

STRUCTURE Silicon Monolithic Integrated Circuit
TYPE Dual Low-Dropout Voltage Regulator
PRODUCT SERIES **BA33D18HFP**
FEATURES

- Dual Output : 3.3V/0.5A, 1.8 V/0.5A
- Output Voltage Accuracy : $\pm 2\%$

○ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply Voltage *1	Vcc	18	V
Power Dissipation *2	Pd	2300	mW
Operating Temperature Range	Topr	-25~+105	°C
Storage Temperature Range	Tstg	-55~+150	°C

*1 Do not however exceed Pd.

*2 Pd derated at 18.4mW/°C for temperature above Ta=25°C, Mounted on 70mm×70mm×1.6mm Glass Epoxy PCB.

The PCB has Thermal Via and 2Layers. The front side Copper Area : 10.5×10.5mm², The back side Copper Area : 15×15mm²

○ OPERATING CONDITIONS (Ta=25°C)

Parameter	Symbol	Min.	Max.	Limit
Supply Voltage	Vcc	4.1	16.0	V
3.3V Peak Output Current	Io1	-	0.5	A
1.8V Peak Output Current	Io2	-	0.5	A

* 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.

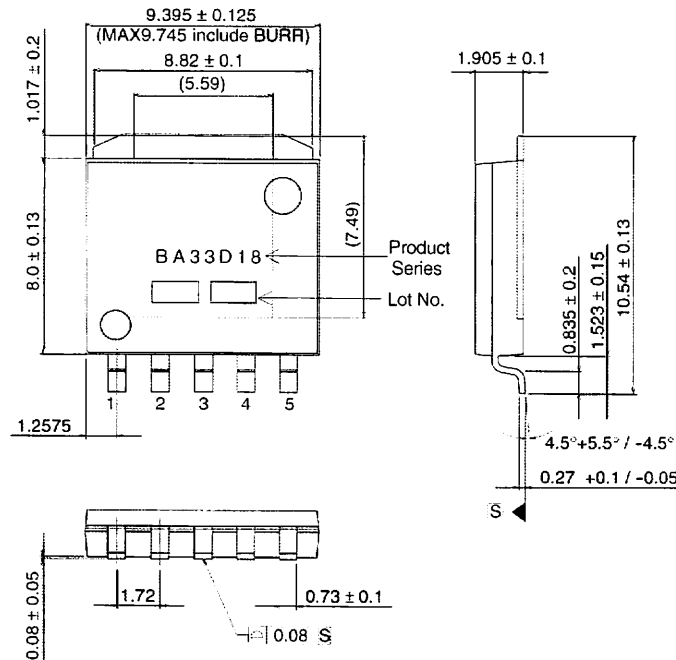
If there are any differences in translation version of this document, formal version takes priority.

○ ELECTRICAL CHARACTERISTICS (Unless otherwise specified Ta=25°C, Vcc=5V)

Parameter	Symbol	Limits			Unit	Condition
		Min.	Typ.	Max.		
Bias Current	Ib	—	0.7	1.6	mA	Io1=0mA, Io2=0mA
[3.3V Output]						
Output Voltage 1	Vo1	3.234	3.30	3.366	V	Io1=250mA
Dropout Voltage 1	ΔVd1	—	0.25	0.50	V	Io1=250mA, Vcc=3.135V
Peak Output Current 1	Io1	0.5	—	—	A	
Ripple Rejection 1	R.R.1	—	68	—	dB	f=120Hz, ein=1Vp-p, Io1=100mA
Line Regulation 1	Reg.L1	—	5	30	mV	Vcc=4.1V→16V, Io1=250mA
Load Regulation 1	Reg.L1	—	30	75	mV	Io1=0mA→0.5A
Temperature Coefficient Output Voltage 1 *3	Tcvo1	—	±0.01	—	%/°C	Io1=5mA, Tj=0~125°C
[1.8V Output]						
Output Voltage 2	Vo2	1.764	1.800	1.836	V	Io2=250mA
Peak Output Voltage 2	Io2	0.5	—	—	A	
Ripple Rejection 2	R.R.2	—	72	—	dB	f=120Hz, ein=1Vp-p, Io2=100mA
Line Regulation 2	Reg.L2	—	5	30	mV	Vcc=4.1V→16V, Io2=250mA
Load Regulation 2	Reg.L2	—	30	75	mV	Io2=0mA→0.5A
Temperature Coefficient Output Voltage 2 *3	Tcvo1	—	±0.01	—	%/°C	Io2=5mA, Tj=0~125°C

