



# U4790B

## Automotive Lamp-Outage Monitor, $V_T = 8\text{ mV}$ , $V_{Z(3,5)} = 22\text{V}$

### Description

The bipolar IC U4790B is designed as a monitor for lamp failure in automobiles. The comparator threshold is matched to the PTC characteristic of incandescent lamps. The threshold is tied to a typical value of  $V_{4,6} = V_S - V_T$  where  $V_T = 8\text{ mV}$ .

If the voltage drop across shunt resistor,  $R_{sh}$ , exceeds  $8\text{ mV}$ , the output is turned off, otherwise the output is turned on. Without supply voltage or open input Pin 8, the output is turned off. An unused comparator input must be connected to Pin 7.

### Features

- 10 kV-ESD protection
- Two comparators with common reference
- Tight threshold tolerance
- Threshold matched to PTC characteristic of incandescent lamps
- Temperature compensated
- NPN output
- Interference and damage-protection according to VDE 0839
- EMI protection
- Reversal polarity protection
- Load-dump protection

### Block Diagram

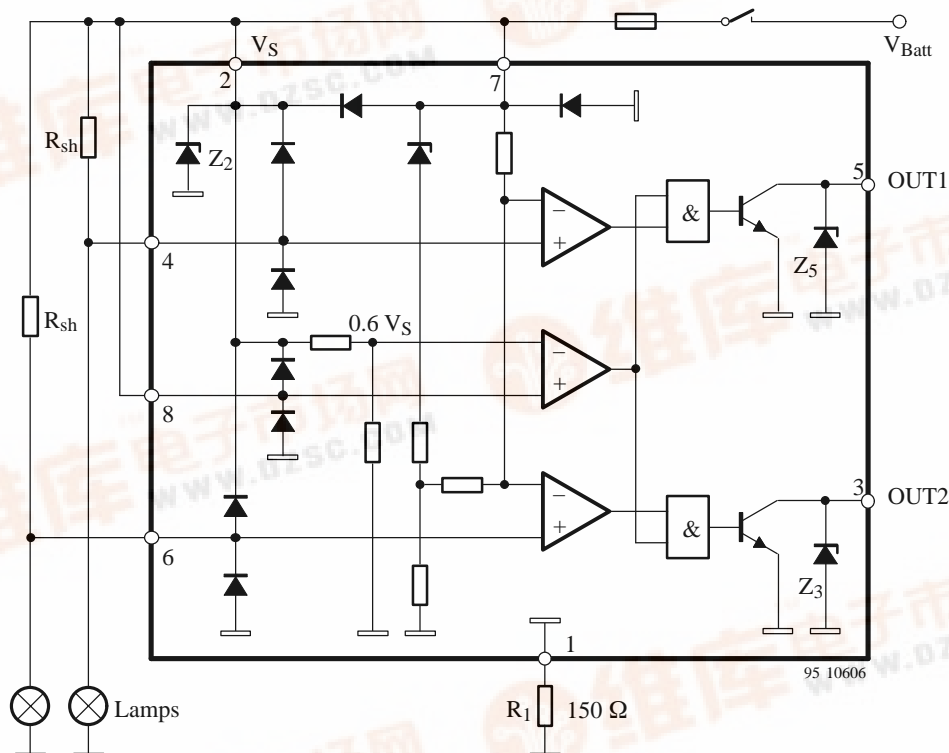


Figure 1. Schematic and application circuit

### Ordering Information

Extended Type Number	Package	Remarks
U4790B	DIP8	

## Pin Description

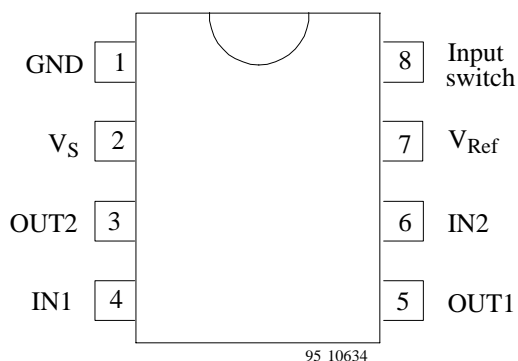


Figure 2. Pinning

Pin	Symbol	Function
1	GND	Reference point, ground
2	V <sub>S</sub>	Supply voltage
3	OUT2	Output 2
4	IN1	Input 1
5	OUT1	Output 1
6	IN2	Input 2
7	V <sub>Ref</sub>	Reference voltage
8	Input	Input switch

## Absolute Maximum Ratings

Parameters		Symbol	Value	Unit
Supply voltage	Pin 2, 7	V <sub>S</sub>	16.5	V
Current consumption t = 2 ms, measured at Pin 1 (GND)	Pin 1	I <sub>I</sub>	1.5	A
Output current	Pin 3, 5	I <sub>3,5</sub>	20	mA
Input voltage reference point Pin 7	Pin 4, 6	-V <sub>4,6</sub>	6	V
Power dissipation T <sub>amb</sub> = 95 °C      DIP 8 T <sub>amb</sub> = 60 °C      DIP 8		P <sub>tot</sub>	420	mW
		P <sub>tot</sub>	690	mW
Ambient temperature range		T <sub>amb</sub>	-40 to +95	°C
Storage temperature range		T <sub>stg</sub>	-55 to +125	°C
Junction temperature		T <sub>j</sub>	150	°C

