

STRUCTURE Silicon Monolithic Integrated Circuit

TYPE Quadruple 2 input Schmitt NANDS Gates

PRODUCT SERIES **BU4093B**
BU4093BF
BU4093BFV

FEATURES

- Wide operating power supply range (3[V]~16[V])
- High impedance input

○ ABSOLUTE MAXIMUM RATINGS (Ta=25[°C])

Parameter	Symbol	Limit	Unit
Power Supply Voltage	VDD	(VSS-0.3)~(VSS+18.0)	V
Power Dissipation	Pd	BU4081B	1180(*1)(*4)
		BU4081BF	610(*2)(*4)
		BU4081BF V	870(*2)(*4)
Supply current	Iin	±10	mA
Operating temperature	ToPr	-40~+85	°C
Storage temperature	Tstg	-55~+150	°C
Input Voltage	Vin	(VSS-0.3)~(VDD+0.3)	V
Maximum junction temperature	Tjmax	150	°C

• This product is designed for protection against radioactive rays.

(*1) When used at Ta=25[°C] on above, value of above is reduced 9.5[mW] per 1[°C].

(*2) When used at Ta=25[°C] on above, value of above is reduced 4.9[mW] per 1[°C].

(*3) When used at Ta=25[°C] on above, value of above is reduced 7.0[mW] per 1[°C].

(*4) Power dissipation is the value for mounting 70[mm]×70[mm]×1.6[mm] FR4 glass epoxy circuit board (copper foil area is 3% or less).

○ OPERATING CONDITION (Ta=-40~+85[°C])

Parameter	Symbol	Limit	Unit
Power Supply Voltage	VDD	+3.0~+16.0	V
Input voltage	VIN	0~VDD	V

Status of this document

The Japanese version of this document is the official specification.

This translated version is intended only as a reference, to aid in understanding the official version.

If there are any differences between the original and translated versions of this document, the official Japanese language version takes priority.

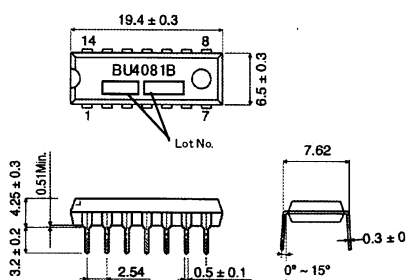
○ ELECTRICAL CHARACTERISTICS (unless otherwise noted, VSS=VEE=0[V], Ta=25[°C])

Parameter	Symbol	Standard Value			Unit	VDD[V]	Condition
		MIN	TYP	MAX			
Input "H" voltage	VIH	3.5	—	—	V	5	—
		7.0	—	—	V	10	
		11.0	—	—	V	15	
Input "L" voltage	VIL	—	—	1.5	V	5	—
		—	—	3.0	V	10	
		—	—	4.0	V	15	
Input "H" current	I _{IH}	—	—	0.3	μA	15	VIH=15[V]
Input "L" current	I _{IL}	—	—	-0.3	μA	15	VIL=0[V]
Output "H" voltage	VOH	4.95	—	—	V	5	IO=0[mA]
		9.95	—	—	V	10	
		14.95	—	—	V	15	
Output "L" voltage	VOL	—	—	0.05	V	5	IO=0[mA]
		—	—	0.05	V	10	
		—	—	0.05	V	15	
Output "H" current	IOH	-0.16	—	—	mA	5	VOH=4.6[V]
		-0.4	—	—	mA	10	VOH=9.5[V]
		-1.2	—	—	mA	15	VOH=13.5[V]
Output "L" current	IOL	0.44	—	—	mA	5	VOL=0.4[V]
		1.1	—	—	mA	10	VOL=0.5[V]
		3.0	—	—	mA	15	VOL=1.5[V]
Supply current	IDD	—	—	1	μA	5	VIN=GND,VDD
		—	—	2	μA	10	
		—	—	4	μA	15	
Input capacitance	CIN	—	5	—	pF	—	—

