Features

- Six Input Comparators with Schmitt-trigger Characteristics
- Input Clamping Current Capability of ±10 mA
- Integrated Protection Cells (EMC, ESD, RF) Dedicated to All Input Stages
- Common Shutdown by Junction-temperature Monitor
- Reset with Hysteresis at Low Voltage
- ESD Protection According to Human Body Model: ±2000V (C = 100 pF, R = 1.5 kΩ)
- Output Stages:
 - Short-circuit Protected
 - Load-dump Protected at 1 k Ω
 - No Crosstalk on Adjacent Channels
 - Jump Start Possible

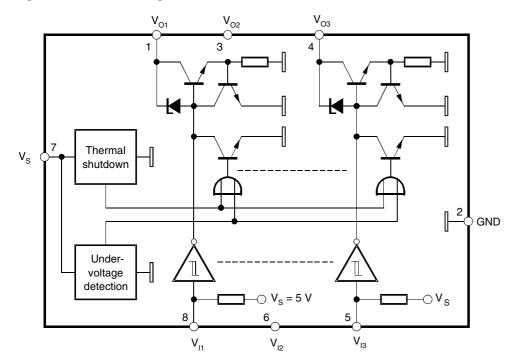


1. Description

The hex driver IC U6805B includes 6 non-inverted and current-limited output stages with an open collector. Common thermal shutdown protects outputs against critical junction temperature.

Each output can sink a current of 20 mA, and parallel output operation is possible. The digital inputs have Schmitt-trigger function with pull-up resistors of up to 5V.

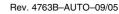
Figure 1-1. Block Diagram





Hex Driver IC with Thermal Monitoring

U6805B







2. Pin Configuration

Figure 2-1. Pinning SO14

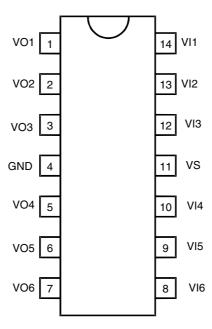


Table 2-1. Pin Description

	2000	Y Y Y
Pin	Symbol	Function
1	VO1	Output 1
2	VO2	Output 2
3	VO3	Output 3
4	GND	Ground
5	VO4	Output 4
6	VO5	Output 5
7	VO6	Output 6
8	VI6	Input 6
9	VI5	Input 5
10	VI4	Input 4
11	VS	Supply voltage, 5V
12	VI3	Input 3
13	VI2	Input 2
14	VI1	Input 1

3. Basic Circuitry

The integrated circuit U6805B requires a stabilized supply voltage ($V_S = 5V \pm 5\%$) to comply with its electrical characteristics. An external buffer capacitor of C = 100 nF is recommended. An integrated 14V Z diode between V_S and ground protects the supply pin.

All input stages are provided with an integrated 250 k Ω pull-up resistor and can be directly connected to a microcontroller.

All output stages are open collectors, each capable of sinking 20 mA. Recommended external components:

Pull-up resistor, $R = 1 \text{ k}\Omega$

Capacitor to GND, C = 470 pF, see Figure 4-1 on page 4

4. Functional Description

4.1 General

ON state: Low level at the input stage activates the corresponding output stage.

OFF state: The internal pull-up resistor provides high level to the input comparator and deactivates the output stage.

7V Zener diodes between each input pin and GND are capable of ±10 mA clamping current without crosstalk on adjacent input stages.

A total clamping current of ±30 mA should be observed with respect to the power dissipation.

4.2 Current Limitation of the Output Stages and Overtemperature Shutdown

A temperature-dependent current limitation in the range of 25 to 100 mA protects the stages in case of a short-circuit. Additionally, the chip temperature is monitored. If $T_{chip} > 148$ °C, all outputs are disabled and automatically enabled with a hysteresis of $\Delta T_{Chip} > 5$ K. Refer to the hex driver U6807B if the temperature shutdown feature is not required.

4.3 Transients and Load Dump

An integrated 28V Zener diode protects each output stage against transients and load dump (Schaffner pulses). With the help of an external 1 k Ω resistor, the output transistor is capable of handling the corresponding current which flows during each of these conditions. Apart from that, the outputs are short-circuit and overload protected.

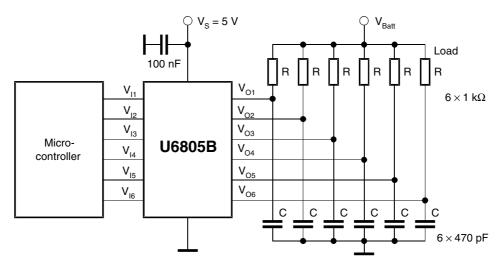
4.4 Low-voltage Detection

When the supply voltage is switched on, a power-on reset pulse is generated internally which disables all output stages until a defined supply-voltage level is reached. The low-voltage detection is provided with a hysteresis of $V_{hyst} = 0.5V$ typically.





