

## Preliminary



SEMICONDUCTOR™

May 2001  
Revised May 2001**FST162244****16-Bit Bus Switch with 25Ω Series Resistor in Outputs  
(Preliminary)****General Description**

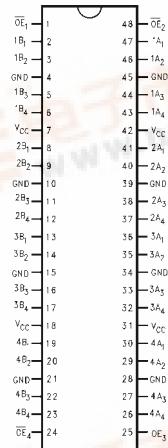
The Fairchild Switch FST162244 provides 16-bits of high-speed CMOS TTL-compatible bus switching. The low On Resistance of the switch allows inputs to be connected to outputs without adding propagation delay or generating additional ground bounce noise.

The device is organized as a 16-bit switch. There are four 4-bit switches with separate output enable inputs. When  $\overline{OE}$  is LOW, the switch is ON and Port A is connected to Port B. When  $\overline{OE}$  is HIGH, the switch is OFF and a high impedance state exists between the A and B Ports. The FST162244 has an equivalent 25Ω series resistors to reduce signal-reflection noise, eliminating the need for external terminating resistors.

**Ordering Code:**

Order Number	Package Number	Package Description
FST162244MTD	MTD48	48-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 6.1mm Wide

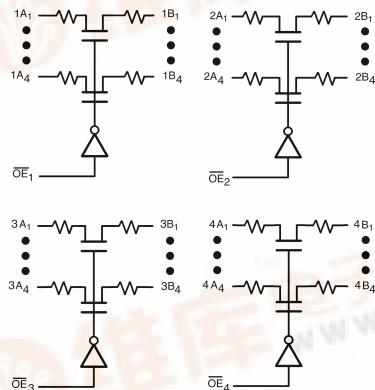
Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

**Connection Diagram****Pin Descriptions**

Pin Name	Description
$\overline{OE}_n$	Output Enable Input (Active LOW)
1A <sub>n</sub> , 2A <sub>n</sub> , 3A <sub>n</sub> , 4A <sub>n</sub>	Bus A
1B <sub>n</sub> , 2B <sub>n</sub> , 3B <sub>n</sub> , 4B <sub>n</sub>	Bus B

**Features**

- 25Ω switch connection between two ports.
- Minimal propagation delay through the switch.
- Low  $I_{CC}$ .
- Zero bounce in flow-through mode.
- Control inputs compatible with TTL level.

**Logic Diagram****Truth Table**

Inputs	Outputs
$\overline{OE}_x$	A, B
L	A Port = B Port
H	Z

H = HIGH Voltage Level L = LOW Voltage Level Z = High Impedance

**FST162244 16-Bit Bus Switch with 25Ω Series Resistor in Outputs (Preliminary)**

Absolute Maximum Ratings <sup>(Note 1)</sup>			Recommended Operating Conditions <sup>(Note 4)</sup>				
Symbol	Parameter	V <sub>CC</sub> (V)	T <sub>A</sub> = -40°C to +85°C			Units	Conditions
			Min	Typ <sup>(Note 5)</sup>	Max		
V <sub>IK</sub>	Clamp Diode Voltage	4.5			-1.2	V	I <sub>IN</sub> = -18mA
V <sub>IH</sub>	HIGH Level Input Voltage	4.0–5.5	2.0			V	
V <sub>IL</sub>	LOW Level Input Voltage	4.0–5.5			0.8	V	
I <sub>I</sub>	Input Leakage Current	5.5			±1.0	µA	0 ≤ V <sub>IN</sub> ≤ 5.5V
		0			±10	µA	V <sub>IN</sub> = 5.5V
I <sub>OZ</sub>	OFF-STATE Leakage Current	5.5			±1.0	µA	0 ≤ A, B ≤ V <sub>CC</sub>
R <sub>ON</sub>	Switch On Resistance <sup>(Note 6)</sup>	4.5	20	26	38	Ω	V <sub>IN</sub> = 0V, I <sub>IN</sub> = 64 mA
		4.5	20	27	40	Ω	V <sub>IN</sub> = 0V, I <sub>IN</sub> = 30 mA
		4.5	20	28	48	Ω	V <sub>IN</sub> = 2.4V, I <sub>IN</sub> = 15 mA
		4.0	20	30	48	Ω	V <sub>IN</sub> = 2.4V, I <sub>IN</sub> = 15 mA
I <sub>CC</sub>	Quiescent Supply Current	5.5			3	µA	V <sub>IN</sub> = V <sub>CC</sub> or GND, I <sub>OUT</sub> = 0
Δ I <sub>CC</sub>	Increase in I <sub>CC</sub> per Input	5.5			2.5	mA	One Input at 3.4V Other Inputs at V <sub>CC</sub> or GND

