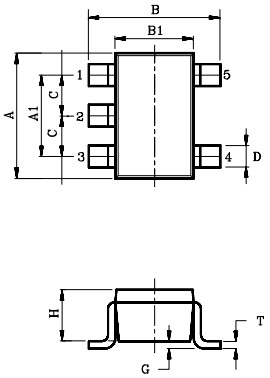
# KIC7SZ05FU

SILICON MONOLITHIC CMOS
DIGITAL INTEGRATED CIRCUIT

INVERTER (OPEN DRAIN)

## FEATURES

- High Output Drive : ±24mA (Typ.)
  @$V_{CC}$=3V
- Super High Speed Operation : $t_{PD}$=2.4ns(Typ.)
  @$V_{CC}$=5V, 50pF
- Operation Voltage Range : $V_{CC(opr)}$=1.8~5.5V.
- Supply Voltage Data Retention : $V_{CC}$=1.5~5.5V.
- 5V Tolerant Function



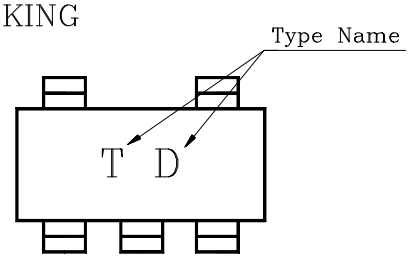

| DIM | MILLIMETERS |
|---|---|
| A | 2.00±0.20 |
| A1 | 1.3±0.1 |
| B | 2.1±0.1 |
| B1 | 1.25±0.1 |
| C | 0.65 |
| D | 0.2+0.10/−0.05 |
| G | 0~0.1 |
| H | 0.9±0.1 |
| T | 0.15+0.1/−0.05 |

USV

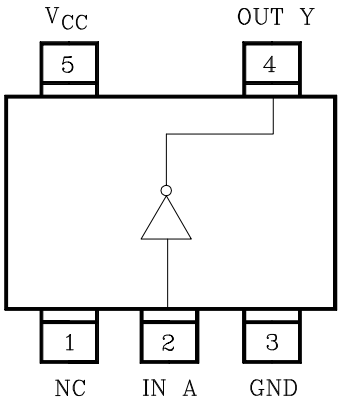
## MAXIMUM RATINGS

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Supply Voltage Range | $V_{CC}$ | -0.5~6 | V |
| DC Input Voltage | $V_{IN}$ | -0.5~6 | V |
| DC Output Voltage | $V_{OUT}$ | -0.5~6 | 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 | $T_{stg}$ | -65~150 | ℃ |
| Lead Temperature (10s) | $T_L$ | 260 | ℃ |

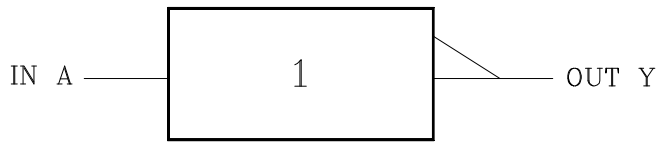
## MARKING




## PIN CONNECTION(TOP VIEW)



LOGIC DIAGRAM




DC ELECTRICAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | $V_{CC}$ (V) | Ta=25℃ MIN. | Ta=25℃ TYP. | Ta=25℃ MAX. | Ta=-40~85℃ MIN. | Ta=-40~85℃ MAX. | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 ×$V_{CC}$ | - | |
| 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 ×$V_{CC}$ | |
| High-Level Output Voltage | $I_{LKG}$ | $V_{IN}$=$V_{IL}$ | | 1.8~5.5 | - | - | ±5 | - | ±10 | μA |
| Low-Level Output Voltage | $V_{OL}$ | $V_{IN}$=$V_{IH}$ | $I_{OL}$=100μA | 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 | |
| | | | $I_{OL}$=8mA | 2.3 | - | 0.1 | 0.3 | - | 0.3 | |
| | | | $I_{OL}$=16mA | 3.0 | - | 0.15 | 0.4 | - | 0.4 | |
| | | | $I_{OL}$=24mA | 3.0 | - | 0.22 | 0.55 | - | 0.55 | |
| | | | $I_{OL}$=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 | $I_{IN}$ | $V_{IN}$ or $V_{OUT}$=5.5V | | 0.0 | - | - | 1 | - | 10 | |
| Quiescent Supply Current | $I_{CC}$ | $V_{IN}$=$V_{CC}$ or GND | | 5.5 | - | - | 2 | - | 20 | |

AC ELECTRICAL CHARACTERISTICS (Input $t_r=t_f=3ns$)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | Ta=25℃ | | | Ta=-40~85℃ | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | $V_{CC}$ (V) | MIN. | TYP. | MAX. | MIN. | MAX. | |
| Propagation Delay Time | $t_{PZL}$ | CL=50pF, RL=500Ω | 1.8 | 1.5 | 4.6 | 10.5 | 1.5 | 11.0 | ns |
| | | | 2.5±0.2 | 0.8 | 3.0 | 7.0 | 0.8 | 7.5 | |
| | | | 3.3±0.3 | 0.8 | 2.4 | 5.0 | 0.8 | 5.2 | |
| | | | 5.0±0.5 | 0.5 | 1.9 | 4.3 | 0.5 | 4.5 | |
| | $t_{PLZ}$ | CL=50pF, RL=500Ω | 1.8 | 1.5 | 4.1 | 10.5 | 1.5 | 1.0 | |
| | | | 2.5±0.2 | 0.8 | 2.5 | 7.0 | 0.8 | 7.5 | |
| | | | 3.3±0.3 | 0.8 | 2.1 | 5.0 | 0.8 | 5.2 | |
| | | | 5.0±0.5 | 0.5 | 1.2 | 4.3 | 0.5 | 4.5 | |
| Input Capacitance | $C_{IN}$ | - | 0~5.5 | - | 4 | - | - | - | pF |
| Power Dissipation Capacitance | $C_{PD}$ | (Note1) | 3.3 | - | 3.6 | - | - | - | |
| | | | 3.5 | - | 6.5 | - | - | - | |

Note 1 : $C_{PD}$ defined as the value of internal equivalent capacitance of IC which is calculated from the operating current consumption without load (refer to Test Circuit.)
Average operating current can be obtained by the equation hereunder.
$I_{CC(opr)}=C_{PD}\cdot V_{CC}\cdot f_{IN}+I_{CC}$