

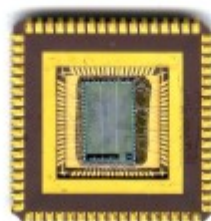
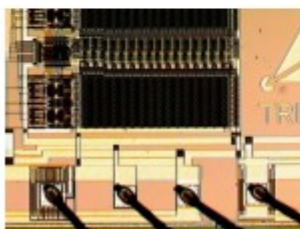
IC PRODUCTS

MOTION CONTROLLER

TRINAMIC: Key Facts



- German Company – privately owned
- Silicon Vendor (fabless) for Motion Control ICs
- Trinamic develops and markets ASSPs:
Application Specific Standard Products
- Trinamic focuses on the market of fractional horse power motion control (Stepper & BLDC)



Integrated Circuits

- Driver
- Motion Controller**
- MOSFETs



Modules for embedded motion control

Mechatronic solutions (PANdrives)

Bus interface converters

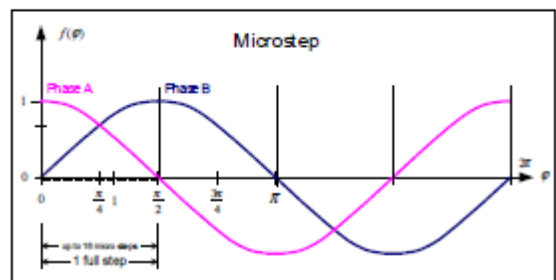
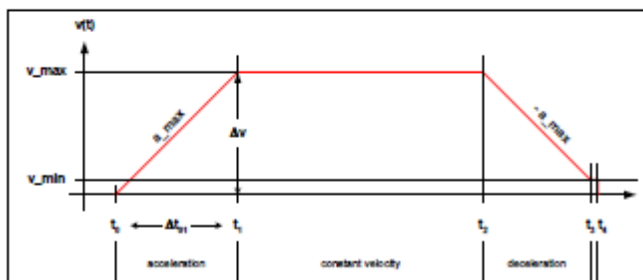
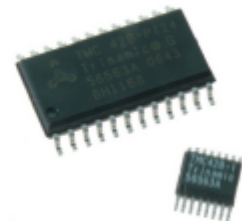


PRODUCT HIGHLIGHT: TMC428

SMALLEST 3-AXIS MOTION CONTROLLER ON THE MARKET

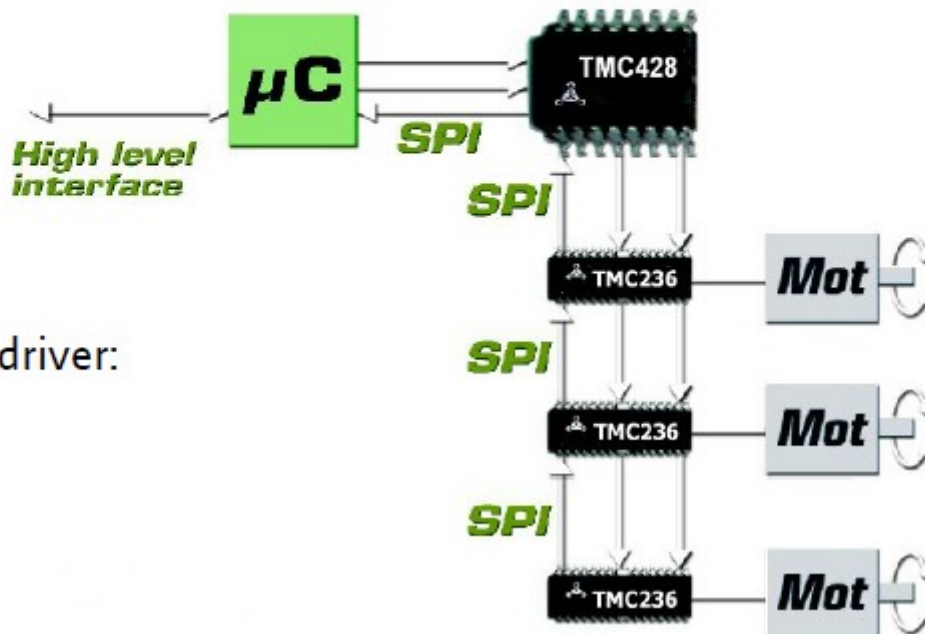
One small component that takes care of the complete motion control task:

