

STRUCTURE	Silicon Monolithic Integrated Circuit
PRODUCTSERIES	2-ch Switching Regulator Controller
TYPE	BA9741F, BA9741FS
FEATURES	<ol style="list-style-type: none"> 1. Built-in timer-latch type short prevention circuit 2. Built-in high-accuracy reference voltage output pin $2.5V \pm 4\%$ 3. Rest period adjustable over the whole range of duty ratio

○ Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Limits	Unit
Power supply voltage	Vcc	36	V
Power dissipation	BA9741F	500* ¹	mW
	BA9741FS	650* ²	mW
Output pin current	Io	120* ³	mA
Output pin voltage	Vo	36	V
Operating temperature	Topr	-40~+85	°C
Storage temperature	Tstg	-55~+125	°C
Junction temperature	Tjmax	125	°C

*1: Reduced by 5.0 mW/°C over Ta = 25°C or more. (When mounted on 70 mm × 70 mm × 1.6 mm, glass epoxy)

*2: Reduced by 6.5 mW/°C over Ta = 25°C or more. (When mounted on 70 mm × 70 mm × 1.6 mm, glass epoxy)

*3: Should not exceed Pd-or ASO-value.

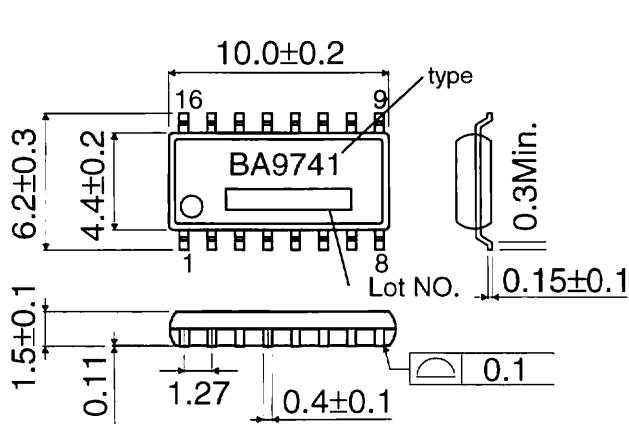
○ Recommendable operation range (Ta=25°C)

Item	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	Vcc	3.6	6.0	35	V
Output pin current	Io	-	-	100	mA
Output pin voltage	Vo	-	-	35	V
Error amplifier input voltage	VOM	0.3	-	1.6	V
Timing capacitance	CcT	100	-	15000	pF
Timing resistance	RRT	5.1	-	50	kΩ
Oscillation frequency	Fosc	10	-	800	kHz

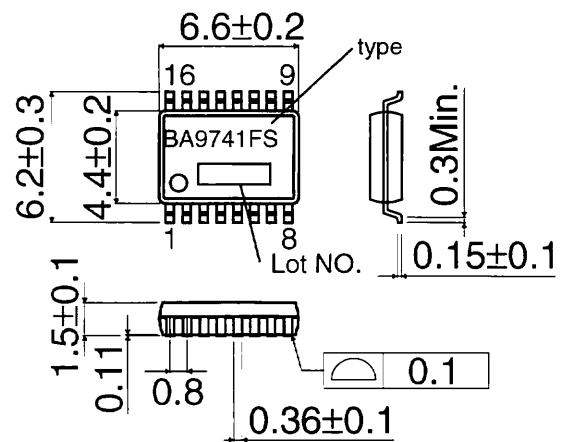
○ Electrical Characteristics (Ta=25°C, VCC=6.0V)

