

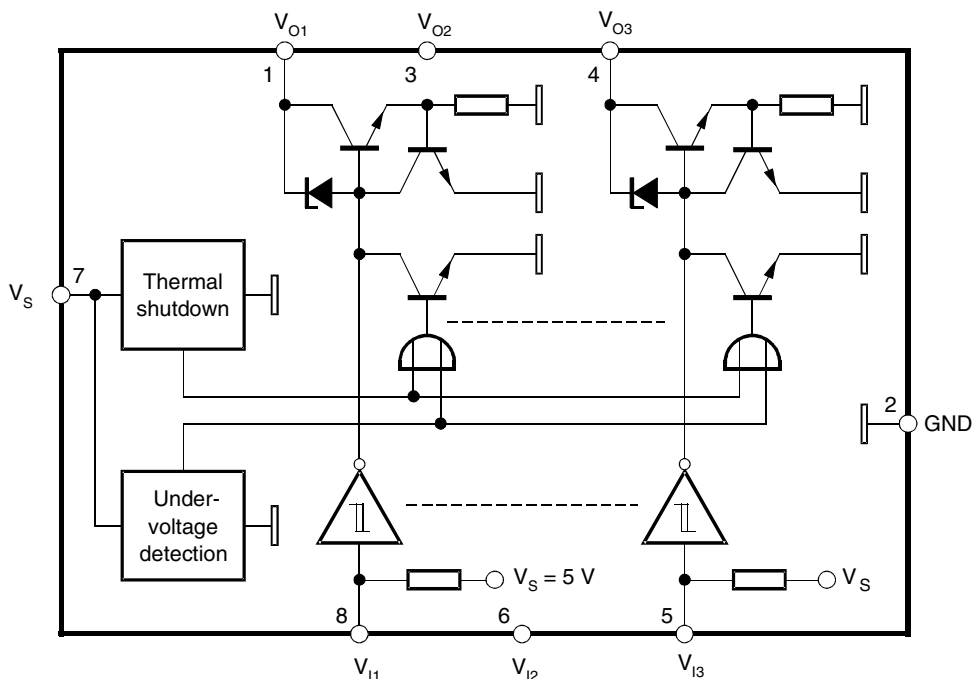
## Features

- Three Input Comparators with Schmitt-trigger Characteristic
- Input Clamping Current Capability of  $\pm 10$  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:  
 $\pm 2000$  V (C = 100 pF, R = 1.5 k $\Omega$ )
- Output Stages:
  - Short-circuit Protected
  - Load-dump Protected at 1 k $\Omega$
  - No Crosstalk on Adjacent Channels
  - Jump Start Possible

## Description

The triple driver IC includes three non-inverted and current-limited output stages with an open collector. Common thermal shutdown protects the outputs against critical junction temperatures. Each output can sink a current of 20 mA, parallel output operation is possible. The digital inputs have Schmitt-trigger function with pull-up resistors to 5 V.

**Figure 1.** Block Diagram

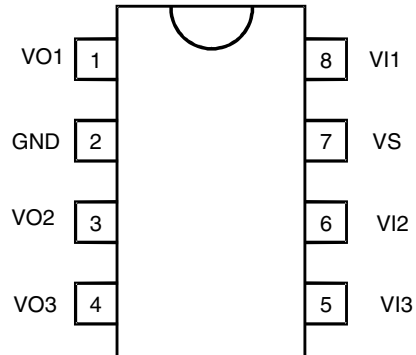


## Triple Driver IC with Thermal Monitoring

## U6803B

## Pin Configuration

**Figure 2.** Pinning SO8



## Pin Description

| Pin | Symbol | Function           |
|-----|--------|--------------------|
| 1   | VO1    | Output 1           |
| 2   | GND    | Ground             |
| 3   | VO2    | Output 2           |
| 4   | VO3    | Output 3           |
| 5   | VI3    | Input 3            |
| 6   | VI2    | Input 2            |
| 7   | VS     | Supply voltage 5 V |
| 8   | VI1    | Input 1            |

## Basic Circuitry

The integrated circuit U6803B requires a stabilized supply voltage ( $V_S = 5\text{ V} \pm 5\%$ ) to comply with its electrical characteristics. An external buffer capacitor of  $C = 100\text{ nF}$  is recommended. An integrated 14 V Zener diode between  $V_S$  and ground protects the supply pin.