- automatic positioning unit
- calculation of acceleration ramps (linear)
- Generation of the μ stepping waveform (1/64 step max)



TMC428 CHIPSET: Principle

SERIAL INTERFACE TO CONTROL STEPPER MOTOR DRIVER (SPI)



suitable driver:

TMC236

TMC239

TMC246

TMC249

TMC428 CHIPSET: Advantages

MOTION CONTROLLER WITH SPI INTERFACE

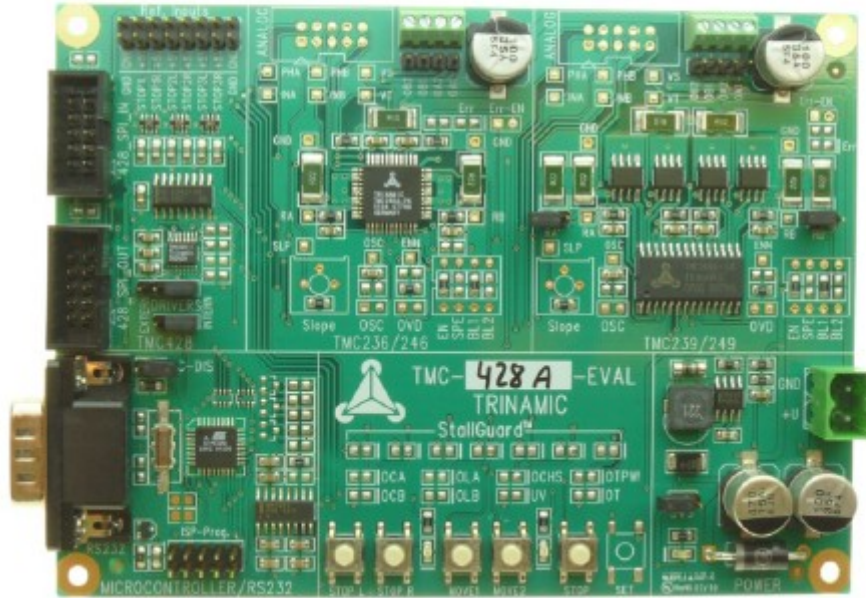
- uses standard serial µ-controller interface (SPI)
- no high performance µ-controller necessary
- all the time critical calculation is done in hardware
- bi-directional interface: diagnosis & protection feedback
- easy multi axis designs
- easy linear interpolation (up to 3 axes)
- miniaturized (SSOP16 package)
- low cost
- only competition: software solution



