

STRUCTURE	Silicon Monolithic Integrated Circuit
PRODUCT	Voltage Detector IC built in Delay Circuit
TYPE	BD45XXXG Series
FEATURES	<ul style="list-style-type: none"> •Detection voltage line up : 2.3~4.8V •High precision detection voltage : $\pm 1.0\%$

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Parameter	Symbol	Limit	Unit
Supply Voltage ※1	VDD—GND	-0.3 to +10	V
Output Voltage ※1	Nch Open Drain Output VOUT	GND-0.3 to +10	V
Input Voltage of ER	VER	GND-0.3 to VDD+0.3	V
Power Dissipation ※2	Pd	540	mW
Operating Temperature ※1	Topr	-40 to +105	°C
Storage Temperature Range	Tstg	-55 to +125	°C
Junction Temperature	Tjmax	125	°C

※1 Do not exceed Pd.

※2 Mounted on 70mm × 70mm × 1.6mm Glass Epoxy PCB, Pd 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, RL=470kΩ ※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, RL=470kΩ	VDET(T) × 0.03	VDET(T) × 0.05	VDET(T) × 0.08	V
'High' Output Delay time	tPLH	CL=100pF, RL=100kΩ ※2, ※3	BD45XX5G	45	50	55
			BD45XX1G	90	100	110
			BD45XX2G	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	
		VDD=VDET-0.2V, VER=0V VDET=4.3V~4.8V	-	0.80	3.15	
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	
		VDD=VDET+0.2V, VER=0V VDET=4.3V~4.8V	-	0.85	4.73	
Operating Voltage Range	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=1.2V	0.4	1.2	-	mA
		VDS=0.5V, VDD=2.4V VDET=2.7V~4.8V	2.0	5.0	-	
Leak Current when OFF	Ileak	VDD=VDS=10V ※2	-	-	0.1	μA
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.

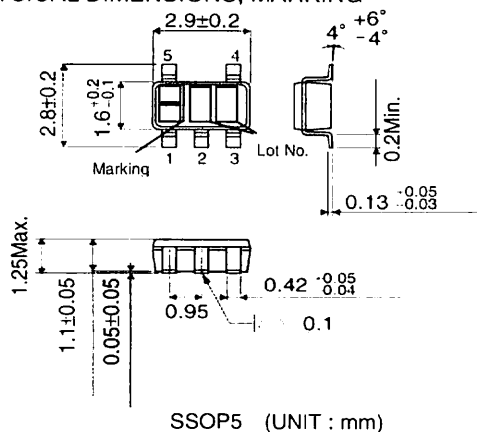
CL : Capacitor to be connected between VOUT and GND.

※2 Guarantee is Ta=25°C.

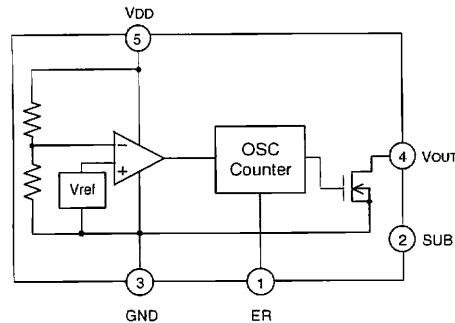
※3 tPLH: VDD=(VDET(T)-0.5V)→(VDET(T)+0.5V)

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

OPHYSICAL DIMENSIONS, MARKING



OBLOCK DIAGRAM



OPIN NO. , PIN NAME

Pin No.	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.

OSTANDARD DETECTION VOLTAGE AND MARKING

BD45XXXG Series

VDET	BD45XX5G		BD45XX1G		BD45XX2G	
	Product	Marking	Product	Marking	Product	Marking
4.8V	BD45485G	T0	BD45481G	TS	BD45482G	UJ
4.7V	BD45475G	T1	BD45471G	TT	BD45472G	UK
4.6V	BD45465G	T2	BD45461G	TU	BD45462G	UL
4.5V	BD45455G	T3	BD45451G	TV	BD45452G	UM
4.4V	BD45445G	T4	BD45441G	TW	BD45442G	UN
4.3V	BD45435G	T5	BD45431G	TX	BD45432G	UP
4.2V	BD45425G	T6	BD45421G	TY	BD45422G	UQ
4.1V	BD45415G	T7	BD45411G	TZ	BD45412G	UR
4.0V	BD45405G	T8	BD45401G	U0	BD45402G	US
3.9V	BD45395G	T9	BD45391G	U1	BD45392G	UT
3.8V	BD45385G	TA	BD45381G	U2	BD45382G	UU
3.7V	BD45375G	TB	BD45371G	U3	BD45372G	UV
3.6V	BD45365G	TC	BD45361G	U4	BD45362G	UW
3.5V	BD45355G	TD	BD45351G	U5	BD45352G	UX
3.4V	BD45345G	TE	BD45341G	U6	BD45342G	UY
3.3V	BD45335G	TF	BD45331G	U7	BD45332G	UZ
3.2V	BD45325G	TG	BD45321G	U8	BD45322G	V0
3.1V	BD45315G	TH	BD45311G	U9	BD45312G	V1
3.0V	BD45305G	TJ	BD45301G	UA	BD45302G	V2
2.9V	BD45295G	TK	BD45291G	UB	BD45292G	V3
2.8V	BD45285G	TL	BD45281G	UC	BD45282G	V4
2.7V	BD45275G	TM	BD45271G	UD	BD45272G	V5
2.6V	BD45265G	TN	BD45261G	UE	BD45262G	V6
2.5V	BD45255G	TP	BD45251G	UF	BD45252G	V7
2.4V	BD45245G	TQ	BD45241G	UG	BD45242G	V8
2.3V	BD45235G	TR	BD45231G	UH	BD45232G	V9

○NOTES 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 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 impedance 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 . Lower than the minimum input voltage makes the VOUT high impedance, and it must be VDD in pull up (VDD) condition.
10. BD45XXXG 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. 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 $50\text{k}\Omega \sim 1\text{M}\Omega$. 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
----------	-----------------------	------------------------