

STRUCTURE Silicon Monolithic Integrated Circuit

TYPE single 2 input NOR gates

PRODUCT SERIES **BU4S01G2**

FEATURES • Low power consumption
 • Wide operating power supply range(3[V]~16[V])

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

| Parameter | Symbol | Limit | Unit |
|------------------------------|--------|---------------------|------|
| Power Supply Voltage | VDD | (VSS-0.3)~(VSS+18) | V |
| Power Dissipation | Pd | 540(*1)(*2) | mW |
| 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 4.32[mW] per 1[°C].
 (*2) Power dissipation is the value for mounting 70[mm]×[70mm]× 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 |

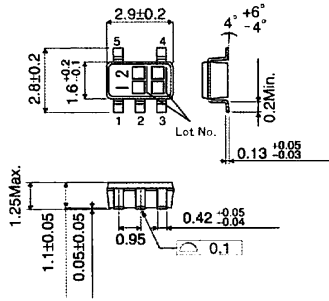
○ ELECTRICAL CHARACTERISTICS (unless otherwise noted, VSS=VEE=0[V], Ta=25[°C])

| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition |
|-----------------------|-----------------|----------------|-----|------|------|--------|-------------------------------|
| | | MIN | TYP | MAX | | | |
| Input "H" voltage | VIH | 3.5 | — | — | V | 5 | VOUT=0.5[V] |
| | | 7.0 | — | — | V | 10 | VOUT=1.0[V] |
| | | 11.0 | — | — | V | 15 | VOUT=1.5[V] IOUT <1[μA] |
| Input "L" voltage | VIL | — | — | 1.5 | V | 5 | VOUT=4.5[V] |
| | | — | — | 3.0 | V | 10 | VOUT=9.0[V] |
| | | — | — | 4.0 | V | 15 | VOUT=13.5[V] IOUT <1[μA] |
| 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 | IOUT <1[μA] VIN=VSS |
| | | 9.95 | — | — | V | 10 | |
| | | 14.95 | — | — | V | 15 | |
| Output "L" voltage | VOL | — | — | 0.05 | V | 5 | IOUT <1[μA] VIN=VDD |
| | | — | — | 0.05 | V | 10 | |
| | | — | — | 0.05 | V | 15 | |
| Output "H" current | IOH | -0.51 | — | — | mA | 5 | VOH=4.6[V] |
| | | -2.1 | — | — | mA | 5 | VOH=2.5[V] |
| | | -1.3 | — | — | mA | 10 | VOH=9.5[V] |
| | | -3.4 | — | — | mA | 15 | VOH=13.5[V] VIN=VSS |
| Output "L" current | IOL | 0.51 | — | — | mA | 5 | VOL=0.4[V] |
| | | 1.3 | — | — | mA | 10 | VOL=0.5[V] |
| | | 3.4 | — | — | mA | 15 | VOL=1.5[V] VIN=VDD |
| Static supply current | IDD | — | — | 0.25 | μA | 5 | VIN=VSS,VDD |
| | | — | — | 0.5 | μA | 10 | |
| | | — | — | 1.0 | μA | 15 | |

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

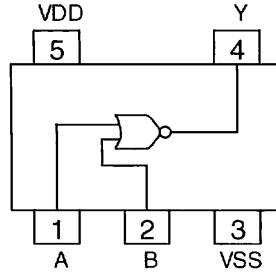
| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition |
|------------------------|------------------|----------------|-----|-----|------|--------|-----------|
| | | MIN | TYP | MAX | | | |
| Output rising time | t _{TLH} | — | 70 | — | ns | 5 | — |
| | | — | 35 | — | ns | 10 | |
| | | — | 30 | — | ns | 15 | |
| Output falling time | t _{THL} | — | 70 | — | ns | 5 | — |
| | | — | 35 | — | ns | 10 | |
| | | — | 30 | — | ns | 15 | |
| Propagation delay time | t _{PLH} | — | 85 | — | ns | 5 | — |
| | | — | 40 | — | ns | 10 | |
| | | — | 30 | — | ns | 15 | |
| | t _{PHL} | — | 85 | — | ns | 5 | |
| | | — | 40 | — | ns | 10 | |
| | | — | 30 | — | ns | 15 | |
| Input capacitance | C _{IN} | — | 5 | — | pF | — | |

○ PHYSICAL DIMENSIONS



BU4S01G2(SSOP5)(UNIT:[mm])

○ BLOCK DIAGRAM



○ PIN DESCRIPTION

| PIN No. | PIN NAME |
|---------|----------|
| 1 | A |
| 2 | B |
| 3 | VSS |
| 4 | Y |
| 5 | 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) 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.
- (4) Mounting errors
Mounting errors, such as incorrect positioning or orientation, may destroy the device.
- (5) Electromagnetic fields
Use in strong electromagnetic fields may cause malfunctions. Be careful operating in electromagnetic fields.
- (6) Treatment of IC
Stress (camber, bend etc) may cause characteristic change due to piezo electric effect.
Pay attention to stress.
- (7) Latch up
Please pay attention to the deterioration and destruction by parasitic element action and latch up that occurs when excessive noise, surge on negative voltage is loaded at the normal operation.
- (8) 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 pong enough attention at conveyance on storage.

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