

EL driver for portable sets

BA3899F

The BA3899F is an IC developed for EL drive applications. It uses a more compact interface than transformer systems, and is ideal for use in thin sets.

●Applications

Pagers, electronic notebooks and other portable devices

●Features

- 1) Drive oscillation frequency can be set using external capacitance.
- 2) Equipped with standby control pin.

●Absolute maximum ratings (Ta = 25°C)

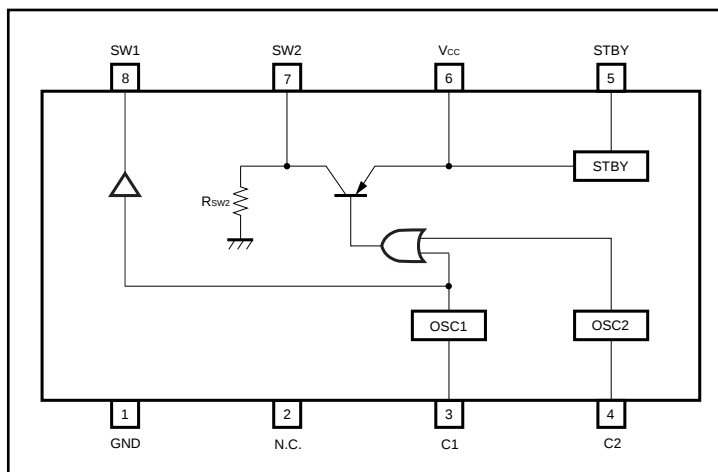
Parameter	Symbol	Limits	Unit
Power supply voltage	V _{CC}	8.0	V
Power dissipation	P _d	450*	mW
Operating temperature	T _{opr}	− 10 ~ + 60	°C
Storage temperature	T _{stg}	− 55 ~ + 125	°C
Maximum applied voltage	V _{ST}	8.0	V

* Reduced by 4.5mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V _{CC}	1.0	5.0	7.0	V

●Block diagram



● Pin descriptions

Pin No.	Pin name	I / O	Pin voltage	Internal equivalent circuit	Function
1	GND	I	—	—	GND pin
2	N.C.	—	—	—	—
3	C1	I / O	—		OSC1 oscillator circuit; external capacitor pin
4	C2	I / O	—		OSC2 oscillator circuit; external capacitor pin
5	STBY	I	0		Standby control pin (HIGH state: standby cancelled) ○When applying resistance, etc. to the STBY pin, be careful not to exceed the threshold values.
6	V _{CC}	I	—	—	V _{CC} input pin
7	SW2	O	—		SW2 switching output pin
8	SW1	O	—		SW1 switching output pin

●Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{V}$, $C_1 = 0.033\mu\text{F}$, $C_2 = 1500\text{pF}$)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply current		I_{CC}	3.0	4.6	6.2	mA	When used as stand-alone unit
C1 pin oscillation frequency		f_{SW1}	75	95	120	Hz	—
C2 pin oscillation frequency		f_{SW2}	17	23	29	kHz	—
SW1	Source current	I_{SW1SO}	100	140	180	μA	$V_{C1} = 1.0\text{V}$, $V_{C2} = 0.05\text{V}$, $V_{SW1} = 0\text{V}$
	Sink current	I_{SW1SI}	-40	—	—	μA	$V_{C1} = 0.05\text{V}$, $V_{C2} = 0.05\text{V}$, $V_{SW1} = 1.0\text{V}$
SW2	Source current	I_{SW2SO}	3.2	4.4	6.1	mA	$V_{C1} = 0.05\text{V}$, $V_{C2} = 0.05\text{V}$, $V_{SW2} = 0\text{V}$
	Pull-down resistance	R_{SW2}	400	500	600	Ω	$V_{ST} = 0.35\text{V}$, $V_{SW2} = 0.3\text{V}$
Standby pin control voltage condition	Operating	V_{STON}	1.0	—	—	V	—
	Non-operating	V_{STOFF}	—	—	0.3	V	—
Quiescent current in standby state		$I_Q(ST)$	—	0	2.0	μA	—

