Automotive Lamp-Outage Monitor, V_T = 53 mV

Description

The monolithic integrated bipolar circuit, U4791B, 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 = 53 mV.

The integrated circuit is recommended for the application of parallel connected lamps. If the voltage drop across shunt resistor, R_{sh}, exceeds 53 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 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

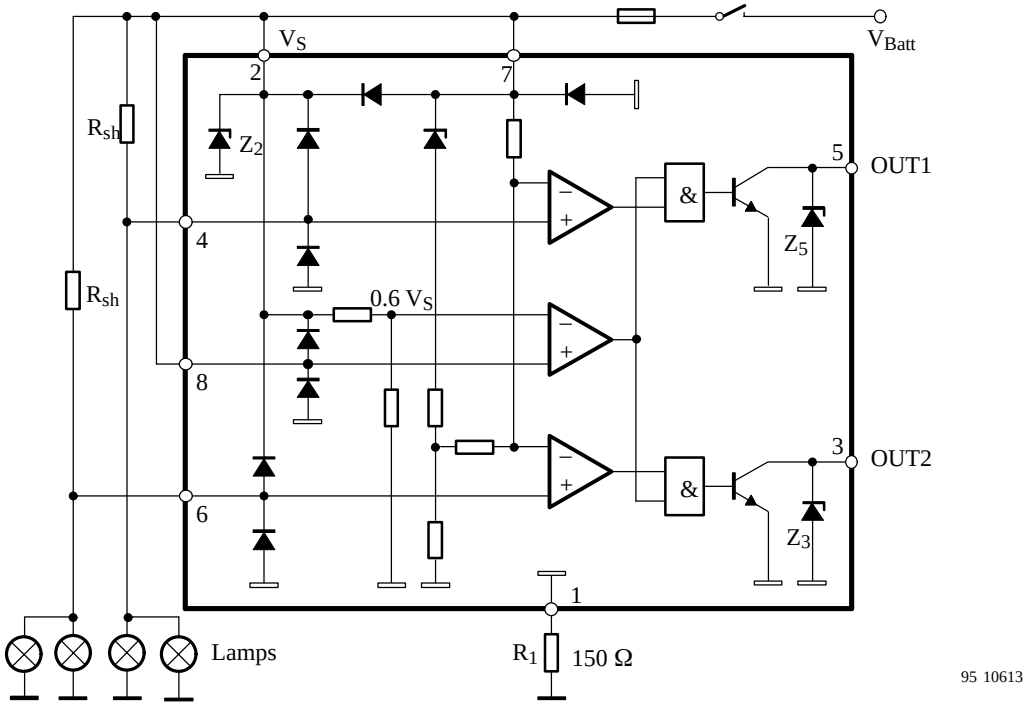
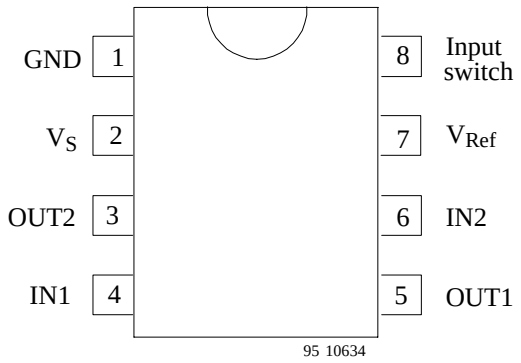


Figure 1. Schematic and application circuit

Ordering Information

Extended Type Number	Package	Remarks
U4791B	DIP8	
U4791B–FP	SO8	

Pin Description



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_S	16.5	V
Current consumption t = 2 ms, measured at Pin 1 (GND)	Pin 1	I_1	1.5	A
Output current	Pin 3, 5	$I_{3,5}$	20	mA
Input voltage reference point Pin 7	Pin 4, 6	$-V_{4,6}$	6	V
Power dissipation T_{amb} = 95 °C DIP 8 SO 8		P_{tot}	420 360	mW
T_{amb} = 60 °C DIP 8 SO 8		P_{tot}	690 560	mW
Ambient temperature range		T_{amb}	–40 to +95	°C
Storage temperature range		T_{stg}	–55 to +125	°C
Junction temperature		T_j	150	°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 °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) $I_{3,5}$ = 1 mA Pin 4,6 V_S = 12 V V_S = 15 V	$-V_T$	 51.5 57	 53.5 59	 55.5 61	mV
Voltage drift $\Delta V = \frac{V_{T(15V)} - V_{T(12V)}}{15\ V - 12V}$	Pin 4,6	ΔV		1.8		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 Pin 3,5 High to low	$t_{d(on)}$		6		µs
	Switch-off Low to high	$t_{d(off)}$		30		µs

