

# TC7WB125FK

## Dual Bus Switch

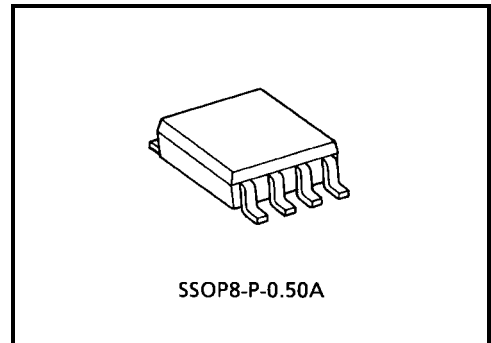
The TC7WB125FK is a low on-resistance, high-speed CMOS 2-bit bus switch. This bus switch allows the connections or disconnections to be made with minimal propagation delay while maintaining Low power dissipation which is the feature of CMOS.

When output enable ( $\overline{OE}$ ) is at low level, the switch is on; when at high level, the switch is off.

All inputs are equipped with protector circuits to protect the device from static discharge.

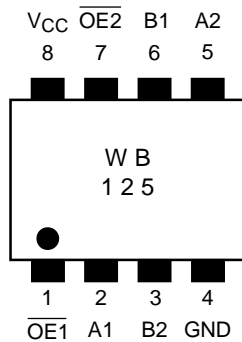
### Features

- Operating voltage:  $V_{CC} = 4.5\sim 5.5$  V
- High speed operation:  $t_{pd} = 0.25$  ns (max)
- Ultra-low on resistance:  $R_{ON} = 5 \Omega$  (typ.)
- Electro-static discharge (ESD) performance:  $\pm 200$  V or more (JEITA)  
 $\pm 2000$  V or more (MIL)
- TTL level input (control input)
- Package: US8



Weight: 0.01 g (typ.)

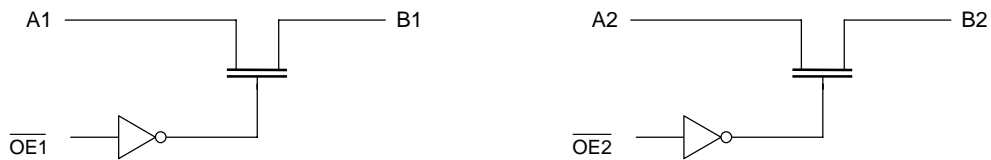
### Pin Assignment (top view)



## Truth Table

Inputs	Function
$\overline{OE}$	
L	A port = B port
H	Disconnect

## System Diagram



## Maximum Ratings

Characteristics	Symbol	Rating	Unit
Power supply voltage	$V_{CC}$	-0.5~7.0	V
Control pin input voltage	$V_{IN}$	-0.5~7.0	V
Switch terminal I/O voltage	$V_S$	-0.5~7.0	V
Clump diode current	$I_{IK}$	-50	mA
Switch I/O current	$I_S$	128	mA
Power dissipation	$P_D$	200	mW
DC $V_{CC}/GND$ current	$I_{CC}/I_{GND}$	$\pm 100$	mA
Storage temperature	$T_{stg}$	-65~150	$^{\circ}C$

## Recommended Operating Conditions

Characteristics	Symbol	Rating	Unit
Power supply voltage	$V_{CC}$	4.5~5.5	V
Control pin input voltage	$V_{IN}$	0~5.5	V
Switch I/O voltage	$V_S$	0~5.5	V
Operating temperature	$T_{opr}$	-40~85	$^{\circ}C$
Control pin input rise/fall time	dt/dv	0~10	ns/V

**Electrical Characteristics**

**DC Characteristics (Ta = -40~85°C)**

Characteristics		Symbol	Test Condition		Min	Typ. (Note1)	Max	Unit
Control pin input voltage	"H" level	V <sub>IH</sub>	—		2.0	—	—	V
	"L" level	V <sub>IL</sub>	—		—	—	0.8	
Input leakage current		I <sub>IN</sub>	V <sub>IN</sub> = 0~5.5 V		4.5~5.5	—	±1.0	μA
Power off leakage current		I <sub>OFF</sub>	A, B, $\overline{OE}$ = 0~5.5 V		0	—	±1.0	μA
Off-state leakage current (switch off)		I <sub>SZ</sub>	A, B = 0~5.5 V, $\overline{OE}$ = V <sub>CC</sub>		4.5~5.5	—	±1.0	μA
ON resistance (Note2)	R <sub>ON</sub>	V <sub>IS</sub> = 0 V	I <sub>IS</sub> = 64 mA		4.5	—	5	Ω
			I <sub>IS</sub> = 30 mA		4.5	—	5	
		V <sub>IS</sub> = 2.4 V, I <sub>IS</sub> = 15 mA		4.5	—	10	15	
Quiescent supply current		I <sub>CC</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND I <sub>OUT</sub> = 0		5.5	—	10	μA
		ΔI <sub>CC</sub>	V <sub>IN</sub> = 3.4 V (one input)		5.5	—	2.5	mA

Note1: The typical values are at V<sub>CC</sub> = 5 V, Ta = 25°C.

Note2: Apply the specified current to the switch, then measure the voltages on pins A and B. The on-resistance is the lower of the two.