●Measurement circuit

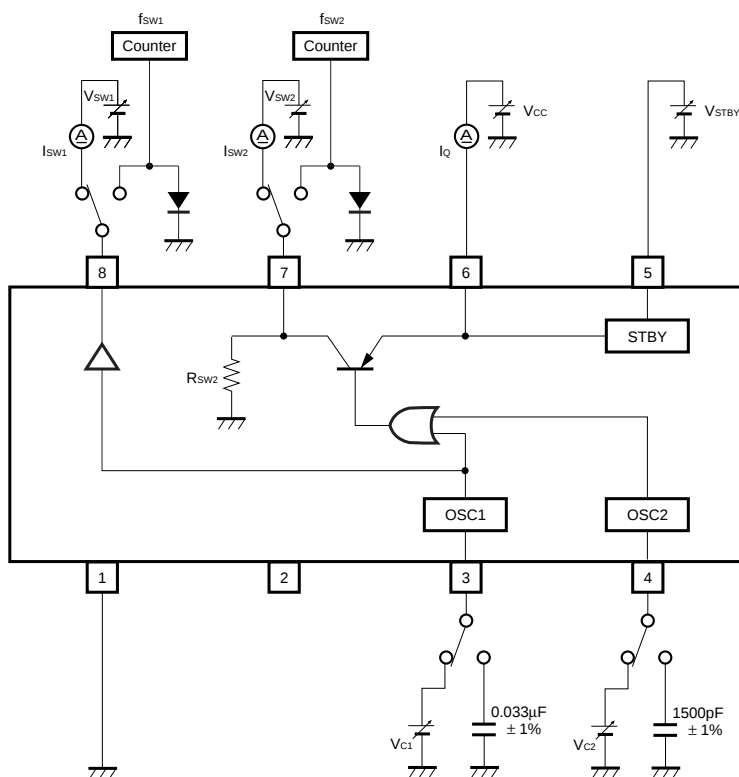


Fig.1

●Application example

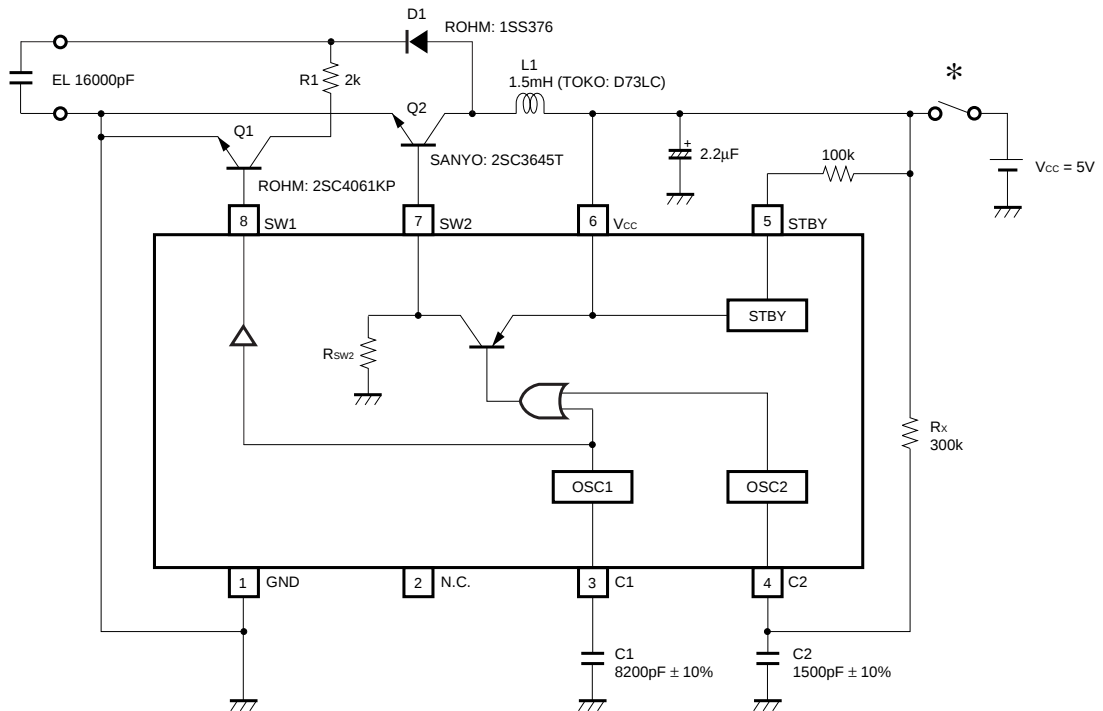


Fig. 2

* Because of the characteristics of the EL element, continuous application of particularly high DC power supply voltage can shorten the lifetime of the element. To avoid this, we recommend inserting a switch in the power supply line.

