



L6474 - easySPIN

Easy, Flexible & Innovative Microstepping

www.st.com/easyspin



.... WHAT's the MERIT against Competition?

➤ **Advanced control with current adaptive decay (ST patented)**

1. PERFORMANCE: smooth microstepping for a silent and soft motion
2. FLEXIBILITY: easy design of "current" control independent on the motor
3. COST: fully integrated solution w/o need of external shunt resistors

➤ **SPI Interface for Diagnostic and Configuration**

1. PERFORMANCE: digital diagnostic
2. FLEXIBILITY: easy configurability w/o hardware modifications
3. COST: no need of passive components to set thresholds, timings, etc.

➤ **Powerful DMOS power stage (0.28ohm RDson)**

1. PERFORMANCE: low dissipation
2. FLEXIBILITY: versatile for a large range of motors
3. COST: compact boards

➤ **Full set of Integrated Protections (OCD, UVLO, THERMAL)**

1. RELIABILITY: short to GND, VCC and load internally protected
2. FLEXIBILITY: easy thresholds configurability thanks to SPI
3. SMALL BOM: no need of ext.components (thermal sens, shunt, comp..)

ST: the Brand for Motor Control

- easySPIN Target Applications



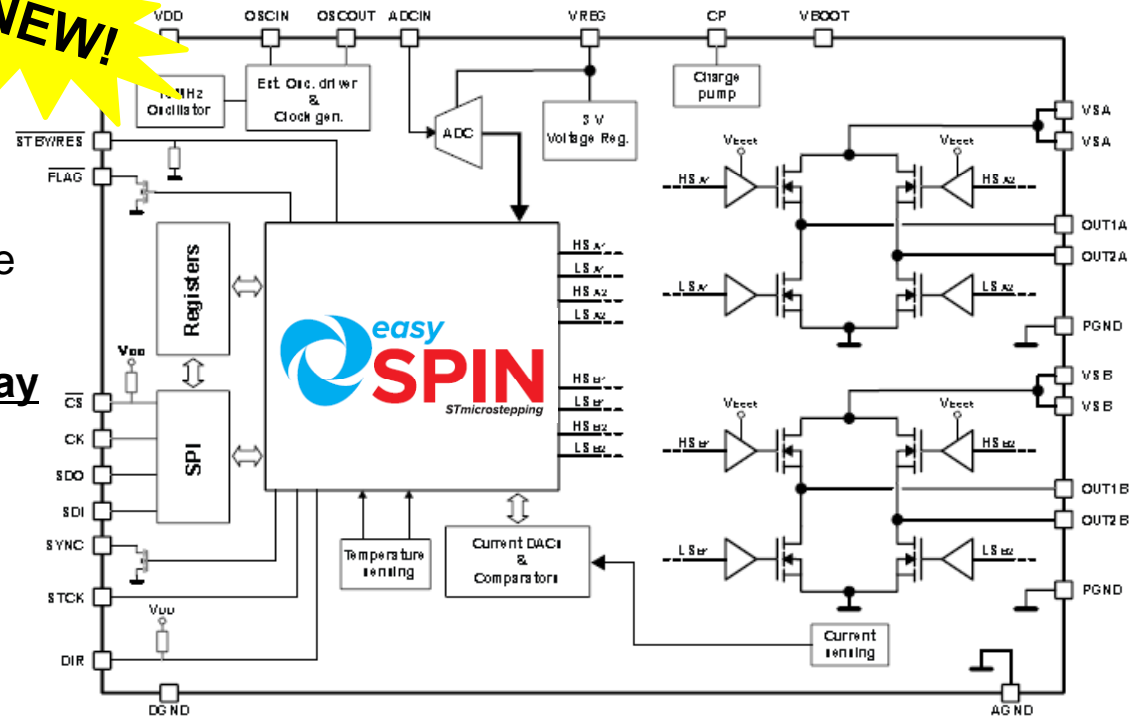
- Factory Automation
 - Pick & Place
 - Servo, Robotics, POS
- ATM systems
 - Label Printers
 - Ticketing
- Vending machine
- Sewing machine
- Printers
 - Laser Printers
 - Thermal Printers
 - Professional Printers
- Medical
 - Diagnostic Equipments
 - Pumps,...
- Automotive
- Stage Lighting
- Casino Machine, Gaming
- Security Camera
- Digital Still Camera
- Robotics
- Satellite and Antennas