**Note 5:** Typical values are at V<sub>CC</sub> = 5.0V and T<sub>A</sub> = +25°C

**Note 6:** 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 Electrical Characteristics

Symbol	Parameter	TA = -40 °C to +85 °C, CL = 50pF, RU = RD = 500Ω				Units	Conditions	Figure Number			
		VCC = 4.5 - 5.5V		VCC = 4.0V							
		Min	Max	Min	Max						
t <sub>PHL</sub> , t <sub>PLH</sub>	Propagation Delay Bus-to-Bus (Note 7)		1.25		1.25	ns	V <sub>I</sub> = OPEN	Figures 1, 2			
t <sub>PZH</sub> , t <sub>PZL</sub>	Output Enable Time	1.0	5.1		5.5	ns	V <sub>I</sub> = 7V for t <sub>PZL</sub> V <sub>I</sub> = OPEN for t <sub>PZH</sub>	Figures 1, 2			
t <sub>PHZ</sub> , t <sub>PLZ</sub>	Output Disable Time	1.0	5.4		5.2	ns	V <sub>I</sub> = 7V for t <sub>PLZ</sub> V <sub>I</sub> = OPEN for t <sub>PHZ</sub>	Figures 1, 2			

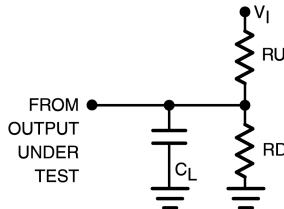
**Note 7:** This parameter is guaranteed by design but is not tested. The bus switch contributes no propagation delay other than the RC delay of the typical On Resistance of the switch and the 50pF load capacitance, when driven by an ideal voltage source (zero output impedance).

## Capacitance (Note 8)

Symbol	Parameter	Typ	Max	Units	Conditions
C <sub>IN</sub>	Control Pin Input Capacitance	3.0		pF	V <sub>CC</sub> = 5.0V, V <sub>IN</sub> = 0V
C <sub>I/O</sub>	Input/Output Capacitance "OFF State"	6		pF	V <sub>CC</sub> , $\overline{OE}$ = 5.0V, V <sub>IN</sub> = 0V

