

STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT Voltage Detector IC built in Delay Circuit

TYPE **BD46XXXG Series**

FEATURES •Detection voltage line up : 2.3~4.8V
 •High precision detection voltage : ± 1.0%

○ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Parameter	Symbol	Limit	Unit
Supply Voltage ※1	V _{DD} -GND	-0.3 to +10	V
Output Voltage ※1	V _{OUT}	GND-0.3 to V _{DD} +0.3	V
Input Voltage of ER	V _{ER}	GND-0.3 to V _{DD} +0.3	V
Power Dissipation ※2	P _d	540	mW
Operating Temperature ※1	T _{opr}	-40 to +105	°C
Storage Temperature Range	T _{stg}	-55 to +125	°C
Junction Temperature	T _{jmax}	125	°C

※1 Do not exceed P_d.

※2 Mounted on 70mm × 70mm × 1.6mm Glass Epoxy PCB, P_d derated at 5.4mW/°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	VDET	VDD=H→L ※2	VDET(T) × 0.99	VDET(T)	VDET(T) × 1.01	V	
Detection Voltage Temperature coefficient	VDET/ ΔT	-40°C~+105°C	-	±100	±360	ppm/ °C	
Hysteresis Voltage	ΔVDET	VDD=L→H→L	VDET(T) × 0.03	VDET(T) × 0.05	VDET(T) × 0.08	V	
'High' Output Delay time	tPLH	CL=100pF ※2, ※3	BD46XX5G	45	50	55	msec
			BD46XX1G	90	100	110	
			BD46XX2G	180	200	220	
Circuit Current when ON	IDD1	VDD=VDET-0.2V, VER=0V VDET=2.3V~3.1V ※2	-	0.70	2.10	μA	
		VDD=VDET-0.2V, VER=0V VDET=2.3V~3.1V	-	0.70	2.85		
		VDD=VDET-0.2V, VER=0V VDET=3.2V~4.2V ※2	-	0.75	2.25		
		VDD=VDET-0.2V, VER=0V VDET=3.2V~4.2V	-	0.75	3.00		
		VDD=VDET-0.2V, VER=0V VDET=4.3V~4.8V ※2	-	0.80	2.40		
Circuit Current when OFF	IDD2	VDD=VDET+0.2V, VER=0V VDET=2.3V~3.1V ※2	-	0.75	2.25	μA	
		VDD=VDET+0.2V, VER=0V VDET=2.3V~3.1V	-	0.75	4.28		
		VDD=VDET+0.2V, VER=0V VDET=3.2V~4.2V ※2	-	0.80	2.40		
		VDD=VDET+0.2V, VER=0V VDET=3.2V~4.2V	-	0.80	4.50		
		VDD=VDET+0.2V, VER=0V VDET=4.3V~4.8V ※2	-	0.85	2.55		
Operating Voltage Range	VOPL	VOL≤0.4V, Ta=-25~-105°C	0.95	-	-	V	
		VOL≤0.4V, Ta=-40~-25°C	1.20	-	-		
'Low' Output Current (Nch)	IOL	VDS=0.5V, VDD=1.2V	0.4	1.2	-	mA	
		VDS=0.5V, VDD=2.4V VDET=2.7V~4.8V	2.0	5.0	-		
'High' Output Current (Pch)	IOH	VDS=0.5V, VDD=4.8V VDET=2.3V~4.2V ※2	1.0	2.2	-	mA	
		VDS=0.5V, VDD=6.0V VDET=2.7V~4.8V ※2	1.2	2.7	-		
ER Pin 'H' Voltage	VEH	※2	2.0	-	-	V	
ER Pin 'L' Voltage	VEL	※2	-	-	0.8	V	
ER Pin Input Current	IEL		-	1	10	μA	

VDET(T) : Standard Detection Voltage (2.3V to 4.8V, 0.1V step)

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

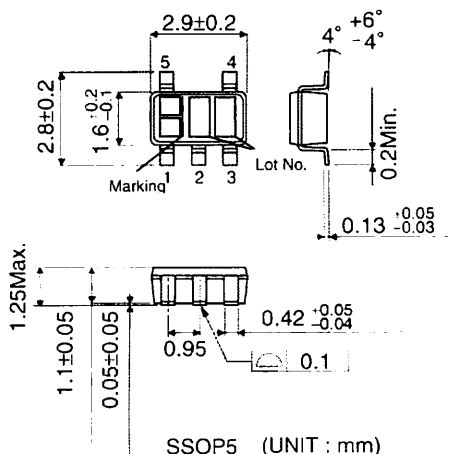
CL : Capacitor to be connected between VOUT and GND.

