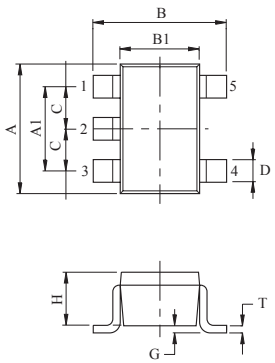
# KIC7SZ66FU

**SILICON MONOLITHIC CMOS DIGITAL INTEGRATED CIRCUIT**

BILATERAL SWITCH

FEATURES

- 250MHz-3dB bandwidth.
- Super High Speed $t_{PD}$=2.7nS(Typ.) at $V_{CC}$=5V.
- On Resistance $R_{OH}$=3Ω(Typ.) at $V_{CC}$=4.5V
  ($V_{IN}$=0V, $I_{IN}$=30mA.)
- Wide Operating Voltage Range : $V_{CC(opr)}$=1.65~5.5V.
- T.H.D : THD=0.11%(Typ.) at $V_{CC}$=5V.



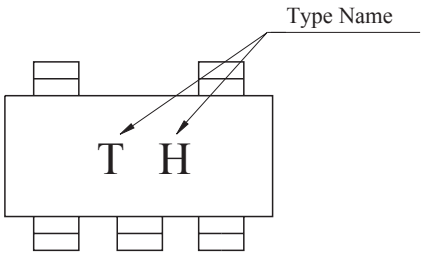

| DIM | MILLIMETERS |
|---|---|
| A | 2.00±0.20 |
| A1 | 1.3±0.1 |
| B | 2.1±0.1 |
| B1 | 1.25±0.1 |
| C | 0.65 |
| D | 0.2+0.10/-0.05 |
| G | 0-0.1 |
| H | 0.9±0.1 |
| T | 0.15+0.1/-0.05 |

USV

MAXIMUM RATINGS (Ta=25℃)

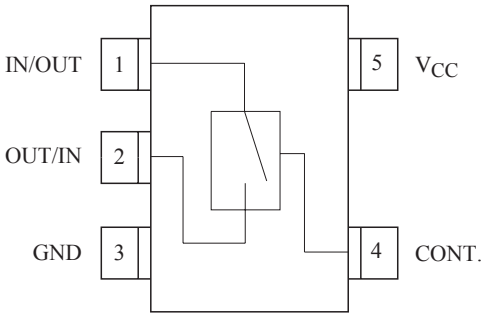
| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| DC Supply Voltage | $V_{CC}$ | -0.5~7.0 | V |
| Control Input Voltage | $V_{IN}$ | -0.5~7.0 | V |
| Swith I/O Voltage | $V_{I/O}$ | -0.5~7.0 | V |
| Control Diode Current | $I_{CK}$ | -50 | mA |
| Output Diode Current | $I_{IOK}$ | ±128 | mA |
| DC $V_{CC}$/Ground Current | $I_{CC}$ | ±100 | mA |
| Power Dissipation | $P_D$ | 200 | mW |
| Storage Temperature Range | $T_{stg}$ | -65 ~ 150 | ℃ |
| Lead Temperature (10s) | $T_L$ | 260 | ℃ |

MARKING




Logic Diagram


PIN CONNECTION(TOP VIEW)




TRUTH TABEL

| CONTROL | SWITCH FUNCTION |
|---|---|
| H | ON |
| L | OFF |

RECOMMENDED OPERATING CONDIITIONS

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Supply Voltage | $V_{CC}$ | 1.65 ~ 5.5 | V |
| Control Input Voltage | $V_{IN}$ | 0 ~ 5.5 | V |
| Switch I/O Voltage | $V_{I/O}$ | 0 ~ $V_{CC}$ | V |
| Operating Temperature | $T_{opr}$ | -40 ~ 85 | ℃ |
| Input Rise and Fall Time | $t_r$, $t_f$ | 0 ~ 10 ($V_{CC}$=2.3~3.6V)<br>0 ~ 5 ($V_{CC}$=4.5~5.5V) | nS/V |