**Note 8:** TA = +25°C, f = 1 MHz, Capacitance is characterized but not tested.

## AC Loading and Waveforms



**Note:** Input driven by 50Ω source terminated in 50Ω

**Note:** CL includes load and stray capacitance

**Note:** Input PRR = 1.0 MHz, t<sub>W</sub> = 500 ns

FIGURE 1. AC Test Circuit

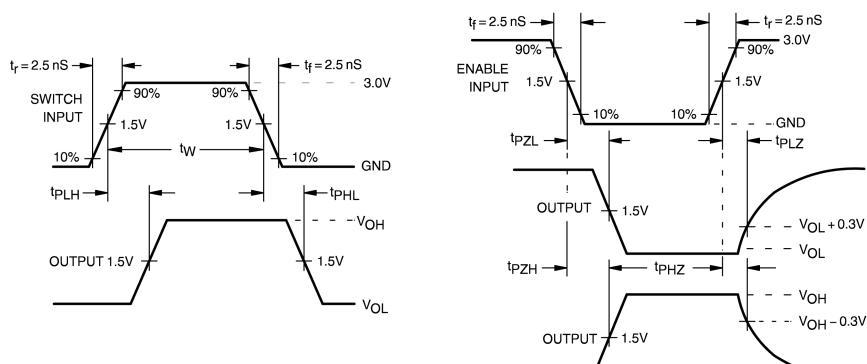
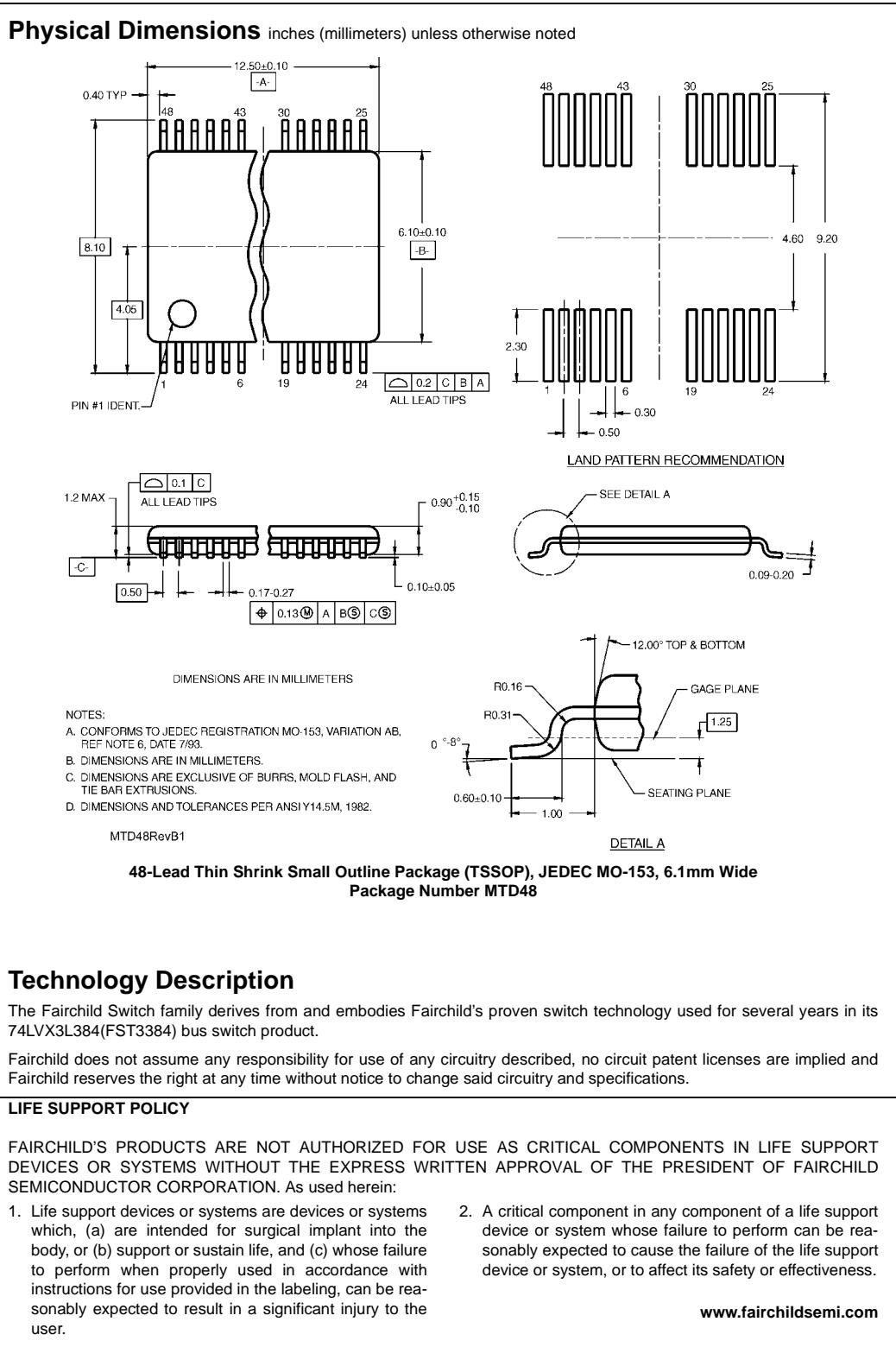


FIGURE 2. AC Waveforms

## Preliminary

### FST162244 16-Bit Bus Switch with $25\Omega$ Series Resistor in Outputs (Preliminary)



### Technology Description

The Fairchild Switch family derives from and embodies Fairchild's proven switch technology used for several years in its 74LVX3L384(FST3384) bus switch product.

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