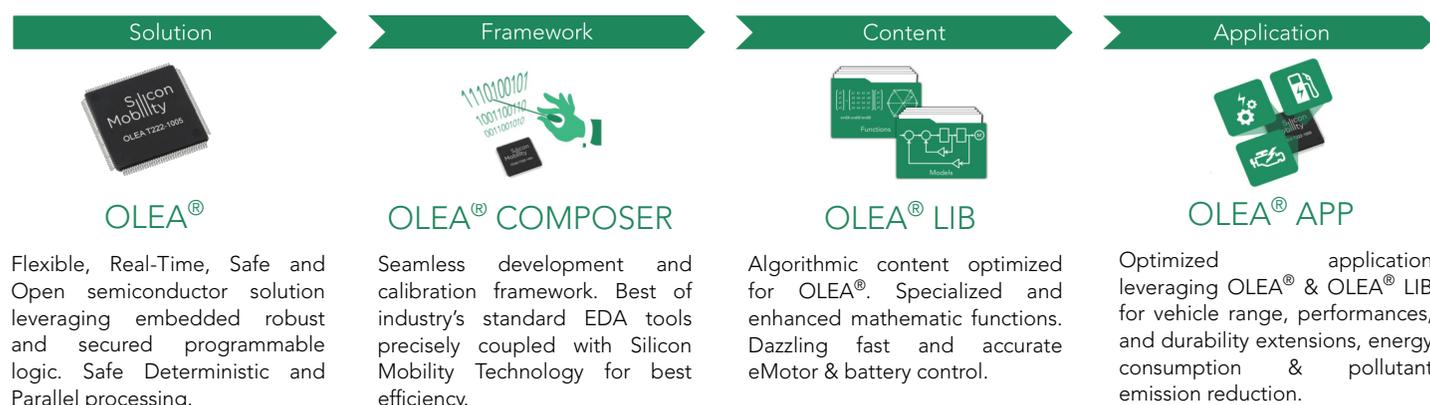
Standards Compliancy

- ISO 26262 ASIL-D
- AUTOSAR 4.2
- AEC-Q100 Automotive Quality

Featuring

Processing	<ul style="list-style-type: none"> 32-bit ARM® Cortex-R5F in lockstep • 200 MHz operating frequency • 16 KB / 8 KB instruction and data cache L1 with ECC • 64 KB Tightly Coupled Memory with ECC • Floating point unit • Thumb2 high code density 	
Sensors Actuators Control and Processing	<p>Advanced Motor Event Control - AMEC®</p> <ul style="list-style-type: none"> • Flexible Logic Unit <ul style="list-style-type: none"> • 4 560 Programmable Logic Elements • 20 x 24-bit Signal Processing Units • 200 MHz clock input • 8 KB DPRAM • Parallel access for acquisition & control <ul style="list-style-type: none"> • Clock Waveform Generator (CWG) with 4 channels • 5 x Pulse Width Modulator (PWM) with 4 channels 	<ul style="list-style-type: none"> • 16 channels Capture • Quad-Encoder • Thermal Estimator Position Engine • 3 x SENT • 2 x SPI with PSIS-S support • 3 x UART with PSIS-S support • 2 x ADC Group Manager • Triggers Router • 118-ch Multiplexed General Purpose I/O • 33 Programmable Input filters
Safety	<p>Safety Integrated Level Agent - SILant®</p> <ul style="list-style-type: none"> • ASIL-D architecture and infrastructure including, for transient faults, system Events Sequences Controlling (ESC), Masters and PWM in lockstep, end to end ECC transfers, safe DMA transfers, CRC; and protections for , I/O, clock, configuration registers, chip supply • Sanity Checker providing BIST for latent faults in logic / memory (LBIST & MBIST) on safety mechanisms , ADC Self-test • Fault Manager Unit 	
System	<ul style="list-style-type: none"> • 2 MB eFlash with EEPROM Emulation support • 24 KB of System SRAM with ECC • DMA Controller with CRC providing 16 channels in lockstep mode and 32 channels DMA split-mode • 8 x System Timers • Watchdog complying AUTOSAR 4.2 	<ul style="list-style-type: none"> • MCU System Configuration Module • 16-priorities Advanced Generic Interrupt Controller (AGIC) • Interconnect with end to end ECC and Multilayer MPU • JTAG and SWD debug ports • Trace Port Interface Unit and Embedded Trace Buffer • 16 KB Overlay RAM
Communication Ports	<ul style="list-style-type: none"> • 2 x CAN FD complying ISO 11898-1:2015 • 3 x UART-LIN complying LIN 1.3; 2.0 and 2.1 	
Analog	<ul style="list-style-type: none"> • 50 MHz Internal Ring Oscillator • Crystal oscillator input 1-50 MHz • Voltage Regulator (3.3V to 1.2V) with bypass • Power on Reset with LVD/HVD 	<ul style="list-style-type: none"> • 8 x 4 channels 12-bit ADC SAR @ 2MS/s MAX • 8 x Analog comparators • 2 x Temperature Sensors
Miscellaneous	<p>Supply</p> <ul style="list-style-type: none"> • 3.3 or 1.2 V for Core supply • 3.3 V for I/O supply • 3.3 V for ADC supply <p>Packages</p> <ul style="list-style-type: none"> • QFP 100, 144 and 176 	<p>Power Consumption</p> <ul style="list-style-type: none"> • < 200mW <p>Ambient Temperature Range</p> <ul style="list-style-type: none"> • -40°C to +125°C (AEC-Q100 Grade 1) • -40°C to +135°C (160°C Tj) Option

A full stack product offer



Everything needed is there

A wide eco-system of tools, software and hardware is available with OLEA® from Silicon Mobility or third parties for a fast application design start. Technical manuals, test reports, PPAP documentation and ISO 26262 safety work products package are also available.

**Silicon
Mobility**

www.silicon-mobility.com
sales@silicon-mobility.com
535 Route des Lucioles
Les Aqueuds – Bâtiment 2
06560 Valbonne
France

Legal Disclaimer: The information given in this Brief shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Silicon Mobility hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.
©2017 Silicon Mobility. All trademarks are property of their respective owner.