ELECTRICAL CHARACTERISTICS

DC Characteristics

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | | Ta=25℃ | | | Ta=-40~85℃ | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $V_{CC}$(V) | MIN. | TYP. | MAX. | MIN. | TYP. (Note4) | MAX. | |
| Input Voltage | High Level | $V_{IH}$ | - | 1.65~1.95 | - | - | - | 0.75× $V_{CC}$ | - | - | V |
| | | | | 2.3~5.5 | - | - | - | 0.7×$V_{CC}$ | - | - | |
| | Low Level | $V_{IL}$ | - | 1.65~1.95 | - | - | - | - | - | 0.25× $V_{CC}$ | |
| | | | | 2.3~5.5 | - | - | - | - | - | 0.3×$V_{CC}$ | |
| Switch On Resistance (Note 1) | | $R_{ON}$ | $V_{IN}$=0V, $I_{IN}$=30mA | 4.5 | - | - | - | - | 3 | 7 | μA |
| | | | $V_{IN}$=2.4V, $I_{IN}$=15mA | | - | - | - | - | 5 | 12 | V |
| | | | $V_{IN}$=4.5V, $I_{IN}$=30mA | | - | - | - | - | 7 | 15 | |
| | | | $V_{IN}$=0V, $I_{IN}$=24mA | 3.0 | - | - | - | - | 4 | 9 | |
| | | | $V_{IN}$=3V, $I_{IN}$=24mA | | - | - | - | - | 10 | 20 | |
| | | | $V_{IN}$=0V, $I_{IN}$=8mA | 2.3 | - | - | - | - | 5 | 12 | |
| | | | $V_{IN}$=2.3V, $I_{IN}$=8mA | | - | - | - | - | 13 | 30 | |
| | | | $V_{IN}$=0V, $I_{IN}$=4mA | 1.8 | - | - | - | - | 7 | 28 | |
| | | | $V_{IN}$=1.8V, $I_{IN}$=4mA | | - | - | - | - | 25 | 60 | |
| On Resistance Flatness (Note 1) (Note 2) (Note 3) | | $R_{flat}$ | $I_A$=-30mA, 0 ≤ $V_{Bn}$ ≤ $V_{CC}$ | 5.0 | - | 6 | - | - | - | - | Ω |
| | | | $I_A$=-24mA, 0 ≤ $V_{Bn}$ ≤ $V_{CC}$ | 3.3 | - | 12 | - | - | - | - | |
| | | | $I_A$=-8mA, 0 ≤ $V_{Bn}$ ≤ $V_{CC}$ | 2.5 | - | 28 | - | - | - | - | |
| | | | $I_A$=-4mA, 0 ≤ $V_{Bn}$ ≤ $V_{CC}$ | 1.8 | - | 125 | - | - | - | - | |
| Input Leakage Current | | $I_{IN}$ | 0 ≤ $V_{IN}$ ≤ =5.5V | 0~5.5 | - | - | - | - | ±0.05 | ±1.0 | μA |
| Power Off Leakage Current | | $I_{OFF}$ | 0 ≤ A,B ≤ =$V_{CC}$ | 1.65~5.5 | - | - | - | - | ±0.05 | ±10.0 | μA |
| Quiescent Supply Current | | $I_{CC}$ | $V_{IN}$=$V_{CC}$ or GND<br>$I_{OUT}$=0 | 1.65~5.5 | - | - | - | - | 0.05 | 10 | μA |

Note1 : Measured by the voltage drop between A and B pins at the indicated current through the switch. On Resistance is determined by the lower of the voltages on the two (A or B) pins.

Note2 : Parameter is characterized but not tested in production.

Note3 : Flatness is defined as the difference between the maximum and minimum value of On Resistance over the specified range of conditions.

