**General-purpose CMOS Logic IC Series (BU4S,BU4000B Series)**

# Single Gate CMOS Logic ICs
# <Logic Gate>

**BU4S01G2, BU4S11G2, BU4SU69G2,BU4S71G2, BU4S81G2, BU4S584G2**    No.09050EAT01

● **Description**

The BU4SxxxG2 are 1ch logic ICs encapsulated in an SSOP5 package.
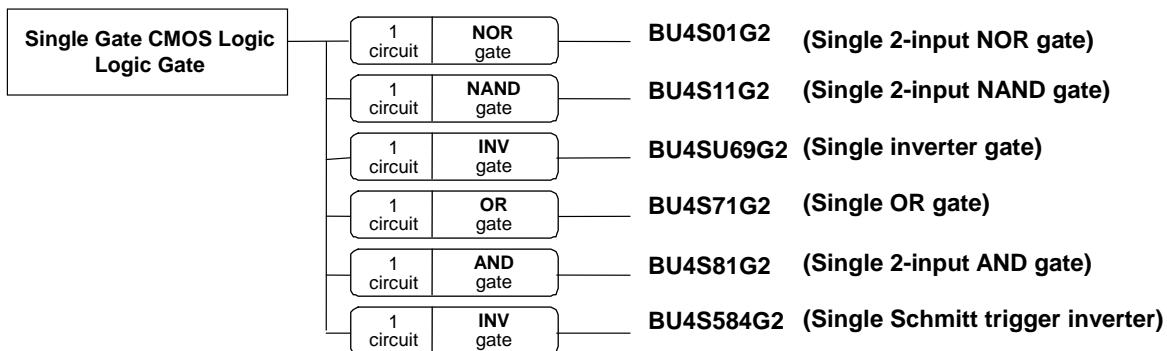They are interchangeable with the genaral-purpose BU4000B series.

● **Features**

1) Low power consumption
2) Surface mount package (SSOP5)
3) Broad operating supply voltage range: 3V-16V
4) High input impedance
5) High fan out
6) L-TTL2 and LS-TTL1 inputs can be driven directly.
7) Function compatible with BU4000B series (1ch).

● **Applications**

Suitable for use where low power consumption and a high degree of noise tolerance are required.

● **Lineup**

| Single Gate CMOS Logic Logic Gate | | | |
|---|---|---|---|
| 1 circuit | NOR gate | **BU4S01G2** | **(Single 2-input NOR gate)** |
| 1 circuit | NAND gate | **BU4S11G2** | **(Single 2-input NAND gate)** |
| 1 circuit | INV gate | **BU4SU69G2** | **(Single inverter gate)** |
| 1 circuit | OR gate | **BU4S71G2** | **(Single OR gate)** |
| 1 circuit | AND gate | **BU4S81G2** | **(Single 2-input AND gate)** |
| 1 circuit | INV gate | **BU4S584G2** | **(Single Schmitt trigger inverter)** |

●**Absolute Maximum Ratings**

| Parameter | Symbol | Limit | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | BU4S01G2 | BU4S11G2 | BU4SU69G2 | BU4S71G2 | BU4S81G2 | BU4S584G2 | |
| Power supply voltage | VDD | -0.3 to 18 | | | | | | V |
| Supply current | Iin | ±10 | | | | | | mA |
| Operating temperature | Topr | -40 to 85 | | | | | | ℃ |
| Storage temperature | Tstg | -55 to 150 | | | | | | ℃ |
| Input voltage | VIN | -0.3 to VDD+0.3 | | | | | | V |
| Maximum junction temperature | Tjmax | 150 | | | | | | ℃ |

●**Recommended Operating Conditions**

| Parameter | Symbol | Limit | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | BU4S01G2 | BU4S11G2 | BU4SU69G2 | BU4S71G2 | BU4S81G2 | BU4S584G2 | |
| Operating power supply | VDD | 3 to 16 | | | | | | V |
| Input voltage | VIN | 0 to VDD | | | | | | V |

●**Thermal Derating Curve**
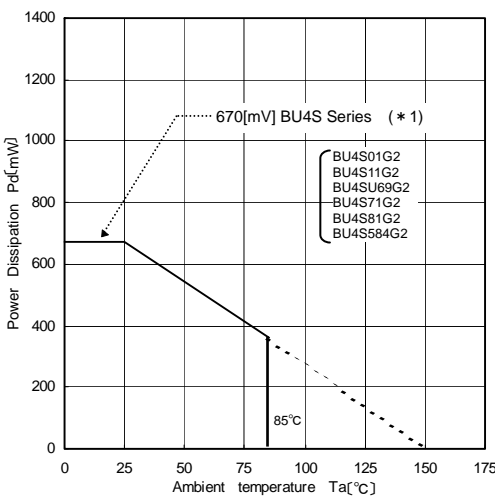


●**Input / output Equivalent Circuits**
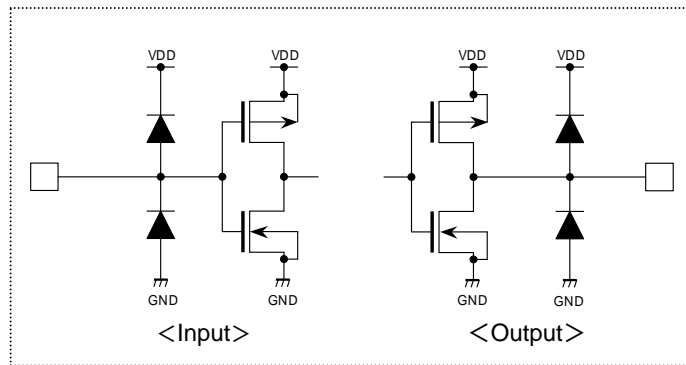


| (*1) | UNIT |
|---|---|
| 5.3 | mW/℃ |

When used at Ta=25[°C] or above, values of above are reduced per 1[°C].
Power dissipation is the value for mounting   70[mm] x 70[mm] x 1.6[mm]
FR4 glass epoxy circuit board (copper foil area is 3% or less).

●**Switching Characteristics**
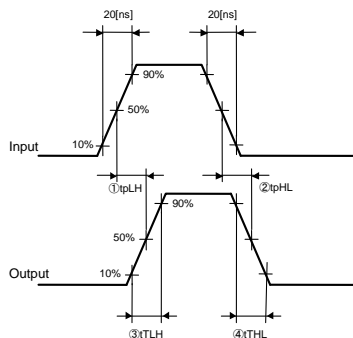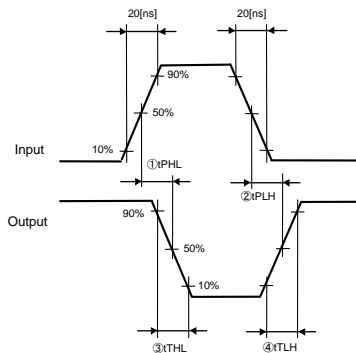


Description of symbols

(1)  tPHL: Time up to 50% of rise time of input waveform
          ~ 50% of fall time of output waveform
(2)  tPLH: Time up to 50% of fall time of input waveform
          ~ 50% of rise time of output waveform
(3)  tTHL: Time up to 90% ~ 10% of fall time of output waveform
(4)  tTLH: Time up to 10% ~ 90% of rise time of output waveform



Description of symbols

(1)  tPLH: Time up to 50% of rise time of input waveform
          ~50% of rise time of output waveform
(2)  tPHL: Time up to 50% of fall time of input waveform
          ~ 50% of fall time of output waveform
(3)  tTLH: Time up to 10% ~ 90% of rise time of output waveform
(4)  tTHL: Time up to 90% ~ 10% of fall time of output waveform

