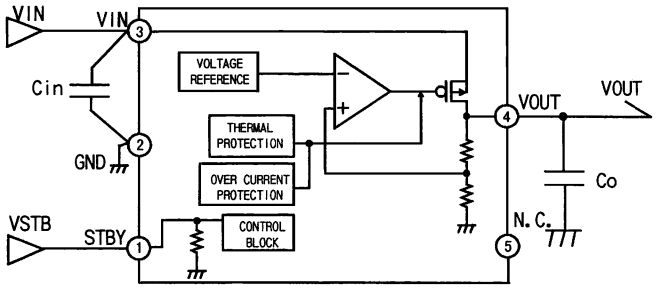
STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT CMOS Type series regulator

TYPE # BH□□NB1WHFV Series

○BLOCK DIAGRAM and APPLICATION CIRCUIT



Cin···0.1μF (Ceramic)

Co ···2.2μF (Ceramic)

Fig.1 BLOCK DIAGRAM and APPLICATION CIRCUIT

○PIN DESCRIPTION

PIN No.	PIN NAME	DESCRIPTION
1	STBY	OUTPUT CONTROL(High:ON, Low:OFF)
2	GND	GROUND Pin
3	VIN	INPUT Pin
4	VOUT	OUTPUT Pin
5	NC	NO CONNECT

○ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER	Symbol	Limit	Unit
Power Supply Voltage	VMAX	-0.3 ~ +6.5	V
Power Dissipation	Pd	410 (Note.1)	mW
Operating Temperature Range	Topr	-40 ~ +85	℃
Storage Temperature Range	Tstg	-55 ~ +125	℃

Note.1 Pd derated at 4.1mW/℃ for temperature above Ta=25℃,
mounted on 70mm×70mm×1.6mm glass-epoxy PCB.

Application example

The application circuit is recommended for use. Make sure to confirm the adequacy of the characteristics.

When using the circuit with changes to the external circuit constants, make sure to leave an adequate margin for external components including static and transitional characteristics as well as dispersion of the IC.

Note that ROHM cannot provide adequate confirmation of patents.

The product described in this specification is 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 this product 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.

ROHM assumes no responsibility for use of any circuits described herein, conveys no license under any patent or other right, and makes no representations that the circuits are free from patent infringement.

○RECOMMENDED OPERATING RANGE

PARAMETER	Symbol	Limit	Unit
Power Supply Voltage	VIN	2.5～5.5	V
Output Max Current	IMAX	150	mA

○ ELECTRICAL CHARACTERISTICS

(Ta=25℃, VIN=VOUT+1.0V, STBY=1.5V, Cin=0.1μF, Co=2.2μF, unless otherwise noted.)

PARAMETER		Symbol	Limit			Unit	Conditions
			MIN.	TYP.	MAX.		
【Regulator】							
Output Voltage		VOUT	VOUT×0.99	VOUT	VOUT×1.01	V	IOUT=1mA
Circuit Current		IGND	-	60	100	μA	IOUT=50mA
Circuit Current (STBY)		ISTBY	-	-	1.0	μA	STBY=0V
Ripple Rejection Ratio		RR	-	80	-	dB	VRR=-20dBv, fRR=1kHz, IOUT=10mA
Load Response 1		LTV1	-	25	-	mV	IOUT=1mA to 30mA
Load Response 2		LTV2	-	25	-	mV	IOUT=30mA to 1mA
Input output Voltage difference 1		VSAT1	-	80	150	mV	VIN=0.98×VOUT, IOUT=30mA
Input output Voltage difference 2		VSAT2	-	250	450	mV	VIN=0.98×VOUT, IOUT=100mA
Line Regulation		VDLI	-	1	20	mV	VIN=VOUT+0.5V to 5.5V, IOUT=50mA
Load Regulation 1		VDL01	-	6	30	mV	IOUT=1mA to 100mA
Load Regulation 2		VDL02	-	9	90	mV	IOUT=1mA to 150mA
【Over Current Protection】							
Limit Current		ILMAX	-	250	-	mA	Vo=VOUT×0.98
Short Current		ISHORT	-	50	-	mA	Vo=0V
【Stand-by block】							
STBY Pull-down Resistor		RSTB	275	550	1100	kΩ	
STBY Control Voltage	ON	VSTBH	1.5	-	VCC	V	
	OFF	VSTBL	-0.3	-	0.3	V	

●This product is not designed for protection against radio active rays.