EVALUATION: TMC428A-EVAL



EVALUATION BOARD FOR SPI CHIPSET

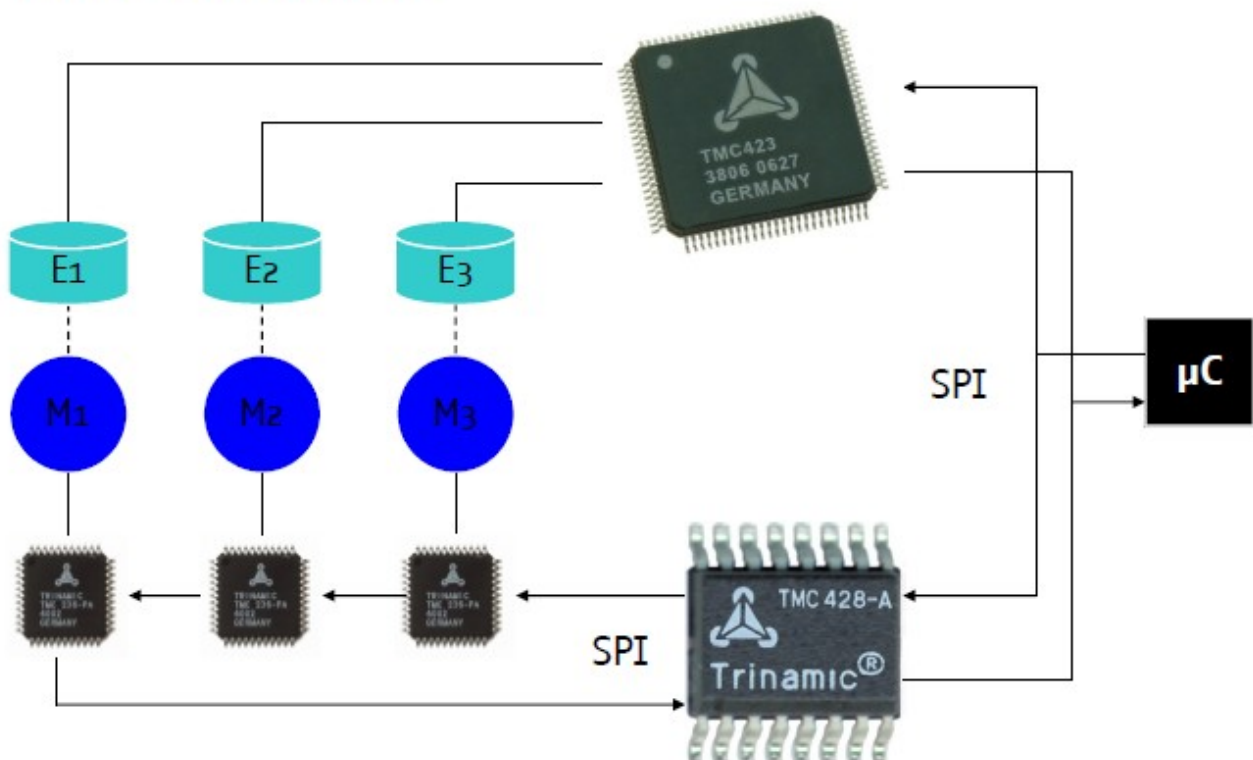


- 1x TMC428
- 1x TMC246A-PA (1A)
- 1x TMC249A-SA (2A)

TMC423: Encoder Interface for SPI-Chipset



TMC428 COMPANION CHIP



TMC222/223: Single Chip Solution

1-AXIS STEPPER MOTOR CONTROLLER & INTEGRATED DRIVER

- controller contains subset of the TMC428
- integrated driver for up to 800 mA
- serial interface: IIC
- smallest solution for one motor
- easy design of flexible decentralised systems
- TMC223 with additional stall detection



OUTLOOK: New Products Q4-2008

INTEGRATED CIRCUITS

TMC457 high-end motion controller for stepper and piezo motors with:

- S-shaped ramps
- encoder feedback for closed loop (**easyPID™**)
- SPI and S/D out
- **chopSync™** for high speed operation
- high resolution (up to 2048 μ steps)

+ **EVALBOARD**



APPLICATIONS: Motion Controller

MULTI AXIS STEPPER MOTOR SOLUTIONS

A lot of designs with the TMC428 are multi axis applications:

- lab automation / biotec / medical equipment
- banking / card reader / POS
- semiconductor equipment
- industrial equipment



blood analyzer



cash recycler / ATM



die bonder



skinning / strip equipment

SUCCESS STORIES

Industry	CCTV / surveillance camera
Application	small dome camera
Product	TMC222 single chip controller/driver
Volume	80.000 pcs. per year
Why Trinamic?	smallest integrated solution on the market



Q&A



If you have questions, please don't hesitate to get in contact with TRINAMIC:

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