

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC7SZ08F, TC7SZ08FU

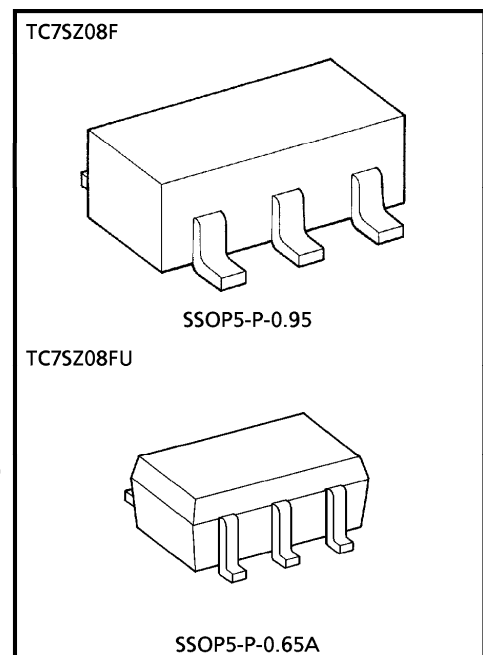
2 INPUT AND GATE

FEATURES

- High Output Drive : $\pm 24\text{mA}$ (Typ.) ($V_{CC} = 3\text{V}$)
- Super High Speed Operation : $t_{pD} = 2.7\text{ns}$ (Typ.)
($V_{CC} = 5\text{V}$, 50pF)
- Operation Voltage Range : $V_{CC}(\text{opr}) = 1.8 \sim 5.5\text{V}$
- 5V Tolerant Function
- Matches the Performance of TC74LCX Series when Operated at $3.3\text{V } V_{CC}$

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|------------------------------|-----------|----------------|------------------|
| Supply Voltage Range | V_{CC} | $-0.5 \sim 6$ | V |
| DC Input Voltage | V_{IN} | $-0.5 \sim 6$ | V |
| DC Output Voltage | V_{OUT} | $-0.5 \sim 6$ | V |
| Input Diode Current | I_{IK} | ± 20 | mA |
| Output Diode Current | I_{OK} | ± 20 | mA |
| DC Output Current | I_{OUT} | ± 50 | mA |
| DC V_{CC} / Ground Current | I_{CC} | ± 50 | mA |
| Power Dissipation | P_D | 200 | mW |
| Storage Temperature | T_{stg} | $-65 \sim 150$ | $^\circ\text{C}$ |
| Lead Temperature (10s) | T_L | 260 | $^\circ\text{C}$ |



Weight
 SSOP5-P-0.95 : 0.016g (Typ.)
 SSOP5-P-0.65A : 0.006g (Typ.)