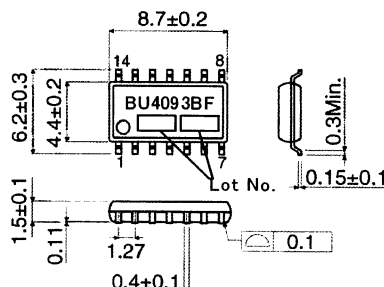
○ Switching Characteristics (unless otherwise noted, Ta=25[°C], VSS=VEE=0[V], RL=10[kΩ], CL=50[pF])

Parameter	Symbol	Standard Value			Unit	VDD[V]	Condition
		MIN	TYP	MAX			
Output rising time	t _{TLH}	—	180	—	ns	5	—
		—	90	—	ns	10	
		—	65	—	ns	15	
Output falling time	t _{THL}	—	100	—	ns	5	—
		—	50	—	ns	10	
		—	40	—	ns	15	
Propagation delay time L → H	t _{PLH}	—	160	—	ns	5	—
		—	65	—	ns	10	
		—	50	—	ns	15	
Propagation delay time H → L	t _{PHL}	—	160	—	ns	5	—
		—	65	—	ns	10	
		—	50	—	%	5	

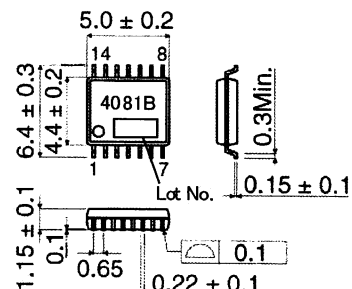
○ PHYSICAL DIMENSIONS



BU4081B(DIP14)(UNIT:[mm])

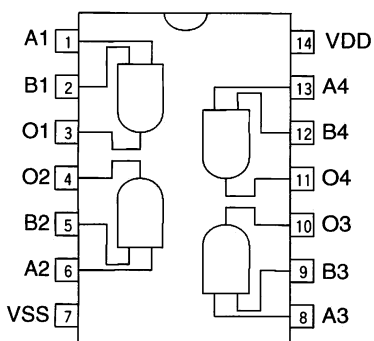


BU4081BF(SOP14)(UNIT:[mm])



BU4081BFV(SSOP-B14)(UNIT:[mm])

○ BLOCK DIAGRAM



○ PIN DESCRIPTION

Pin number	Pin name
1	A1
2	B1
3	O1
4	O2
5	B2
6	A2
7	VSS
8	A3
9	B3
10	O3
11	O4
12	B4
13	A4
14	VDD

○ NOTES FOR USE

(1) Absolute maximum ratings

Exceeding the absolute maximum ratings, including applied voltage and operating temperature range, may damage or destroy the IC. Since the cause of the damage cannot be conclusively identified (as, for example, a short or open mode), be sure to take appropriate physical safety measures, such as incorporating fuses, whenever a special mode anticipated to exceed absolute maximum ratings is employed.

(2) External voltage at input terminal

$VDD+0.3[V]$, $VSS-0.3[V]$ can be input led without characteristics deterioration and destruction. However the circuit operation is not guaranteed. Please use within recommended operating conditions.

(3) Treatment about input of unused circuit

Redundancy current and oscillation may occur, so untreated input should be connected to VDD or VSS. At connection, it is better to connect resistance (about $100k\Omega$).

(4) Power Dissipation

If the IC is used out of this power dissipation area, the faulty operation or reduction of current characteristics may occur due to the rise of IC temperature. Also, be sure to Use this IC within a power dissipation range while also allowing enough margins.

(5) Mounting errors

Mounting errors, such as incorrect positioning or orientation, may destroy the device.

(6) Electromagnetic fields

Use in strong electromagnetic fields may cause malfunctions. Be careful operating in electromagnetic fields.

(7) Treatment of IC

Stress (camber, bend etc) may cause characteristic change due to piezo electric effect.

Pay attention to stress.

(8) Latch up

Please pay attention to the deterioration and destruction by parasitic element action and latch up that occurs when excessive noise, surge or negative voltage is loaded at the normal operation.

(9) Test with set PCB

When you connect capacitor to low impedance terminal. You should discharge to avoid stress under IC.

Also at attachment and detachment to jig in testing line, its power supply should be "OFF".

Moreover for static electricity, please set ground to assembly line, and pay enough attention at conveyance on storage.

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
----------	-----------------------	------------------------