

Product Brief

iMOTION™ IRMCK099

High performance sensor less motor control IC

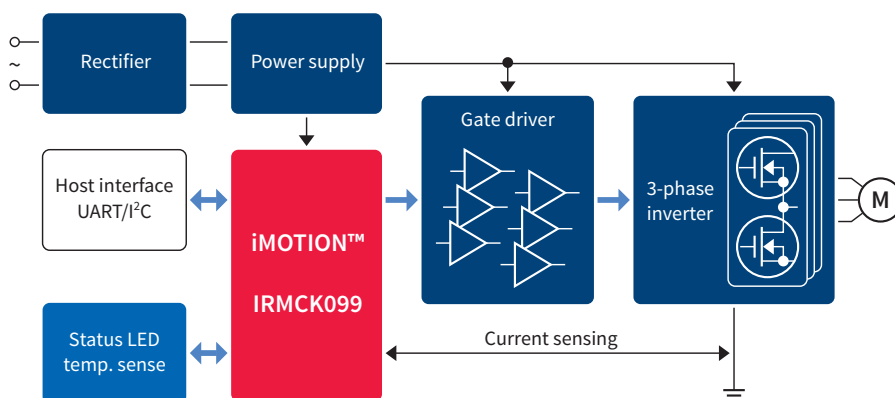
iMOTION™ is a family of highly integrated products for the control of variable speed drives. By integrating both the required hardware and software to perform sensor less control of a Permanent Magnet Synchronous Motor (PMSM) they provide the highest energy efficient appliance motor system with the lowest system cost.

The IRMCK099 is the stand-alone implementation of Infineon's patented and field proven Motion Control Engine (MCE) that eliminates software coding from the motor control algorithm development process. With the help of the IRMCK099 implementing a variable speed drive is reduced to simply configuring the MCE for the respective motor. Assisted by powerful tools like MCEWizard and MCEDesigner it is possible to have the motor up and running in less than an hour.

The MCE implements sensor less field oriented control using single or leg shunt current feedback and uses space vector PWM with sinusoidal signals to provide highest energy efficiency. For applications with specific acoustic requirements the MCE can be tuned for minimum noise.

One IRMCK099 can hold the parameter sets for up to 31 different motors which are identified via their ID. In applications running multiple motors in parallel like a multi copter the IRMCK099 supports a special UART communication scheme that allows the communication to 4 or 6 motors in parallel via a single UART of the application host.

Application block diagram



Key benefits

Ready-to-use solution for variable speed drives based on sensor less Field Oriented Control (FOC) of Permanent Magnet Synchronous Motors (PMSM).

Outstanding customer benefits

- > Fastest time to market
 - No C programming
 - Factory calibrated
 - Easy motor parametrization
- > Lowest BOM cost
 - Integrated A/D converter, OP amps and comparators
 - Single or leg shunt
 - Internal oscillator
- > Patented and field proven Motion Control Engine (MCE)
- > Very wide speed range
- > Multiple motor support
- > Integrated protection features
- > Standby function
- > Tiny 5 x 5 mm² QFN-32

Applications

- > Pumps
- > Fans
- > Drones, copters
- > Home appliances
- > ... any other PMSM drive

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MCEWizard helps to create the concrete motor configuration by guiding the developer through several self-explanatory questions.

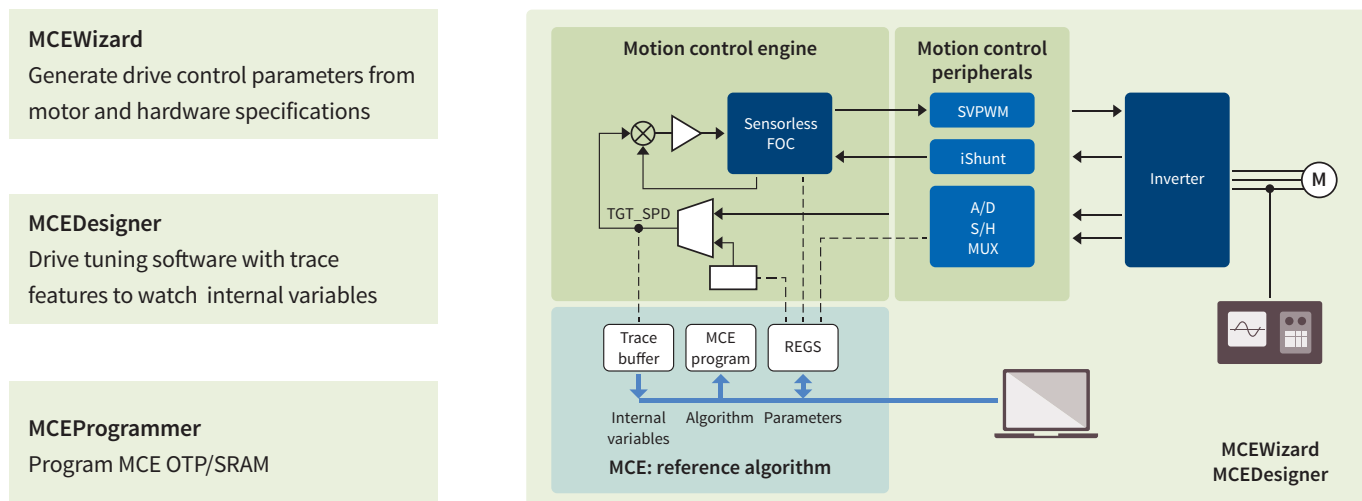
The MCEDesigner is used to program the motor parameter sets and fine-tune to best meet the application requirements.

Using the internal RAM allows an unlimited number of development cycles, while the MCEProgrammer is used to write the firmware and final parameter set into the OTP memory.

An IRMCK099 control card is available for the iMOTION™ MADK development platform.

The IRMCK099 provides several interfaces that can be used to control the speed of the motor in the application and report back the status of the motor drive: UART, an analog or frequency input or setting the on-time of a square wave.

Additional application flexibility is provided via digital and analog IOs that are controlled from an internal state machine and can be used e.g. for Frequency/Pulse Generator (FG/PG) signal, reading temperature values or driving an LED.



Ordering information

Product	SP number	OPN	
IRMCK099M	SP001534150	IRMCK099M	Tray packing, dry pack, 2.450 pcs
IRMCK099MTR	SP001534248	IRMCK099MTR	Tape and reel, dry pack, 3.000 pcs
EVAL-M1-099M	SP001591856	EVALM1099MTOBO1	IRMCK099 control card & MCE Tool V2 & required wires for the iMOTION™ MADK

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