STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT SERIES Low Voltage Detector IC with Adjustable Output Delay

TYPE **BU43XXG Series**

FEATURES
- Detection voltage lineup : 0.9V～4.8V
- High precision detection voltage : ±1%

○ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

Parameter		Symbol	Limit	Unit
Supply Voltage ※1		$V_{DD}-GND$	-0.3 to +7	V
Output Voltage ※1	CMOS Output	V_{OUT}	GND-0.3 to V_{DD}+0.3	V
Input Voltage of CT		V_{CT}	GND-0.3 to V_{DD}+0.3	V
Power Dissipation ※2		Pd	540	mW
Operating Temperature ※1		Topr	-40 to +125	℃
Storage Temperature Range		Tstg	-55 to +125	℃
Junction Temperature		Tjmax	125	℃

※1 Do not exceed Pd.

※2 Mounted on 70mm × 70mm × 1.6mm Glass Epoxy PCB, Pd derated at 5.4mW/℃ 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.

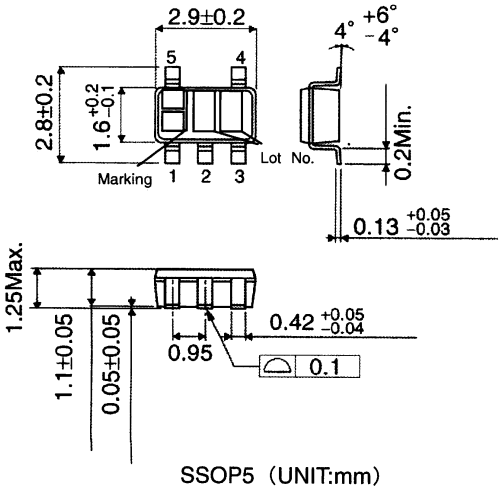
Status of this document
The Japanese version of this document is the formal specification.
A customer may use this translation version only for a reference to help reading the formal version.
If there are any differences in translation version of this document, formal version takes priority.

○ELECTRICAL CHARACTERISTICS (Unless Otherwise Specified Ta=-25 to 125℃)

Parameter	Symbol	Condition		Limit Min.	Limit Typ.	Limit Max.	Unit
Detection Voltage	V_{DET}	V_{DD}=H→L Ta=25℃		$V_{DET(T)}$ ×0.99	$V_{DET(T)}$	$V_{DET(T)}$ ×1.01	V
Circuit Current when ON	I_{DD1}	V_{DD}=V_{DET}−0.2V,	V_{DET}=0.9-1.3V	-	0.15	0.88	μA
			V_{DET}=1.4-2.1V	-	0.20	1.05	
			V_{DET}=2.2-2.7V	-	0.25	1.23	
			V_{DET}=2.8-3.3V	-	0.30	1.40	
			V_{DET}=3.4-4.2V	-	0.35	1.58	
			V_{DET}=4.3-4.8V	-	0.40	1.75	
Circuit Current when OFF	I_{DD2}	V_{DD}=V_{DET}+2.0V,	V_{DET}=0.9-1.3V	-	0.30	1.40	μA
			V_{DET}=1.4-2.1V	-	0.35	1.58	
			V_{DET}=2.2-2.7V	-	0.40	1.75	
			V_{DET}=2.8-3.3V	-	0.45	1.93	
			V_{DET}=3.4-4.2V	-	0.50	2.10	
			V_{DET}=4.3-4.8V	-	0.55	2.28	
Operating Voltage Range	V_{OPL}	V_{OL}≦0.4V Ta=25℃～125℃		0.70	-	-	V
		V_{OL}≦0.4V Ta=-25℃～25℃		0.90	-	-	
'Low' Output Current (Nch)	I_{OL}	V_{DS}=0.05V, V_{DD}=0.85V		20	100	-	μA
		V_{DS}=0.5V, V_{DD}=1.5V, V_{DET}=1.7-4.8V		1.0	3.3	-	mA
		V_{DS}=0.5V, V_{DD}=2.4V, V_{DET}=2.7-4.8V		3.6	6.5	-	
'High' Output Current (Pch)	I_{OH}	V_{DS}=0.5V V_{DD}=4.8V, V_{DET}=0.9-3.9V		1.7	3.4	-	mA
		V_{DS}=0.5V V_{DD}=6.0V, V_{DET}=4.0-4.8V		2.0	4.0	-	
CT pin Threshold Voltage	V_{CTH}	V_{DD}=V_{DET} × 1.1 Ta=25℃ V_{DET}=0.9V-2.5V		V_{DD} × 0.35	V_{DD} × 0.45	V_{DD} × 0.55	V
		V_{DD}=V_{DET} × 1.1 Ta=25℃ V_{DET}=2.6V-4.8V		V_{DD} × 0.40	V_{DD} × 0.50	V_{DD} × 0.60	
Output Delay Resistance	R_{CT}	V_{DD}=V_{DET} × 1.1 V_{CT}=0.5V Ta=25℃		9.0	10.0	11.0	MΩ
CT pin Output Current	I_{CT}	V_{CT}=0.1V V_{DD}=0.85V		5	40	-	μA
		V_{CT}=0.5V V_{DD}=1.5V V_{DET}=1.7V-4.8V		200	400	-	
Detection Voltage Temperature coefficient	$V_{DET}/\Delta T$	Ta=-40℃～125℃ (Designed Guarantee)		-	±30	-	ppm/℃
Hysteresis Voltage	ΔV_{DET}	V_{DD}=L→H→L Ta=-40℃～125℃	V_{DET}≦1.0V	V_{DET} × 0.03	V_{DET} × 0.05	V_{DET} × 0.08	V
			V_{DET}≧1.1V	V_{DET} × 0.03	V_{DET} × 0.05	V_{DET} × 0.07	