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Flexible innovative microstepping motor driver



- Operating voltage: 8 – 45V
- 7.0 A output peak current (3.0 A r.m.s.)
- 0.28ohm RDSon power MOSFETs
- Programmable power MOS slew-rate
- Up to 1/16 microstepping
- Current control with adaptive decay**
- SPI interface**
- Low quiescent and standby currents
- Integrated 5bit ADC
- Non dissipative current sensing
- Full set of Protection**
 - Programmable non dissipative over current (on all power MOS)
 - Two levels over temperature protection
 - UVLO



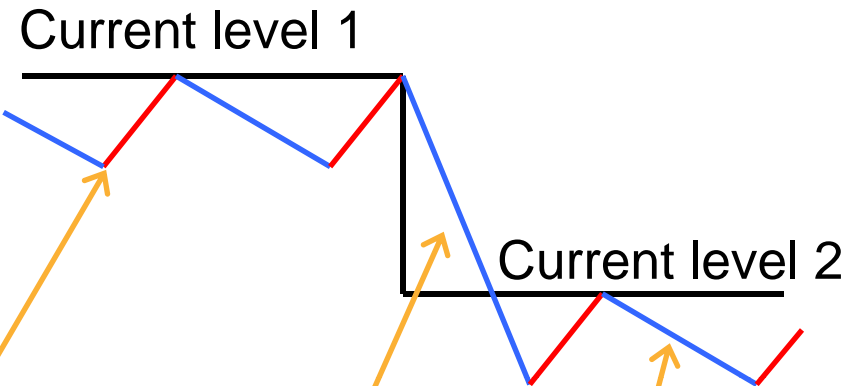
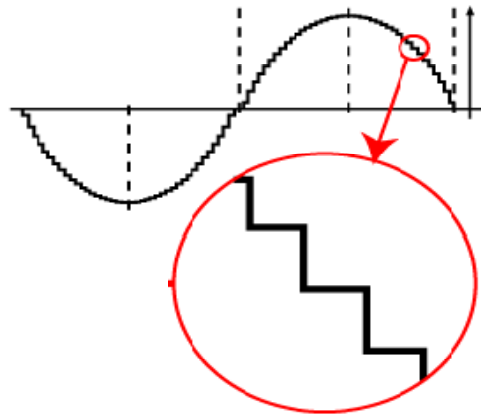
L6474PD



L6474H

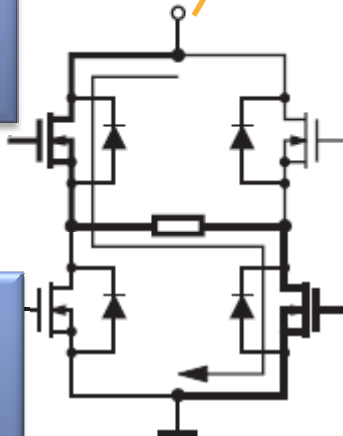
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- Adaptive decay control

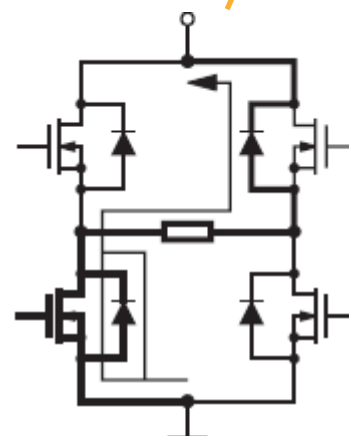


easySPIN automatically performs the best decay mode

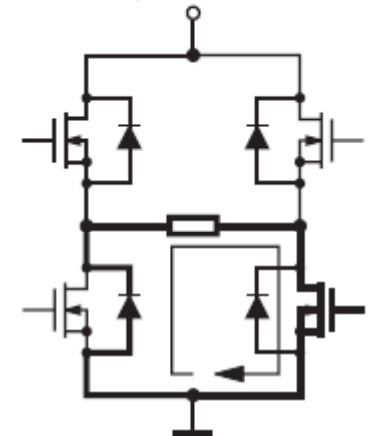
- Torque ripple reduction
- Soft and silent Motion
- Accurate positioning