Item	Symbol	Limits			Unit	Conditions
		Min.	Typ.	Max.		
【Reference voltage section】						
Output voltage	VREF	2.4	2.5	2.6	V	IREF=1mA
Input stability	VDLI	—	1	10	mV	VCC=3.6~35V
Load stability	VDLO	—	1	10	mV	IREF=0~5mA
【Triangular wave oscillator section】						
Oscillation frequency	FOSC	320	400	480	KHz	RRT=10kΩ, CCT=220pF
Frequency variation	FDV	—	1	—	%	VCC=3.6~35V
【Protection circuit section】						
Threshold voltage	VIT	1.48	1.64	1.80	V	
Standby voltage	VSTB	—	50	100	mV	No pull-up
Latch voltage	VLТ	—	30	100	mV	No pull-up
Source current	ISCP	1.5	2.5	3.5	μA	
Comparator threshold voltage	VCT	0.9	1.05	1.2	V	5pin, 12pin
【Rest period adjustment circuit section】						
Input threshold voltage (fosc=10kHz)	Vt0	1.79	1.97	2.15	V	Duty cycle =0%
	Vt100	1.32	1.48	1.64	V	Duty cycle =100%
ON duty cycle	DON	45	55	65	%	VREF is divided by 13kΩ and 27kΩ resistors.
Input bias current	IBDT	—	0.1	1	μA	DTC=2.0V
Latch mode source current	IDT	200	560	—	μA	DTC=0V
Latch input voltage	VDТ	2.28	2.48	—	V	IDT=40 μA
【Low-input-voltage malfunction prevention circuit section】						
Threshold voltage	VUT	—	2.53	—	V	
【Error amplifier section】						
Input offset voltage	VIO	—	—	6	mV	
Input offset current	IIO	—	—	30	nA	
Input bias current	IIB	—	15	100	nA	
Open loop gain	AV	70	85	—	dB	
Common-mode input voltage	VCM	0.3	—	1.6	V	VCC=3.6~35V
Common-mode rejection ratio	CMRR	60	80	—	dB	
Maximum output voltage	VOM	2.3	2.5	—	V	
Minimum output current	VOL	—	0.7	0.9	V	
Output sink current	IOI	3	20	—	mA	FB=1.25V
Output source current	IOO	45	75	—	μA	FB=1.25V
【PWM comparator section】						
Input threshold voltage (fosc=10kHz)	Vt0	1.79	1.97	2.15	V	Duty cycle =0%
	Vt100	1.32	1.48	1.64	V	Duty cycle=100%
【Output section】						
Saturation voltage	VSAT	—	0.8	1.2	V	Io=75mA
Leak current	ILEAK	—	—	5	μA	Vo=35V
【Total device】						
Standby current	ICCS	—	1.3	1.8	mA	When output is OFF
Average current dissipation	ICCA	—	1.6	2.3	mA	RRT=10kΩ

○ Outline figure

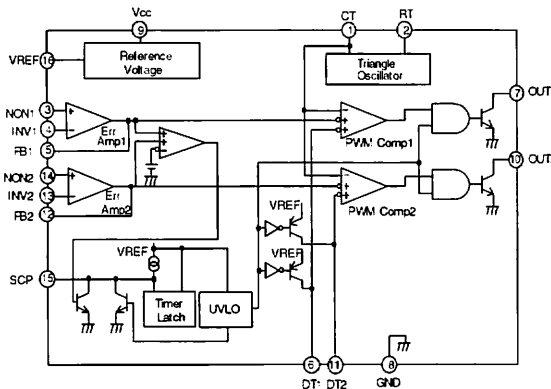


SOP-16 (Unit : mm)



SSOP-A16 (Unit : mm)

○ Block Diagram



○ PIN No./ name / function

Pin No.	Pin name	Function
1	CT	External timing capacitance
2	RT	External timing resistance
3	NON1	Positive input for error amplifier 1
4	INV1	Negative input for error amplifier 1
5	FB1	Output for error amplifier 1
6	DT1	Output 1 dead time/soft start setting
7	OUT1	Output 1
8	GND	GROUND
9	Vcc	Power Supply
10	OUT2	Output 2
11	DT2	Output 2 dead time/soft start setting
12	FB2	Output for error amplifier 2
13	INV2	Negative input for error amplifier 2
14	NON2	Positive input for error amplifier 2
15	SCP	Timer latch setting
16	VREF	Reference voltage output

○ Cautions on use

1. Absolute maximum ratings

An excess in the absolute maximum ratings, such as applied voltage, operating temperature range, etc., can degrade or break down devices, thus making impossible to identify breaking mode such as short circuit mode or an open mode. If any special mode exceeding the absolute maximum ratings is assumed, consideration should be given to take physical safety measures including use of fuses, etc.

