



Automotive Lamp-outage Monitor IC

U479B

Features

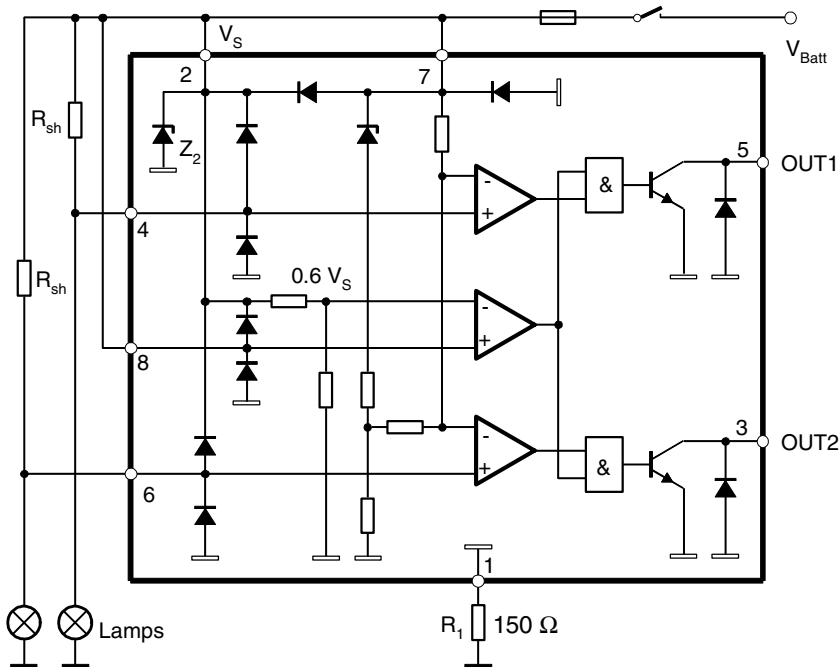
- 2-kV ESD Protection
- Two Comparators with Common Reference
- Tight Threshold Tolerance
- Threshold Matched to PTC Characteristic of Incandescent Lamps
- Temperature Compensated
- NPN Output
- Interference and Damage-protection According to VDE 0839
- EMI Protection
- Reversal Polarity Protection
- Load-dump Protection

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 $V_{4,6} = V_S - V_T$ where $V_T = 8$ mV.

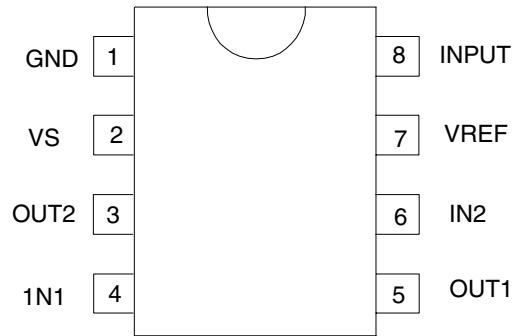
If the voltage drop across the shunt resistor, R_{sh} , exceeds 8 mV, the output is turned off, otherwise, the output is turned on. Without supply voltage or open input pin 8, the output is turned off. A comparator input, which is not used, must be connected to pin 7.

Figure 1. Schematic and Application Circuit



Pin Configuration

Figure 2. Pinning DIP8/SO8



Pin Description

| Pin | Symbol | Function |
|-----|--------|-------------------------|
| 1 | GND | Reference point, ground |
| 2 | VS | Supply voltage |
| 3 | OUT2 | Output 2 |
| 4 | IN1 | Input 1 |
| 5 | OUT1 | Output 1 |
| 6 | IN2 | Input 2 |
| 7 | VREF | Reference voltage |
| 8 | INPUT | Input switch |

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 | Pin | Symbol | Value | Unit |
|---|------|------------------|-------------|------------------|
| Supply voltage | 2, 7 | V_S | 16.5 | V |
| Current consumption, $t = 2 \text{ ms}$ | 1 | I_1 | 1.5 | A |
| Output current | 3, 5 | $I_{3,5}$ | 20 | mA |
| Input voltage Reference point pin 7 | 4, 6 | $-V_{4,6}$ | 6 | V |
| Power dissipation | | | | |
| $T_{\text{amb}} = 95^\circ\text{C}$ | DIP8 | P_{tot} | 420 | mW |
| | SO8 | P_{tot} | 360 | mW |
| $T_{\text{amb}} = 60^\circ\text{C}$ | DIP8 | P_{tot} | 690 | mW |
| | SO8 | P_{tot} | 560 | mW |
| Ambient temperature range | | T_{amb} | -40 to +95 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | -55 to +125 | $^\circ\text{C}$ |
| Junction temperature | | T_j | 150 | $^\circ\text{C}$ |