※2 Guarantee is Ta=25°C.

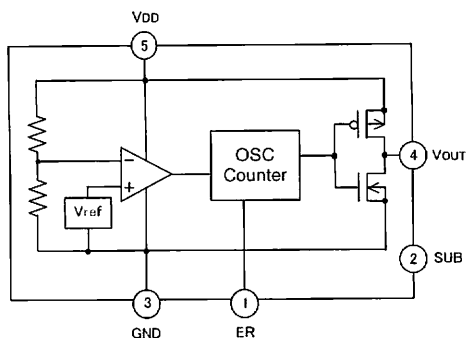
※3 tPLH: VDD=(VDET(T)-0.5V)→(VDET(T)+0.5V)

Attention: Please connect the GND when you don't use 'ER'

OPHYSICAL DIMENSIONS, MARKING



○ BLOCK DIAGRAM



OPIN NO. , PIN NAME

Pin Number	Pin Name
1	ER
2	SUB
3	GND
4	VOUT
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

BD46XXXG Series

VDET	BD46XX5G		BD46XX1G		BD46XX2G	
	Product	Marking	Product	Marking	Product	Marking
4.8V	BD46485G	VA	BD46481G	W2	BD46482G	WU
4.7V	BD46475G	VB	BD46471G	W3	BD46472G	WV
4.6V	BD46465G	VC	BD46461G	W4	BD46462G	WW
4.5V	BD46455G	VD	BD46451G	W5	BD46452G	WX
4.4V	BD46445G	VE	BD46441G	W6	BD46442G	WY
4.3V	BD46435G	VF	BD46431G	W7	BD46432G	WZ
4.2V	BD46425G	VG	BD46421G	W8	BD46422G	X0
4.1V	BD46415G	VH	BD46411G	W9	BD46412G	X1
4.0V	BD46405G	VJ	BD46401G	WA	BD46402G	X2
3.9V	BD46395G	VK	BD46391G	WB	BD46392G	X3
3.8V	BD46385G	VL	BD46381G	WC	BD46382G	X4
3.7V	BD46375G	VM	BD46371G	WD	BD46372G	X5
3.6V	BD46365G	VN	BD46361G	WE	BD46362G	X6
3.5V	BD46355G	VP	BD46351G	WF	BD46352G	X7
3.4V	BD46345G	VQ	BD46341G	WG	BD46342G	X8
3.3V	BD46335G	VR	BD46331G	WH	BD46332G	X9
3.2V	BD46325G	VS	BD46321G	WJ	BD46322G	XA
3.1V	BD46315G	VT	BD46311G	WK	BD46312G	XB
3.0V	BD46305G	VU	BD46301G	WL	BD46302G	XC
2.9V	BD46295G	VV	BD46291G	WM	BD46292G	XD
2.8V	BD46285G	VW	BD46281G	WN	BD46282G	XE
2.7V	BD46275G	VX	BD46271G	WP	BD46272G	XF
2.6V	BD46265G	VY	BD46261G	WQ	BD46262G	XG
2.5V	BD46255G	VZ	BD46251G	WR	BD46252G	XH
2.4V	BD46245G	W0	BD46241G	WS	BD46242G	XJ
2.3V	BD46235G	W1	BD46231G	WT	BD46232G	XK

OTECHICAL NOTE

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 the 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 Terminal 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 . The VDD line inpedance might cause oscillation because of the detection current.

8 . A VDD -GND capacitor (as close connection as possible) should be used in high VDD line impedance condition.

9 . BD46XXXG 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.If $1\text{M}\Omega$ leakage is assumed between the ER terminal and the GND terminal, $100\text{k}\Omega$ connection between the ER terminal and the VDD terminal would be recommended.

10. 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
----------	-----------------------	------------------------