MLX10402

Motor Driver IC

Features and Benefits

- Small package (SOIC16)
- Current limitation
- Low power consumption
- Thermal Overload protection
- Microcontroller compatible

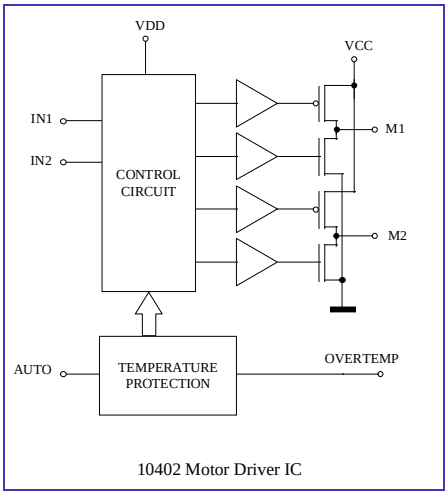
Applications

- Small DC inductive motor driver
- Lamp driver

Ordering Information

Part No.	Temperature Suffix	Package
MLX10402	C (0°C to +70°C)	DF (SOIC 16)

1. Functional Diagram



10402 Motor Driver IC

2. Description

The IC drives directly small DC inductive or active loads like electric motors, lamps, etc. There are four main driving modes. These are set by digital inputs “In1” and “In2” :

IN1	IN2	M1	M2	Driving Mode
1	0	1	0	Forward
0	1	0	1	Reverse
1	1	0	0	Brake (Motor shorted)
0	0	Z	Z	Off (Motor disabled)

The current of the output-drivers is limited for all kinds of overload- and short-circuit conditions and in the whole supply voltage- and temperature range.

The outputs “M1” and “M2” need to be off-chip protected with against motor inductances by standard Si-diodes.

If the temperature of the chip exceeds a certain value (changable with pin “Auto”), the temperature-overload protection-circuit disables the outputs, preventing the chip from being overheated. In addition, this so called “temp ovl”-state is signaled with a low level at the “overtemp”-pin.

Table of Contents

3. Electrical Characteristics

Following characteristics are valid at ± 0°C to 70°C

Characteristics	Test Conditions	Limits			
		Min	Typ	Max	Units
Supply voltage Vcc		5	9	12	V
Supply voltage Vdd		4.5	5.0	5.5	V
Mean motor current	Vcc=9V	330			mA
	Vcc=6V	300			mA
Motor current limit	Vcc=9V			550	mA
	Vcc=6V			500	mA
Brake current	Vcc=9V	240			mA
	Vcc=6V	180			mA
Voltage drop at the 2 output transistors together	Vcc=9V, Icc=300mA			1.2	V
	Vcc=6V, Icc=260mA			1.2	V
Supply current Icc	FORW, REVERSE, BRAKE, TEMP OVL			5.0	mA
	OFF mode			10.0	µA
Supply current Idd	FORW, REVERSE, BRAKE, TEMP OVL			1.0	mA
	OFF mode			10.0	µA
Inputs "In1" & "In2"	Logic level		TTL, 1.4		V
Input "Auto" (Pull up)	Current sourced (if tied to GND)			25	uA
Output "overtemp" (Open DRAIN)	TEMP OK output			HiZ	
	TEMP OVL output @1mA sink			0.4	V

Temperature characteristics

Characteristics	Conditions	Limits			
		Min	Typ	Max	Units
TEMP OVL-Protection turn on Temperature	**1.1.1.1 "Auto" = 1 or floating**		122		°C
	"Auto" = 0		155		°C
TEMP OVL-Protection turn off Temperature	**"Auto" = 1 or floating**		93		°C
	"Auto" = 0		105		°C

4. Absolute Maximum Ratings

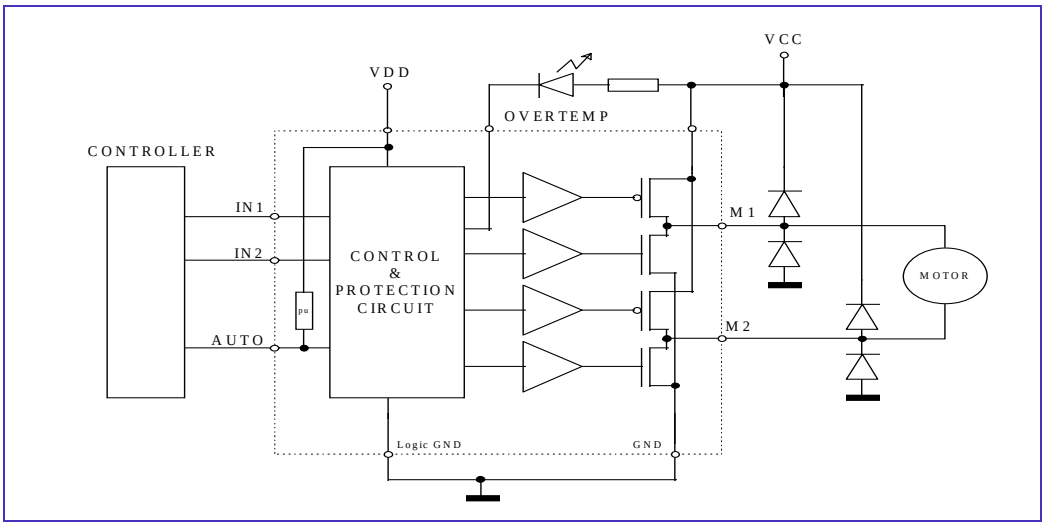
Vcc	+16V
Maximum Output Current	700mA
Die Temperature	+160°C
Storage Temperature	-55°C to 125°C

5. Pin-out

Pin 1:	M2	Pin 16:	AUTO
Pin 2:	VCC	Pin 15:	N.C.
Pin 3:	N.C.	Pin 14:	GND (logic)
Pin 4:	GND	Pin 13:	OVERTEMP
Pin 5:	GND	Pin 12:	VDD
Pin 6:	N.C.	Pin 11:	N.C.
Pin 7:	VCC	Pin 10:	IN1
Pin 8:	M1	Pin 9:	IN2

Note: N.C. = must be "not connected".

6. Typical application circuit



7. Reliability Information

Melexis devices are classified and qualified regarding suitability for infrared, vapor phase and wave soldering with usual (63/37 SnPb-) solder (melting point at 183degC).
The following test methods are applied:

IPC/JEDEC J-STD-020A (issue April 1999)
Moisture/Reflow Sensitivity Classification For Nonhermetic Solid State Surface Mount Devices
CECC00802 (issue 1994)
Standard Method For The Specification of Surface Mounting Components (SMDs) of Assessed Quality
MIL 883 Method 2003 / JEDEC-STD-22 Test Method B102
Solderability

For all soldering technologies deviating from above mentioned standard conditions (regarding peak temperature, temperature gradient, temperature profile etc) additional classification and qualification tests have to be agreed upon with Melexis.

The application of Wave Soldering for SMD's is allowed only after consulting Melexis regarding assurance of adhesive strength between device and board.

For more information on manufacturability/solderability see quality page at our website:
http://www.melexis.com/

8. ESD Precautions

Electronic semiconductor products are sensitive to Electro Static Discharge (ESD).
Always observe Electro Static Discharge control procedures whenever handling semiconductor products.

9. Disclaimer

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Or for additional information contact Melexis Direct:

Europe and Japan:
Phone: +32 13 67 04 95
E-mail: sales_europe@melexis.com

All other locations:
Phone: +1 603 223 2362
E-mail: sales_usa@melexis.com

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