

## Automotive Lamp Outage Monitor, $V_T = 8 \text{ mV}$

### Description

The monolithic integrated bipolar circuit, U479B, 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  $V_{4,6} = V_S - V_T$  whereas  $V_T = 8 \text{ mV}$ .

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. A not used comparator input must be connected to Pin 7.

### Features

- 2 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

### Ordering Information

| Extended Type Number | Package | Remarks |
|----------------------|---------|---------|
| U479B                | DIP8    |         |
| U479B-FP             | SO8     |         |

### Block Diagram

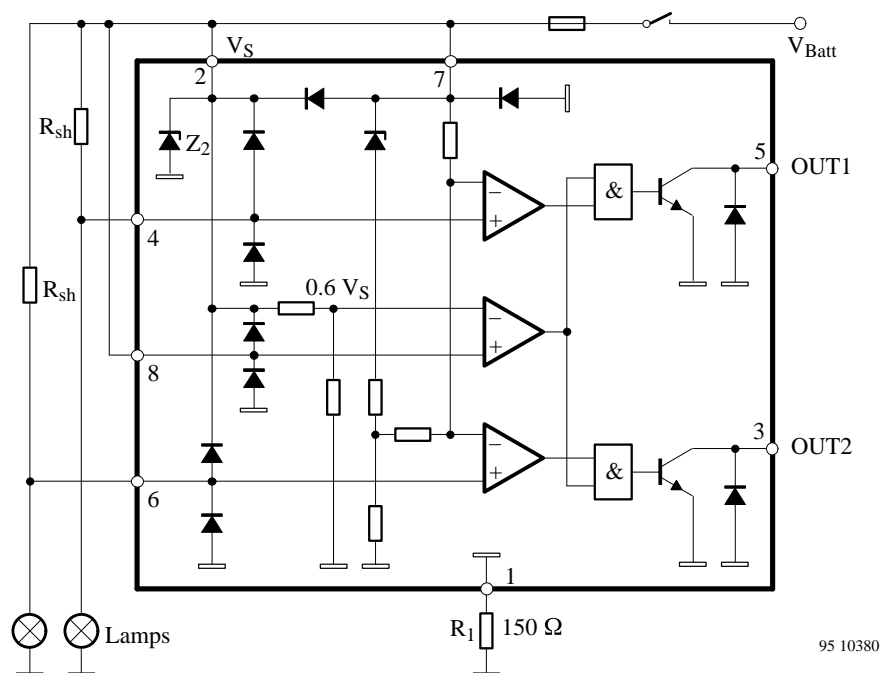


Figure 1. Schematic and application circuit

## Pin Description

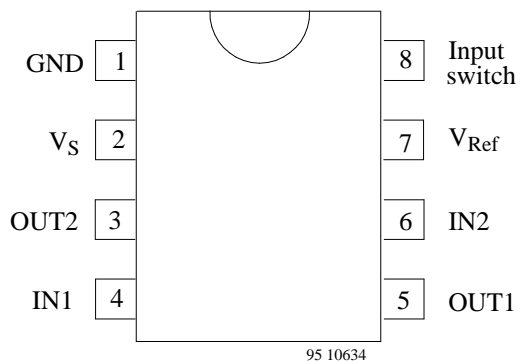


Figure 2. Pinning

| Pin | Symbol    | Function                |
|-----|-----------|-------------------------|
| 1   | GND       | Reference point, ground |
| 2   | $V_S$     | Supply voltage          |
| 3   | OUT2      | Output 2                |
| 4   | IN1       | Input 1                 |
| 5   | OUT1      | Output 1                |
| 6   | IN2       | Input 2                 |
| 7   | $V_{Ref}$ | 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<br>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<br>reference point Pin 7  | Pin 4, 6 | −V <sub>4,6</sub>                        | 6                        | V            |
| Power dissipation<br>T <sub>amb</sub> = 95 °C<br>DIP 8<br>SO 8<br>T <sub>amb</sub> = 60 °C<br>DIP 8<br>SO 8 |          | P <sub>tot</sub><br><br>P <sub>tot</sub> | 420<br>360<br>690<br>560 | mW<br><br>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<br>DIP8<br>SO8 | $R_{thJA}$ | 110   | K/W  |
|                                 | $R_{thJA}$ | 160   | 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<br>Pin 1<br>measured at Pin 1 (GND)   | $I_1$        |            | 4.5       | 6           | mA   |
| Output saturation voltage   | $V_S = 9$ V, $I_{3,5} = 10$ mA<br>$T_{amb} = 25$ °C<br>Pin 3,5                                 | $V_{sat}$    |            |           | 0.5         | V    |
| Control signal threshold  | Reference point Pin 7 ( $V_7$ )<br>$I_{3,5} = 3$ mA<br>Pin 4,6<br>$V_S = 12$ V<br>$V_S = 15$ V | $-V_T$       | 6.5<br>7.8 | 8<br>9.3  | 9.5<br>10.8 | mV   |
| Voltage drift<br>$\Delta V = \frac{V_{T(15V)} - V_{T(12V)}}{15\text{ V} - 12\text{ V}}$ | 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<br>High to low<br>Pin 3,5  | $t_{d(on)}$  |            | 6         |             | μs   |
|   | Switch-off<br>Low to high  | $t_{d(off)}$ |            | 30        |             | μs   |

