STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT SERIES Voltage Detector IC

TYPE **BD49XXFVE Series**

FEATURES
- Detection voltage lineup : 2.3V～6.0V
- High precision detection voltage : ±1.0%

○ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

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
Power Dissipation ※2		Pd	210	mW
Operating Temperature Range ※1		Topr	-40 to +105	℃
Storage Temperature Range		Tstg	-55 to +125	℃

※1 Do not exceed Pd.
※2 Mounted on 70mm × 70mm × 1.6mm Glass Epoxy PCB, Pd derated at 2.1mW/℃ for tempearture above Ta=25℃

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℃)

Parameter	Symbol	Condition		Limit Min.	Limit Typ.	Limit Max.	Unit
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 ※4 Vout=GND→50%		-	-	100	μsec
Circuit Current when ON	ICC1	VDD=VS−0.2V, ※3	VS=2.3-3.1V	-	0.51	1.53	μA
			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	μA
			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, Ta=-25～-105℃		0.95	-	-	V
		VOL≦0.4V, Ta=-40～-25℃		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	-	
'High'Output Current (Pch)	IOH	VDS=0.5V, VDD=4.8V, VS=2.3-4.2V		0.7	1.4	-	mA
		VDS=0.5V, VDD=6.0V, VS=4.3-5.2V		0.9	1.8	-	
		VDS=0.5V, VDD=8.0V, VS=5.3-6.0V		1.1	2.2	-	
Detection Voltage Temperature coefficient	VS/ΔT	Ta=-40℃ to 105℃ (Designed Guarantee)		-	±100	±360	ppm/℃
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)

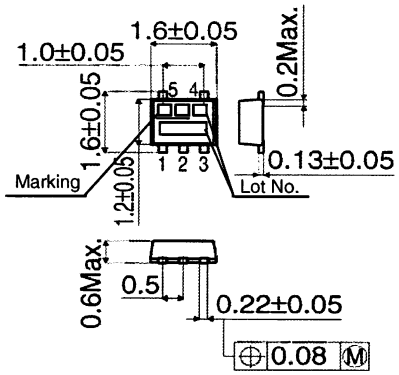
CL: Capacitor to be connected between VOUT and GND.

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

※3 Guarantee is Ta=25℃.

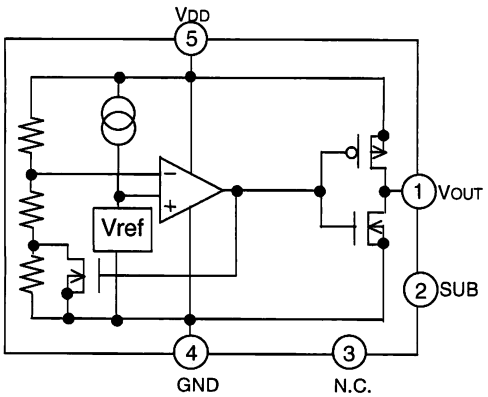
※4 tPLH: VDD=(Vs typ.-0.5V)→(Vs typ.+0.5V)

○PHYSICAL DIMENSIONS, MARKING



VSOF5 (UNIT:mm)

○BLOCK DIAGRAM



○PIN 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
BD4960	6.000	GW	BD4941	4.100	GB
BD4959	5.900	GV	BD4940	4.000	GA
BD4958	5.800	GU	BD4939	3.900	FV
BD4957	5.700	GT	BD4938	3.800	FU
BD4956	5.600	GS	BD4937	3.700	FT
BD4955	5.500	GR	BD4936	3.600	FS
BD4954	5.400	GQ	BD4935	3.500	FR
BD4953	5.300	GP	BD4934	3.400	FQ
BD4952	5.200	GN	BD4933	3.300	FP
BD4951	5.100	GM	BD4932	3.200	FN
BD4950	5.000	GL	BD4931	3.100	FM
BD4949	4.900	GK	BD4930	3.000	FL
BD4948	4.800	GJ	BD4929	2.900	FK
BD4947	4.700	GH	BD4928	2.800	FJ
BD4946	4.600	GG	BD4927	2.700	FH
BD4945	4.500	GF	BD4926	2.600	FG
BD4944	4.400	GE	BD4925	2.500	FF
BD4943	4.300	GD	BD4924	2.400	FE
BD4942	4.200	GC	BD4923	2.300	FD

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. BD49XXFVE 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.

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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As of 18th. April 2005