Note4 : All typical values are at the specified $V_{CC}$, and Ta=25℃

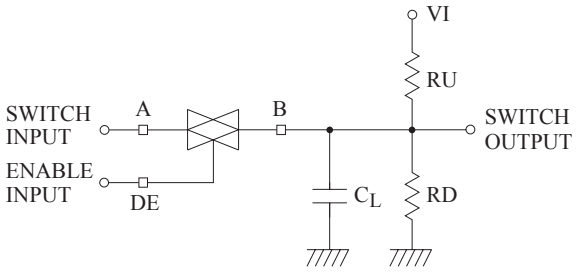
AC Characteristics

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | Ta=-40℃~85℃, $C_L$=50pF, $R_U$=$R_D$=500Ω | | | UNIT |
|---|---|---|---|---|---|---|---|
| | | | $V_{CC}$(V) | MIN. | TYP. | MAX. | |
| Propagation Delay Bus to Bus (Figures 1,2) | $t_{PHL}$ $t_{PLH}$ | $V_{IN}$=OPEN | 1.65~1.95 | - | - | 4.3 | ns |
| | | | 2.3~2.7 | - | - | 1.2 | |
| | | | 3.0~3.6 | - | - | 0.8 | |
| | | | 4.5~5.5 | - | - | 0.3 | |
| Output Enable Time (Figures 1,2) | $t_{PZL}$ $t_{PZH}$ | $V_{IN}$=2×$V_{CC}$ for $t_{PZL}$ $V_{IN}$=0V for $t_{PZH}$ | 1.65~1.95 | 1.5 | 7.0 | 14.2 | ns |
| | | | 2.3~2.7 | 1.5 | 3.3 | 7.0 | |
| | | | 3.0~3.6 | 1.5 | 2.4 | 5.5 | |
| | | | 4.5~5.5 | 1.5 | 2.0 | 4.5 | |
| Output Disable Time (Figures 1,2) | $t_{PLZ}$ $t_{PHZ}$ | $V_{IN}$=2×$V_{CC}$ for $t_{PLZ}$ $V_{IN}$=0V for $t_{PHZ}$ | 1.65~1.95 | 1.5 | 9.2 | 18.2 | ns |
| | | | 2.3~2.7 | 1.5 | 5.3 | 9.0 | |
| | | | 3.0~3.6 | 1.5 | 4.0 | 7.0 | |
| | | | 4.5~5.5 | 1.5 | 2.7 | 5.0 | |
| Charge Injection (Figures 3) | Q | $C_L$=0.1nF, $V_{GEN}$=0V, $R_{GEN}$=0Ω, f=1MHz | 1.65~5.5 | - | 0.05 | - | pC |
| Off lsolation (Figures 4) | OIRR | $R_L$=50Ω, $C_L$=5pF, f=10MHz | 1.65~5.5 | - | -50 | - | dB |
| -3dB Bandwidth (Figures 5) | BW | $R_L$=50Ω | 1.65~5.5 | - | >250 | - | MHz |
| Total Harmonic Distortion | THD | $R_L$=600Ω, 0.5$V_{P-P}$ f=600Hz~20kHz | 5 | - | 0.011 | - | % |

Capacitance

| Symbol | Parameter | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|
| $C_{IN}$ | Control Pin Input Capacitance | 2 | | pF | $V_{CC}$=0V |
| $C_{I/O}$ | Input/Output Capacitance | 6 | | pF | $V_{CC}$=5.0V |

AC Loading and Waveforms




Input driven by 50Ω source terminated in 50Ω
$C_L$ includes load and stray capacitance.
Input PRR=1.0MHz ; $t_W$ =500ns

