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Product Brief

TMPM370 Vector Motor Controller

Highlights

- ARM® Cortex™-M3 CPU core
  - Hardware multiply and divide logic, including multiply-accumulate and saturated math
  - 1.25 DMIPS/MHz
  - Power-down modes
  - Nested Vectored Interrupt Controller
  - ARM CoreSight™ debug module for non-intrusive real-time system development
    - Serial Wire Debug and Trace
- 256 KB on-chip FLASH
- 8, 16-bit timers
- 2 channels Programmable Motor Driver
  - 3-phase PWM
  - Sync ADC start
- 2 channels encoder input
- Dual 12-bit ADCs with up to 22 inputs
- 4 channels programmable-gain op-amp for motor sensor inputs
- Programmable threshold for sensor comparator inputs and limit values in the ADCs quickly detect abnormal conditions
- Power-on reset, low-voltage detect and oscillator frequency detect analog blocks for reliable operation
- 100-pin LQFP/QFP packages

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Description

The Toshiba TX03 general-purpose Microcontroller family with ARM® Cortex™-M3 processors offers an MCU for every cost/performance point from computation- and memory-intensive DSP applications to cost-sensitive 8-bit MCU upgrades.

The M370 group of motor control MCUs offers fast ARM Cortex-M3 CPUs with hardware acceleration for vector algorithms, along with specialized digital and analog blocks, large memories, lots of I/O and timers for cost-effective embedded systems.

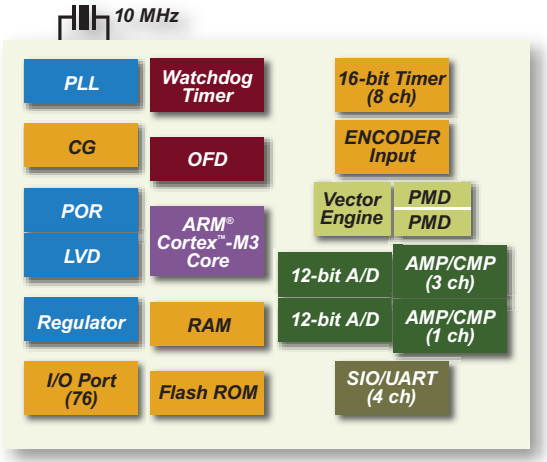
Key Features

- **Fast CPU.** The ARM Cortex-M3 CPU features low power, high code density and 1.25 DMIPS/MHz performance. Hardware multiply and divide instructions are useful for motor control algorithms.
- **Powerful Debug Capability.** The Cortex-M3 CoreSight™ debug module comes equipped with JTAG and Serial Wire View/Trace capability.
- **Dual or Single Motor Control.** The combination of the 80 MHz CPU with hardware vector calculations and autonomous PWM channels give the M370 MCU the throughput needed to control two motors at the same time.
- **IEC60730 Class B Support.** Hardware and software work together to ensure safe and reliable operation.
- **Hardware Vector Engine.** Field-oriented control of AC motors requires extensive mathematical calculations to translate between Id/Iq space and the physical state of the motor. The M370 MCU manages this translation in hardware, freeing up the CPU to run the motor models.
- **Two Programmable Motor Driver Units.** Each unit provide autonomous PWM outputs and synchronizes the A/D conversion of the sensor inputs.
- **Integrated comparators.** Detects out-of-range conditions.
- **Integrated dual 12-bit ADC.** Utilizes programmable gain op-amps for reading motor states.

Key Applications

- Single or Dual AC motor control
- Appliances
- HVAC

TMPM370 Diagram



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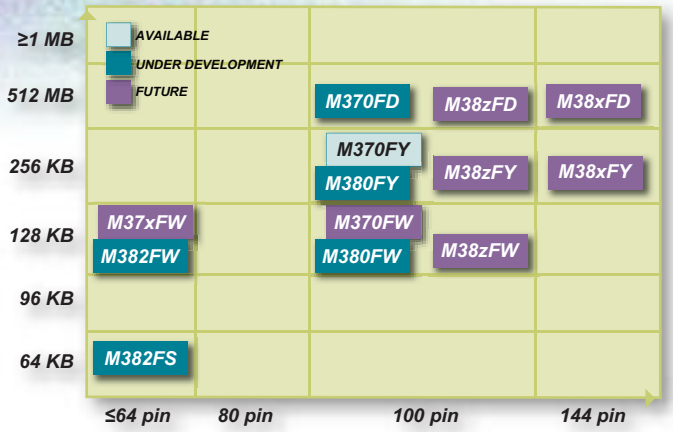
TMPM370 MCU Family with ARM® Cortex™-M3 Cores



Ordering Information

Part Number	ROM (FLASH)	RAM	Package
TMPM370FYDFG	256 KByte	10 KByte	QFP100-P-1420-0.65A
TMPM370FYFG	256 KByte	10 KByte	LQFP100-P-1414-0.5H

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