●**Electrical Characteristics（BU4S01G2）**

DC Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃])

| Parameter | Symbol | Standard Value | | | Unit | | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | VDD[V] | | |
| Input "H" voltage | VIH | 3.5 | - | - | V | 5 | VOUT=0.5[V] | 1 |
| | | 7.0 | - | - | | 10 | VOUT=1.0[V] | 2 |
| | | 11.0 | - | - | | 15 | VOUT=1.5[V] \|IOUT\|<1[μA] | 3 |
| Input "L" voltage | VIL | - | - | 1.5 | V | 5 | VOUT=4.5[V] | 1 |
| | | - | - | 3.0 | | 10 | VOUT=9.0[V] | 2 |
| | | - | - | 4.0 | | 15 | VOUT=13.5[V] \|IOUT\|<1[μA] | 3 |
| Input "H" current | IIH | - | - | 0.3 | μA | 15 | VIH=15[V] | - |
| Input "L" current | IIL | - | - | -0.3 | μA | 15 | VIL=0[V] | - |
| Output "H" voltage | VOH | 4.95 | - | - | V | 5 | \|IOUT\|<1[μA] VIN=VSS | 4 |
| | | 9.95 | - | - | | 10 | | |
| | | 14.95 | - | - | | 15 | | |
| Output "L" voltage | VOL | - | - | 0.05 | V | 5 | \|IOUT\|<1[μA] VIN=VDD | 5 |
| | | - | - | 0.05 | | 10 | | |
| | | - | - | 0.05 | | 15 | | |
| Output "H" current | IOH | -0.51 | - | - | mA | 5 | VOH=4.6[V] | 4 |
| | | -2.1 | - | - | | 5 | VOH=2.5[V] | |
| | | -1.3 | - | - | | 10 | VOH=9.5[V] | |
| | | -3.4 | - | - | | 15 | VOH=13.5[V] VIN=VSS | |
| Output "L" current | IOL | 0.51 | - | - | mA | 5 | VOL=0.4[V] | 5 |
| | | 1.3 | - | - | | 10 | VOL=0.5[V] | |
| | | 3.4 | - | - | | 15 | VOL=1.5[V] VIN=VDD | |
| Static supply current | IDD | - | - | 0.25 | μA | 5 | VIN=VSS,VDD | - |
| | | - | - | 0.5 | | 10 | | |
| | | - | - | 1.0 | | 15 | | |

Switching Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃],CL=50[pF])

| Parameter | Symbol | Standard Value | | | Unit | | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | VDD[V] | | |
| Output rising time | tTLH | - | 70 | - | ns | 5 | - | 6 |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Output falling time | tTHL | - | 70 | - | ns | 5 | - | 7 |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Propagation delay time | tPLH | - | 85 | - | ns | 5 | - | 8 |
| | | - | 40 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| | tPHL | - | 85 | - | ns | 5 | - | 9 |
| | | - | 40 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Input capacitance | CIN | - | 5 | - | pF | 5 | - | - |

●**Electrical Characteristics(BU4S11G2)**
DC Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃])

| Parameter | Symbol | Standard Value | | | Unit | Condition | | Fig. No |
| | | MIN | TYP | MAX | | VDD[V] | | |
|---|---|---|---|---|---|---|---|---|
| Input "H" voltage | VIH | 3.5 | - | - | V | 5 | VOUT=0.5[V] | 10 |
| | | 7.0 | - | - | | 10 | VOUT=1.0[V] | 11 |
| | | 11.0 | - | - | | 15 | VOUT=1.5[V] \|IOUT\|<1[μA] | 12 |
| Input "L" voltage | VIL | - | - | 1.5 | V | 5 | VOUT=4.5[V] | 10 |
| | | - | - | 3.0 | | 10 | VOUT=9.0[V] | 11 |
| | | - | - | 4.0 | | 15 | VOUT=13.5[V] \|IOUT\|<1[μA] | 12 |
| Input "H" current | IIH | - | - | 0.3 | μA | 15 | VIH=15[V] | - |
| Input "L" current | IIL | - | - | -0.3 | μA | 15 | VIL=0[V] | - |
| Output "H" voltage | VOH | 4.95 | - | - | V | 5 | \|IOUT\|<1[μA] VIN=VSS | 13 |
| | | 9.95 | - | - | | 10 | | |
| | | 14.95 | - | - | | 15 | | |
| Output "L" voltage | VOL | - | - | 0.05 | V | 5 | \|IOUT\|<1[μA] VIN=VDD | 14 |
| | | - | - | 0.05 | | 10 | | |
| | | - | - | 0.05 | | 15 | | |
| Output "H" current | IOH | -0.51 | - | - | mA | 5 | VOH=4.6[V] | 13 |
| | | -2.1 | - | - | | 5 | VOH=2.5[V] | |
| | | -1.3 | - | - | | 10 | VOH=9.5[V] | |
| | | -3.4 | - | - | | 15 | VOH=13.5[V] VIN=VSS | |
| Output "L" current | IOL | 0.51 | - | - | mA | 5 | VOL=0.4[V] | 14 |
| | | 1.3 | - | - | | 10 | VOL=0.5[V] | |
| | | 3.4 | - | - | | 15 | VOL=1.5[V] VIN=VDD | |
| Static supply current | IDD | - | - | 0.25 | μA | 5 | VIN=VSS,VDD | - |
| | | - | - | 0.5 | | 10 | | |
| | | - | - | 1.0 | | 15 | | |

Switching Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃],CL=50[pF])

| Parameter | Symbol | Standard Value | | | Unit | Condition | Fig. No |
| | | MIN | TYP | MAX | | VDD[V] | |
|---|---|---|---|---|---|---|---|
| Output rising time | tTLH | - | 70 | - | ns | 5 | 15 |
| | | - | 35 | - | | 10 | |
| | | - | 30 | - | | 15 | |
| Output falling time | tTHL | - | 70 | - | ns | 5 | 16 |
| | | - | 35 | - | | 10 | |
| | | - | 30 | - | | 15 | |
| Propagation delay time | tPLH | - | 85 | - | ns | 5 | 17 |
| | | - | 40 | - | | 10 | |
| | | - | 30 | - | | 15 | |
| | tPHL | - | 85 | - | ns | 5 | 18 |
| | | - | 40 | - | | 10 | |
| | | - | 30 | - | | 15 | |
| Input capacitance | CIN | - | 5 | - | pF | 5 | - |

●**Electrical Characteristics(BU4SU69G2)**

DC Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃])

| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | | | |
| Input "H" voltage | VIH | 4.0 | - | - | V | 5 | VOUT=0.5[V] | 19 |
| | | 8.0 | - | - | | 10 | VOUT=1.0[V] | 20 |
| | | 12.0 | - | - | | 15 | VOUT=1.5[V] \|IOUT\|<1[μA] | 21 |
| Input "L" voltage | VIL | - | - | 1.0 | V | 5 | VOUT=4.5[V] | 19 |
| | | - | - | 2.0 | | 10 | VOUT=9.0[V] | 20 |
| | | - | - | 3.0 | | 15 | VOUT=13.5[V] \|IOUT\|<1[μA] | 21 |
| Input "H" current | IIH | - | - | 0.3 | μA | 15 | VIH=15[V] | - |
| Input "L" current | IIL | - | - | -0.3 | μA | 15 | VIL=0[V] | - |
| Output "H" voltage | VOH | 4.95 | - | - | V | 5 | \|IOUT\|<1[μA] VIN=VSS | 22 |
| | | 9.95 | - | - | | 10 | | |
| | | 14.95 | - | - | | 15 | | |
| Output "L" voltage | VOL | - | - | 0.05 | V | 5 | \|IOUT\|<1[μA] VIN=VDD | 23 |
| | | - | - | 0.05 | | 10 | | |
| | | - | - | 0.05 | | 15 | | |
| Output "H" current | IOH | -0.51 | - | - | mA | 5 | VOH=4.6[V] | 22 |
| | | -2.1 | - | - | | 5 | VOH=2.5[V] | |
| | | -1.3 | - | - | | 10 | VOH=9.5[V] | |
| | | -3.4 | - | - | | 15 | VOH=13.5[V] VIN=VSS | |
| Output "L" current | IOL | 0.51 | - | - | mA | 5 | VOL=0.4[V] | 23 |
| | | 1.3 | - | - | | 10 | VOL=0.5[V] | |
| | | 3.4 | - | - | | 15 | VOL=1.5[V] VIN=VDD | |
| Static supply current | IDD | - | - | 0.25 | μA | 5 | VIN=VSS,VDD | - |
| | | - | - | 0.5 | | 10 | | |
| | | - | - | 1.0 | | 15 | | |