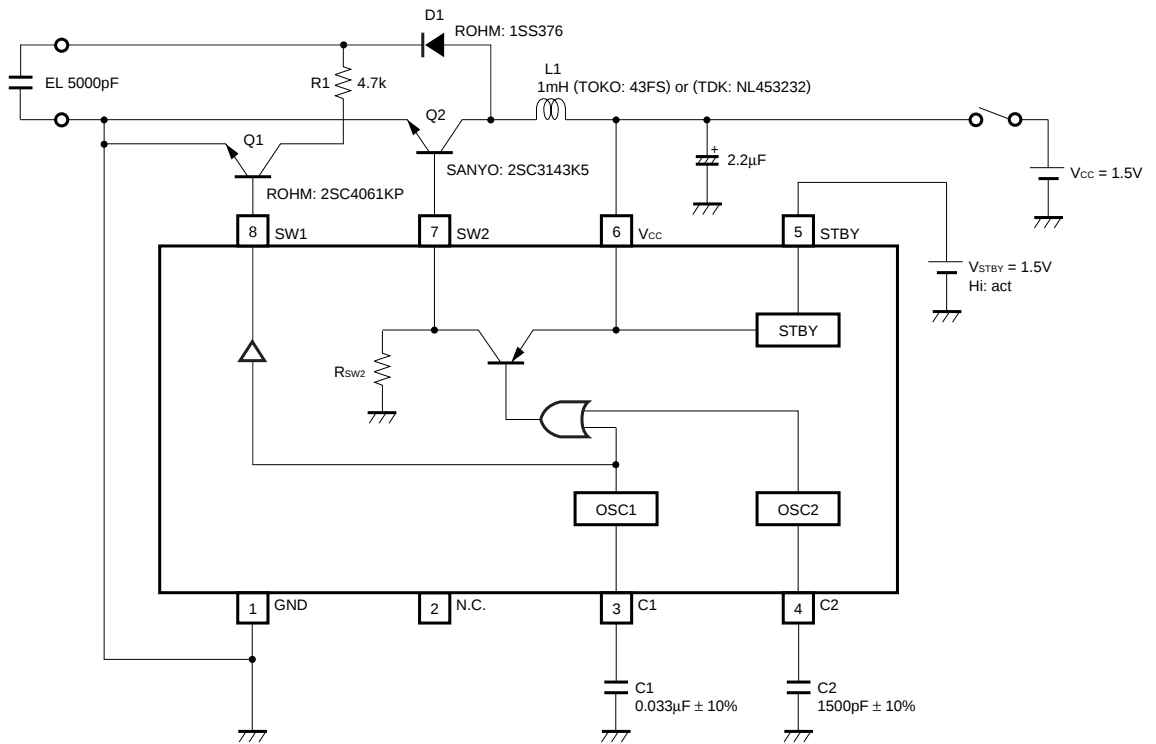


Fig. 3

● Operation notes

(1) EL drive output

As shown in Figure 4, the EL drive output consists of charging (rise in voltage caused by switching) and discharging waveforms. The switching frequency is determined by f_{SW2} and the charging and discharging timing by f_{SW1} .

