

STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT SERIES Voltage Detector IC

TYPE **BD48XXFVE Series**

- FEATURES
- Detection voltage lineup : 2.3V~6.0V
  - High precision detection voltage:  $\pm 1.0\%$

**ABSOLUTE MAXIMUM RATINGS (Ta=25°C)**

Parameter	Symbol	Limit	Unit
Supply Voltage ※1	V <sub>DD</sub> -GND	-0.3 to +10	V
Output Voltage ※1 Nch Open Drain Output	V <sub>OUT</sub>	GND-0.3 to +10	V
Power Dissipation ※2	P <sub>d</sub>	210	mW
Operating Temperature Range ※1	T <sub>opr</sub>	-40 to +105	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +125	°C

※1 Do not exceed P<sub>d</sub>.

※2 Mounted on 70mm × 70mm × 1.6mm Glass Epoxy PCB, P<sub>d</sub> derated at 2.1mW/°C for temperature above Ta=25°C

NOTE : 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.

NOTE : This product is not designed for protection against radioactive rays.

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.

**OELECTRICAL CHARACTERISTICS** (Unless Otherwise Specified Ta=-40 to 105°C)

Parameter	Symbol	Condition	Limit			Unit	
			Min.	Typ.	Max.		
Detection Voltage	Vs	RL=470kΩ, VDD=H→L ※3	Vs(T) × 0.99	Vs(T)	Vs(T) × 1.01	V	
Output Delay Time "L→H"	tPLH	CL=100pF RL=100kΩ Vout=GND→50% ※4	-	-	100	μ sec	
Circuit Current when ON	Icc1	VDD=Vs-0.2V, ※3	Vs=2.3-3.1V	-	0.51	1.53	μ A
			Vs=3.2-4.2V	-	0.56	1.68	
			Vs=4.3-5.2V	-	0.60	1.80	
			Vs=5.3-6.0V	-	0.66	1.98	
Circuit Current when OFF	Icc2	VDD=Vs+2.0V, ※3	Vs=2.3-3.1V	-	0.75	2.25	μ A
			Vs=3.2-4.2V	-	0.80	2.40	
			Vs=4.3-5.2V	-	0.85	2.55	
			Vs=5.3-6.0V	-	0.90	2.70	
Minimum Operating Voltage	VOPL	VOL≤0.4V, RL=470kΩ, Ta=-25~-105°C	0.95	-	-	V	
		VOL≤0.4V, RL=470kΩ, Ta=-40~-25°C	1.20	-	-		
'Low'Output Current (Nch)	IoL	VDS=0.5V, VDD=1.5V, Vs=2.3-6.0V	0.4	1.0	-	mA	
		VDS=0.5V, VDD=2.4V, Vs=2.7-6.0V	2.0	4.0	-		
Leak Current when OFF	Ileak	VDD=VDS=10V ※3	-	-	0.1	μ A	
Detection Voltage Temperature coefficient	Vs/ΔT	Ta=-40°C to 105°C (Designed Guarantee)	-	± 100	± 360	ppm/°C	
Hysteresis Voltage	ΔVs	VDD=L→H→L	Vs × 0.03	Vs × 0.05	Vs × 0.08	V	

Vs(T) : Standard Detection Voltage (2.3V to 6.0V, 0.1V step)

RL: Pull-up resistor to be connected between VOUT and power supply.

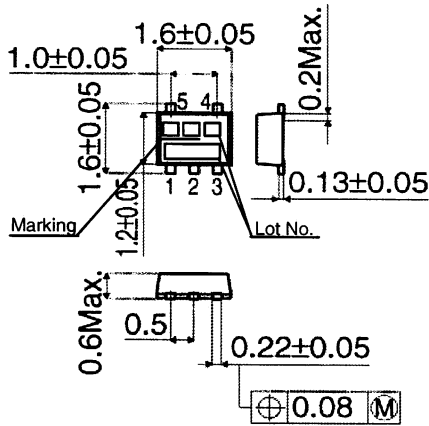
CL: Capacitor to be connected between VOUT and GND.

Designed Guarantee.(Outgoing inspection is not done on all products.)

※3 Guarantee is Ta=25°C.