Switching Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃],CL=50[pF])

| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | | | |
| Output rising time | tTLH | - | 70 | - | ns | 5 | - | 24 |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Output falling time | tTHL | - | 70 | - | ns | 5 | - | 25 |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Propagation delay time | tPLH | - | 55 | - | ns | 5 | - | 26 |
| | | - | 30 | - | | 10 | | |
| | | - | 25 | - | | 15 | | |
| | tPHL | - | 55 | - | ns | 5 | - | 27 |
| | | - | 30 | - | | 10 | | |
| | | - | 25 | - | | 15 | | |
| Input capacitance | CIN | - | 5 | - | pF | 5 | - | - |

●**Electrical Characteristics(BU4S71G2)**

DC Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃])

| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | | | |
| Input "H" voltage | VIH | 3.5 | - | - | V | 5 | \|IOUT\|<1[μA] | 28 |
| | | 7.0 | - | - | | 10 | | 29 |
| | | 11.0 | - | - | | 15 | | 30 |
| Input "L" voltage | VIL | - | - | 1.5 | V | 5 | \|IOUT\|<1[μA] | 28 |
| | | - | - | 3.0 | | 10 | | 29 |
| | | - | - | 4.0 | | 15 | | 30 |
| Input "H" current | IIH | - | - | 0.3 | μA | 18 | VIH=18[V] | - |
| Input "L" current | IIL | - | - | -0.3 | μA | 18 | VIL=0[V] | - |
| Output "H" voltage | VOH | 4.95 | - | - | V | 5 | \|IOUT\|<1[μA] VIN=VSS or VDD | 31 |
| | | 9.95 | - | - | | 10 | | |
| | | 14.95 | - | - | | 15 | | |
| Output "L" voltage | VOL | - | - | 0.05 | V | 5 | \|IOUT\|<1[μA] VIN=VSS | 32 |
| | | - | - | 0.05 | | 10 | | |
| | | - | - | 0.05 | | 15 | | |
| Output "H" current | IOH | -0.51 | - | - | mA | 5 | VOH=4.6[V] | 31 |
| | | -2.1 | - | - | | 5 | VOH=2.5[V] | |
| | | -1.3 | - | - | | 10 | VOH=9.5[V] | |
| | | -3.4 | - | - | | 15 | VOH=13.5[V] | |
| Output "L" current | IOL | 0.51 | - | - | mA | 5 | VOL=0.4[V] | 32 |
| | | 1.3 | - | - | | 10 | VOL=0.5[V] | |
| | | 3.4 | - | - | | 15 | VOL=1.5[V] | |
| Static supply current | IDD | - | - | 0.25 | μA | 5 | VIN=VSS,VDD | - |
| | | - | - | 0.5 | | 10 | | |
| | | - | - | 1.0 | | 15 | | |

Switching Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃],CL=50[pF])

| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | | | |
| Output rising time | tTLH | - | 70 | - | ns | 5 | - | 33 |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Output falling time | tTHL | - | 70 | - | ns | 5 | - | 34 |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Propagation delay time | tPLH | - | 90 | - | ns | 5 | - | 35 |
| | | - | 45 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| | tPHL | - | 90 | - | ns | 5 | - | 36 |
| | | - | 45 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Input capacitance | CIN | - | 5 | - | pF | 5 | - | - |

●**Electrical Characteristics(BU4S81G2)**

DC Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[°C])

| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | | | |
| Input "H" voltage | VIH | 3.5 | - | - | V | 5 | \|IOUT\|<1[µA] | 37 |
| | | 7.0 | - | - | | 10 | | 38 |
| | | 11.0 | - | - | | 15 | | 39 |
| Input "L" voltage | VIL | - | - | 1.5 | V | 5 | \|IOUT\|<1[µA] | 37 |
| | | - | - | 3.0 | | 10 | | 38 |
| | | - | - | 4.0 | | 15 | | 39 |
| Input "H" current | IIH | - | - | 0.3 | µA | 18 | VIH=18[V] | - |
| Input "L" current | IIL | - | - | -0.3 | µA | 18 | VIL=0[V] | - |
| Output "H" voltage | VOH | 4.95 | - | - | V | 5 | \|IOUT\|<1[µA] VIN=VSS or VDD | 40 |
| | | 9.95 | - | - | | 10 | | |
| | | 14.95 | - | - | | 15 | | |
| Output "L" voltage | VOL | - | - | 0.05 | V | 5 | \|IOUT\|<1[µA] VIN=VSS | 41 |
| | | - | - | 0.05 | | 10 | | |
| | | - | - | 0.05 | | 15 | | |
| Output "H" current | IOH | -0.51 | - | - | mA | 5 | VOH=4.6[V] | 40 |
| | | -2.1 | - | - | | 5 | VOH=2.5[V] | |
| | | -1.3 | - | - | | 10 | VOH=9.5[V] | |
| | | -3.4 | - | - | | 15 | VOH=13.5[V] | |
| Output "L" current | IOL | 0.51 | - | - | mA | 5 | VOL=0.4[V] | 41 |
| | | 1.3 | - | - | | 10 | VOL=0.5[V] | |
| | | 3.4 | - | - | | 15 | VOL=1.5[V] | |
| Static supply current | IDD | - | - | 0.25 | µA | 5 | VIN=VSS,VDD | - |
| | | - | - | 0.5 | | 10 | | |
| | | - | - | 1.0 | | 15 | | |

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

| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | | | |
| Output rising time | tTLH | - | 70 | - | ns | 5 | - | 42 |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Output falling time | tTHL | - | 70 | - | ns | 5 | - | 43 |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Propagation delay time | tPLH | - | 90 | - | ns | 5 | - | 44 |
| | | - | 45 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| | tPHL | - | 90 | - | ns | 5 | - | 45 |
| | | - | 45 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Input capacitance | CIN | - | 5 | - | pF | 5 | - | - |

●**Electrical Characteristics(BU4S584G2)**
DC Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃])

| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | | | |
| Input "H" voltage | VIH | 2.6 | - | - | V | 3 | - | 46 |
| | | 3.5 | - | - | | 5 | | 47 |
| | | 7.0 | - | - | | 10 | | 48 |
| | | 11.0 | - | - | | 15 | | |
| Input "L" voltage | VIL | - | - | 0.4 | V | 3 | - | 46 |
| | | - | - | 1.5 | | 5 | | 47 |
| | | - | - | 3.0 | | 10 | | 48 |
| | | - | - | 4.0 | | 15 | | |
| Input "H" current | IIH | - | - | 0.3 | µA | 15 | VIH=15[V] | - |
| Input "L" current | IIL | - | - | -0.3 | µA | 15 | VIL=0[V] | - |
| Output "H" voltage | VOH | 2.95 | - | - | V | 3 | \|IOUT\|<1[µA] VIN=VSS | 49 |
| | | 4.95 | - | - | | 5 | | |
| | | 9.95 | - | - | | 10 | | |
| | | 14.95 | - | - | | 15 | | |
| Output "L" voltage | VOL | - | - | 0.05 | V | 3 | \|IOUT\|<1[µA] VIN=VDD | 50 |
| | | - | - | 0.05 | | 5 | | |
| | | - | - | 0.05 | | 10 | | |
| | | - | - | 0.05 | | 15 | | |
| Output "H" current | IOH | -0.1 | - | - | mA | 3 | VOH=2.7[V] | 49 |
| | | -0.51 | - | - | | 5 | VOH=4.6 [V] | |
| | | -2.1 | - | - | | 5 | VOH=2.5[V] | |
| | | -1.3 | - | - | | 10 | VOH=9.5[V] | |
| | | -3.4 | - | - | | 15 | VOH=13.5[V] | |
| Output "L" current | IOL | 0.1 | - | - | mA | 3 | VOL=0.3[V] | 50 |
| | | 0.51 | - | - | | 5 | VOL=0.4[V] | |
| | | 1.3 | - | - | | 10 | VOL=0.5[V] | |
| | | 3.4 | - | - | | 15 | VOL=1.5[V] | |
| Hysteresis voltage | VH | 0.1 | - | 0.5 | V | 3 | - | - |
| | | 0.15 | - | 0.6 | | 5 | | |
| | | 0.25 | - | 1.0 | | 10 | | |
| | | 0.40 | - | 1.5 | | 15 | | |
| Supply current | IDD | - | - | 0.2 | µA | 3 | VIN=VSS or VDD | - |
| | | - | - | 0.25 | | 5 | | |
| | | - | - | 0.5 | | 10 | | |
| | | - | - | 1.0 | | 15 | | |

