阅读申明

- 1.本站收集的数据手册和产品资料都来自互联网,版权归原作者所有。如读者和版权方有任何异议请及时告之,我们将妥善解决。
- 2.本站提供的中文数据手册是英文数据手册的中文翻译,其目的是协助用户阅读,该译文无法自动跟随原稿更新,同时也可能存在翻译上的不当。建议读者以英文原稿为参考以便获得更精准的信息。
- 3.本站提供的产品资料,来自厂商的技术支持或者使用者的心得体会等,其内容可能存在描 叙上的差异,建议读者做出适当判断。
- 4.如需与我们联系,请发邮件到marketing@iczoom.com,主题请标有"数据手册"字样。

Read Statement

- 1. The datasheets and other product information on the site are all from network reference or other public materials, and the copyright belongs to the original author and original published source. If readers and copyright owners have any objections, please contact us and we will deal with it in a timely manner.
- 2. The Chinese datasheets provided on the website is a Chinese translation of the English datasheets. Its purpose is for reader's learning exchange only and do not involve commercial purposes. The translation cannot be automatically updated with the original manuscript, and there may also be improper translations. Readers are advised to use the English manuscript as a reference for more accurate information.
- 3. All product information provided on the website refer to solutions from manufacturers' technical support or users the contents may have differences in description, and readers are advised to take the original article as the standard.
- 4. If you have any questions, please contact us at marketing@iczoom.com and mark the subject with "Datasheets" .

Features

- Temperature and Voltage Compensated Frequency
- Warning Indication of Lamp Failure by Means of Frequency Doubling can be Disabled
- Voltage Dependence of the Car Indicator Lamps Compensated for Lamp Failure
- Relay Output with High Current Carrying Capacity and Low Saturation Voltage
- Minimum Lamp Load for Flasher Operation ≥ 1W
- Load-dump Protection
- Very Low Susceptibility to EMI
- Protection According to ISO/TR 7637/1 Level 4



1. Description

The design of the U6433B is similar to that of U6043B, both devices have the same excellent EMC (Electro Magnetic Capability) and protection features. The U6433B includes an additional 8-mV comparator and a logical connection with the frequency doubling stage. This combination can be used for a hazard switch which bypasses the external shunt resistor to disable the frequency doubling. This feature is especially important with respect to the US automotive industry. During direction mode the U6433B works like other flashers, that is, frequency doubling in the case of lamp outage.



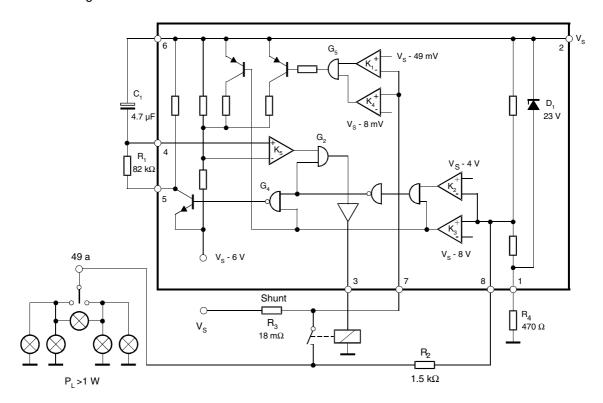
Flasher, 18-mΩ
Shunt,
Frequency
Doubling
Disabling

U6433B





Figure 1-1. Block Diagram



2. Pin Configuration

Figure 2-1. Pinning SO8

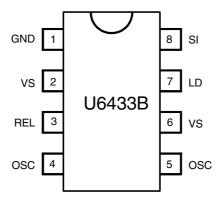


Table 2-1. Pin Description

Pin	Symbol	Function
1	GND	IC ground
2	VS	Supply voltage
3	REL	Relay driver
4	OSC	Oscillator
5	OSC	Oscillator
6	VS	Supply voltage
7	LD	Lamp failure detection
8	SI	Start input (49a)



3. Functional Description

3.1 Pin 1, GND

The integrated circuit is protected against damage via resistor R₄ to ground (–31) in the case of battery reversal.

An integrated protection circuit together with external resistances R₂ and R₄ limits the current pulses in the IC.

3.2 Pin 2, Supply Voltage, V_S – Power

The arrangement of the supply connections to pin 2 must be so as to ensure that, on the connection printed circuit board (PCB), the resistance of V_S to pin 6 is lower than that to pin 2.