ON state



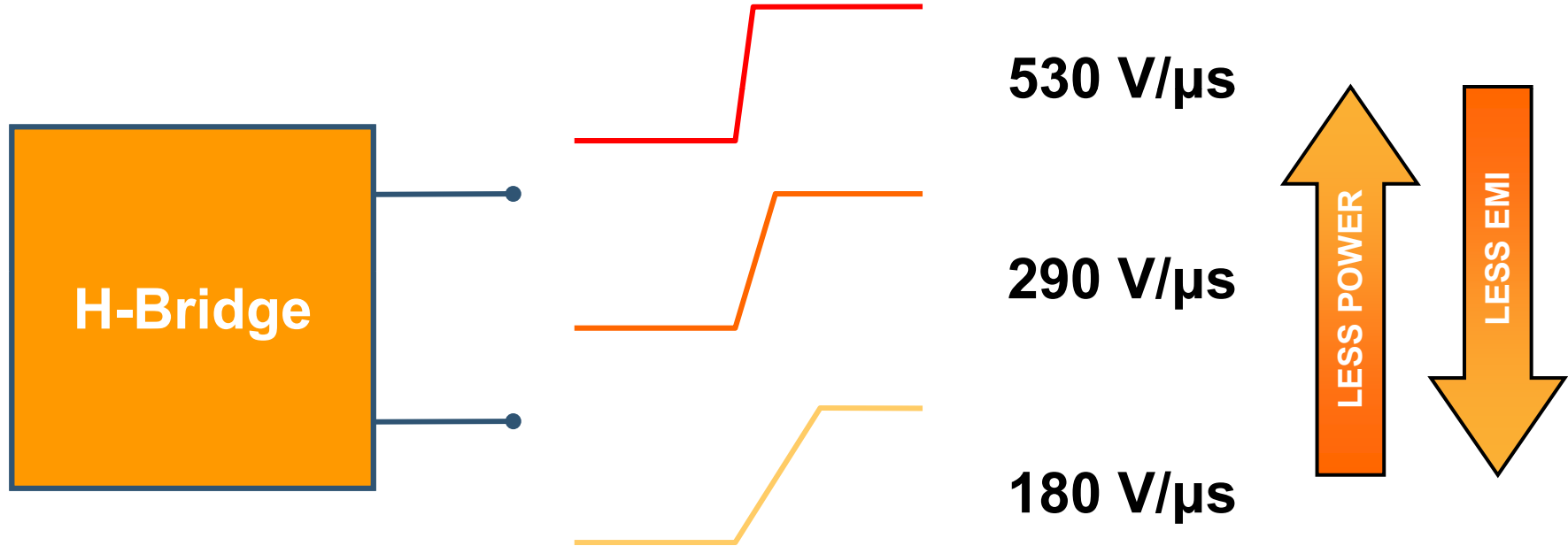
fast decay



slow decay

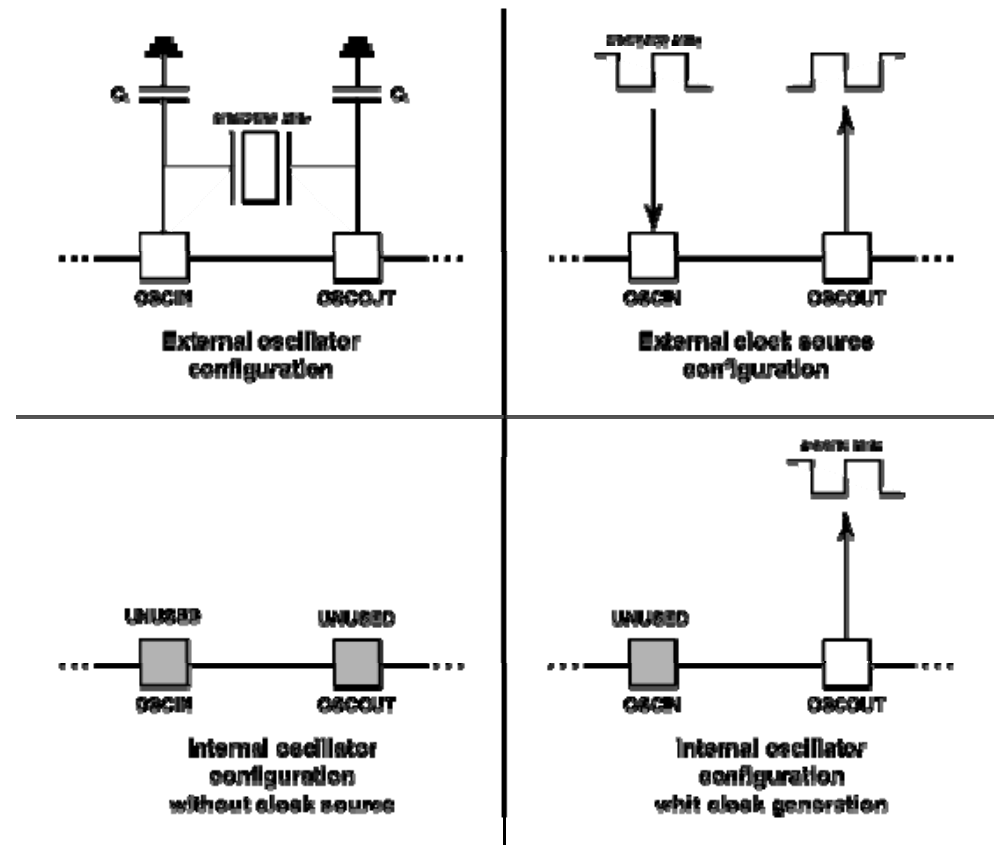


Three output slew-rate values can be selected via SPI in order to fit the application EMI / Power dissipation tradeoff.



Four clock configurations available:

- ✓ Internal clock oscillator