Figure 4-1. Application Schematic



5. Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Parameters	Symbol	Value	Unit
Supply voltage	V _S	7.0	V
Ambient temperature range	T _{amb}	-40 to +125	°C
Storage temperature range	T _{stg}	-50 to +150	°C
Maximum junction temperature	T _j	+150	°C

6. Thermal Resistance

Parameters	Symbol Value		Unit	
Junction ambient	R _{thJA}	120	K/W	

7. Electrical Characteristics

 $V_S = 5V \pm 5\%$, $T_{amb} = 27$ °C, reference point pin 4 (GND), unless otherwise specified, see Figure 1-1 on page 1

Parameters	Test Conditions	Symbol	Min.	Тур.	Max.	Unit
Supply, Pin 11		'				
Supply voltage		V _S	4.75		5.25	V
Supply current	Inputs open Inputs switched to GND	I _S	0.8 7		3.2 13	mA mA
Low-voltage detection threshold	ON OFF	$V_{TH(ON)} \ V_{TH(OFF)}$	3.7 3.0		4.6 3.8	V V
Low-voltage hysteresis		V _{hyst}	0.55		1.05	V
Temperature shutdown		T _{Chip}	140		149	°C
Temperature shutdown hysteresis		T _{hyst}	5			°C
Inputs; Pins 8, 9, 10, 12, 13 and 14			•	•	•	
Z-diode protection voltage	I _I = 10 mA	V _I	6.7		8.5	V
Z-diode clamping current		I ₁			±10	mA
Pull-up resistor		R _I	170	250	305	kΩ
Switching threshold	OFF ON	V _I V _I		3.3 1.8		V V
Hysteresis		V_{hyst}		1.5		V
Outputs; Pins 1, 2, 3, 5, 6 and 7						
Z-diode protection voltage	I _O = 10 mA	Vo	26.5			V
Integrated capacitor				5		pF
Leakage current		I _{Leak}			2.5	μΑ
Saturation voltage	I _O = 20 mA	V_{Sat}			0.7	V
Current limitation		I _{limit}	25		100	mA
Propagation delay	470 pF, 1 kΩ, 20V	t _d			5	μs

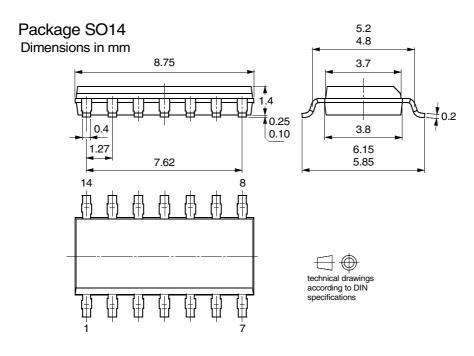




8. Ordering Information

Extended Type Number	Package	Remarks
U6805B-MFPG3Y	SO14	Taped and reeled, Pb-free

9. Package Information



10. Revision History

Please note that the following page numbers referred to in this section refer to the specific revision mentioned, not to this document.

Revision No.	History
	Put datasheet in a new template
4763B-AUTO-09/05	Pb-free logo on page 1 added
	Table "Ordering Information" on page 6 changed



Atmel Corporation

2325 Orchard Parkway San Jose, CA 95131, USA Tel: 1(408) 441-0311 Fax: 1(408) 487-2600

Regional Headquarters

Europe

Atmel Sarl Route des Arsenaux 41 Case Postale 80 CH-1705 Fribourg Switzerland

Tel: (41) 26-426-5555 Fax: (41) 26-426-5500

Asia

Room 1219 Chinachem Golden Plaza 77 Mody Road Tsimshatsui East Kowloon Hong Kong Tel: (852) 2721-9778

Tel: (852) 2721-9778 Fax: (852) 2722-1369

Japan

9F, Tonetsu Shinkawa Bldg. 1-24-8 Shinkawa Chuo-ku, Tokyo 104-0033 Japan

Tel: (81) 3-3523-3551 Fax: (81) 3-3523-7581

Atmel Operations

Memory

2325 Orchard Parkway San Jose, CA 95131, USA Tel: 1(408) 441-0311 Fax: 1(408) 436-4314

Microcontrollers

2325 Orchard Parkway San Jose, CA 95131, USA Tel: 1(408) 441-0311 Fax: 1(408) 436-4314

La Chantrerie BP 70602 44306 Nantes Cedex 3, France Tel: (33) 2-40-18-18-18 Fax: (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards

Zone Industrielle 13106 Rousset Cedex, France Tel: (33) 4-42-53-60-00 Fax: (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd. Colorado Springs, CO 80906, USA

Tel: 1(719) 576-3300 Fax: 1(719) 540-1759

Scottish Enterprise Technology Park Maxwell Building East Kilbride G75 0QR, Scotland

Tel: (44) 1355-803-000 Fax: (44) 1355-242-743

RF/Automotive

Theresienstrasse 2 Postfach 3535 74025 Heilbronn, Germany Tel: (49) 71-31-67-0 Fax: (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd. Colorado Springs, CO 80906, USA

Tel: 1(719) 576-3300 Fax: 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/ High Speed Converters/RF Datacom

Avenue de Rochepleine BP 123

38521 Saint-Egreve Cedex, France

Tel: (33) 4-76-58-30-00 Fax: (33) 4-76-58-34-80

Literature Requests www.atmel.com/literature

Disclaimer: The information in this document is provided in connection with Atmel products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Atmel products. EXCEPT AS SET FORTH IN ATMEL'S TERMS AND CONDITIONS OF SALE LOCATED ON ATMEL'S WEB SITE, ATMEL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ATMEL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ATMEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Atmel makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Atmel does not make any commitment to update the information contained herein. Unless specifically provided otherwise, Atmel products are not suitable for, and shall not be used in, automotive applications. Atmel's products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.

© Atmel Corporation 2005. All rights reserved. Atmel[®], logo and combinations thereof, Everywhere You Are[®] and others, are registered trademarks or trademarks of Atmel Corporation or its subsidiaries. Other terms and product names may be trademarks of others.