All input stages are provided with an integrated 250 k $\Omega$  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,  $C = 470\text{ pF}$ , see Figure 3 on page 4

## Functional Description

### General

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

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

7 V Zener diodes between each input pin and GND are capable of  $\pm 10\text{ mA}$  clamping currents without crosstalk on adjacent input stages.

A total clamping current of  $\pm 30\text{ mA}$  should be observed with respect to the power dissipation.

### 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. Additionally, the chip temperature is monitored. For  $T_{\text{Chip}} > 148^\circ\text{C}$ , all outputs are disabled and automatically enabled with a hysteresis of  $T_{\text{Chip}} > 5^\circ\text{C}$ .

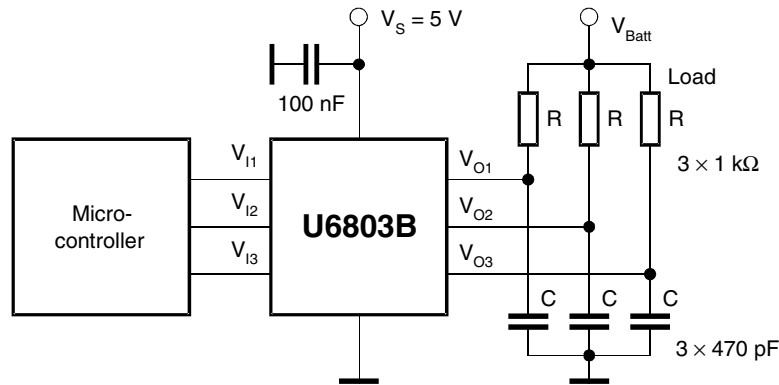
### Transients and Load Dump

An integrated 28 V Zener diode protects each output stage against transients and load-dump (Schaffner pulses). With the help of an external 1 k $\Omega$  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.

### 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  $V_{\text{hyst}} = 0.5\text{ V}$  typically.

**Figure 3. Application Schematic**



## 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    | $T_{\text{amb}}$ | -40 to +125 | °C   |
| Storage temperature range    | $T_{\text{stg}}$ | -50 to +150 | °C   |
| Maximum junction temperature | $T_J$            | +150        | °C   |

## Thermal Resistance

| Parameters       | Symbol            | Value | Unit |
|------------------|-------------------|-------|------|
| Junction ambient | $R_{\text{thJA}}$ | 160   | K/W  |

## Electrical Characteristics

$V_S = 5\text{ V} \pm 5\%$ ,  $T_{\text{amb}} = 27^\circ\text{C}$ , reference point pin 2 (GND), unless otherwise specified, see Figure 1 on page 1 and Figure 3 on page 4

