

Product brief

MOTIX™ IMD700A / IMD701A

3-phase motor drive with integrated ARM® Cortex®-M0

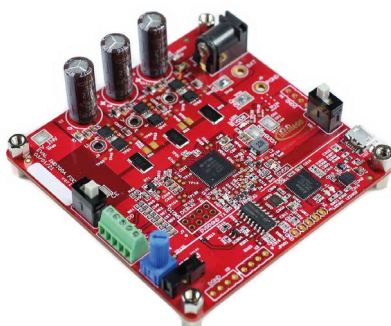
Today's newest battery-operated motor drive applications, require increased power density and longer run-time, which requires higher efficiency. MOTIX™ IMD700A and IMD701A are Infineon's latest fully programmable motor controllers integrating XMC1404 microcontroller with MOTIX™ 6EDL7141 3-phase gate driver IC in one package to enable the development of next-generation battery-operated products using BLDC or PMSM motors. These controllers are ideal for applications such as professional cordless power tools, gardening products, e-bikes, and automated guided vehicles. With integrated precision power supply and current shunt amplifiers, many of the peripheral circuitry are no longer necessary, reducing PCB space and improving system packaging possibilities.

XMC1404, ARM® Cortex®-M0 based microcontroller incorporates dedicated features to improve motor drives control. A hardware MATH Co-Processor clocked at 96 MHz, enhances calculations, including division and trigonometric functions such as 'Arctan', commonly used in Field Oriented Control of PMSM. Additionally, XMC1404 inherits most of the high-end peripherals found in the XMC4000 family (ARM® Cortex®-M4), including PWM timers-CCU8 and CCU4-, Position interface (POSIF) or serial communication modules including CAN, ensuring the best-in-class control.

The integrated MOTIX™ 3-phase gate driver (6EDL7141) is also designed for maximum flexibility. With configurable gate drive sink and source currents up to 1.5 A, it has the ability to drive a wide range of MOSFET's effectively to minimize losses and increase efficiency. It has adjustable gate driver supply voltage setting between 7 V, 10 V, 12 V and 15 V even at low battery voltage thanks to built-in high and low side charge pumps. The 6EDL7141 also has adjustable gate driver parameters to enable control of the slew rate to minimize system EMI. All of the 6EDL7141 settings can be quickly changed with the available simple-to-use PC-based GUI tool. In addition, with a full suite of system protection features such as OCP, UVLO, over-temperature, and locked rotor detection, this dedicated motor controller will increase reliability and robustness in severe operating fault conditions.

EVAL_IMD700A_FOC_3SH

Three shunt evaluation board
for FOC control of BLDC motors
with 40 V OptiMOS™ 5 PQFN
On-board programmer /debugger
Featured IC: IMD701A



Key features

- > XMC1404 with MATH co-processor
- > Integrated power supplies
- > Adjustable slew rate
- > Programmable gate drive parameters
- > 3x current shunt amplifier
- > Complete dedicated motor control protection suite