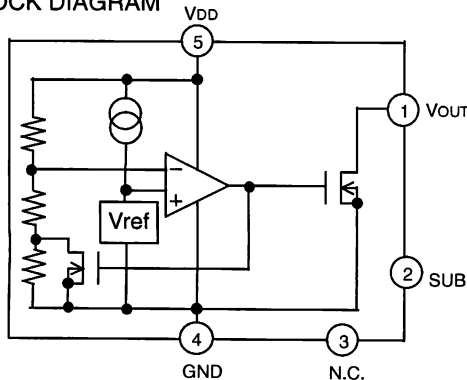
※4 tPLH: VDD = (Vs typ.-0.5V) → (Vs typ.+0.5V)

**OPHYSICAL DIMENSIONS, MARKING**



VSO5 (UNIT:mm)

**OBLOCK DIAGRAM**



**OPIN NO. , PIN NAME**

Pin Number	Pin Name
1	VOUT
2	SUB
3	N.C.
4	GND
5	VDD

NOTE : Substrate Pin should be connected with GND

\* Please refer to Technical note concerning application circuit, and etc.

## ○STANDARD DETECTION VOLTAGE AND MARKING

Type	Standard Detection Voltage[V]	Marking	Type	Standard Detection Voltage[V]	Marking
BD4860	6.000	EW	BD4841	4.100	EB
BD4859	5.900	EV	BD4840	4.000	EA
BD4858	5.800	EU	BD4839	3.900	DV
BD4857	5.700	ET	BD4838	3.800	DU
BD4856	5.600	ES	BD4837	3.700	DT
BD4855	5.500	ER	BD4836	3.600	DS
BD4854	5.400	EQ	BD4835	3.500	DR
BD4853	5.300	EP	BD4834	3.400	DQ
BD4852	5.200	EN	BD4833	3.300	DP
BD4851	5.100	EM	BD4832	3.200	DN
BD4850	5.000	EL	BD4831	3.100	DM
BD4849	4.900	EK	BD4830	3.000	DL
BD4848	4.800	EJ	BD4829	2.900	DK
BD4847	4.700	EH	BD4828	2.800	DJ
BD4846	4.600	EG	BD4827	2.700	DH
BD4845	4.500	EF	BD4826	2.600	DG
BD4844	4.400	EE	BD4825	2.500	DF
BD4843	4.300	ED	BD4824	2.400	DE
BD4842	4.200	EC	BD4823	2.300	DD

## ONOTES FOR USE

- 1 . Absolute maximum range  
Absolute Maximum Ratings are those values beyond which the life of a device may be destroyed. We cannot be defined the failure mode, such as short mode or open mode. Therefore a physical security countermeasure, like fuse, is to be given when a specific mode to be beyond absolute maximum ratings is considered.
- 2 . GND potential  
GND terminal should be a lowest voltage potential every state.  
Please make sure all pins which are over ground even if include transient feature.
- 3 . Electrical Characteristics  
Be sure to check the electrical characteristics, that is one the tentative specification will be changed by temperature, supply voltage, and external circuit.
- 4 . Bypass capacitor for noise rejection  
Please put into capacitor to reject noise between VDD pin and GND.  
If extremely big capacitor is used, transient response might be late. Please confirm sufficiently for the point
- 5 . Short Circuit between Terminals and Soldering  
Don't short-circuit between Output pin and VDD pin, Output pin and GND pin, or VDD pin and GND pin. When soldering the IC on circuit board, please be unusually cautious about the orientation and the position of the IC. When the orientation is mistaken the IC may be destroyed.
- 6 . Electromagnetic field  
Mal-function may happen when the device is used in the strong electromagnetic field.
- 7 . When using high VDD pin impedance, the through current may cause oscillation.
- 8 . When using high VDD pin impedance, set capacitor between VDD-GND.
- 9 . When VDD drops and goes below the minimum operating voltage, output is uncertain; when the output is pulled up, output becomes the voltage is the same as VDD.
10. BD48XFVE has extremely high impedance terminals. Small leak current due to the uncleanness of PCB surface might cause unexpected operations. Application values in these conditions should be selected carefully. Also, If the leakage is assumed between the VOUT terminal and the GND terminal, the pull up resistor should be less than 1/10 of the assumed leak resistance.
11. External parameters  
The recommended parameter range for  $R_L$  is  $50k\Omega \sim 1M\Omega$ . When attempting to operate beyond these parameters, be sure to verify the actual operation before continuing use.
12. Power on reset operation  
Please note that the power on reset output varies with the Vcc rise up time.  
Please verify the actual operation.

### 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
----------	-----------------------	------------------------