$V_{DET(T)}$: Standard Detection Voltage (0.9V to 4.8V、0.1V step)
Designed Guarantee.(Outgoing inspection is not done on all products.)

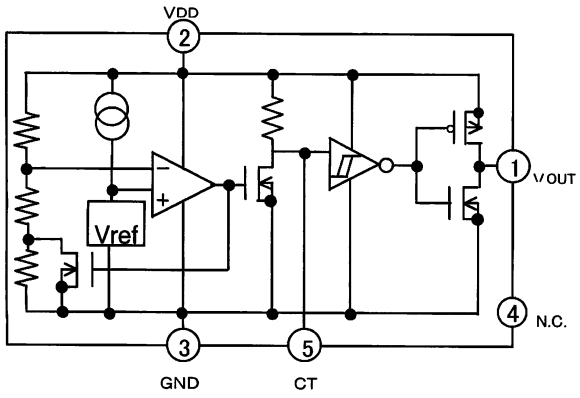
○PHYSICAL DIMENSIONS, MARKING



SSOP5 (UNIT:mm)

Rev.C

OBLOCK DIAGRAM



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

OPIN NO. , PIN NAME

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

OSTANDARD DETECTION VOLTAGE AND MARKING

Type	Standard Detection Voltage[V]	Marking	Type	Standard Detection Voltage[V]	Marking
BU4348	4.800	1H	BU4328	2.800	0M
BU4347	4.700	1G	BU4327	2.700	0L
BU4346	4.600	1F	BU4326	2.600	0K
BU4345	4.500	1E	BU4325	2.500	0J
BU4344	4.400	1D	BU4324	2.400	0H
BU4343	4.300	1C	BU4323	2.300	0G
BU4342	4.200	1B	BU4322	2.200	0F
BU4341	4.100	1A	BU4321	2.100	0E
BU4340	4.000	0Z	BU4320	2.000	0D
BU4339	3.900	0Y	BU4319	1.900	0C
BU4338	3.800	0X	BU4318	1.800	0B
BU4337	3.700	0W	BU4317	1.700	0A
BU4336	3.600	0V	BU4316	1.600	ZZ
BU4335	3.500	0U	BU4315	1.500	ZY
BU4334	3.400	0T	BU4314	1.400	ZX
BU4333	3.300	0S	BU4313	1.300	ZW
BU4332	3.200	0R	BU4312	1.200	ZV
BU4331	3.100	0Q	BU4311	1.100	ZU
BU4330	3.000	0P	BU4310	1.000	ZT
BU4329	2.900	0N	BU4309	0.900	ZS

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 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 . Case of needless Delay time, recommended to insert more 470kΩ resister between V_{DD} and CT.

10 . BU43XXG 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 10MΩ leakage is assumed between the CT terminal and the GND terminal, 1MΩ connection between the CT terminal and the V_{DD} terminal would be recommended.
The value of R_{CT} depends on the external resistor that is connected to CT terminal, so please consider the delay time that is decided by $\tau \times R_{CT} \times C_{CT}$ changes.

11. Delay time (tPLH)

$tPLH = \tau \times R_{CT} \times C_{CT}$ (sec)

τ : time constant

R_{CT} : 10MΩ (typ.) (built-in resistor)

C_{CT} : capacitor connected CT pin.

Recommended value of C_{CT} capacitor TS over 100pF.

The reference value

$(\tau \times R_{CT}) \times 10^6$

V_{DET} = 0.9 to 2.5V

Ta = 25°C	(min. = 5.1×10^6	typ.= 6.0×10^6	max = 6.9×10^6)
Ta = -25 to 125°C	(min. = 3.3×10^6	typ. = 6.0×10^6	max = 8.7×10^6)

V_{DET} = 2.6 to 4.8V

Ta = 25°C	(min. = 5.9×10^6	typ.= 6.9×10^6	max = 7.9×10^6)
Ta = -25 to 125°C	(min. = 3.8×10^6	typ.= 6.9×10^6	max = 10.0×10^6)

12. External parameters
The recommended parameter range for CT is 10pF～0.1μF. When attempting to operate beyond these parameters, be sure to verify the actual operation before continuing use.

13. CT pin discharge
Due to the capabilities of the CT pin discharge transistor, the CT pin may not completely discharge when a short input pulse is applied, and in this case the delay time may not be controlled. Please verify the actual operation.

14. 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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