

## Relay Hex-Driver

### Description

The U6806B hexdriver IC includes six non-inverted output stages with an open collector. Common thermal shutdown protects outputs against critical junction temperature. Each output can sink 250 mA.

Parallel output operation is possible. The digital inputs have Schmitt-Trigger function with pull-up current sources to 5 V.

### Features

- Six input comparators with Schmitt-trigger characteristic
- Input clamping current capability to  $\pm 10$  mA
- Integrated protection cells (EMC, ESD, RF) dedicated to all input stages
- Common shutdown by junction temperature monitor
- Low voltage reset with hysteresis
- ESD protection to human body model:  $\pm 2000$  V ( $C = 100$  pF,  $R = 1.5$  k $\Omega$ )
- Relay output stages:
  - No crosstalk on adjacent channels
  - Integrated 28-V Zener-diodes
  - Jump start possible

### Ordering Information

Extended Type Number	Package	Remarks
U6806B-FL	SO20 Batwing	

### Block Diagram

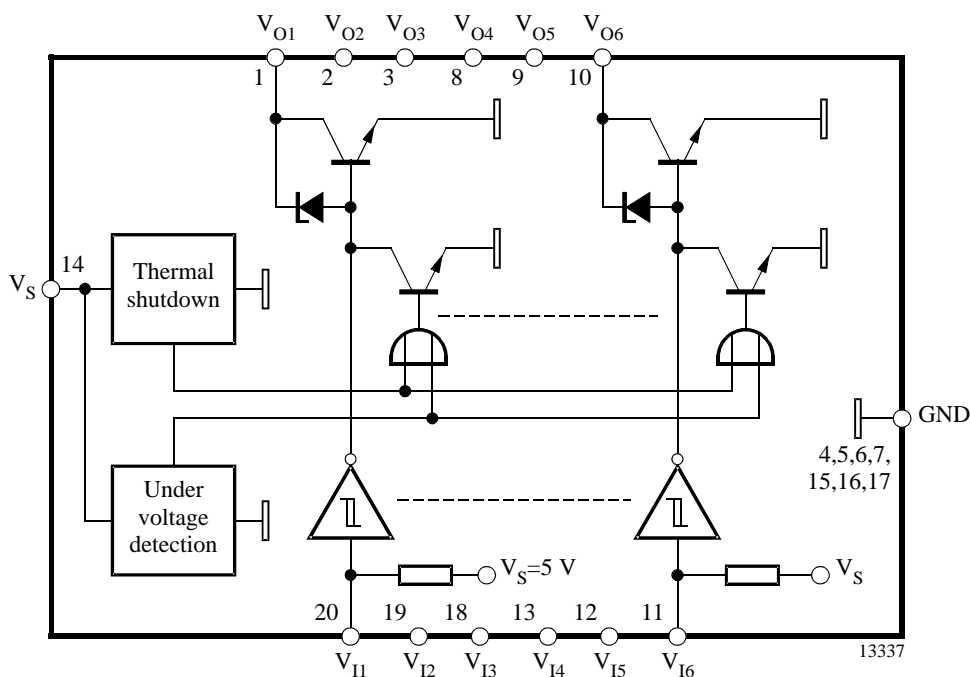
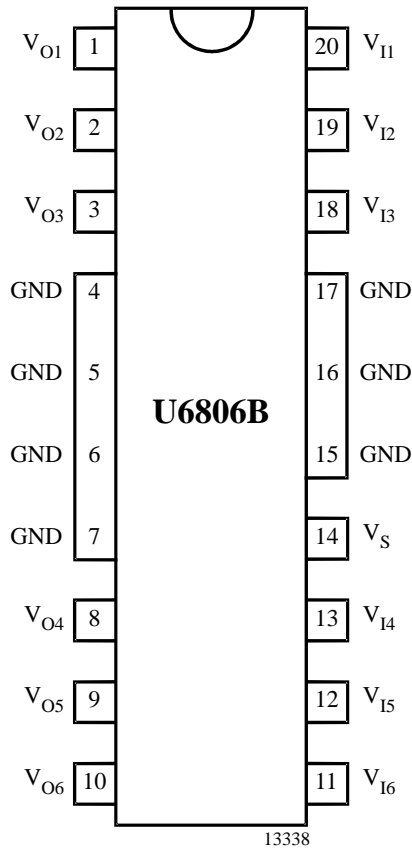