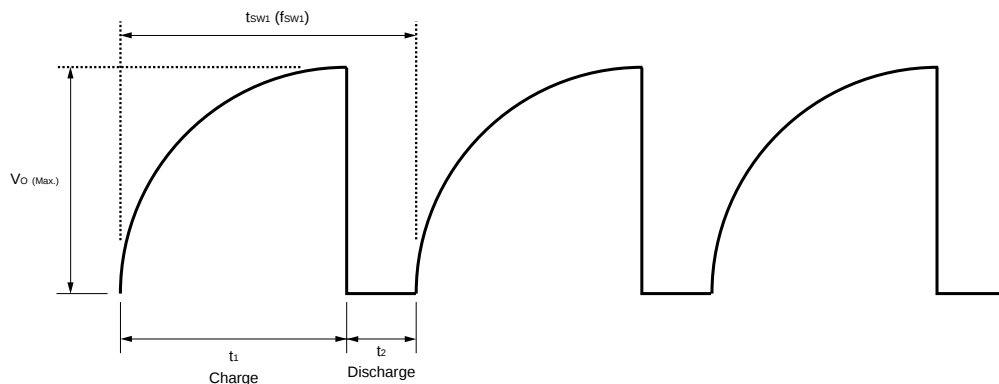


Fig.4

(2) Setting f_{SW1}

The oscillation frequency is determined by charging and discharging of the external capacitance of the C1 pin. The value for C1 should be set based on the following equation.

$$C1 = \frac{1}{V_{C1} \times \left(\frac{1}{I_1} + \frac{1}{I_2} \right)} \times \frac{1}{f_{SW1}}$$

$$= (3.14E - 6) \times \frac{1}{f_{SW1}} \quad (V_{CC} = 5V)$$

The recommended setting range for f_{SW1} is 40Hz to 800Hz. However, the V_O (Max.) shown in Figure 4 is determined by f_{SW1} , so caution is required concerning the pressure withstand values of Q1, Q2, and D1.

(3) f_{SW2}

f_{SW2} is the switching pressure rise frequency, and is determined by the external capacitance of the C2 pin. This value (1500pF) is determined by the inductance value and the Q2 transistor capability. When changing this value, the drive capability of Q2 must be taken into consideration in order to avoid the possibility of malfunction.

(4) Q1, Q2, and D1

The V_O (Max.) shown in Figure 4 is applied to the output V_O , so if using any transistor other than that recommended, caution is required concerning the pressure withstand value. Also, Q2 must have characteristics which allow it to keep pace with the switching speed of f_{SW2} .

(5) R_x (resistor for adjusting light volume)

With a configuration like that shown in Figure 5, the volume of light can be adjusted. However, R_x should be set so that I_x satisfies the following condition.

$$I_x \left(= \frac{V_x - 0.2V}{R_x} \right) < 40\mu A$$

If $I_x > 40\mu A$, LSI dispersion, temperature fluctuation, and other elements can cause oscillation of the C2 pin to stop. Be sure the above condition is satisfied.

