



Infineon's MC-ISAR eMotor Driver

3-phase motor control for mass production

Electrical 3-phase motors like PMSM (Permanent Magnetic Synchronous Motors) and BLDC (Brush Less DC) motors are used across the automotive applications domains (e.g. chassis control, (H)EV inverter, dry double clutch transmission etc.).

3-phase sinusoidal distributed and mechanically displaced windings are the characteristic of PMSM. The rotating magnetic field, activated by sinusoidal and time-displaced current, drives the motor. Three-phase current is switched into the motor windings via MOSFETs. Field Oriented Control (FOC) algorithm generates the PWM pattern needed for the current control. The rotor position and current are continuously sensed. High performance microcontroller plays the key role to FOC algorithm, allowing higher accuracy, safer execution and improved efficiency for motor control.

The MC-ISAR eMotor driver collects common feature of current and torque control, serving as perfect solution to motor drive applications. Position and speed control can be achieved on application specific basis, supporting multiple position acquisition modes, satisfying different customer needs.

MC-ISAR eMotor Benefits

- Developed for mass production, off-the-shelf implementation
- Limited software effort
- Direct resolver mode (no external resolver IC), reduced system cost
- Compliant to ISO 26262 process and CMM level 3
- Seamless configuration under the same configuration tool for AUTOSAR MCAL driver
- Easy to use

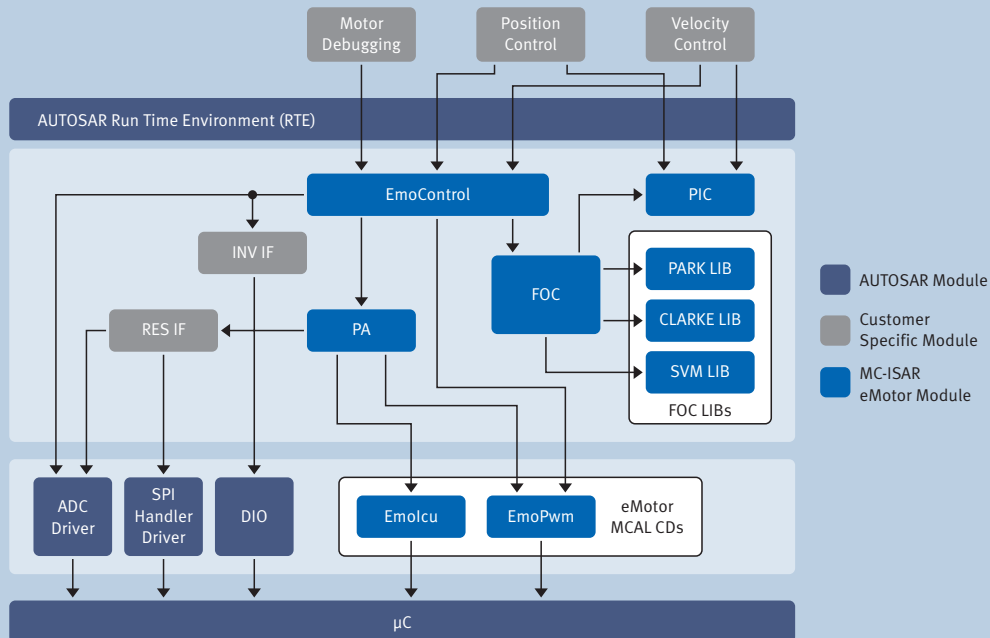
Main Features

- Lead implementation: TC1798
- Feature highlights:
 - Control PMSM motors via Field Oriented Control FOC including Space Vector Modulation SVM
 - Control BLDC motors via block commutation BC
 - Mixed control of FOC/BC motors
 - Integrated with AUTOSAR drivers
 - Support safety applications
- Sensors in FOC mode
 - Hall sensors / incremental encoder
 - Direct resolver mode (without resolver IC)
 - Resolver mode (with resolver IC)
 - Sensorless FOC
 - Current measurement: 3 phases, 2 phase parallel and sequential, DC link sequential
- Sensors in BC mode
 - Hall sensors
 - Sensorless via back EMF
 - Current measurement: DC link single

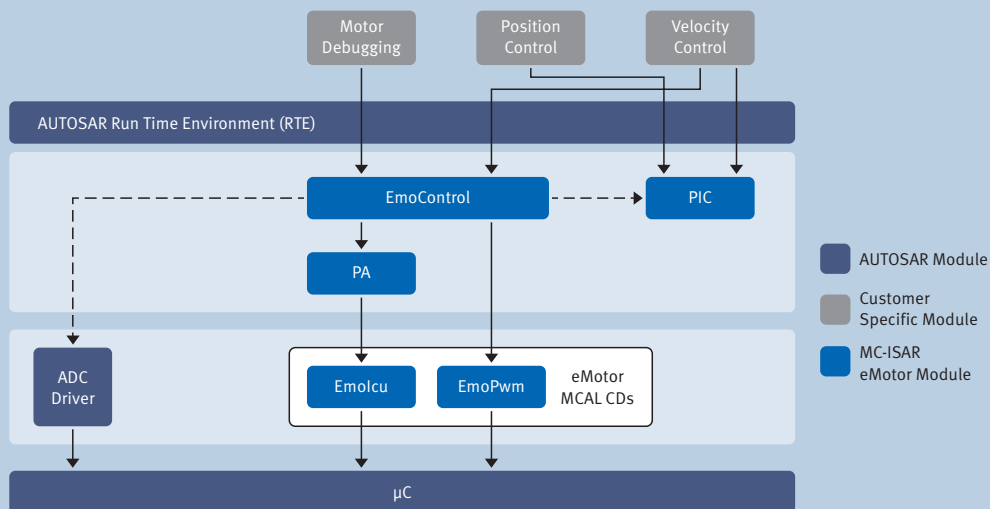
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FOC Mode



BC Mode



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