Figure 1. Block diagram

## Pin Description



Pin	Symbol	Function
1	V <sub>O1</sub>	Output 1
2	V <sub>O2</sub>	Output 2
3	V <sub>O3</sub>	Output 3
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	V <sub>O4</sub>	Output 4
9	V <sub>O5</sub>	Output 5
10	V <sub>O6</sub>	Output 6
11	V <sub>I6</sub>	Input 6
12	V <sub>I5</sub>	Input 5
13	V <sub>I4</sub>	Input 4
14	V <sub>S</sub>	Supply voltage 5 V
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	V <sub>I3</sub>	Input 3
19	V <sub>I2</sub>	Input 2
20	V <sub>I1</sub>	Input 1

## Basic Circuitry

The integrated circuit, U6806B, requires a stabilized supply voltage ( $V_S = 5\text{ V} \pm 5\%$ ) to comply with its electrical characteristics. An external buffer capacitor of  $C = 100\text{ nF}$  value 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-collector types each capable of sinking 250 mA to drive relays with a coil resistance of  $R = 80\ \Omega$  (see figure 2).

The integrated Zener-diodes limit inductive surges, external free wheeling diodes are **not** necessary.

## Functional Description

### General

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

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

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

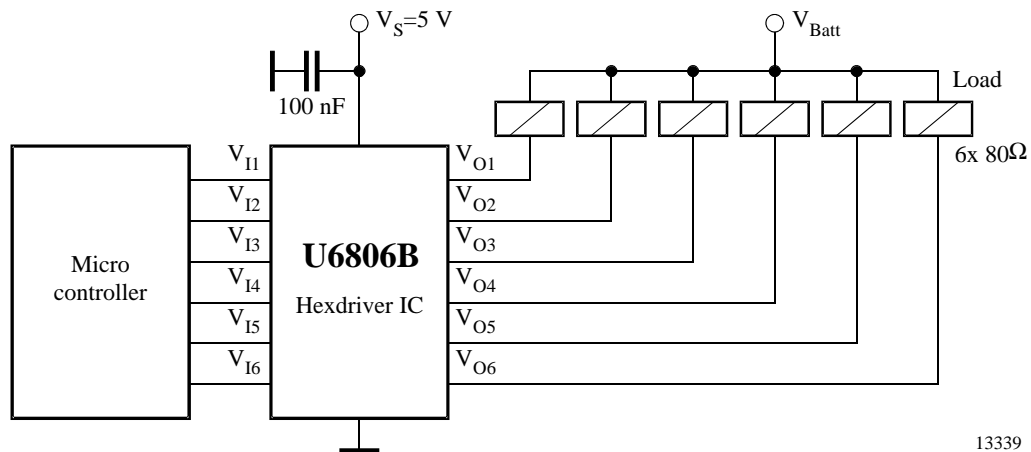
A total clamping current of  $\pm 30$  mA should be observed with respect to the power dissipation.

### Overtemperature Shut-Down

For  $T_{\text{chip}} > 148^\circ\text{C}$  all outputs are disabled and automatically enabled with a hysteresis of  $T_{\text{Chip}} > 5^\circ\text{C}$ .

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



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Figure 2. Application schematic

## Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
Supply voltage range	$V_S$	4.75 to 5.25	V
Ambient temperature range	$T_{amb}$	- 40 to + 100	°C
Storage temperature range	$T_{stg}$	- 50 to + 150	°C
Maximum junction temperature	$T_j$	+ 150	°C