Key benefits

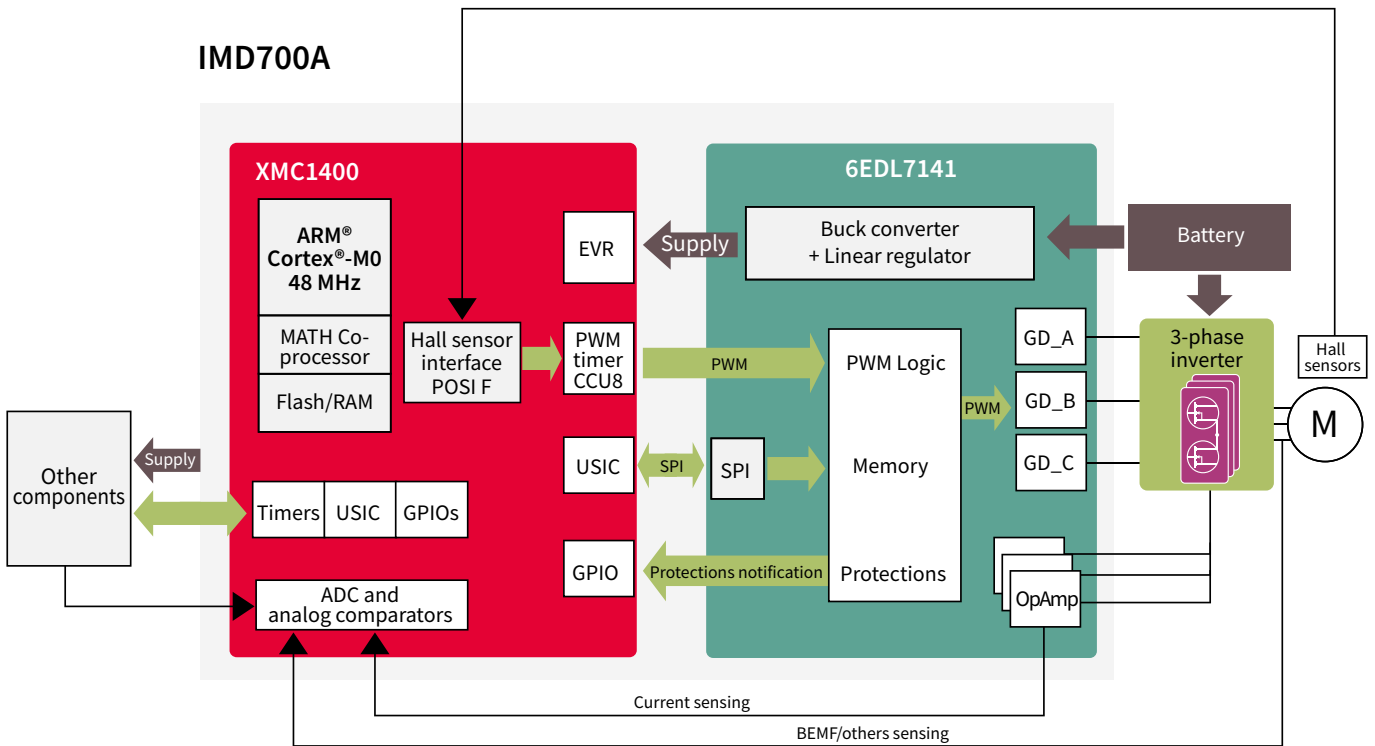
- > Reduced external component count and PCB area
- > Optimized efficiency and EMI
- > Maximum flexibility to use different inverter MOSFET's
- > Highly accurate integrated current sense saves external components
- > Higher dynamic range to increase signal resolution
- > Improved reliability and fault detection



MOTIX™ IMD700A / IMD701A

3-phase motor drive with integrated ARM® Cortex®-M0

Block diagram



Product portfolio

Part number	Package	Voltage [V]	DVDD regulator output [V]
IMD700A-Q064X128-AA	PG-VQFN-64-8 9 x 9 mm	5.5 – 60 V	3.3 V
IMD701A-Q064X128-AA	PG-VQFN-64-8 9 x 9 mm	5.5 – 60 V	5.0 V

Published by
Infineon Technologies Austria AG
9500 Villach, Austria

© 2022 Infineon Technologies AG.
All Rights Reserved.

Please note!

This document is for information purposes only and any information given herein shall in no event be regarded as a warranty, guarantee or description of any functionality, conditions and/or quality of our products or any suitability for a particular purpose. With regard to the technical specifications of our products, we kindly ask you to refer to the relevant product data sheets provided by us. Our customers and their technical departments are required to evaluate the suitability of our products for the intended application.

We reserve the right to change this document and/or the information given herein at any time.

Additional information

For further information on technologies, our products, the application of our products, delivery terms and conditions and/or prices, please contact your nearest Infineon Technologies office (www.infineon.com).

Warnings

Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by us in a written document signed by authorized representatives of Infineon Technologies, our products may not be used in any life-endangering applications, including but not limited to medical, nuclear, military, life-critical or any other applications where a failure of the product or any consequences of the use thereof can result in personal injury.