Switching Characteristics (Unless otherwise noted, VSS=0[V],Ta=25[℃],CL=50[pF])

| Parameter | Symbol | Standard Value | | | Unit | VDD[V] | Condition | Fig. No |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | | | | |
| Output rising time | tTLH | - | 140 | - | ns | 3 | - | 51 |
| | | - | 70 | - | | 5 | | |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Output falling time | tTHL | - | 140 | - | ns | 3 | - | 52 |
| | | - | 70 | - | | 5 | | |
| | | - | 35 | - | | 10 | | |
| | | - | 30 | - | | 15 | | |
| Propagation delay time | tPLH | - | 230 | - | ns | 3 | - | 53 |
| | | - | 125 | - | | 5 | | |
| | | - | 60 | - | | 10 | | |
| | | - | 50 | - | | 15 | | |
| | tPHL | - | 230 | - | ns | 3 | - | 54 |
| | | - | 125 | - | | 5 | | |
| | | - | 60 | - | | 10 | | |
| | | - | 50 | - | | 15 | | |

## ●Electrical Characteristics Curves(BU4S01G2)
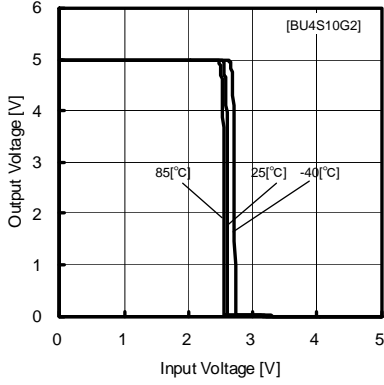


Fig.1
Output voltage－Input voltage characteristics
（VDD=5[V] / VSS=0[V]）
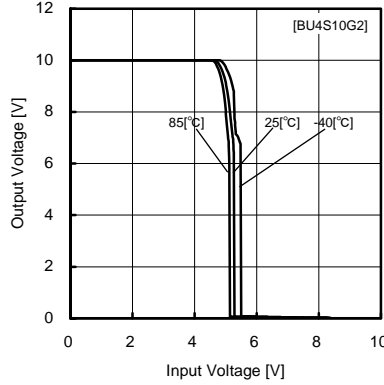
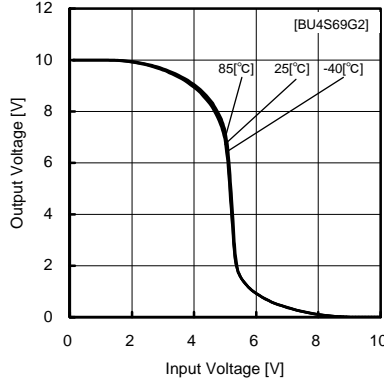Fig.2
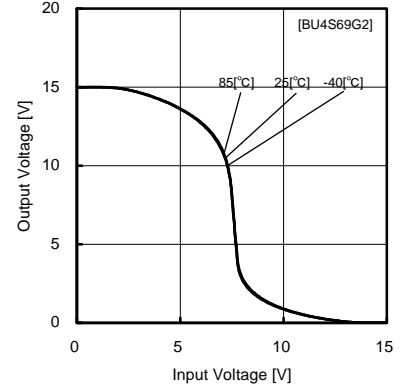Output voltage－Input voltage characteristics
（VDD=10[V] / VSS=0[V]）
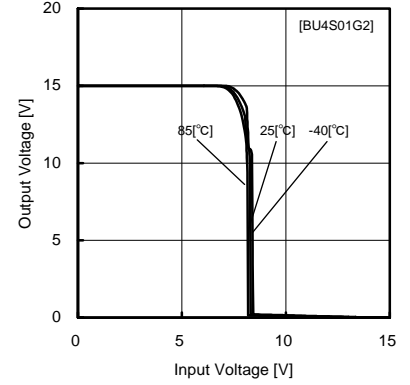
Fig.3
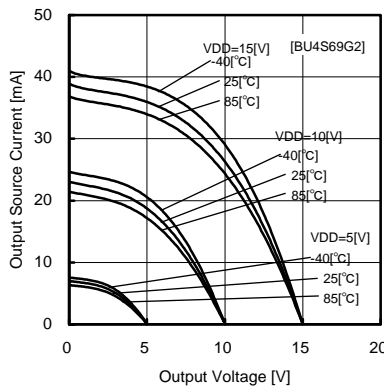Output voltage－Input voltage characteristics
（VDD=15[V] / VSS=0[V]）
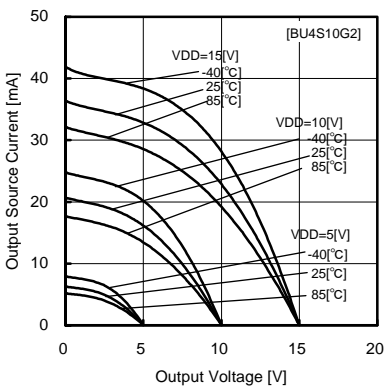
Fig.4
Output source current－voltage characteristics
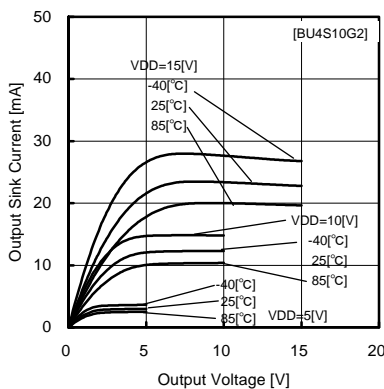
Fig.5
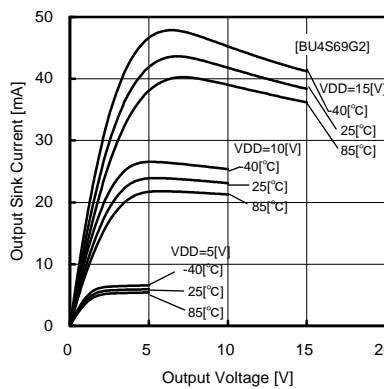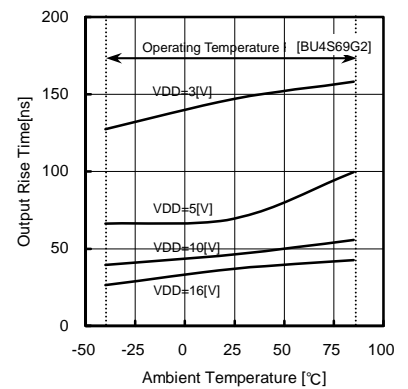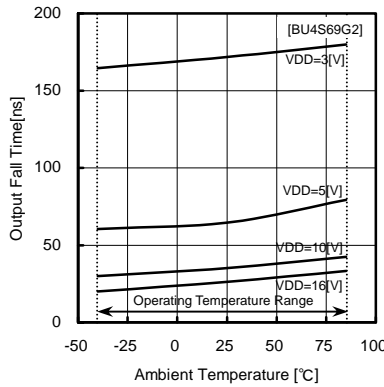Output sink current－voltage characteristics
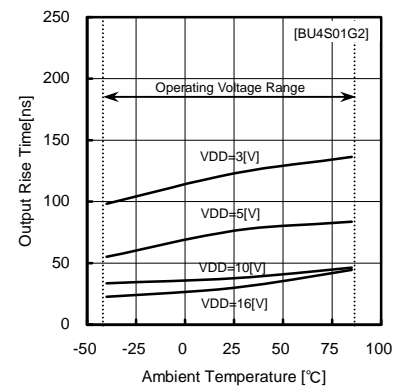
Fig.6
Output rising time tTLH
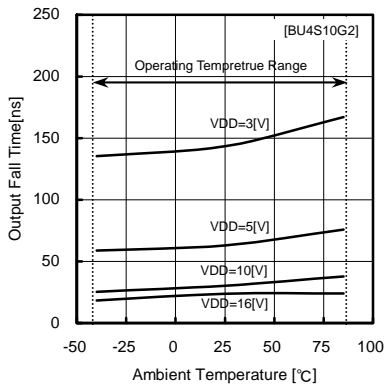
Fig.7
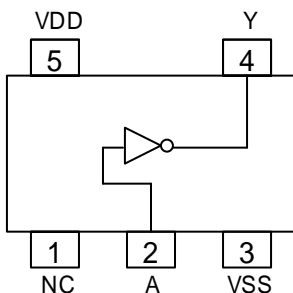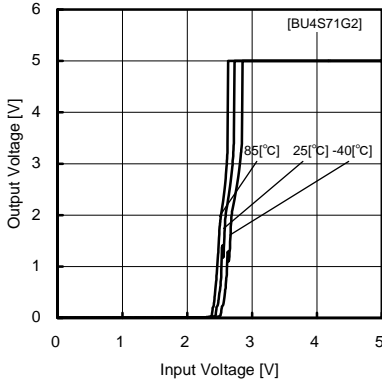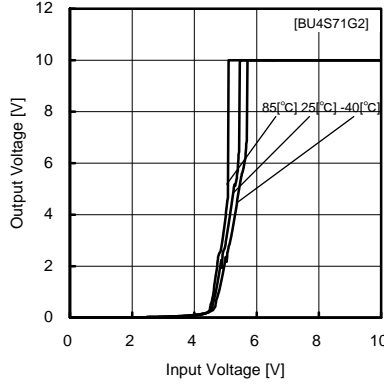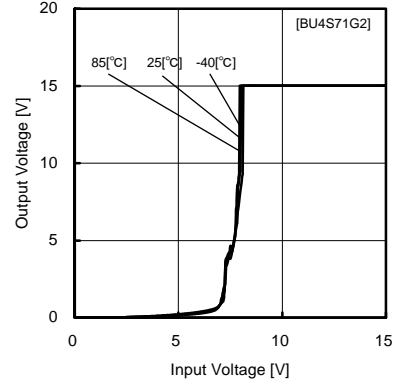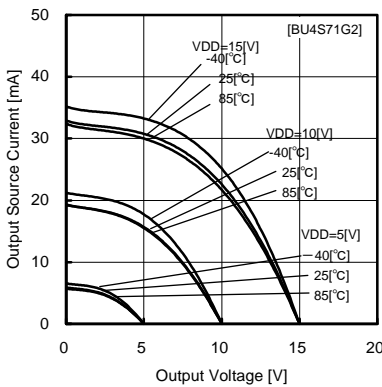Output falling time tTHL
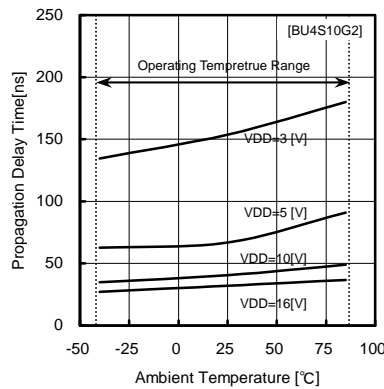
Fig.8
Propagation delay time tPLH
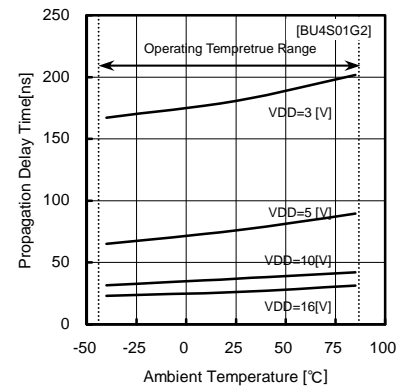
Fig.9
Propagation delay time tPHL
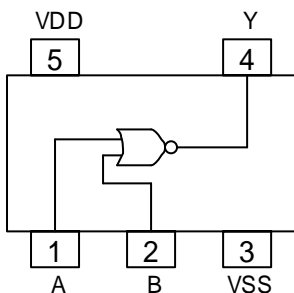
## ●Pinout Diagram ・Pin Description・Input / Output Table