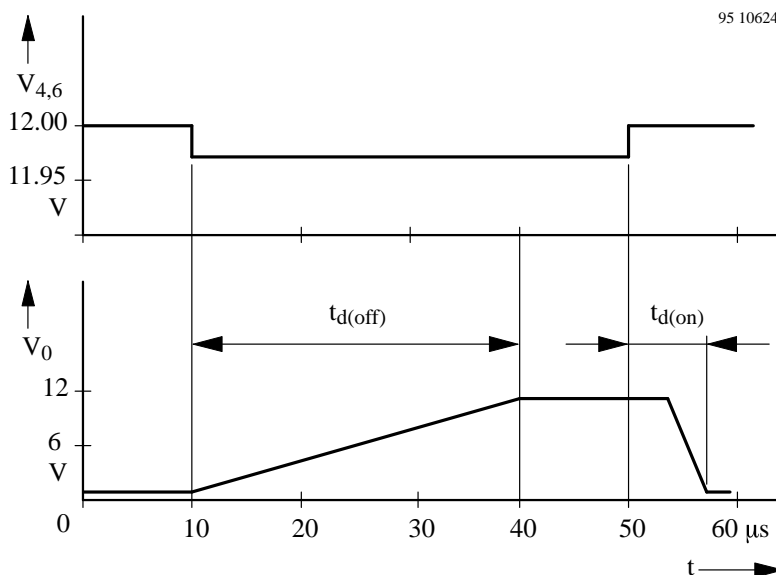
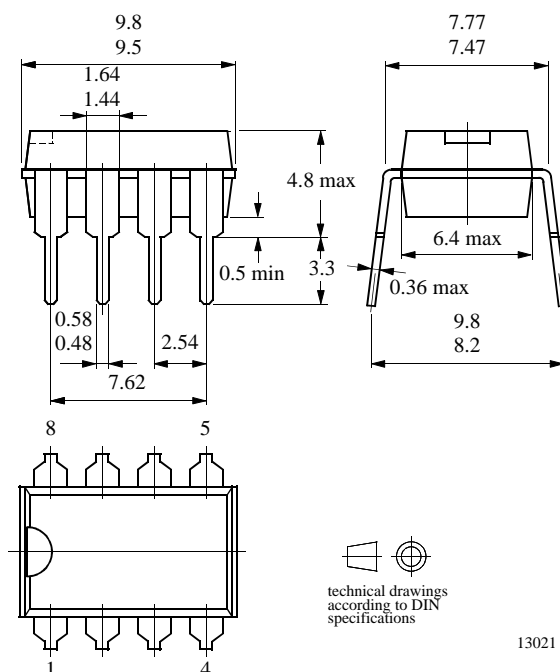


Figure 3. Delay times

## Dimensions in mm

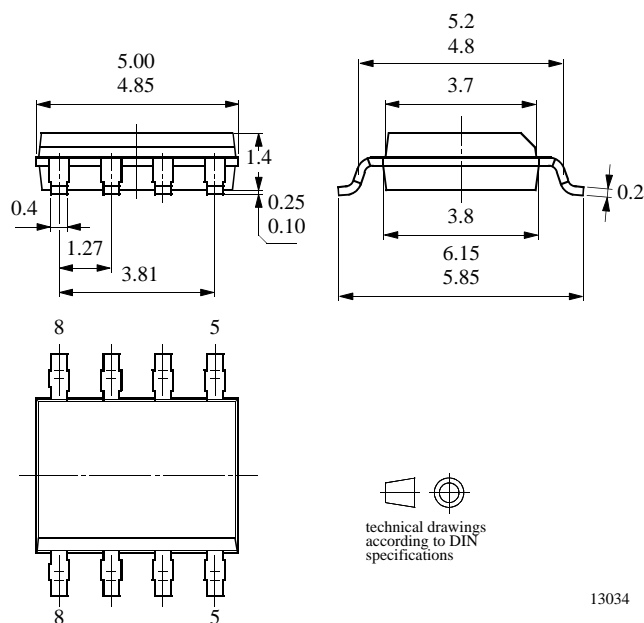
### Package DIP8

Dimensions in mm



### Package SO8

Dimensions in mm



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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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