- ✓ Internal clock oscillator with external clock generation (2, 4, 8 or 16 MHz)
- ✓ External clock source (8, 16, 24, or 32MHz)
- ✓ External xtal/resonator (8, 16, 24, or 32MHz)



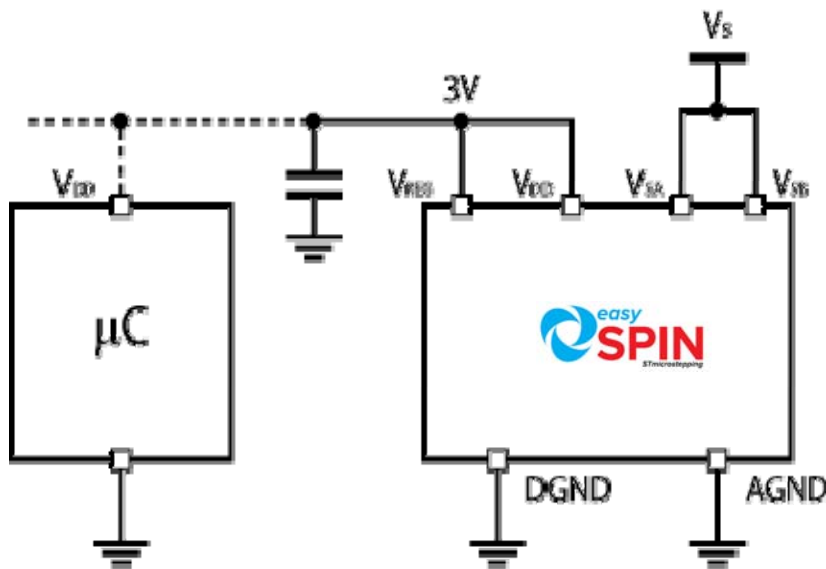
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- Integrated 3V regulator