| PIN | PIN NAME | I/O | PIN FUNCTION |
|-----|----------|-----|--------------|
| 1 | A | I | Input |
| 2 | B | I | Input |
| 3 | VSS | - | Power supply(-) |
| 4 | Y | O | Output |
| 5 | VDD | - | Power supply(+) |

| A | B | Y |
|---|---|---|
| L | L | H |
| L | H | L |
| H | L | L |
| H | H | L |

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●**Electrical Characteristics Curves(BU4S11G2)**
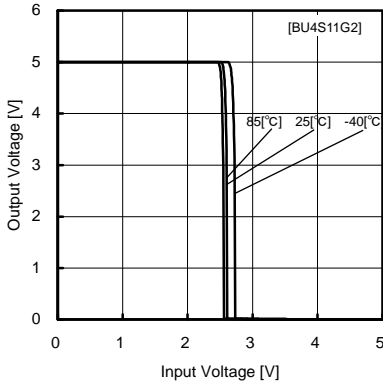
Fig.10
Output voltage－Input voltage characteristics
（VDD=5[V ]/ VSS=0[V]）
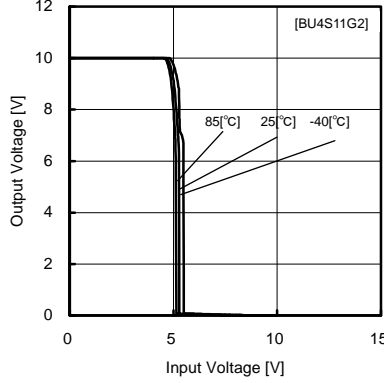
Fig.11
Output voltage－Input voltage haracteristics
（VDD=10[V] / VSS=0[V]）
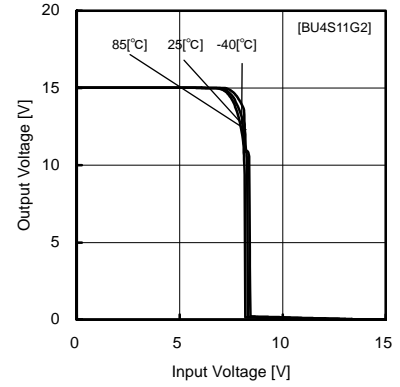
Fig.12
Output voltage－Input voltage characteristics
（VDD=15[V] / VSS=0[V]）
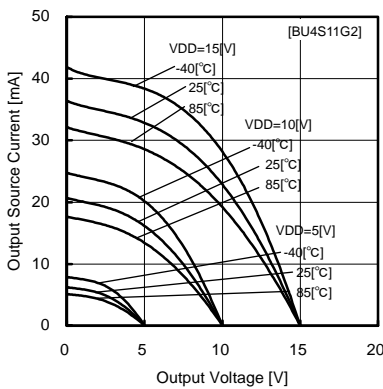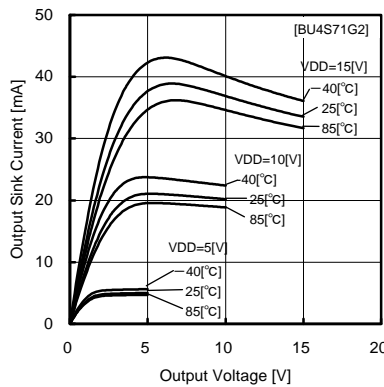
Fig.13
Output source current－voltage characteristics
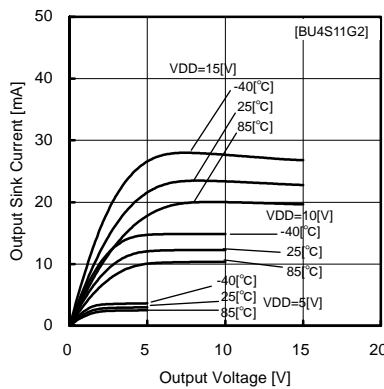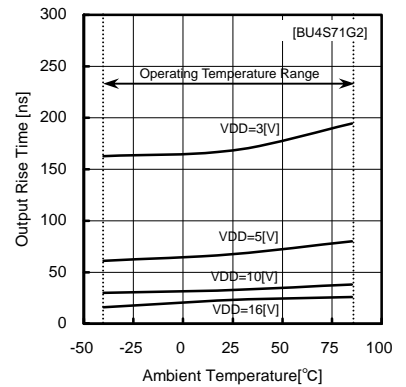
Fig.14
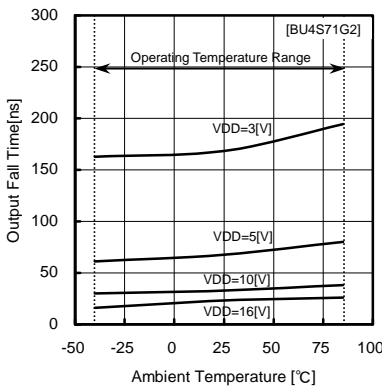Output sink current－voltage characteristics
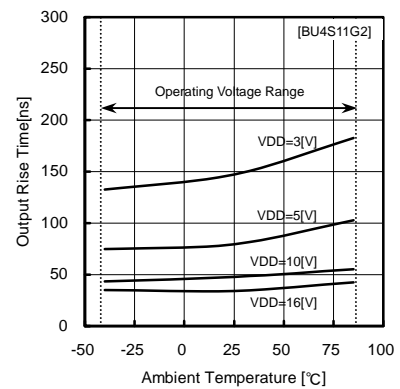
Fig.15
Output rising time tTLH
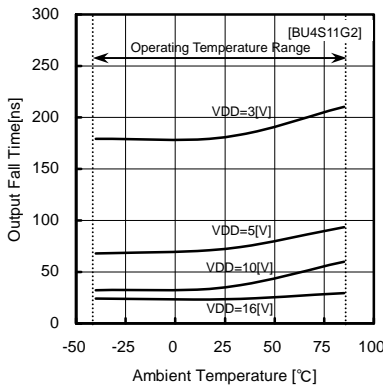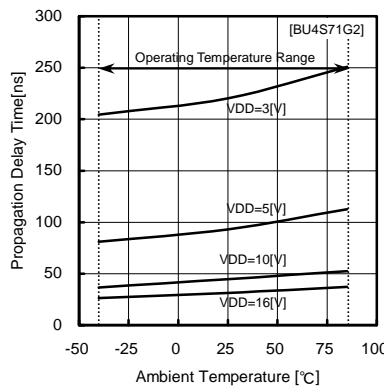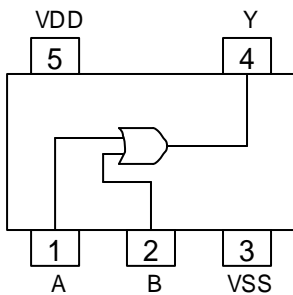
Fig.16
Output falling time tTHL
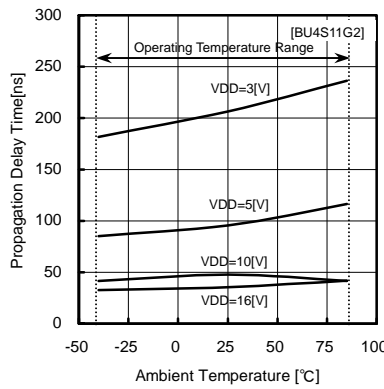
Fig.17
Propagation delay time tPLH
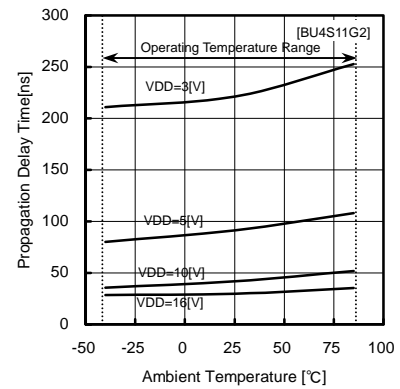
Fig.18
Propagation delay time tPHL
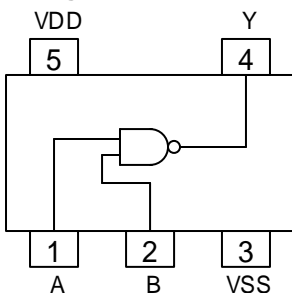
●**Pinout Diagram ・Pin Description・Input / Output Table**

| PIN | PIN NAME | I/O | PIN FUNCTION |
