

STRUCTURE Silicon Monolithic Integrated Circuit
 PRODUCT NAME 1ch Switching Regulator Controller
 TYPE **B D 9 3 0 0 F V**
 FEATURES PWM Switching Regulator Controller
 Input Voltage Range:3.6V~35V

● ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	36	V
Power Dissipation	Pd	400*	mW
Operating Temperature Range	Topr	-40~+85	°C
Storage Temperature Range	Tstg	-55~+125	°C
Output Pin Current	Io	100**	mA
Output Pin Voltage	Vo	36	V
Junction Temperature	Tjmax	125	°C

* Derating is done 4mW/°C for operating above Ta≥25°C
(On 70.0mm×70.0mm×1.6mm board)

** Pd should not be exceeded

● OPERATING CONDITIONS (Ta=-40°C~+85°C)

Parameter	Symbol	Limit			Unit
		Min	Typ	Max	
Supply Voltage	Vcc	3.6	12	35	V
Output Sink Current	Io	—	—	30	mA
Output Pin Voltage	Vo	—	—	35	V
Timing Capacitance	CT	33	—	1000	pF
Timing Resistance	RT	5	—	100	kΩ
Oscillator Frequency	Fosc	20	—	800	kHz

★This product is not designed for protection against radioactive rays.

★The product described in this specification is a strategic product (and/or Service) subject to COCOM regulations. It should not be exported without Authorization from the appropriate government.

Status of this document

The Japanese version of this document is the formal specification.

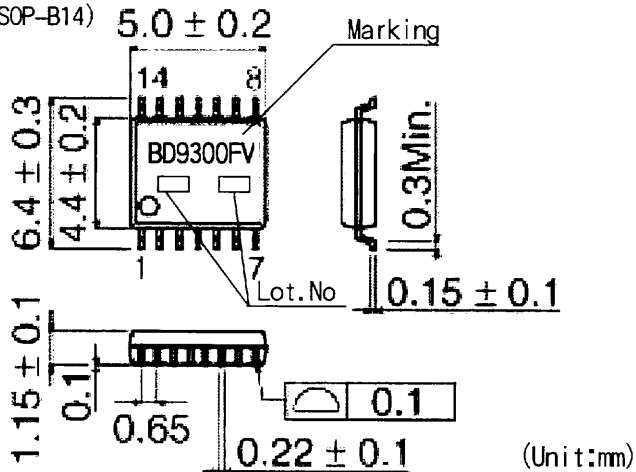
A customer may use this translation version only for a reference to help reading the formal version.

If there are any differences in translation version of this document, formal version takes priority.

●ELECTORICAL CHARACTERISTICS (Unless otherwise specified, Ta=25°C Vcc=12V, CT=200pF, RT=20kΩ)

Parameter	Symbol	Limit			Unit	Condition
		Min	Typ	Max		
[REFERENCE VOLTAGE BLOCK]						
Output Voltage	VREF	2.475	2.500	2.525	V	IREF=1mA
Line Regulation	VDLI	—	1.5	20	mV	Vcc=3.6~35V IREF=1mA
Load Regulation	VDLD	—	0.5	20	mV	IREF=0~1mA
1/2 VREF Voltage	1/2VREF	1.212	1.25	1.288	V	
[OSCILLATION BLOCK]						
Oscillation Frequency	FOSC	165	220	275	kHz	
Threshold Voltage Of Charging	VOSC+	—	1.95	—	V	
Threshold Voltage Of Discharging	VOSC-	—	1.45	—	V	
Frequency Drift	FDV0	—	1	—	%	Vcc=3.6~35V
[PROTECTION CIRCUIT BLOCK]						
Threshold Voltage	VIT	1.5	1.8	2.1	V	
SCP Source Current	Iscp	—	7	11	μA	
[DEAD TIME CONTROL INPUT]						
Input Threshold Voltage High	VtH	2.05	—	—	V	Duty Cycle=0%
Input Threshold Voltage Low	VtL	—	—	1.35	V	Duty Cycle=100%
Input Bias Current	Ibd	—	0.1	1	μA	DTC=1.5V
Latch Mode Source Current	Idtc	200	500	—	μA	DTC=0V
[UNDER VOLTAGE LOCK OUT BLOCK]						
Threshold Voltage	VUT	—	2.8	—	V	
[ERROR AMPLIFIER BLOCK]						
Input Bias Current	IIB	—	0.1	1	μA	
Open Loop Gain	AV	—	85	—	dB	Null AMP
Max. Output Voltage	VOH	2.3	2.5	—	V	
Min. Output Voltage	VOL	—	0.7	0.9	V	
Output Sink Current	IOL	0.1	1	—	mA	VFB=1.25V
Output Source Current	IOO	40	70	—	μA	VFB=1.25V
[OUTPUT BLOCK]						
Saturation Voltage	VSAT	—	1.0	1.4	V	Ic=30mA
Leak Current	I _{LEAK}	—	—	10	μA	OUT=35V
[CONTROL BLOCK]						
CTL ON Voltage	VON	2	—	—	V	
CTL OFF Voltage	VOFF	—	—	0.7	V	
CTL SINK current	ICTL	—	57	90	μA	VCTL=5V
[DEVICE]						
Stand-by Current	ISTB	—	0	10	μA	VCTL=0V
Average Supply Current	ICC	—	1.2	2.4	mA	RT=VREF

●PHYSICAL DIMENSION • MARKING (SSOP-B14)



Rev. C

NOTES FOR USE

1. Operation supply voltage range

The circuit functionality is guaranteed within operation of ambient temperature range, as long as it is within operation supply voltage range. The standard electrical characteristic values are guaranteed at the test circuit voltage of $V_{CC}=12V$. They cannot be guaranteed at other voltages. However, the variation will be small.

2. Grounding

It is recommended that every capacitor (bypass and another capacitors) is grounded to PIN7 using single-point connections.

3. FB Terminal

The FB terminal is for phase margin of the DC/DC system. A capacitor and a resistor or an only capacitor placed between the FB terminal and the INV terminal. The values of the capacitor and the resistor shall be adjusted according to the output current and the output capacitor value. The output may be oscillating if the value of capacitor is not sufficient, also the transient response may become insufficient if the value is too large. Therefore, the value of the capacitor and the resistor shall be adequately set up based on the condition of the temperature, and so on. Since the FB terminal also detects output short condition compulsorily applying an external voltage onto the FB terminal must not be performed because it may activate the timer latch protection circuit.

4. OUT Terminal

Since the IC may possibly be destroyed if a current exceeding its absolute maximum rating is input, be sure to locate a current limiting resistor. The resistance value shall be determined with a sufficient margin based on the input voltage (V_{CC}), the V_{BE} of the external transistor and output SAT voltage (V_{SAT}).

5. VCC Terminal

For reduce the influence of switching noise, bypass capacitor is connected between V_{CC} and GND .

6. Electromagnetic Fields

The IC is susceptible to strong electromagnetic fields and may cause malfunction. Therefore, caution should be used when placing it on the PCB.

7. Miscellaneous

This product is produced with strict quality control, but can be destroyed if used beyond absolute maximum ratings. Furthermore, the failure mode cannot be defined (e.g. short mode or open mode), if the device is used above the absolute maximum ratings, a fuse is recommended.

8. Application Design

When designing the external circuit, included adequate margins, including not only steady state but also transient characteristics.

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
----------	-----------------------	------------------------