**AC Characteristics (Ta = -40~85°C)**

Characteristics		Symbol	Test Condition		Min	Max	Unit	
								V <sub>CC</sub> (V)
Propagation delay time (bus to bus)		t <sub>pLH</sub> t <sub>pHL</sub>	Figure 1, Figure 2 (Note3)		4.5	—	0.25	ns
Output enable time		t <sub>pZL</sub> t <sub>pZH</sub>	Figure 1, Figure 3		4.5	—	4.0	ns
Output disable time		t <sub>pLZ</sub> t <sub>pHZ</sub>	Figure 1, Figure 3		4.5	—	5.0	ns

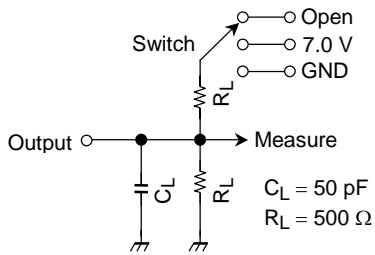
Note3: The propagation delay time is calculated by the RC (on-resistance and load capacitance) time constant.

**Capacitive Characteristics (Ta = 25°C)**

Characteristics		Symbol	Test Condition		Typ.	Unit	
							V <sub>CC</sub> (V)
Control pin input capacitance		C <sub>IN</sub>	(Note4)		5.0	3	pF
Switch terminal capacitance		C <sub>I/O</sub>	$\overline{OE}$ = V <sub>CC</sub>		5.0	10	pF

Note4: This item is guaranteed by design.

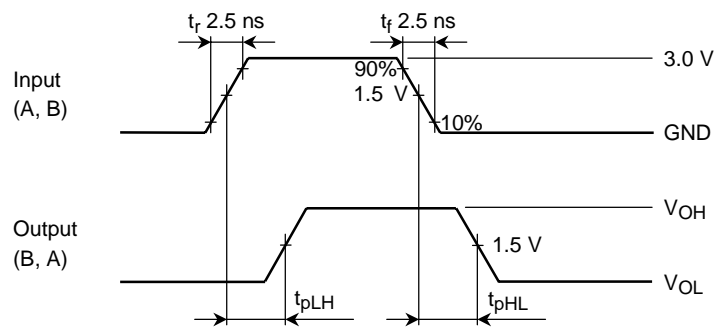
**AC Test Circuit**



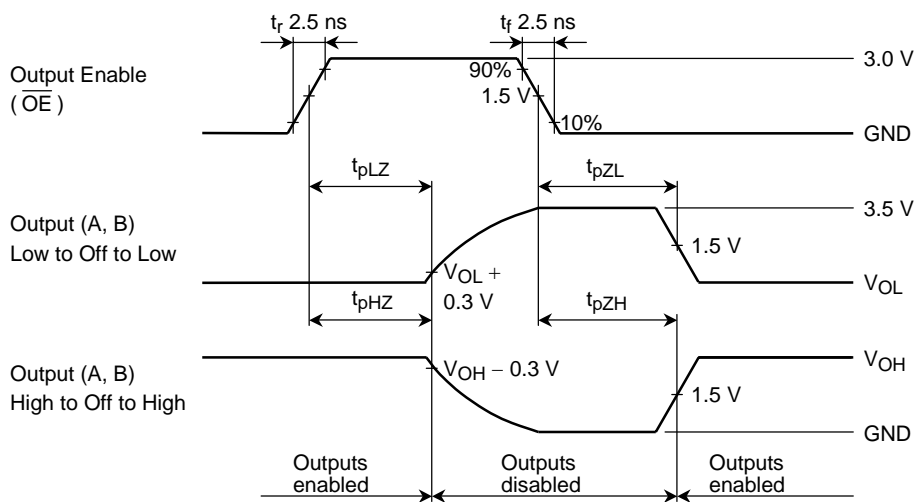
Parameter	Switch
$t_{pLH}$ , $t_{pHL}$	Open
$t_{pLZ}$ , $t_{pZL}$	7.0 V
$t_{pHZ}$ , $t_{pZH}$	Open

**Figure 1**

**AC Waveform**



**Figure 2  $t_{pLH}$ ,  $t_{pHL}$**

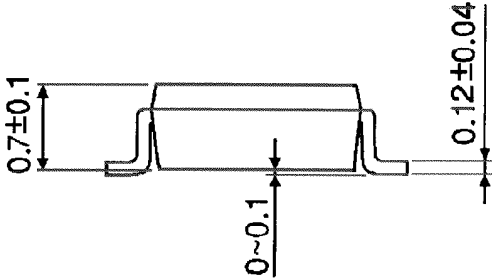
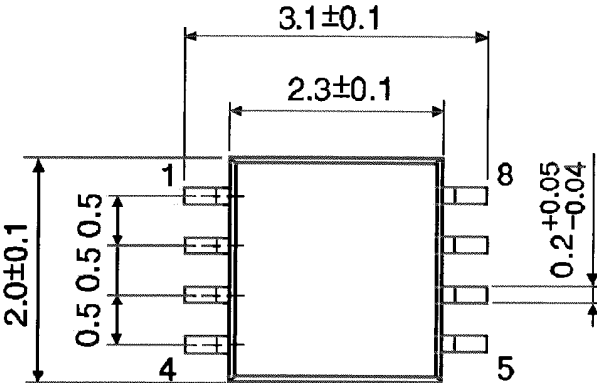


**Figure 3  $t_{pLZ}$ ,  $t_{pHZ}$ ,  $t_{pZL}$ ,  $t_{pZH}$**

Package Dimensions

SSOP8-P-0.50A

Unit : mm



Weight: 0.01 g (typ.)

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