|-----|----------|-----|--------------|
| 1 | A | I | Input |
| 2 | B | I | Input |
| 3 | VSS | - | Power supply(-) |
| 4 | Y | O | Output |
| 5 | VDD | - | Power supply(+) |

| A | B | Y |
|---|---|---|
| L | L | H |
| L | H | H |
| H | L | H |
| H | H | L |

●**Electrical Charasteristics Curves (BU4SU69G2)**
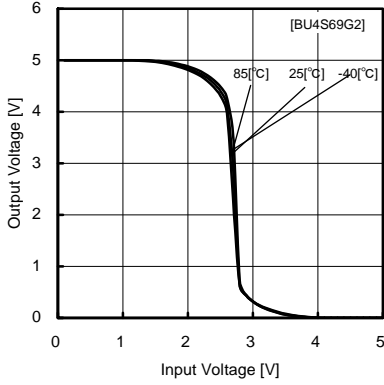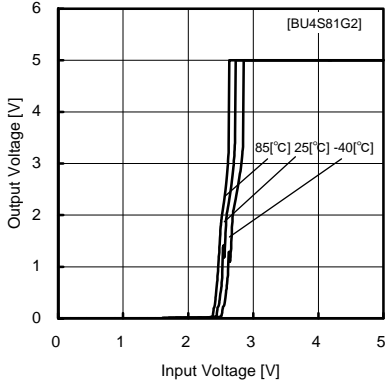


Fig.19
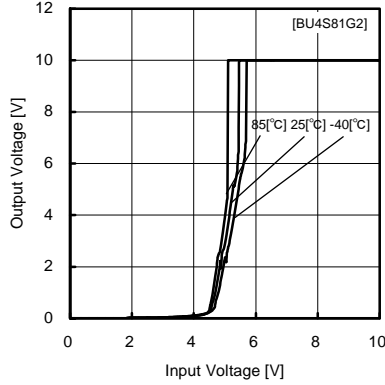Output voltage－Input voltage characteristics
（VDD=5[V] / VSS=0[V]）



Fig.20
Output voltage－Input voltagecharacteristics
（VDD=10[V] / VSS=0[V]）



Fig.21
Output voltage－Input voltage characteristics
（VDD=15[V] / VSS=0[V]）



Fig.22
Output source current－voltage characteristics



Fig.23
Output sink current－voltage characteristics



Fig.24
Output rising time tTLH



Fig.25
Output falling time tTHL
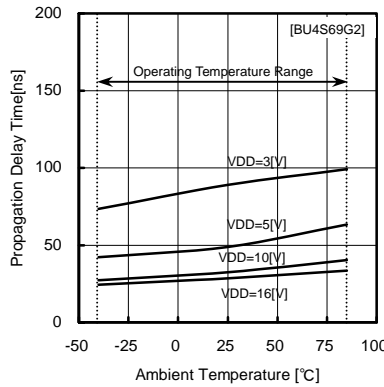


Fig.26
Propagation delay time tPLH
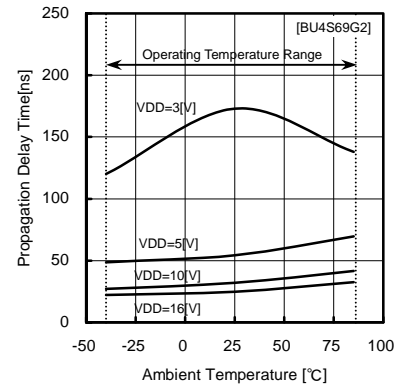


Fig.27
Propagation delay time tPHL

●Pinout Diagram・Pin Description・Input / Output Table



| PIN | PIN NAME | I/O | PIN FUNCTION |
|-----|----------|-----|--------------|
| 1 | NC | - | NC |
| 2 | A | I | Input |
| 3 | VSS | - | Power supply(-) |
| 4 | Y | O | Output |
| 5 | VDD | - | Power supply(+) |

| A | Y |
|---|---|
| L | H |
| H | L |

● **Electrical Charasteristics Curves (BU4S71G2)**



Fig.28
Output voltage－Input voltage characteristics
（VDD=5[V]/ VSS=0[V]）

Fig.29
Output voltage－Input voltage characteristics
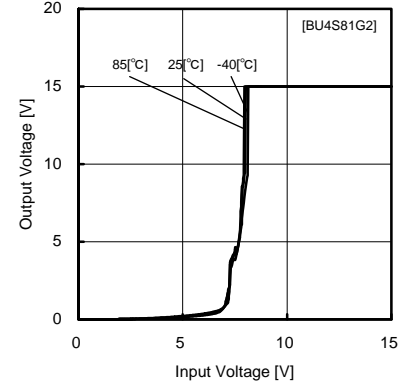（VDD=10[V] / VSS=0[V]）

