

# TC7WB126FK

## Dual Bus Switch

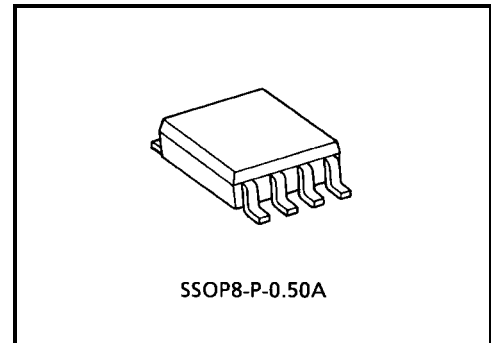
The TC7WB126FK is a low on-resistance, high-speed CMOS dual-bit bus switch. This bus switch allows the connections or disconnections to be made with minimal propagation delay while maintaining Low power dissipation which is the feature of CMOS.

When output enable (OE) is at High level, the switch is on; when at Low level, the switch is off.

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

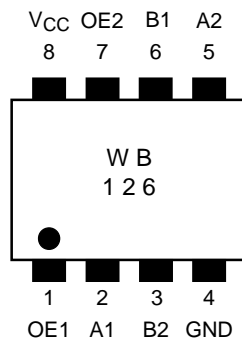
## Features

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



Weight: 0.01 g (typ.)

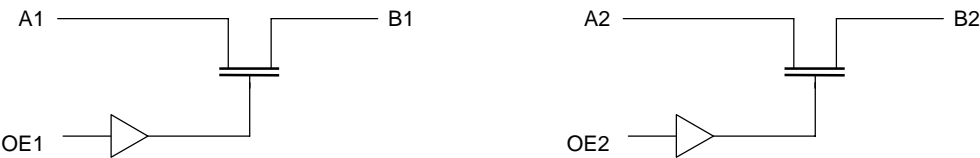
## Pin Assignment (top view)



Truth Table

Inputs	Function
OE	
L	Disconnect
H	A port = B port

System Diagram



Maximum Ratings

Characteristics	Symbol	Rating	Unit
Power supply range	$V_{CC}$	-0.5~7.0	V
DC input voltage	$V_{IN}$	-0.5~7.0	V
DC switch voltage	$V_S$	-0.5~7.0	V
Input diode current	$I_{IK}$	-50	mA
Continuous channel 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
Supply voltage	$V_{CC}$	4.5~5.5	V
Input voltage	$V_{IN}$	0~5.5	V
Switch voltage	$V_S$	0~5.5	V
Operating temperature	$T_{opr}$	-40~85	$^{\circ}C$
Input rise and 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
				V <sub>CC</sub> (V)				
Input voltage	"H" level	V <sub>IH</sub>	—	4.5~5.5	2.0	—	—	V
	"L" level	V <sub>IL</sub>	—	4.5~5.5	—	—	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, 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, OE = GND	4.5~5.5	—	—	±1.0	μA
ON resistance (Note2)	R <sub>ON</sub>	V <sub>IS</sub> = 0 V	I <sub>IS</sub> = 30 mA	4.5	—	5	7	Ω
			I <sub>IS</sub> = 64 mA	4.5	—	5	7	
		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: Typical values are at V<sub>CC</sub> = 5 V and Ta = 25°C.

Note2: 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.

## 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	—	5.5	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>	OE = GND (Note4)	5.0	10	pF

Note4: This item is guaranteed by design.

Switch

Open

7.0 V

GND

Output

Measure

$R_L$

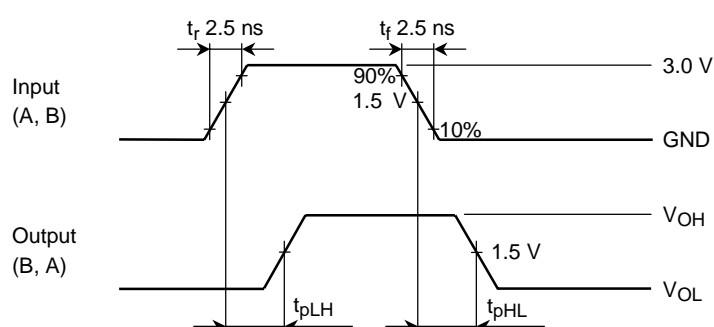
$C_L$

$R_L$

$C_L = 50 \text{ pF}$

$R_L = 500 \Omega$

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



Timing diagram for the 74VHC125 showing the relationship between the Output Enable (OE) signal and the Output (A, B) signals during transitions from Low to Off to Low and High to Off to High.

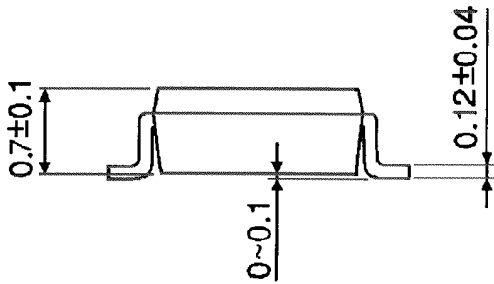
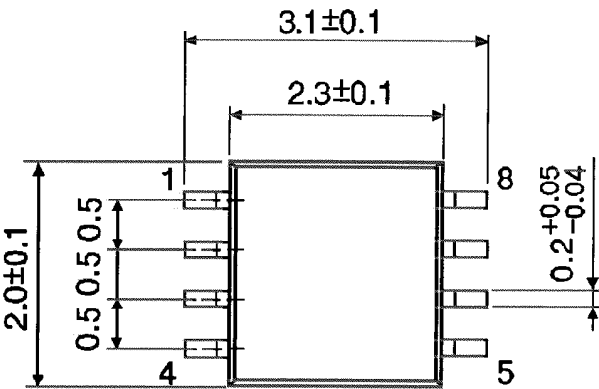
The diagram illustrates the following parameters and states:

- Output Enable (OE):** Transitions from high to low and back to high. The rise and fall times are specified as  $t_r$  2.5 ns.
- Output (A, B) Low to Off to Low:** Shows the output signal transitioning from a low state to an off state (high impedance) and back to low. The propagation delay from OE falling to the output reaching  $V_{OL} + 0.3$  V is  $t_{pLZ}$ . The propagation delay from OE rising to the output reaching  $V_{OL}$  is  $t_{pZL}$ .
- Output (A, B) High to Off to High:** Shows the output signal transitioning from a high state to an off state (high impedance) and back to high. The propagation delay from OE falling to the output reaching  $V_{OH} - 0.3$  V is  $t_{pHZ}$ . The propagation delay from OE rising to the output reaching  $V_{OH}$  is  $t_{pZH}$ .
- Output Levels:** The output signal levels are 3.5 V for low and 1.5 V for high. The off-state voltage levels are  $V_{OL} + 0.3$  V and  $V_{OH} - 0.3$  V.
- Regions:** The diagram is divided into three regions: "Outputs enabled", "Outputs disabled", and "Outputs enabled".

Package Dimensions

SSOP8-P-0.50A

Unit : mm



Weight: 0.01 g (typ.)

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