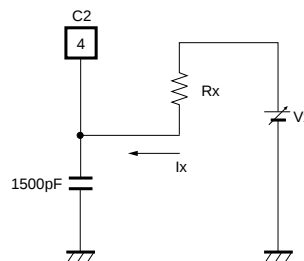


Fig.5

● Electrical characteristic curves

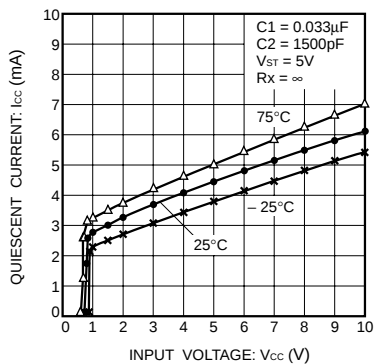


Fig. 6 Supply current (when used as stand-alone unit) vs. power supply voltage

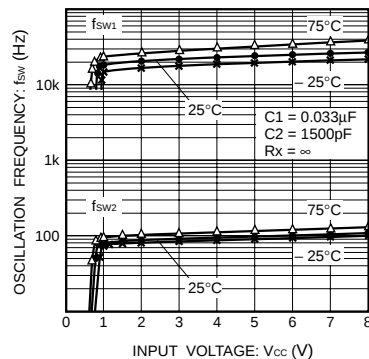


Fig. 7 Oscillation frequency of C1 and C2 pins vs. power supply voltage

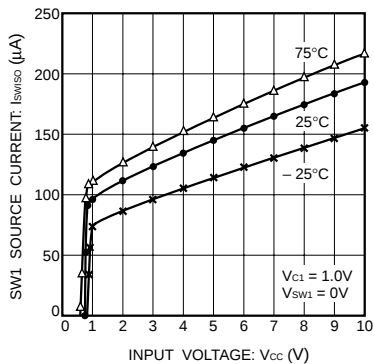


Fig. 8 SW1 sink current vs. power supply voltage

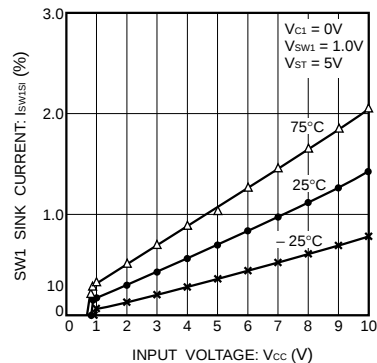


Fig. 9 SW1 source current vs. power supply voltage

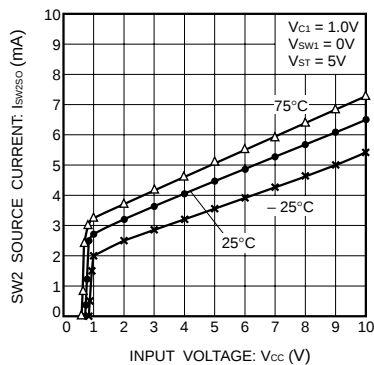


Fig. 10 SW2 source current vs. power supply voltage

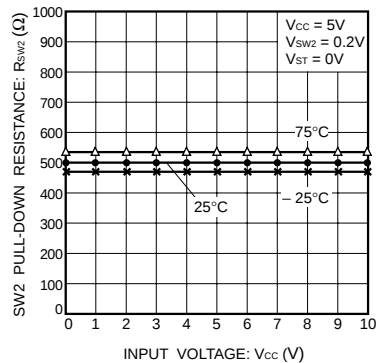
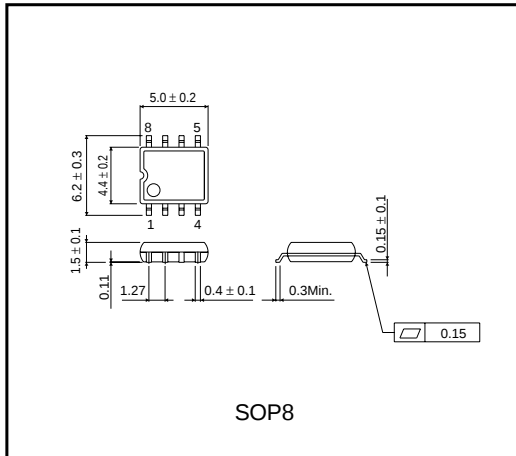


Fig. 11 SW2 pull-down resistance vs. power supply voltage

● External dimensions (Units: mm)



Notes

- No technical content pages of this document may be reproduced in any form or transmitted by any means without prior permission of ROHM CO.,LTD.
- The contents described herein are subject to change without notice. The specifications for the product described in this document are for reference only. Upon actual use, therefore, please request that specifications to be separately delivered.
- Application circuit diagrams and circuit constants contained herein are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.
- Any data, including, but not limited to application circuit diagrams information, described herein are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO.,LTD. disclaims any warranty that any use of such devices shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes no liability of whatsoever nature in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices, other than for buyer's right to use such devices itself, resell or otherwise dispose of the same, no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by
- ROHM CO., LTD. is granted to any such buyer.
- Products listed in this document use silicon as a basic material.
Products listed in this document are no antiradiation design.

The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).

Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

About Export Control Order in Japan

Products described herein are the objects of controlled goods in Annex 1 (Item 16) of Export Trade Control Order in Japan.

In case of export from Japan, please confirm if it applies to "objective" criteria or an "informed" (by MITI clause) on the basis of "catch all controls for Non-Proliferation of Weapons of Mass Destruction.

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru

www.lifeelectronics.ru