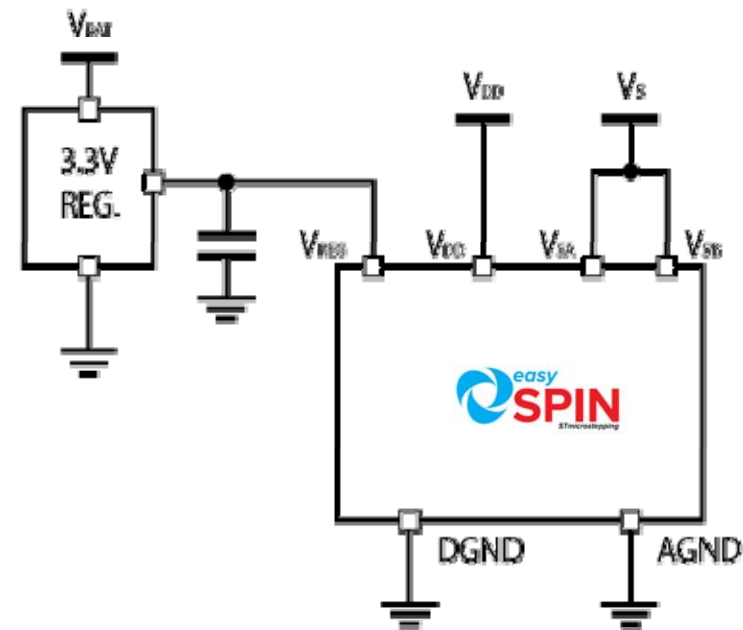


Device logic supply management is also flexible!

1. Supply IC logic through the internal 3V regulator
2. Supply IC logic using an external 3V3 supply
3. Supply external components (e.g. a μC) through the internal voltage regulator



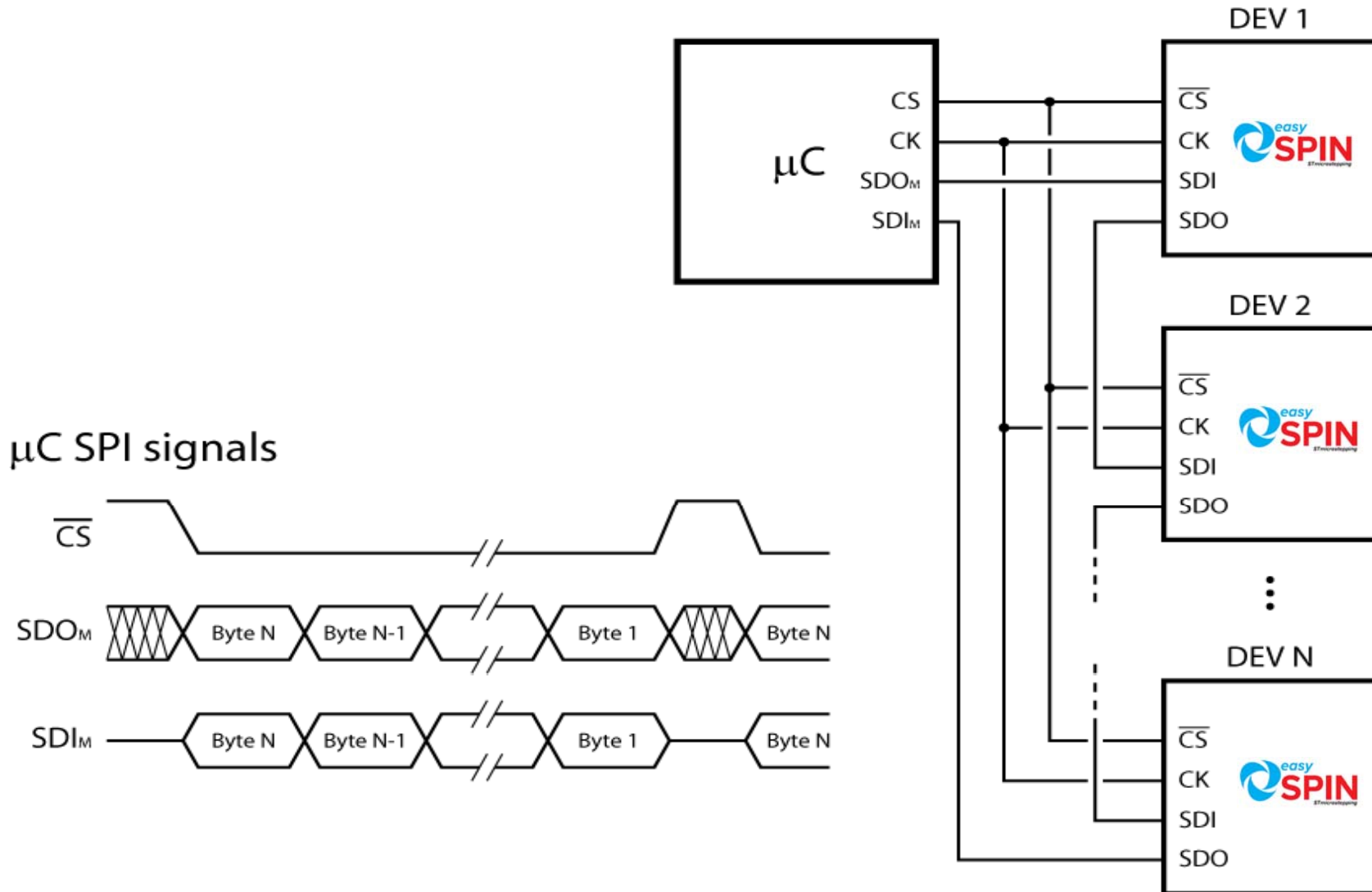
Logic supplied by
INTERNAL voltage regulator