FIGURE 1. AC Test Circuit

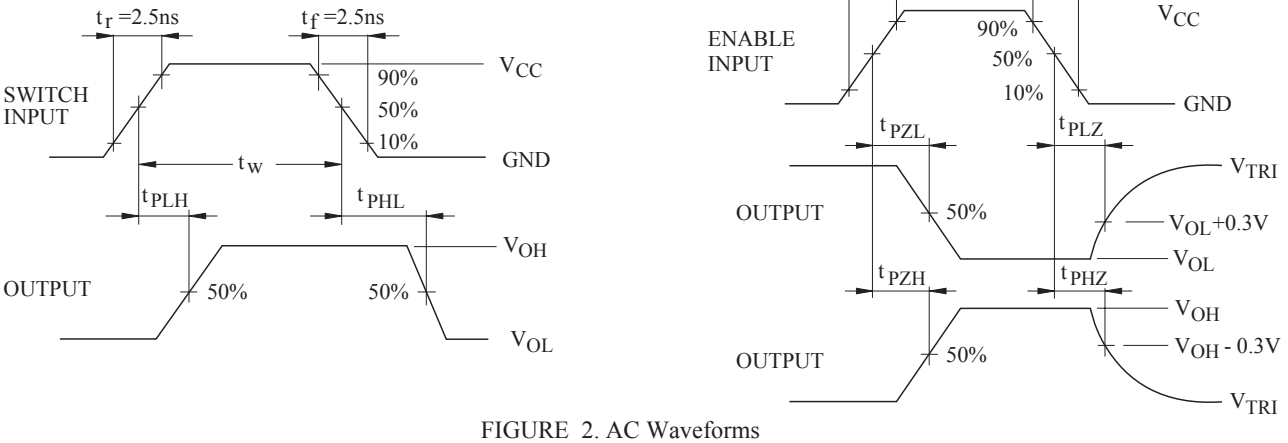



FIGURE 2. AC Waveforms

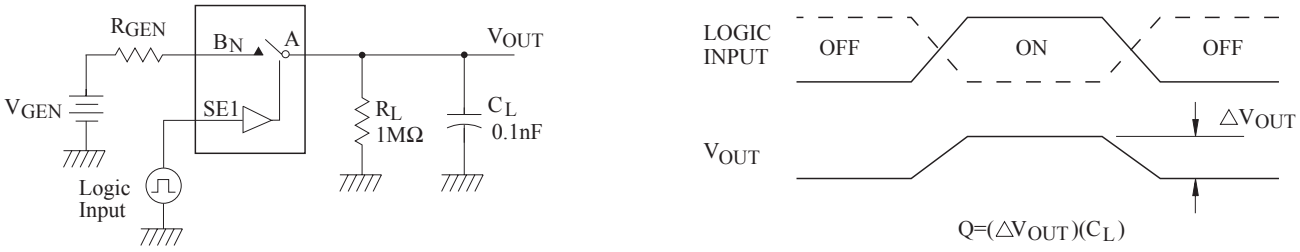



FIGURE 3. Charge Injection Test

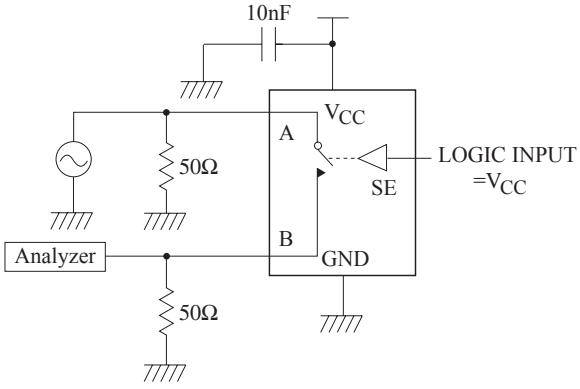



FIGURE 4. Off lsolation

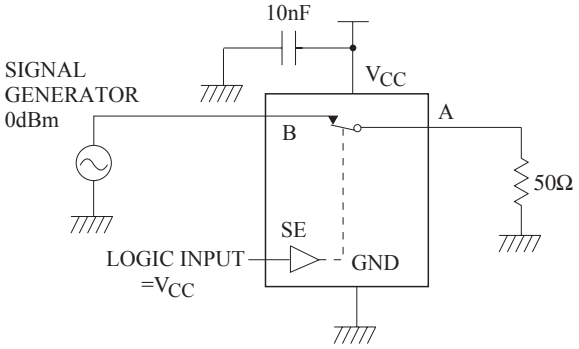



FIGURE 5. Bandwidth