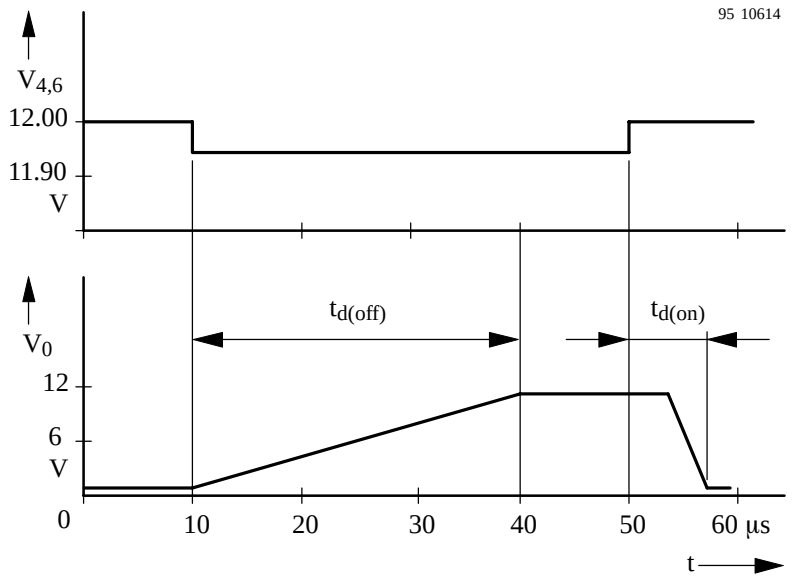
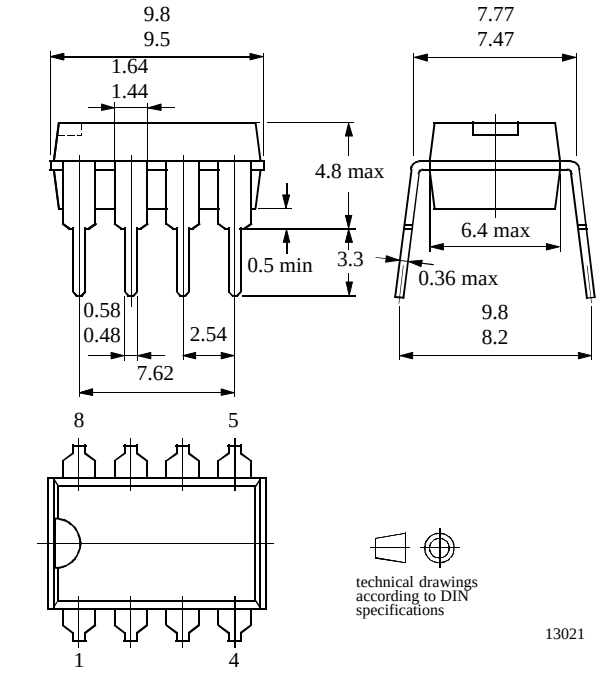


Figure 2.

Package Information

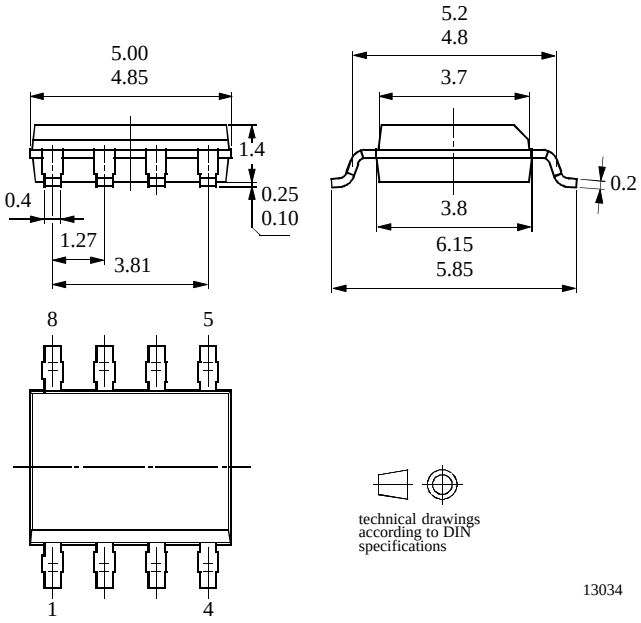
Package DIP8

Dimensions in mm



Package SO8

Dimensions in mm



Ozone Depleting Substances Policy Statement

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.

Data sheets can also be retrieved from the Internet: http://www.atmel–wm.com

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