

## 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:  
 $\pm 2000\text{V}$  ( $C = 100$  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**



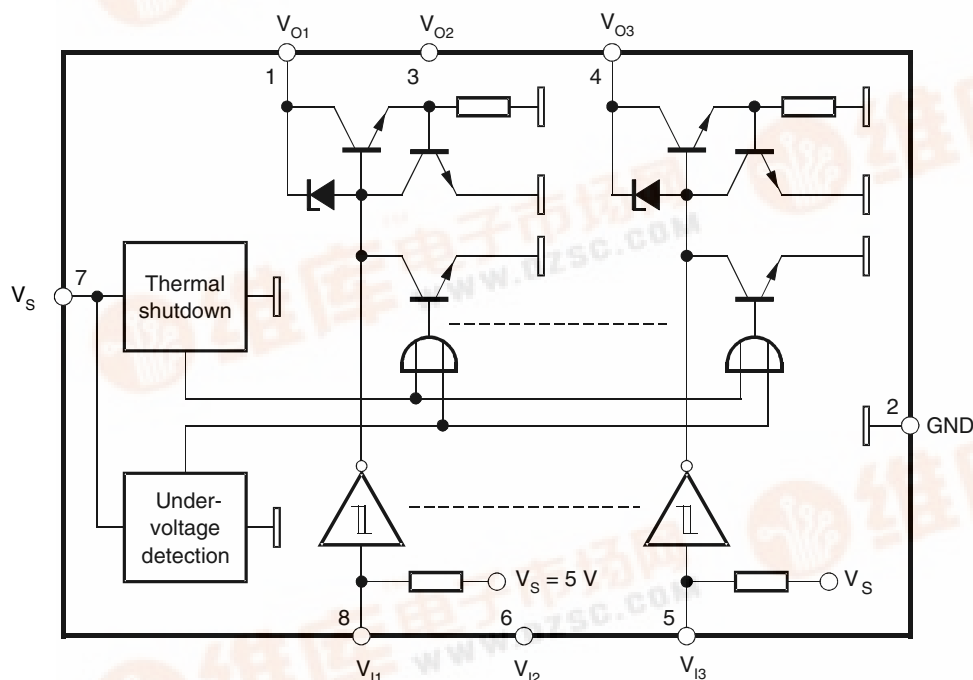
# Triple Driver IC with Thermal Monitoring

**U6803B**

## 1. Description

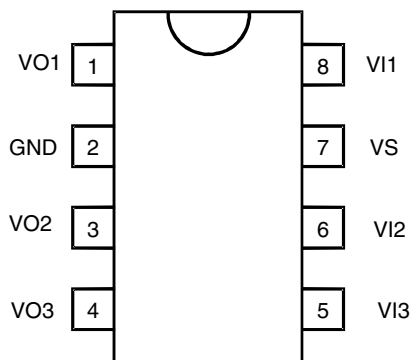
The triple driver IC includes three non-inverted and current-limited output stages with an open collector. Common thermal shutdown protects the outputs against critical junction temperatures. Each output can sink a current of 20 mA, parallel output operation is possible. The digital inputs have Schmitt-trigger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

**Figure 1-1.** Block Diagram



## 2. Pin Configuration

**Figure 2-1.** Pinning SO8



**Table 2-1.** 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 5V
8	VI1	Input 1

## 3. Basic Circuitry

The integrated circuit U6803B requires a stabilized supply voltage ( $V_S = 5V \pm 5\%$ ) to comply with its electrical characteristics. An external buffer capacitor of  $C = 100 \text{ nF}$  is recommended. An integrated 14V 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 4-1 on page 3](#)

## 4. Functional Description

### 4.1 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.

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

A total clamping current of  $\pm 30$  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 mA 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  $T_{\text{Chip}} > 5^\circ\text{C}$ .

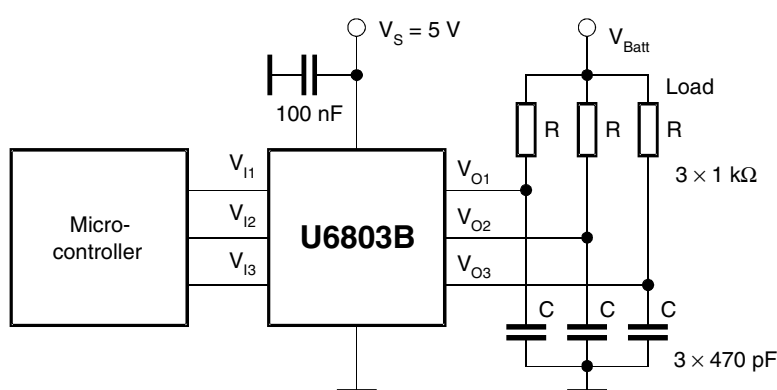
### 4.3 Transients and Load Dump

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

### 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  $V_{\text{hyst}} = 0.5\text{V}$  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	$R_{thJA}$	160	K/W

## 7. Electrical Characteristics

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

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	$V_{TH(ON)}$	3.7		4.6	V
	OFF	$V_{TH(OFF)}$	3.0		3.8	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
<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	k $\Omega$
Switching threshold	OFF	$V_I$		3.3		V
	ON	$V_I$		1.8		V
Hysteresis		$V_{hyst}$		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		$I_{Leak}$			2.5	$\mu\text{A}$
Saturation voltage	( $I_O = 20\text{ mA}$ )	$V_{Sat}$			0.7	V
Current limitation		$I_{limit}$	25		100	mA
Propagation delay	(470 pF, 1 k $\Omega$ , 20V)	$t_d$			5	$\mu\text{s}$

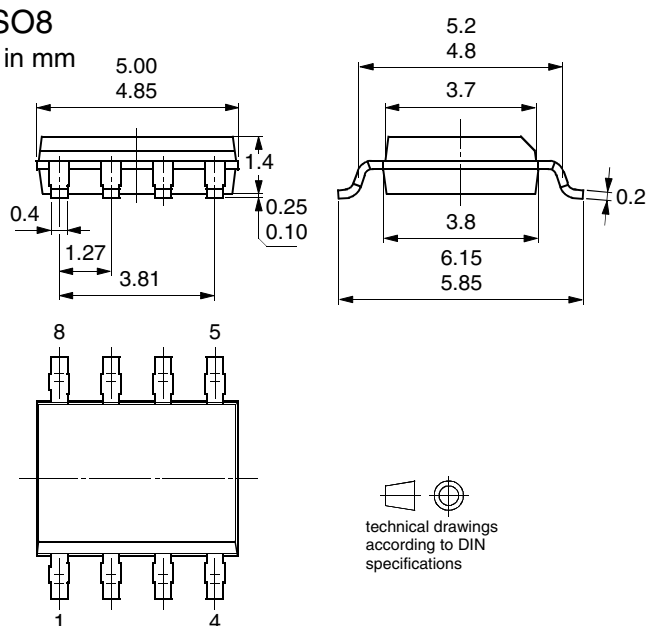
## 8. Ordering Information

Extended Type Number	Package	Remarks
U6803B-MFPY	SO8	Tube, Pb-free
U6803B-MFPG3Y	SO8	Taped and reeled, Pb-free

## 9. Package Information

### Package SO8

Dimensions in mm



## 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
4762B-AUTO-09/05	<ul style="list-style-type: none"> <li>Put datasheet in a new template</li> <li>Pb-free Logo on page 1 added</li> <li>Ordering Information on page 5 changed</li> </ul>



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