○RECOMMENDED OPERATING CONDITION

PARAMETER	Symbol	MIN.	TYP.	MAX.	Unit	CONDITION
Input Capacitor	Cin	0.1	-	-	μF	Ceramic capacitor recommended
Output Capacitor	Co	2.2	-	-	μF	Ceramic capacitor recommended

○TEST CIRCUIT

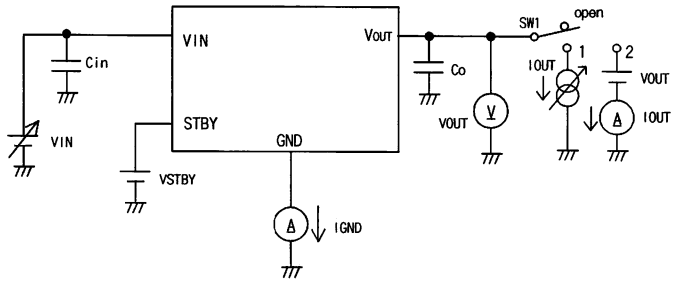


Fig.2 TEST CIRCUIT

○Power Dissipation Reduction

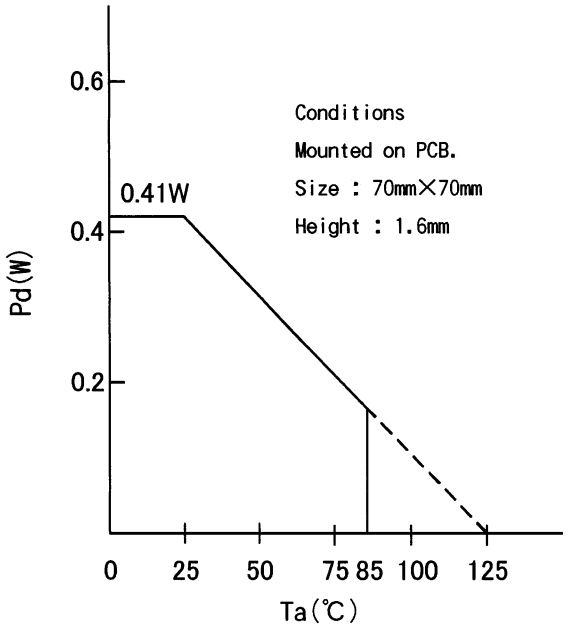


Fig.3 Pd reduction (example)

○Device Name and Marking

Device Name : BH□□NB1WHFV

a

Symbol	Description		Device Mark
	□□	Output Voltage	
a	25	2.5V typ.	CV
	28	2.8V typ.	CW
	2J	2.85Vtyp.	C2
	29	2.9V typ.	CX
	30	3.0V typ.	CY
	31	3.1V typ.	CZ
	33	3.3V typ.	C0

○ Package dimensions (HVSOF5)

