

Features and Benefits

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

Applications

- Small DC inductive motor driver
- Lamp driver

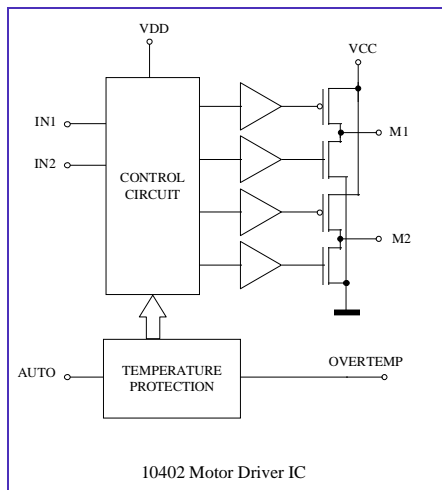
Ordering Information

Part No.
MLX10402

Temperature Suffix
C (0°C to +70°C)

Package
DF (SOIC 16)

1. Functional Diagram



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

Features and Benefits 1

Applications 1

Ordering Information 1

1. Functional Diagram 1

2. Description 1

3. Electrical Characteristics 3

4. Absolute Maximum Ratings 3

5. Pin-out 4

6. Typical application circuit 4

7. Reliability Information 5

8. ESD Precautions 5

9. Disclaimer 6

3. Electrical Characteristics

Following characteristics are valid at $\pm 0^{\circ}\text{C}$ to 70°C

Characteristics	Test Conditions	Limits			Units
		Min	Typ	Max	
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	μA
Output "overtemp" (Open DRAIN)	TEMP OK output			HiZ	
	TEMP OVL output @ 1mA sink			0.4	V

Temperature characteristics

Characteristics	Conditions	Limits			Units
		Min	Typ	Max	
TEMP OVL-Protection turn on Temperature	1.1.1.1 "Auto" = 1 or floating		122		$^{\circ}\text{C}$
	"Auto" = 0		155		$^{\circ}\text{C}$
TEMP OVL-Protection turn off Temperature	"Auto" = 1 or floating		93		$^{\circ}\text{C}$
	"Auto" = 0		105		$^{\circ}\text{C}$

4. Absolute Maximum Ratings

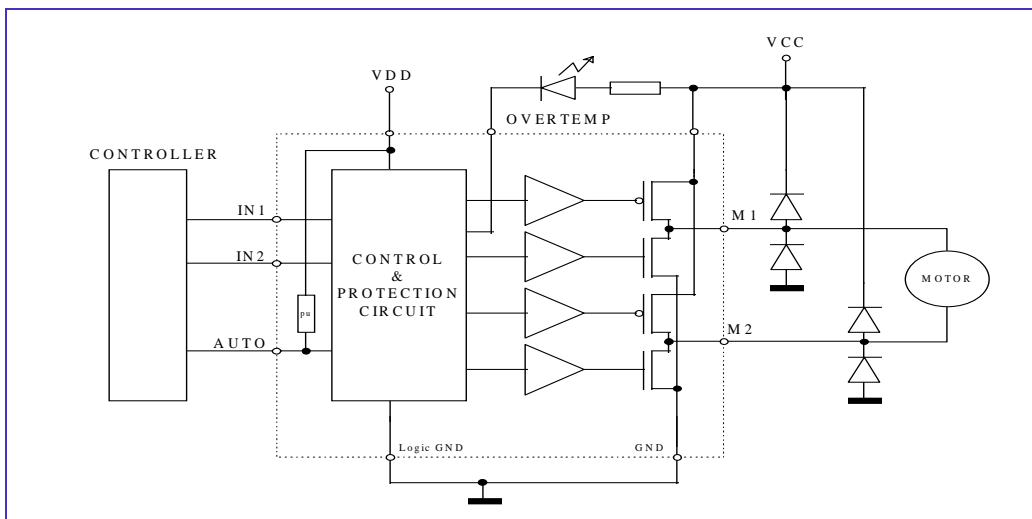
Vcc	+16V
Maximum Output Current	700mA
Die Temperature	+160 $^{\circ}\text{C}$
Storage Temperature	-55 $^{\circ}\text{C}$ to 125 $^{\circ}\text{C}$

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

Devices sold by Melexis are covered by the warranty and patent indemnification provisions appearing in its Term of Sale. Melexis makes no warranty, express, statutory, implied, or by description regarding the information set forth herein or regarding the freedom of the described devices from patent infringement. Melexis reserves the right to change specifications and prices at any time and without notice. Therefore, prior to designing this product into a system, it is necessary to check with Melexis for current information. This product is intended for use in normal commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or life-sustaining equipment are specifically not recommended without additional processing by Melexis for each application.

The information furnished by Melexis is believed to be correct and accurate. However, Melexis shall not be liable to recipient or any third party for any damages, including but not limited to personal injury, property damage, loss of profits, loss of use, interrupt of business or indirect, special incidental or consequential damages, of any kind, in connection with or arising out of the furnishing, performance or use of the technical data herein. No obligation or liability to recipient or any third party shall arise or flow out of Melexis' rendering of technical or other services.

© 2002 Melexis NV. All rights reserved.

For the latest version of this document, go to our website at:

www.melexis.com

Or for additional information contact Melexis Direct:

Europe and Japan:	All other locations:
Phone: +32 13 67 04 95	Phone: +1 603 223 2362
E-mail: sales_europe@melexis.com	E-mail: sales_usa@melexis.com

QS9000, VDA6.1 and ISO14001 Certified