3.3 Pin 3, Relay Control Output (Driver)

The relay control output is a high-side driver with a low saturation voltage and is capable of driving a typical automotive relay with a minimum coil resistance of 60Ω

3.4 Pins 4 and 5, Oscillator

The flashing frequency, f_1 , is determined by the R_1C_1 components as follows (see Figure 1-1 on page 2):

$$f_1 \approx \frac{1}{R_1 \times C_1 \times 1.5} Hz$$

where

 $C_1 \le 47 \mu F$

 $R_1 + 6.8 \text{ k}\Omega \text{ to } 510 \text{ k}\Omega$

In the case of a lamp outage (see pin 7) the oscillator frequency is switched to the lamp outage frequency f_2 with $f_2 \approx 2.2 \times f_1$.

Duty cycle in normal flashing mode: 50%

Duty cycle in lamp outage mode: 40% (bright phase)

3.5 Pin 6, Supply Voltage, Sense

For accurate monitoring via the shunt resistor, a minimized layer resistance from point V_S/shunt to pin 6 is recommended.

3.6 Pin 7, Lamp Outage Detection

3.6.1 Control Signal Threshold 1 (49-mV Comparator K1)

The detection point for lamp failure can be calculated from the control signal threshold, typically 49 mV with $V_S = 12V$. With a measuring resistance of $R_3 = 18$ m Ω , the frequency change-over is reached at a lamp load of 21W + 11.4W. The variation of the control signal threshold supply voltage takes into account the PTC characteristic of filament lamps.

3.6.2 Control Signal Threshold 2 (8-mV Comparator K4)

A voltage drop between 49 mV to 8 mV at R₃ shunt resistor lets the flasher work in frequency doubling mode.

If the voltage drop decreases to a value below $V_{R3MAX} = 8$ mV, frequency doubling is disabled. This can be achieved either with a switch which bypasses the shunt resistor (for example, a special hazard warning switch) or with a small lamp load.

The arrangement of the supply connections to pins 2 and 6 must ensure that, on the connection PCB, the layer resistance from V_S to pin 6 is lower than the resistance to pin 2.

Flasher operation starts with a lamp load of $P_1 \ge 1W$.

3.7 Pin 8, Start Input

Start condition for flashing: the voltage at pin 8 has to be below the K3 threshold (flasher switch closed).

Humidity and dirt may decrease the resistance between 49a and GND. If this leakage resistance is > 5 k Ω , the IC is still kept in its off condition. In this case the voltage at pin 8 is between the thresholds of comparators K2 and K3.

During the bright phase the voltage at pin 8 is above the K2 threshold; during the dark phase it is below the K3 threshold.

For proper start conditions, a minimum lamp wattage of 1W is required.

4. 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. Reference point pin 1.

Parameters	Symbol	Value	Unit
Supply voltage, pins 2 and 6	V _S	18	V
Surge forward current $t_p = 0.1$ ms, pins 2 and 6 $t_p = 300$ ms, pins 2 and 6 $t_p = 300$ ms, pin 8	I _{FSM}	1.5 1.0 30.0	A A mA
Output current, pin 3	I _O	0.3	Α
Power dissipation $T_{amb} = 95^{\circ}C, SO8$ $T_{amb} = 60^{\circ}C, SO8$	P _{tot}	340 560	mW mW
Junction temperature	T _j	150	°C
Ambient temperature range	T _{amb}	-40 to +105	°C
Storage temperature range	T _{stg}	-55 to +150	°C

5. Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient SO8	R_{thJA}	160	K/W





6. Electrical Characteristics

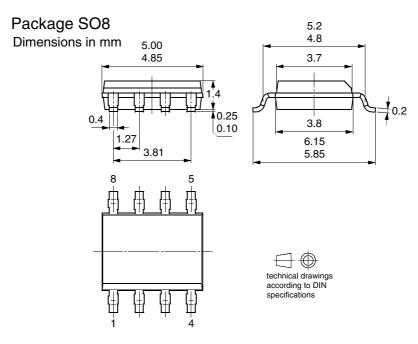
Typical values under normal operation of the application circuit shown in Figure 1-1 on page 2, $V_S = 12V$ (pins 2 and 6). $T_{amb} = 25^{\circ}C$, reference point ground (-31), unless otherwise specified.

