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	CMOS Output	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		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 tempearture 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.

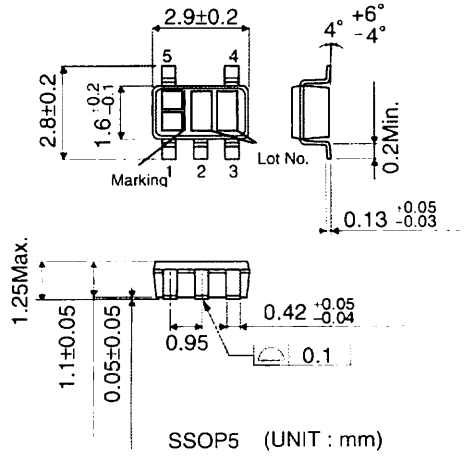
Status of this document
The Japanese version of this document is the formal specification.
A customer may use this translation version only for a reference to help reading the formal version.
If there are any differences in translation version of this document, formal version takes priority.

○ELECTRICAL CHARACTERISTICS (Unless Otherwise Specified Ta=-40 to 105°C)

Parameter	Symbol	Condition		Limit Min.	Limit Typ.	Limit Max.	Unit
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	
		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, 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

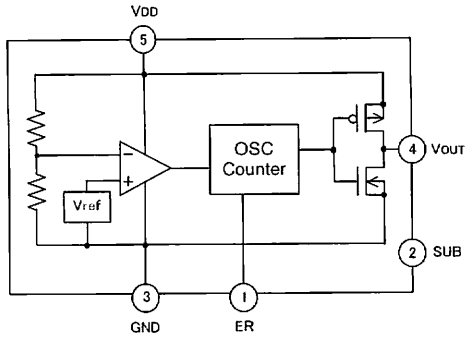
VDET(T) : Standard Detection Voltage (2.3V to 4.8V, 0.1V step)
RL : Pull-up resistor to be connected between VOUT and power supply.
CL : Capacitor to be connected between VOUT and GND.
※2 Guarantee is Ta=25°C.
※3 tPLH: VDD=(VDET(T)-0.5V)→(VDET(T)+0.5V)
Attention: Please connect the GND when you don't use 'ER'

○PHYSICAL DIMENSIONS, MARKING



SSOP5 (UNIT : mm)

○ BLOCK DIAGRAM



NOTE: Substrate Pin should be connected with GND

※ Please refer to technical note concerning application circuit, and etc.

○PIN NO. , PIN NAME

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

○STANDARD DETECTION VOLTAGE AND MARKING

BD46XXXG Series

	BD46XX5G		BD46XX1G		BD46XX2G	
VDET	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 V_{DD} 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 V_{DD} pin, Output pin and GND pin, or V_{DD} 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 V_{DD} line inpedance might cause oscillation because of the detection current.

8 . A V_{DD} -GND capacitor (as close connection as possible) should be used in high V_{DD} 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 1MΩ leakage is assumed between the ER terminal and the GND terminal, 100kΩ 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.

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