Fig.30
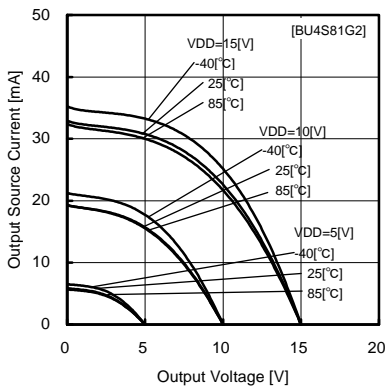Output voltage－Input voltage characteristics
（VDD=15[V] / VSS=0[V]）

Fig.31
Output source current－voltage characteristics

Fig.32
Output sink current－voltage characteristics

Fig.33
Rising time tTLH

Fig.34
falling time tTHL

Fig.35
Propagation delay time tPLH
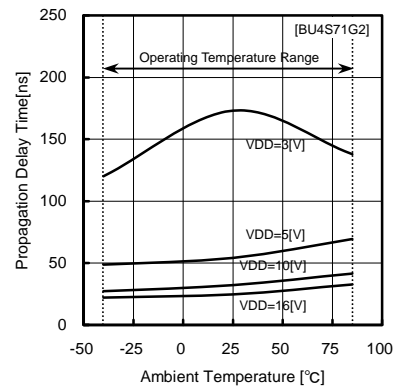
Fig.36
Propagation delay time tPHL

● **Pinout Diagram・Pin Description・Input / Output Table**



| PIN | PIN NAME | I/O | PIN FUNCTION |
|-----|----------|-----|--------------|
| 1 | A | I | Input |
| 2 | B | I | Input |
| 3 | VSS | - | Power supply(-) |
| 4 | Y | O | Output |
| 5 | VDD | - | Power supply(+) |

| A | B | Y |
|---|---|---|
| L | L | L |
| L | H | H |
| H | L | H |
| H | H | H |

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●**Electrical Charasteristics Curves(BU4S81G2)**

Fig.37
Output voltage－Iput voltage characteristics
（VDD=5[V] / VSS=0[V]）

Fig.38
Output voltae－Input voltage characteristics
（VDD=10[V] / VSS=0[V]）

Fig.39
Output voltage－Input voltage characteristics
（VDD=15[V] / VSS=0[V]）
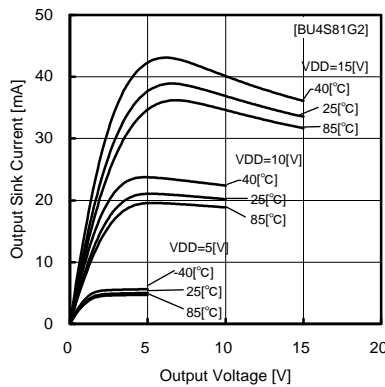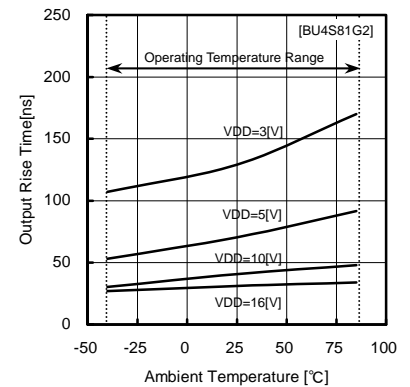
Fig.40
Output source current－voltage characteristics

Fig.41
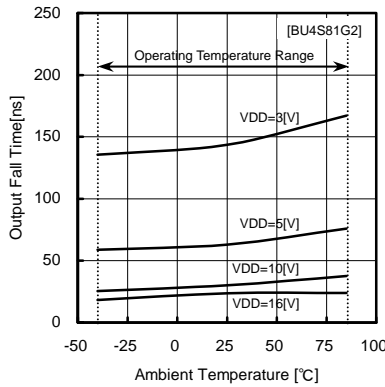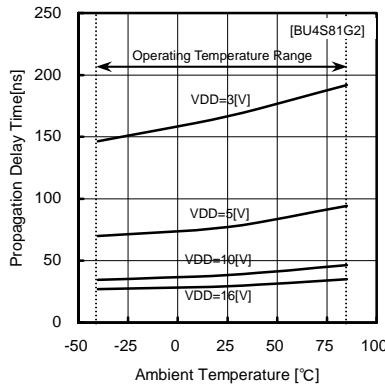Output sink current－voltage characteristics

Fig.42
Output rising time tTLH

Fig.43
Output falling time tTHL

Fig.44
Propagation delay time tPLH
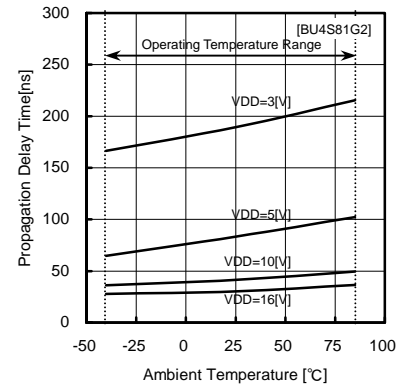
Fig.45
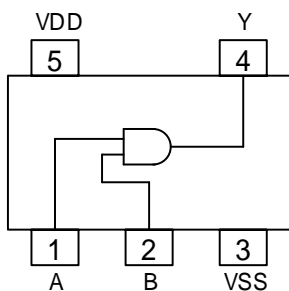Propagation delay time tPHL

●**Pinout Diagram・Pin Description・Input / Output Table**

| PIN | PIN NAME | I/O | PIN FUNCTION |
|-----|----------|-----|--------------|
| 1 | NC | - | Input |
| 2 | A | I | Input |
| 3 | VSS | - | Power supply(-) |
| 4 | Y | O | Output |
| 5 | VDD | - | Power supply(+) |

| A | B | Y |
|---|---|---|
| L | L | L |
| L | H | L |
| H | L | L |
| H | H | H |

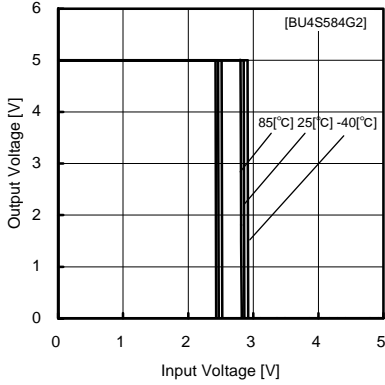●**Electrical Charasteristics Curves(BU4S584G2)**



Fig.46
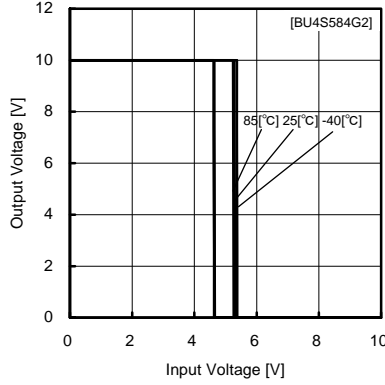Output voltage－Input voltage characteristics
（VDD=5[V] / VSS=0[V]）

Fig.47
Output voltage－Input voltage characteristics
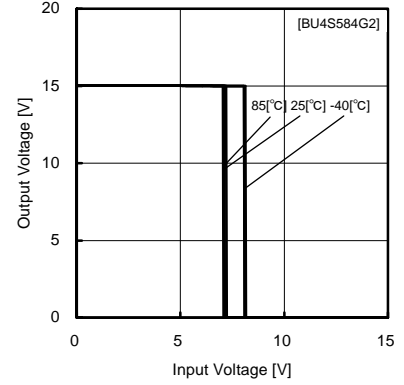（VDD=10[V] / VSS=0[V]）