Thermal Resistance

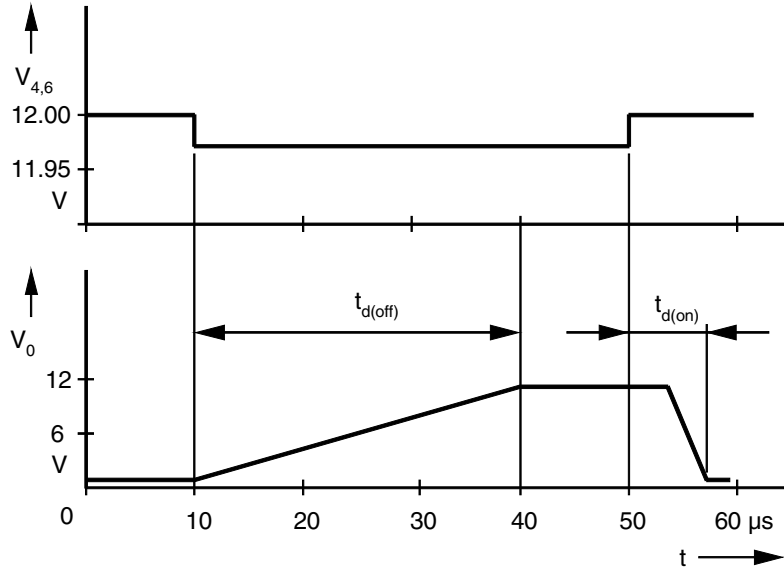
| Parameters | | Symbol | Value | Unit |
|------------------|------|-------------------|-------|------|
| Junction ambient | DIP8 | R_{thJA} | 110 | K/W |
| | SO8 | R_{thJA} | 160 | K/W |

Electrical Characteristics

$V_S = 9$ to 15 V, $T_{amb} = -40$ to $+95^\circ\text{C}$, Figure 1 on page 1, unless otherwise specified.

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

Figure 3. Delay Times



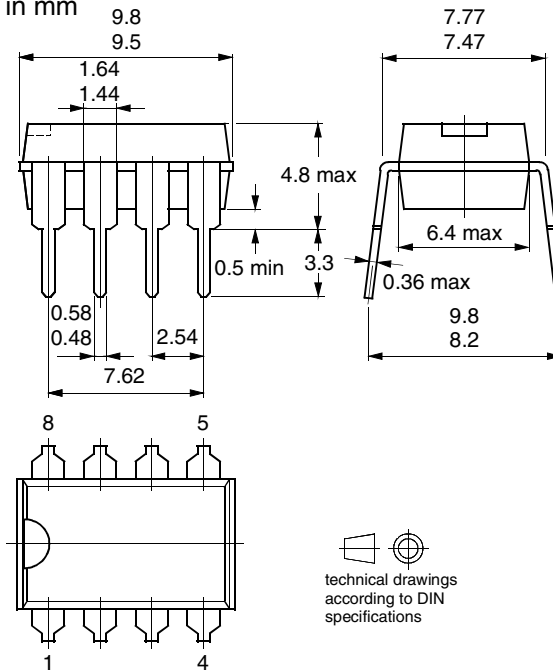
Ordering Information

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

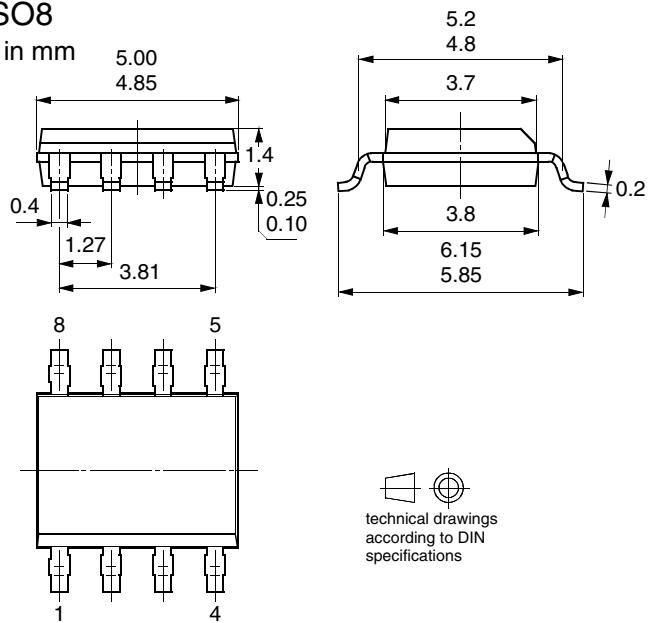
Package Information

Package DIP8

Dimensions in mm



Package SO8
Dimensions in mm





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