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DC ELECTRICAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | TEST CONDITION | V _{CC} (V) | T _a = 25°C | | | T _a = -40~85°C | | UNIT | | |
|---------------------------|------------------|--|---------------------------|-------------------------|------|------------------------|---------------------------|------------------------|------|---|------|
| | | | | MIN. | TYP. | MAX. | MIN. | MAX. | | | |
| High-Level Input Voltage | V _{IH} | | 1.8 | 0.88 × V _{CC} | — | — | 0.88 × V _{CC} | — | V | | |
| | | | 2.3~5.5 | 0.75 × V _{CC} | — | — | 0.75 × V _{CC} | — | V | | |
| Low-Level Input Voltage | V _{IL} | | 1.8 | — | — | 0.12 × V _{CC} | — | 0.12 × V _{CC} | V | | |
| | | | 2.3~5.5 | — | — | 0.25 × V _{CC} | — | 0.25 × V _{CC} | V | | |
| High-Level Output Voltage | V _{OH} | V _{IN} = V _{IH} or V _{IL} | I _{OH} = -100 μA | 1.8 | 1.7 | 1.8 | — | 1.7 | — | V | |
| | | | | 2.3 | 2.2 | 2.3 | — | 2.2 | — | | |
| | | | | 3.0 | 2.9 | 3.0 | — | 2.9 | — | | |
| | | | | 4.5 | 4.4 | 4.5 | — | 4.4 | — | | |
| | | | I _{OH} = -8mA | 2.3 | 1.9 | 2.15 | — | 1.9 | — | V | |
| | | | | I _{OH} = -16mA | 3.0 | 2.4 | 2.8 | — | 2.4 | | — |
| | | | | I _{OH} = -24mA | 3.0 | 2.3 | 2.68 | — | 2.3 | | — |
| I _{OH} = -32mA | 4.5 | 3.8 | 4.2 | — | 3.8 | — | | | | | |
| Low-Level Output Voltage | V _{OL} | V _{IN} = V _{IH} or V _{IL} | I _{OH} = 100 μA | 1.8 | — | 0 | 0.1 | — | 0.1 | V | |
| | | | | 2.3 | — | 0 | 0.1 | — | 0.1 | | |
| | | | | 3.0 | — | 0 | 0.1 | — | 0.1 | | |
| | | | | 4.5 | — | 0 | 0.1 | — | 0.1 | | |
| | | | I _{OH} = 8mA | 2.3 | — | 0.1 | 0.3 | — | 0.3 | V | |
| | | | | I _{OH} = 16mA | 3.0 | — | 0.15 | 0.4 | — | | 0.4 |
| | | | | I _{OH} = 24mA | 3.0 | — | 0.22 | 0.55 | — | | 0.55 |
| I _{OH} = 32mA | 4.5 | — | 0.22 | 0.55 | — | 0.55 | | | | | |
| Input Leakage Current | I _{IN} | V _{IN} = 5.5V or GND | 0~5.5 | — | — | ±1 | — | ±10 | μA | | |
| Power Off Leakage Current | I _{OFF} | V _{IN} or V _{OUT} = 5.5V | 0.0 | — | — | 1 | — | 10 | μA | | |
| Quiescent Supply Current | I _{CC} | V _{IN} = V _{CC} or GND | 5.5 | — | — | 2 | — | 20 | μA | | |

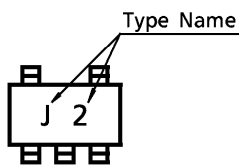
AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3\text{ns}$)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | V _{CC} (V) | Ta = 25°C | | | Ta = -40~85°C | | UNIT |
|-------------------------------|--------------------------------------|--|------------------------|-----------|------|------|---------------|------|------|
| | | | | MIN. | TYP. | MAX. | MIN. | MAX. | |
| Propagation Delay Time | t _{pLH} t _{pHL} | C _L = 15pF, R _L = 1MΩ | 1.8 | 2.0 | 5.2 | 9.5 | 2.0 | 10.5 | ns |
| | | | 2.5 ± 0.2 | 0.8 | 3.4 | 7.0 | 0.8 | 7.5 | |
| | | | 3.3 ± 0.3 | 0.5 | 2.6 | 4.7 | 0.5 | 5.0 | |
| | | C _L = 50pF, R _L = 500Ω | 5.0 ± 0.5 | 0.5 | 2.2 | 4.1 | 0.5 | 4.4 | |
| | | | 3.3 ± 0.3 | 1.5 | 3.3 | 5.2 | 1.5 | 5.5 | |
| | | | 5.0 ± 0.5 | 0.8 | 2.7 | 4.5 | 0.8 | 4.8 | |
| Input Capacitance | C _{IN} | | 0~5.5 | — | 4 | — | — | pF | |
| Power Dissipation Capacitance | C _{PD} | (Note 1) | 3.3 | — | 20 | — | — | — | pF |
| | | | 5.5 | — | 25 | — | — | — | |

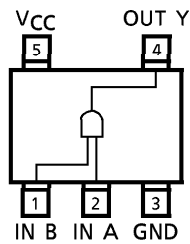
(Note 1) : C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.
Average operating current can be obtained by the equation.

$$I_{CC (opr)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$$

MARKING



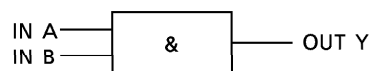
PIN ASSIGNMENT (TOP VIEW)