Fig.48
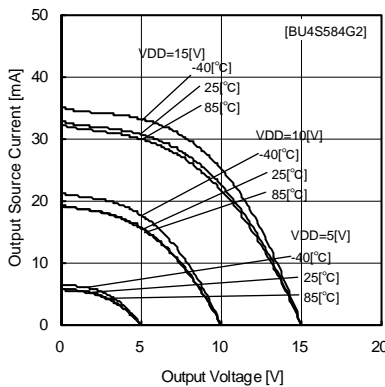Output voltage－Input voltage characteristics
（VDD=15[V] / VSS=0[V]）

Fig.49
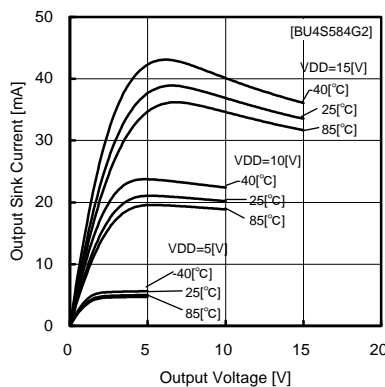Output source current－voltage characteristics

Fig.50
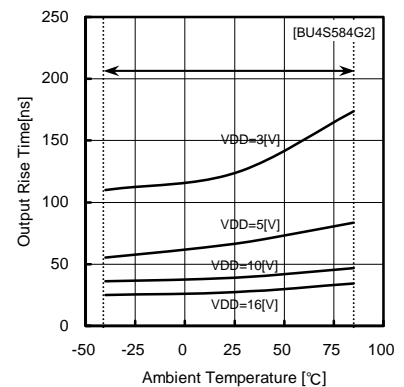Output sink current－voltage characteristics

Fig.51
Output rising time tTLH
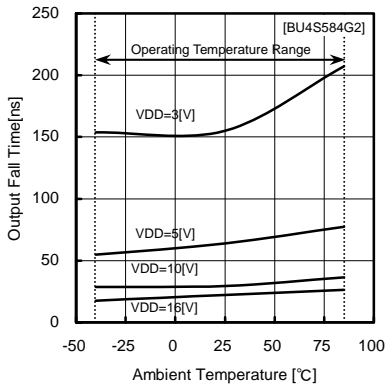
Fig.52
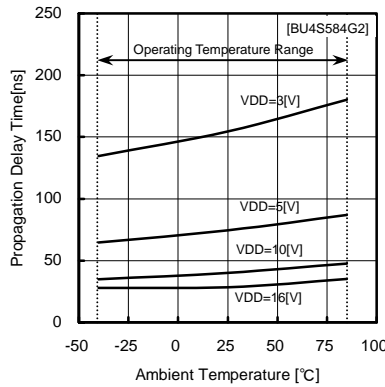Output falling time tTHL

Fig.53
Propagation delay time tPLH
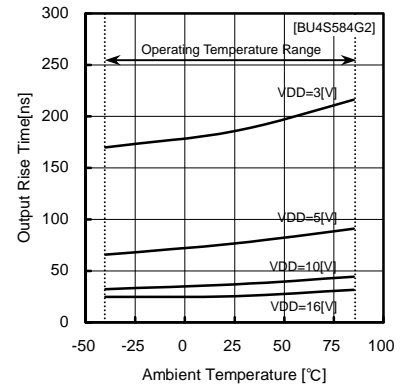
Fig.54
Propagation delay time tPHL
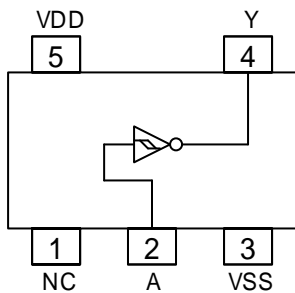
●**Pinout Diagram・Pin Description・Input / Output Table**

| PIN | PIN NAME | I/O | PIN FUNCTION |
|-----|----------|-----|--------------|
| 1 | NC | - | NC |
| 2 | A | I | Input |
| 3 | VSS | - | Power supply(-) |
| 4 | Y | O | Output |
| 5 | VDD | - | Power supply(+) |

| A | Y |
|---|---|
| L | H |
| H | L |

●**Notes for use**

1. Absolute Maximum ratings
   An excess in the absolute maximum ratings, such as supply voltage, temperature range of operating conditions, etc., can break down the devices, thus making impossible to identify breaking mode, such as short circuit or an open circuit. If any over rated values will expect to exceed the absolute maximum ratings, consider adding circuit protection devices, such as fuses.

2. Connecting the power supply connector backward
   Connecting of the power supply in reverse polarity can damage IC. Take precautions when connecting the power supply lines. An external direction diode can be added.

3. Power supply lines
   Design PCB layout pattern to provide low impedance GND and supply lines. To obtain a low noise ground and supply line, separate the ground section and supply lines of the digital and analog blocks. Furthermore, for all power supply terminals to ICs, connect a capacitor between the power supply and the GND terminal. When applying electrolytic capacitors in the circuit, not that capacitance characteristic values are reduced at low temperatures.

4. GND voltage
   The potential of GND pin must be minimum potential in all operating conditions.

5. Thermal design
   Use a thermal design that allows for a sufficient margin in light of the power dissipation (Pd) in actual operating conditions.

6. Inter-pin shorts and mounting errors
   Use caution when positioning the IC for mounting on printed circuit boards. The IC may be damaged if there is any connection error or if pins are shorted together.

7. Actions in strong electromagnetic field
   Use caution when using the IC in the presence of a strong electromagnetic field as doing so may cause the IC to malfunction.

8. Testing on application boards
   When testing the IC on an application board, connecting a capacitor to a pin with low impedance subjects the IC to stress. Always discharge capacitors after each process or step. Always turn the IC's power supply off before connecting it to or removing it from a jig or fixture during the inspection process. Ground the IC during assembly steps as an antistatic measure. Use similar precaution when transporting or storing the IC.

9. Ground Wiring Pattern
   When using both small signal and large current GND patterns, it is recommended to isolate the two ground patterns, placing a signal ground point at the ground potential of application so that the pattern wiring resistance and voltage variations caused by large currents do not cause variations in the small signal ground voltage. Be careful not to change the GND wiring pattern of any external components, either.
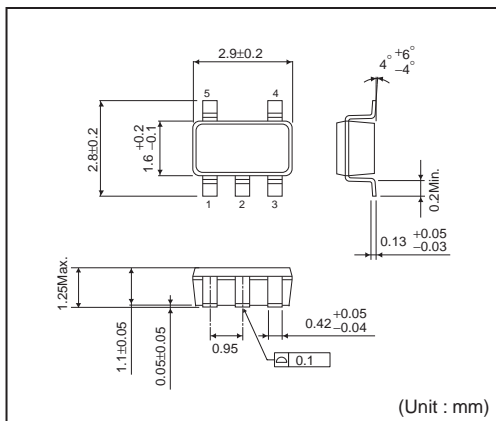
10. Unused input terminals
    Connect all unused input terminals to VDD or VSS in order to prevent excessive current or oscillation.
    Insertion of a resistor (100kΩ approx.) is also recommended.

●**Ordering part number**

| B | U |  | 4 | S | 0 | 1 |  | G | 2 | - | T | R |

Part No.

Part No.
4S01 , 4S11
4SU69 , 4S71
4S81 , 4S584

Package
G2: SSOP5

Packaging and forming specification
TR: Embossed tape and reel

**SSOP5**



(Unit : mm)

<Tape and Reel information>

| Tape | Embossed carrier tape |
|---|---|
| Quantity | 3000pcs |
| Direction of feed | TR<br>The direction is the 1pin of product is at the upper right when you hold reel on the left hand and you pull out the tape on the right hand |



＊Order quantity needs to be multiple of the minimum quantity.
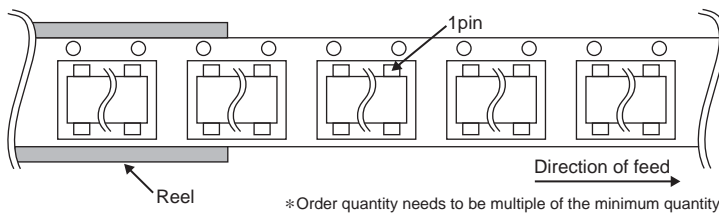
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