2. GND potential

Make setting of the potential of the GND terminal so that it will be maintained at the minimum in any operating state. Furthermore, check to be sure no pins other than the GND pin fall below the GND voltage, including an actual electric transient.

3. Thermal design

With consideration given to power dissipation(Pd) in the actual use state, provide the thermal design with an adequate margin.

4. Short circuit between pins and erroneous mounting

In order to mount ICs on a set PCB, pay thorough attention to the direction and offset of the ICs. Erroneous mounting can break down the ICs. Furthermore, if a short circuit occurs due to foreign matters entering between pins or between the pin and the power supply or the GND pin, the ICs can break down.

5. Operation in strong electromagnetic field

Be noted that using ICs in the strong electromagnetic field can malfunction them.

6. Inspection with set printed circuit board

On the inspection with the set printed circuit board, if a capacitor is connected to a low-impedance pin, the IC can suffer stress. Therefore, be sure to discharge from the set printed circuit board by each process. For protection against static electricity, establish a ground for the assembly process and pay thorough attention to the transportation and the storage of the set printed circuit board. Furthermore, in order to connect the jig for the inspection process, be sure to turn OFF the power supply and then mount the set printed circuit board to the jig. After the completion of the inspection, be sure to turn OFF the power supply and then dismount the set printed circuit board from the jig.

7. Common impedance

For power supply and GND wirings, thorough consideration should be given, for example, to reduce common impedance, minimize ripple currents(in other words, to provide as thick and short wirings as possible or reduce ripple currents according to L and C values), etc.

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 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.

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available,
please contact your nearest sales office.

Please contact our sales offices for details ;

U.S.A / San Diego	TEL : +1(858)625-3630	FAX : +1(858)625-3670
Atlanta	TEL : +1(770)754-5972	FAX : +1(770)754-0691
Dallas	TEL : +1(972)312-8818	FAX : +1(972)312-0330
Germany / Dusseldorf	TEL : +49(2154)9210	FAX : +49(2154)921400
United Kingdom / London	TEL : +44(1)908-282-666	FAX : +44(1)908-282-528
France / Paris	TEL : +33(0)1 56 97 30 60	FAX : +33(0) 1 56 97 30 80
China / Hong Kong	TEL : +852(2)740-6262	FAX : +852(2)375-8971
Shanghai	TEL : +86(21)6279-2727	FAX : +86(21)6247-2066
Dilian	TEL : +86(411)8230-8549	FAX : +86(411)8230-8537
Beijing	TEL : +86(10)8525-2483	FAX : +86(10)8525-2489
Taiwan / Taipei	TEL : +866(2)2500-6956	FAX : +866(2)2503-2869
Korea / Seoul	TEL : +82(2)8182-700	FAX : +82(2)8182-715
Singapore	TEL : +65-6332-2322	FAX : +65-6332-5662
Malaysia / Kuala Lumpur	TEL : +60(3)7958-8355	FAX : +60(3)7958-8377
Philippines / Manila	TEL : +63(2)807-6872	FAX : +63(2)809-1422
Thailand / Bangkok	TEL : +66(2)254-4890	FAX : +66(2)256-6334

Japan /
(Internal Sales)

Tokyo	2-1-1, Yaesu, Chuo-ku, Tokyo 104-0082	TEL : +81(3)5203-0321	FAX : +81(3)5203-0300
Yokohama	2-4-8, Shin Yokohama, Kohoku-ku, Yokohama, Kanagawa 222-8575	TEL : +81(45)476-2131	FAX : +81(45)476-2128
Nagoya	Dainagayo Building 9F 3-28-12, Meieki, Nakamura-ku, Nagoya, Aichi 450-0002	TEL : +81(52)581-8521	FAX : +81(52)561-2173
Kyoto	579-32 Higashi Shiokouji-cho, Karasuma Nishi-iru, Shiokoujidori, Shimogyo-ku, Kyoto 600-8216	TEL : +81(75)311-2121	FAX : +81(75)314-6559

(Contact address for overseas customers in Japan)

Yokohama	TEL : +81(45)476-9270	FAX : +81(045)476-9271
----------	-----------------------	------------------------