Parameters	Test Conditions	Symbol	Min.	Тур.	Max.	Unit
Supply voltage range	Pins 2 and 6	Vs	9		16.5	V
Supply current, dark phase	Pins 2 and 6	I _S		4.5	8	mA
Supply current, bright phase	Pins 2 and 6	I _S		7.0	11	mA
Relay output, saturation voltage	$I_{O} = 150 \text{ mA},$ $V_{S} = 9V, \text{ pin } 3$	V _O			1.0	V
Relay output reverse current	Pin 3	Io			0.1	mA
Relay coil resistance		R_L	60			Ω
Start delay	First bright phase	t _{on}			10	ms
Frequency determining resistor		R ₁	6.8		510	kΩ
Frequency determining capacitor		C ₁			47	μF
Frequency tolerance	Normal flashing, basic frequency f ₁ not including the tolerances of the external components R ₁ and C ₁	Δf_1	-5		+5	%
Bright period	Basic frequency f ₁ , V _S = 9V to 15V	Δf_1	47		53	%
Bright period	Control frequency f ₂ , V _S = 9V to 15V	Δf_2	37		45	%
Frequency increase	Lamp failure, V _S = 9V to 15V	f ₂	$2.15 \times f_1$		$2.3 \times f_1$	Hz
Control signal threshold 1	$V_S = 15V$, pin 7 $V_S = 9V$ $V_S = 12V$	V_{R3}	50 43 47	53 45 49	57 47 51	mV
Control signal threshold 2		V _{R3}	2		10	mV
Leakage resistance	49a to GND	R_p			5	kΩ
Lamp load		P_L	1			W

7. Ordering Information

Extended Type Number	Package	Remarks
U6433B-MFPY	SO8	Tubed, Pb-free
U6433B-MFPG3Y	SO8	Taped and reeled, Pb-free

8. Package Information



9. Revision History

Please note that the following page numbers referred to in this section refer to the specific revision mentioned, not to this document.

Revision No.	History
	Put datasheet in a new template
4810B-AUTO-08/05	Updated text to new style guide
4610B-A010-06/03	First page: Pb-free logo added
	Page 7: Ordering Information changed





Atmel Corporation

2325 Orchard Parkway San Jose, CA 95131, USA Tel: 1(408) 441-0311 Fax: 1(408) 487-2600

Regional Headquarters

Europe

Atmel Sarl Route des Arsenaux 41 Case Postale 80 CH-1705 Fribourg Switzerland

Tel: (41) 26-426-5555 Fax: (41) 26-426-5500

Asia

Room 1219 Chinachem Golden Plaza 77 Mody Road Tsimshatsui East Kowloon Hong Kong Tel: (852) 2721-9778

Tel: (852) 2721-9778 Fax: (852) 2722-1369

Japan

9F, Tonetsu Shinkawa Bldg. 1-24-8 Shinkawa Chuo-ku, Tokyo 104-0033 Japan

Tel: (81) 3-3523-3551 Fax: (81) 3-3523-7581

Atmel Operations

Memory

2325 Orchard Parkway San Jose, CA 95131, USA Tel: 1(408) 441-0311 Fax: 1(408) 436-4314

Microcontrollers

2325 Orchard Parkway San Jose, CA 95131, USA Tel: 1(408) 441-0311 Fax: 1(408) 436-4314

La Chantrerie BP 70602 44306 Nantes Cedex 3, France Tel: (33) 2-40-18-18-18 Fax: (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards

Zone Industrielle 13106 Rousset Cedex, France Tel: (33) 4-42-53-60-00

Fax: (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd. Colorado Springs, CO 80906, USA

Tel: 1(719) 576-3300 Fax: 1(719) 540-1759

Scottish Enterprise Technology Park Maxwell Building East Kilbride G75 0QR, Scotland

Tel: (44) 1355-803-000 Fax: (44) 1355-242-743

RF/Automotive

Theresienstrasse 2 Postfach 3535 74025 Heilbronn, Germany Tel: (49) 71-31-67-0 Fax: (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd. Colorado Springs, CO 80906, USA

Tel: 1(719) 576-3300 Fax: 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/ High Speed Converters/RF Datacom

Avenue de Rochepleine BP 123

38521 Saint-Egreve Cedex, France

Tel: (33) 4-76-58-30-00 Fax: (33) 4-76-58-34-80

Literature Requests www.atmel.com/literature

Disclaimer: The information in this document is provided in connection with Atmel products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Atmel products. EXCEPT AS SET FORTH IN ATMEL'S TERMS AND CONDITIONS OF SALE LOCATED ON ATMEL'S WEB SITE, ATMEL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ATMEL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ATMEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Atmel makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Atmel does not make any commitment to update the information contained herein. Unless specifically provided otherwise, Atmel products are not suitable for, and shall not be used in, automotive applications. Atmel's products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.

© Atmel Corporation 2005. All rights reserved. Atmel[®], logo and combinations thereof, Everywhere You Are[®] and others, are registered trademarks or trademarks of Atmel Corporation or its subsidiaries. Other terms and product names may be trademarks of others.