## Thermal Resistance

Parameters	Symbol	Maximum	Unit
Junction case	$R_{thJC}$	15	K/W

## Electrical Characteristics

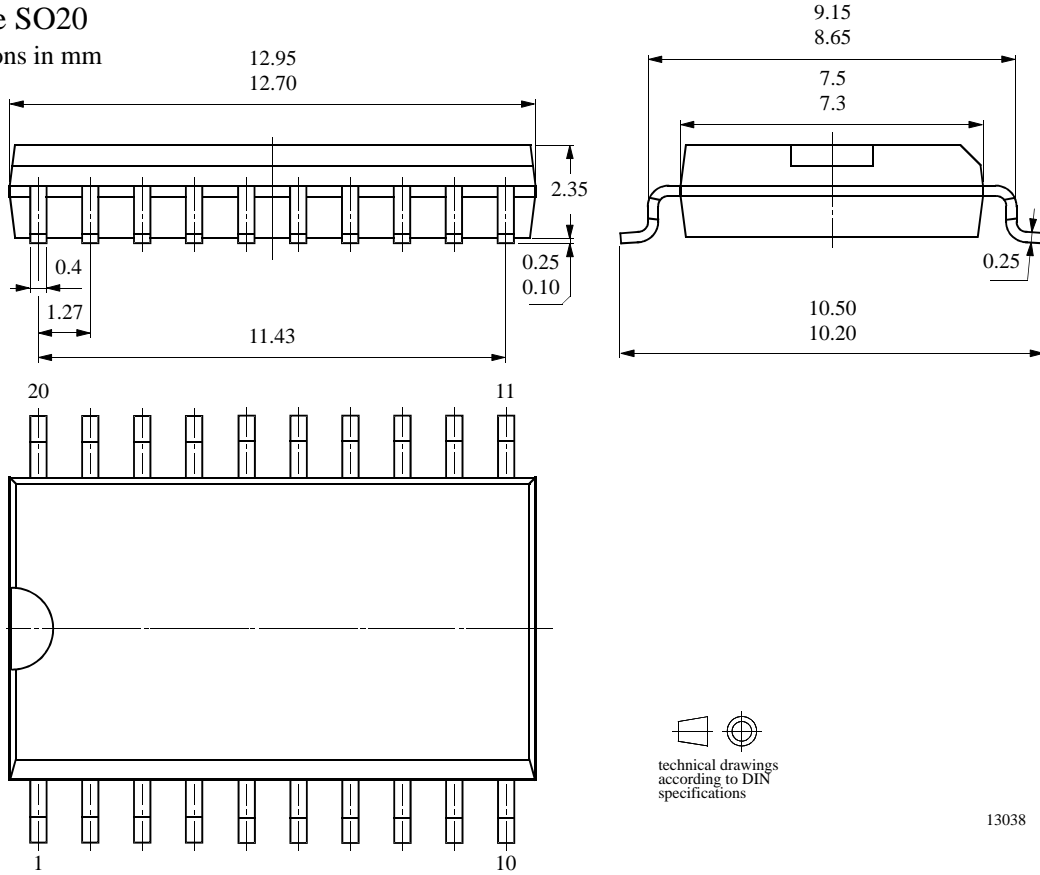
$V_S = 5\text{ V} \pm 5\%$ ,  $T_{amb} = 27^\circ\text{C}$ , reference point Pin 4 (GND), unless otherwise specified, see figure 1.


Parameters	Test Conditions / Pin	Symbol	Min	Typ	Max	Unit
Supply Pin 14						
Supply voltage		$V_S$	4.75		5.25	V
Supply current	Inputs open/closed to GND	$I_S$	0.8		3.2	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 shut down		$T_{Chip}$	140		149	°C
Temperature shut down hysteresis		$T_{hyst}$	5			°C
Input Pins 11, 12, 13, 18, 19 and 20						
Z-diode protection voltage		$V_I$	6.7		8.5	V
Z-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
Output Pins 1, 2, 3, 8, 9 and 10						
Z-diode protection voltage		$V_O$	26.5			V
Leakage current		$I_{Leak}$			2.5	$\mu\text{A}$
Saturation voltage	$I_O = 250\text{ mA}$	$V_{Sat}$			1.5	V
Output current		$I_O$			250	mA

**Package Information**

Package SO20

Dimensions in mm



  
technical drawings  
according to DIN  
specifications

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2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

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1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

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