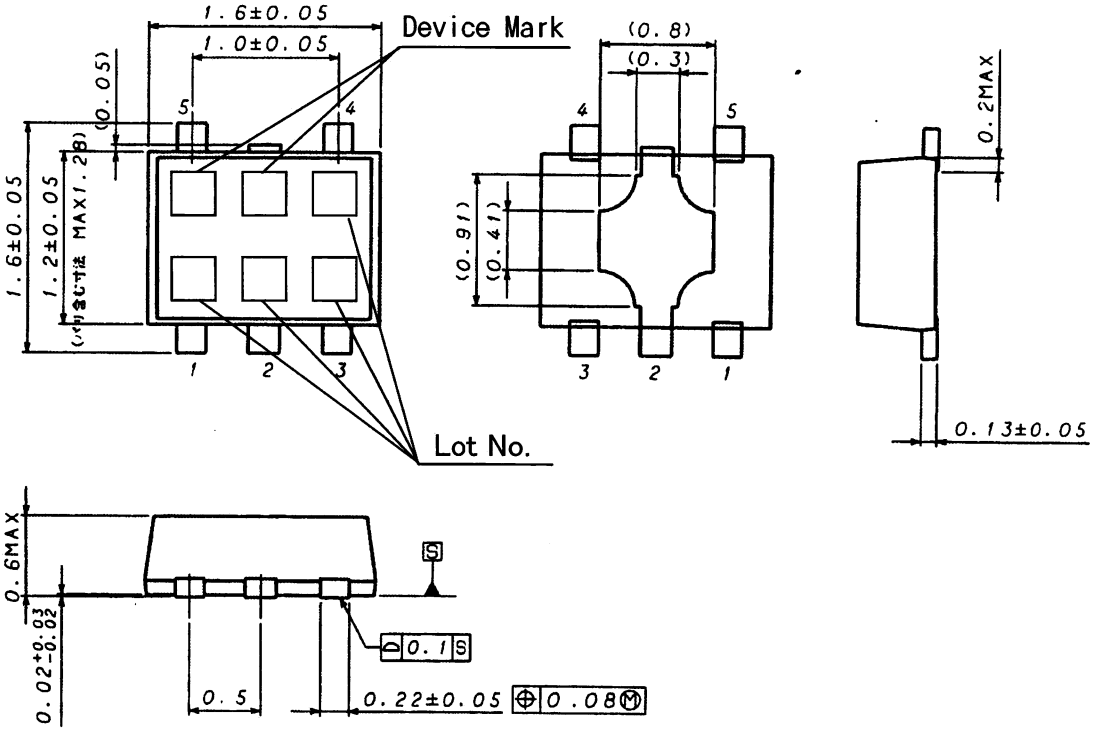


Fig.4 Package dimensions (UNIT:mm)

○Operation Notes

1.) Absolute maximum ratings

May be destroyed if it is operated beyond its absolute maximum ratings. If the device is destroyed in exceeding the recommended maximum ratings, the failure mode will be difficult to determine. (E.g. short mode, open mode) Therefore, physical protection counter-measures (like fuse) should be implemented when operating conditions are beyond the absolute maximum ratings specified.

2.) GND potential

GND potential must be the lowest potential no matter what may happen. Actually, including transitional states, all pins except GND must not be the voltage below GND.

3.) Setting of heat

Consider Pd of actually using states, carry out the heat design that have adequate margin.

4.) Pin short and mistake fitting

When mounting the IC on the PCB, pay attention to the orientation of the IC. If there is a placement mistake, the IC may be burned up.

5.) Actions in strong magnetic field

Using the IC within a strong magnetic field may cause a malfunction.

6.) Mutual impedance

Use short and wide wiring tracks for the power supply and ground to keep the mutual impedance as small as possible. Use a capacitor to keep ripple to a minimum.

7.) Voltage of STB pin

For standby mode, set STB voltage below 0.3V. For normal operation, set the pin voltage beyond 1.2V. It is not recommended to set STB voltage between 0.3V and 1.5V, and it may cause improper operation.

8.) Over current protection circuit

Over current and short circuit protection is built-in at the output, and IC destruction is prevented at the time of load short circuit. These protection circuits is effective in the destructive prevention by the sudden accident, please avoid use to which a protection circuit operates continuously.

9.) Thermal shutdown

In cases of operation at high temperature, thermal shut-down will be activated and output will be turned off. Once IC is returned on normal operating temperature, the output will be turned back on.

10.)Output capacitor

To prevent oscillation at output, it is recommended that the IC be operated at the stable region show as Fig.5. It is recommended that the IC operated at the capacitor of more than 2.2μF, and also ESR=500mΩ below.

As capacitance is larger, stability becomes more stable and characteristic of output load fluctuation is also improved.

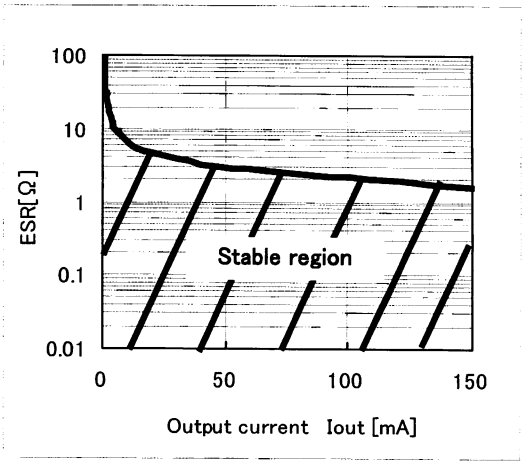


Fig.5 Stable region (Example)

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 with 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

As of 18th. April 2005