## Thermal Resistance

Parameters		Symbol	Value	Unit
Junction ambient	DIP8	R <sub>thJA</sub>	110	K/W

## Electrical Characteristics

$V_S = 9$  to  $15$  V,  $T_{amb} = -40$  to  $+95$  °C, figure 1, unless otherwise specified

Parameters	Test Conditions / Pin	Symbol	Min	Typ	Max	Unit
Supply voltage	Pin 2,7	$V_S$	9		15	V
Internal Z diode $Z_2$	Pin 2	$V_Z$	20			V
Current consumption	$V_S = 12$ V Pin 1 measured at Pin 1 (GND)	$I_1$		4.5	6	mA
Output saturation voltage	$V_S = 9$ V, $I_{3,5} = 10$ mA $T_{amb} = 25$ °C Pin 3,5	$V_{sat}$			0.5	V
Output Z diodes $Z_3, Z_5$	Pin 3,5	$V_Z$	21			V
Control signal threshold	Reference point Pin 7 ( $V_7$ ) $I_{3,5} = 3$ mA Pin 4,6 $V_S = 12$ V $V_S = 15$ V	$-V_T$	6.5 7.8	8 9.3	9.5 10.8	mV
Voltage drift	$\Delta V = \frac{V_{T(15V)} - V_{T(12V)}}{15\text{ V} - 12\text{ V}}$ Pin 4,6	$\Delta V$		0.45		mV/V
Threshold voltage	Switch identification Pin 8	$V_8$		$0.6 V_S$		V
Input currents	Pin 4,6	$I_I$		100		nA
	Pin 8			5		µA
Delay time	Switch-on High to low Pin 3,5	$t_{d(on)}$		6		µs
	Switch-off Low to high	$t_{d(off)}$		30		µs

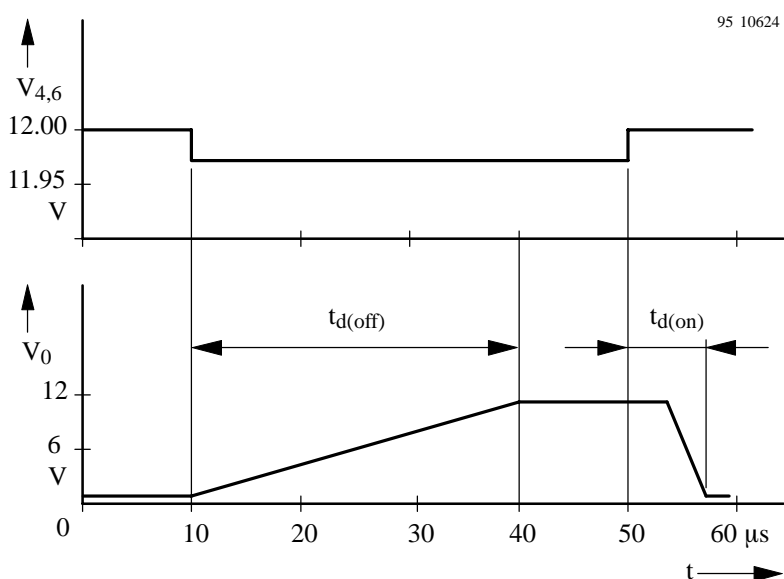


Figure 3.

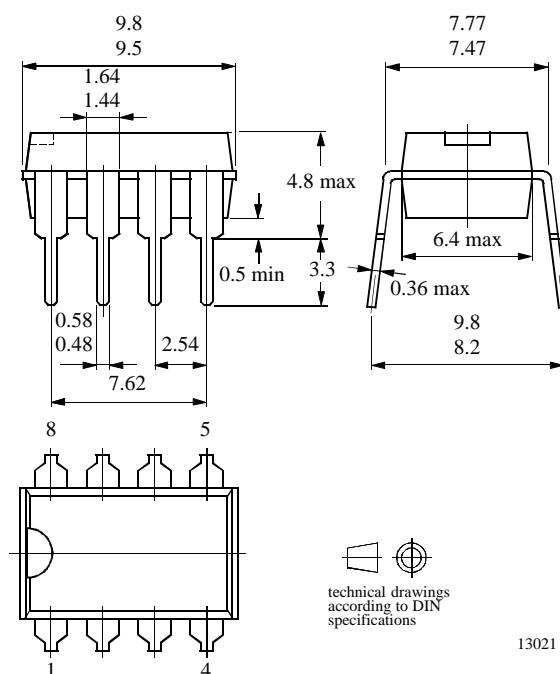
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## Package Information

Package DIP8

Dimensions in mm



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It is the policy of **Atmel Germany GmbH** to

1. Meet all present and future national and international statutory requirements.
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.

**Atmel Germany GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

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.

**Atmel Germany GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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