▸ Sensorless speed control of DC-motors

E910.94

FEATURES

- Supply voltage range VDD 7V to 16V
- Low standby current typ. 40µA
- Speed regulation using the ripple signal of motor current
- Evaluation of commutation ripple signal
- Fully protected half bridge (slew rate, gate voltage and temperature)
- Overlap free PWM actuation for external power MOS half bridge
- Internal charge pump for 100% actuation
- Adjustable maximum motor voltage
- Conditioning of motor current for external µP and ADC
- Watch dog with emergency function depending on the Kl. 15 signal
- CRASH input for emergency shutoff of pump
- STATUS output for failure analysis
- Over voltage shutdown
- Over temperature shutdown
- –40°C to +125°C operating temperature
- SO 24w package

DESCRIPTION

The IC is designed to control the speed of DC-motors. In order to determine the motor speed the commutation-related ripple of the motor current is evaluated and converted to a 5V digital signal for the µC. The filtered motor current is also buffered and provided to the µC's ADC. Many types of motors can be adapted with appropriate filter design.

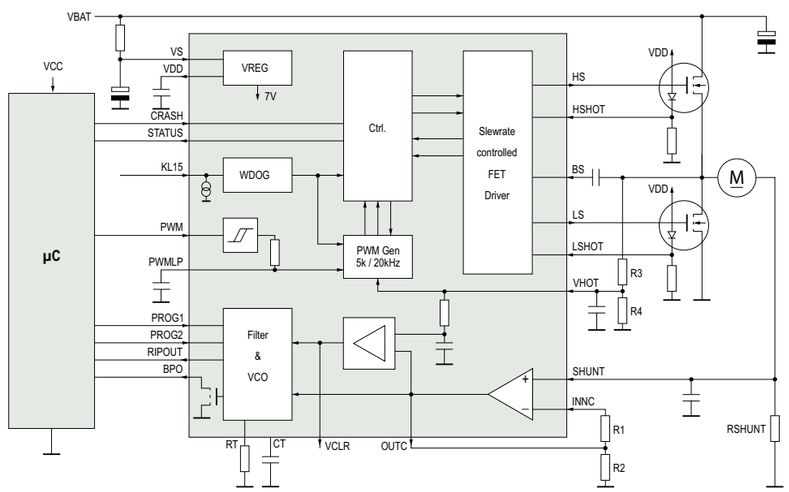
The nominal motor voltage, provided by the µC is converted into a 20kHz PWM signal used to drive the power MOS half bridge. Duty cycle of 100% is possible due to an implemented charge pump.

The CRASH signal immediately stops the motor in case of an error. An over-temperature driver shut down is provided with appropriate TEMPFET transistors. With an integrated power supply and watch dog, an emergency function with maximum motor drive can be realized in case the µC fails.

APPLICATION

- Fuel and hydraulic pumps regulator
- Fan regulator
- Speed regulator

BLOCK DIAGRAM



PINNING

Pin	Name	Description
1	CRASH	Digital input crash signal
2	BPO	Bandpass output
3	VCRL	VCO control voltage
4	OUTC	Current amplifier output
5	INNC	Current amplifier, inverting input
6	SHUNT	Current amplifier, non-inverting input
7	VDD	5 V voltage control output
8	GND	Ground
9	KL15	Signal input Kl. 15
10	LS	Gate output for low side driver
11	VMOT	Input motor voltage
12	LSOT	Over voltage control of low side driver
13	HSOT	Over voltage control of high side driver
14	VBS	I/O for bootstrap voltage
15	HS	Gate output for high side driver
16	VDD2	Positive supply voltage, battery voltage
17	PROG1	Programming of filter gain
18	PROG2	Programming of filter gain
19	RIPOUT	Digital output ripple signal
20	PWM	PWM input motor target value
21	PWMLP	Pin for PWM lowpass capacitor
22	CT	Timing capacitor for VCO
23	RT	Timing resistor for VCO
24	STATUS	Digital output for status signal

PACKAGE