TRUTH TABLE

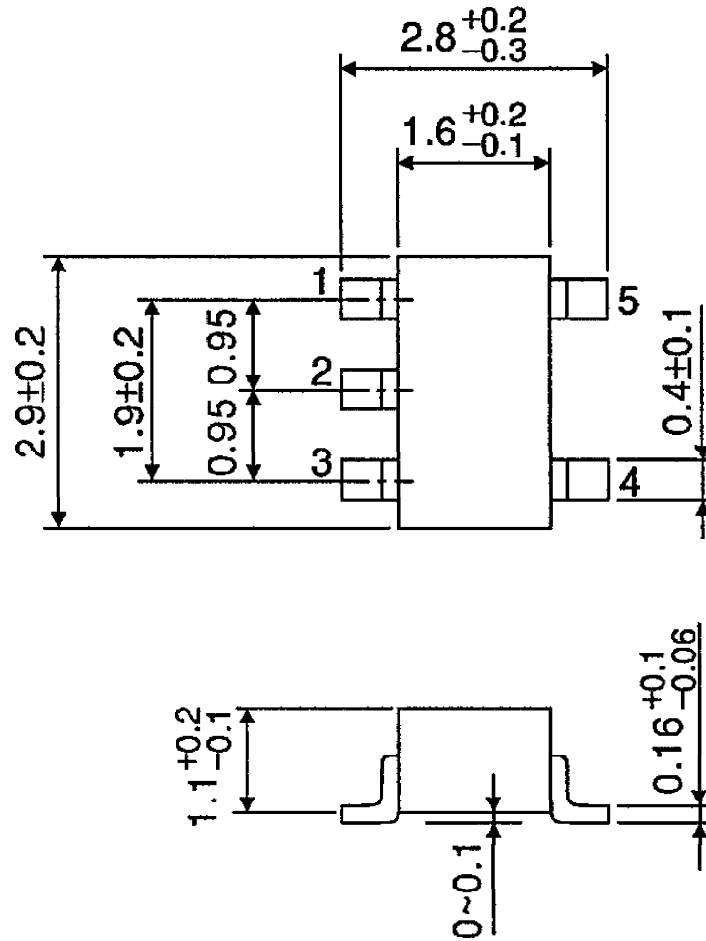
| A | B | Y |
|---|---|---|
| L | L | L |
| L | H | L |
| H | L | L |
| H | H | H |

LOGIC DIAGRAM



OUTLINE DRAWING
SSOP5-P-0.95

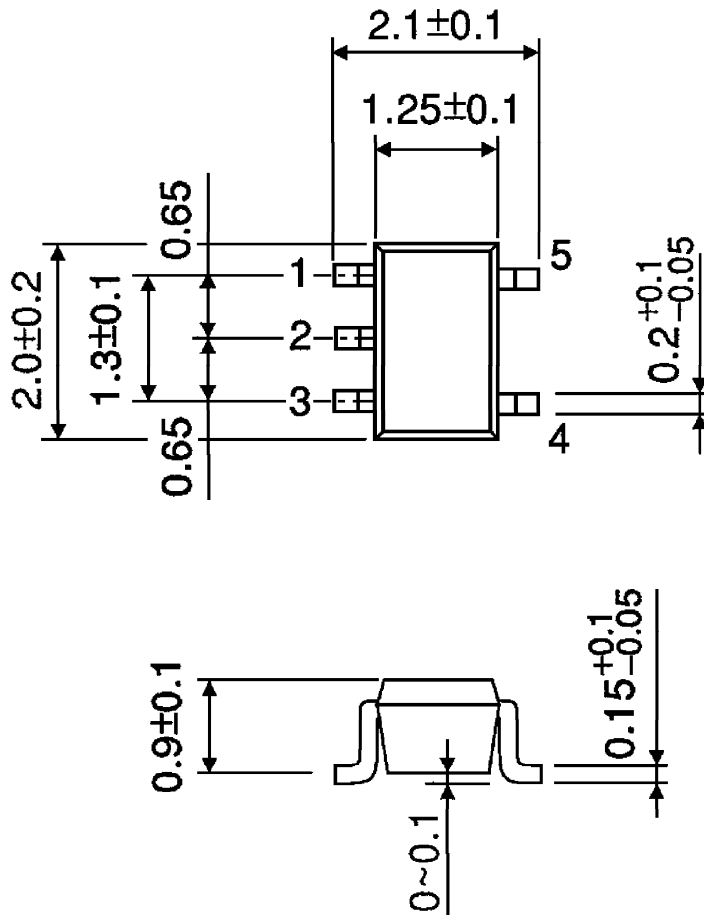
Unit : mm



Weight : 0.016g (Typ.)

OUTLINE DRAWING
SSOP5-P-0.65A

Unit : mm



Weight : 0.006g (Typ.)