| Parameters                      | Test Conditions                     | Symbol               | Min. | Typ. | Max.     | Unit             |
|---------------------------------|-------------------------------------|----------------------|------|------|----------|------------------|
| <b>Supply, Pin 7</b>            |                                     |                      |      |      |          |                  |
| Supply voltage                  |                                     | $V_S$                | 4.75 |      | 5.25     | V                |
| Supply current                  | Inputs open                         | $I_S$                | 0.8  |      | 3.2      | mA               |
|                                 | Inputs closed to GND                | $I_S$                | 7    |      | 13       | mA               |
| Low-voltage detection threshold | ON                                  | $V_{\text{TH(ON)}}$  | 3.7  |      | 4.6      | V                |
|                                 | OFF                                 | $V_{\text{TH(OFF)}}$ | 3.0  |      | 3.8      | V                |
| Low-voltage hysteresis          |                                     | $V_{\text{hyst}}$    | 0.55 |      | 1.05     | V                |
| Temperature shutdown            |                                     | $T_{\text{Chip}}$    | 140  |      | 149      | $^\circ\text{C}$ |
| Temperature shutdown hysteresis |                                     | $T_{\text{hyst}}$    | 5    |      |          | $^\circ\text{C}$ |
| <b>Input; Pins 5, 6, 8</b>      |                                     |                      |      |      |          |                  |
| Zener-diode protection voltage  | $I_I = 10\text{ mA}$                | $V_I$                | 6.7  |      | 8.5      | V                |
| Zener-diode clamping current    |                                     | $I_I$                |      |      | $\pm 10$ | mA               |
| Pull-up resistor                |                                     | $R_I$                | 170  | 250  | 305      | $\text{k}\Omega$ |
| Switching threshold             | OFF                                 | $V_I$                |      | 3.3  |          | V                |
|                                 | ON                                  | $V_I$                |      | 1.8  |          | V                |
| Hysteresis                      |                                     | $V_{\text{hyst}}$    |      | 1.5  |          | V                |
| <b>Output; Pins 1, 3, 4</b>     |                                     |                      |      |      |          |                  |
| Zener-diode protection voltage  | $I_O = 10\text{ mA}$                | $V_O$                | 26.5 |      |          | V                |
| Integrated capacitor            |                                     |                      |      | 5    |          | pF               |
| Leakage current                 |                                     | $I_{\text{Leak}}$    |      |      | 2.5      | $\mu\text{A}$    |
| Saturation voltage              | ( $I_O = 20\text{ mA}$ )            | $V_{\text{Sat}}$     |      |      | 0.7      | V                |
| Current limitation              |                                     | $I_{\text{limit}}$   | 25   |      | 100      | mA               |
| Propagation delay               | (470 pF, 1 $\text{k}\Omega$ , 20 V) | $t_d$                |      |      | 5        | $\mu\text{s}$    |

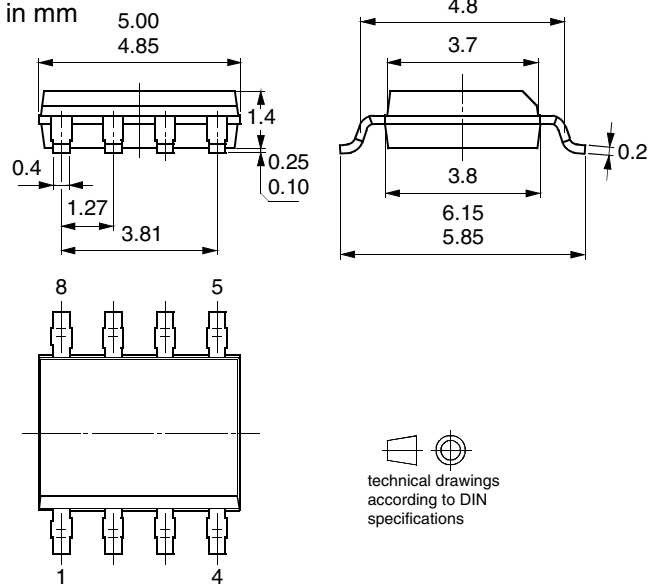
## Ordering Information

| Extended Type Number | Package | Remarks          |
|----------------------|---------|------------------|
| U6803B-MFP           | SO8     | Tube             |
| U6803B-MFPG3         | SO8     | Taped and reeled |

## Package Information

### Package SO8

Dimensions in mm





## 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  
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  
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Colorado Springs, CO 80906, USA  
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Fax: 1(719) 540-1759

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Maxwell Building  
East Kilbride G75 0QR, Scotland  
Tel: (44) 1355-803-000  
Fax: (44) 1355-242-743

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

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Fax: (33) 4-76-58-34-80

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4762A-AUTO-11/03