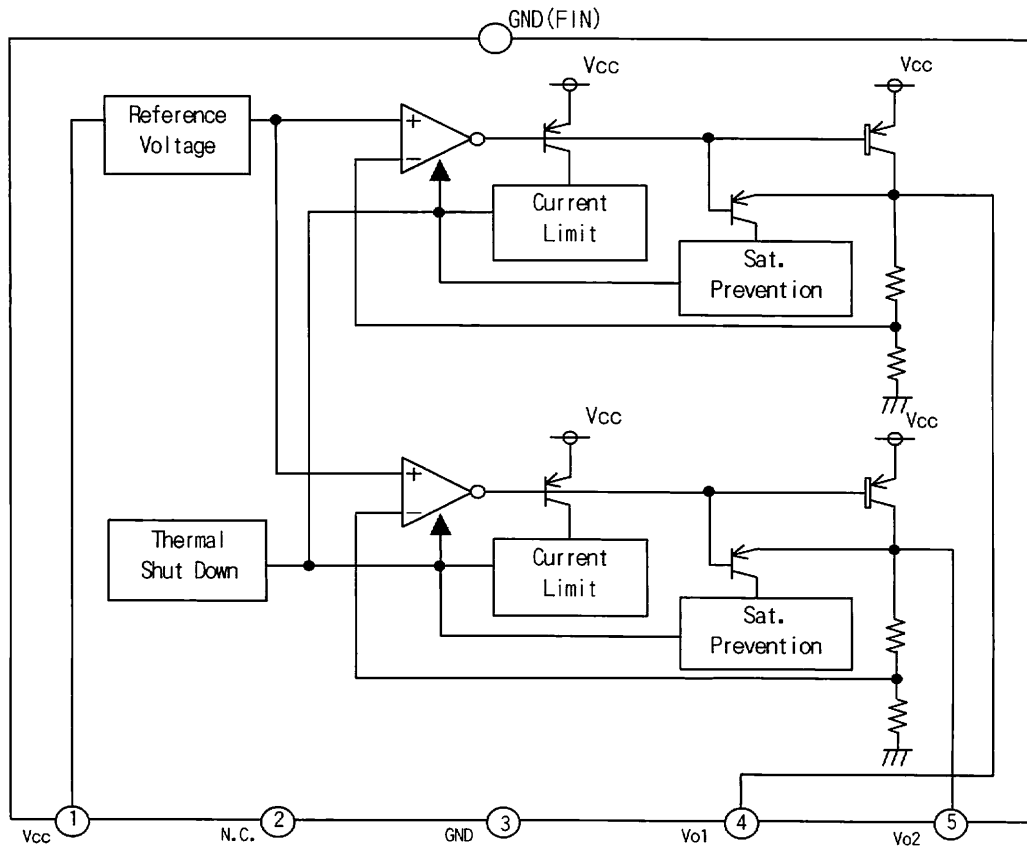
*3 Design Guarantee (Outgoing inspection is not done on all products.)

○ PHYSICAL DIMENSIONS • MARKING



HRP5 (単位: mm)

○ Block Diagram



* Refer to the Technical Note about the details of the application.

○ Pin No. • Pin Name

Pin No.	Pin Name
1	Vcc
2	N.C
3	GND
4	Vo1
5	Vo2
FIN	GND

NOTES FOR USE

1. Absolute maximum range

This product are produced with strict quality control, but might be destroyed in using beyond absolute maximum ratings. The IC destroyed a failure mode cannot be defined (like Short mode, or Open mode). Therefore physical security countermeasure, like fuse, is to be given when a specified mode to be beyond absolute maximum ratings is considered.

2. Ground potential

GND terminal should be a lowest voltage potential every state.
Please make sure all pins which is over ground even if include transient feature.

3. About oscillation stopper of output and bypass capacitor

Please put into capacitor to stop oscillation between output pin and GND. It has a possibility of oscillation if capacitance is changed due to temperature change, etc and it recommends using small tantalum electrolytic capacitor of internal serial resistor (ESR). It recommends degree of 10 μ F capacitance capacitor. If extremely big capacitor (over 1000 μ F) is used, it may have a case to occur oscillation of low frequency. Please confirm for the point. And it recommend to put into bypass capacitor with 1 μ F degree into the nearest position between Vcc pin and GND.

4. Over current protection circuit

The over-current protection circuits are built in at output, according to their respective current outputs and prevent the IC from being damaged when the load is short-circuited or over-current. But, these protection circuits are effective for preventing destruction by unexpected accident. When it's in continuous protection circuit moving period don't use please. And for ability, because this chip has minus characteristic, be careful for heat plan.

5. Built-in thermal circuit

A temperature control circuit is built in the IC to prevent the damage due to overheat. Therefore, all the outputs are turned off when the thermal circuit works and are turned on when the temperature goes down to the specified level. But, built-in the IC a temperature control circuit to protect itself. Except this IC, the other components be designed under 150°C.

6. Mounting Failures

Mounting failure, such as misdirection or mismount, may cause a malfunction in the device.

7. Application

Internal circuit could be damaged if there are modes in which the electric potential of the application's input (Vcc) and GND are the opposite of the electric potential of the various outputs. Use of a diode or other such bypass is recommended.

8. Mal-function may happen when the device is used in the strong electromagnetic field.

9. Recommended to put DIODE for protection purpose in case of output pin connected with large load of impedance or reserve current occurred at initial and output off.

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