Logic supplied by
EXTERNAL voltage regulator

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- Daisy chain compatibility



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- FLAG PIN: programmable alarm



- FLAG pin can be configured to report following events:
 - Power-up or standby/reset exit
 - Overcurrent detection
 - Thermal warning
 - Thermal shutdown
 - UVLO
 - Switch turn-on event
 - Wrong command
 - Non performable command

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- Register map



Address [Hex]	Register name	Register [bit]	Reset Hex	Reset Value	Remarks(1)	
h01	ABS_POS	Current Position	22	000000	0	R, WR
h02	EL_POS	Electrical Position	22	000000	0	R, WH
h03	MARK	Mark Position	22	000000	0	R, WR
h04 - 08	RESERVED	Reserved address				
h09	TVAL	Reference current	7	29	1.3125A	R, WR
h0A-0D	RESERVED	Reserved address				
h0E	T_FAST	Fast decay/fall step time	8	19	1 μ s / 5 μ s	R, WH
h0F	TON_MIN	Minimum ON time	7	29	20.5 μ s	R, WH
h10	TOFF_MIN	Minimum OFF time	7	29	20.5 μ s	R, WH
h11	RESERVED	Reserved address	8			
h12	ADC_OUT	ADC output	8	29		R
h13	OCD_TH	OCD threshold	4	8	3.38A	R,WR
h14-15	RESERVED	Reserved address				

Abs. position register

Motor electrical position (current μ step) can be set with output disabled

Amplitude of the sine-wave in μ step (or square wave in full step)

Maximum fast decay time / maximum fall step time

Minimum ON / OFF time used by the current control system

Over Current threshold

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- Register map



Address [Hex]	Register name	Register function	Len. [bit]	Reset Hex	Reset Value	Remarks(1)
h16	STEP_MODE	Step mode	8	7	16 μ s	R, WH
h17	ALARM_EN	Alarms enables	8	FF	All alarms enabled	R, WR
h18	CONFIG	IC configuration	16	2E88	Internal oscillator, 2MHz OSCOUT clock, supply voltage compensation disabled, overcurrent shutdown enabled, slew rate = 290V/ μ s, TSW = 40 μ s	R, WH
h19	STATUS	Deceleration Final Slope	16	XXXX	High impedance state, UVLO/Reset flag set	R
h1A-1B	RESERVED					

Device configuration and status

(1) R:Readable, WH: Writable only when outputs are in high impedance, WR: always writable

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High Performance solution with a SMALL BOM!

