

March 2008

# FST3245 — 8-Bit Bus Switch

#### Features

- 4Ω Switch Connection between Two Ports
- Minimal Propagation Delay through the Switch
- Low I<sub>CC</sub>
- Zero Bounce in Flow-through Mode
- Control Inputs Compatible with TTL Level

### Description

The FST3245 switch provides eight-bits of high-speed CMOS TTL-compatible bus switching in a standard '245 pin-out. The low on resistance allows inputs to be connected to outputs without adding propagation delay or generating additional ground bounce noise.

The device is organized as an eight-bit switch. When /OE is LOW, the switch is ON and port A is connected to port B. When /OE is HIGH, the switch is OPEN and a high-impedance state exists between the two ports.

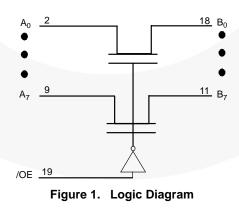
#### **Ordering Information**

Part Number	Operating Temperature Range	Package	Packing Method
FST3245WMX	-40 to +85°C	20-Lead, Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300-inch Wide	Tape and Reel
FST3245QSC	-40 to +85°C	20-Lead Quarter Size Outline Package (QSOP), JEDEC MO-137, 0.150-inch Wide	Tube
FST3245QSCX	-40 to +85°C	20-Lead Quarter Size Outline Package (QSOP), JEDEC MO-137, 0.150-inch Wide	Tape and Reel
FST3245MTC	-40 to +85°C	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide	Tube
FST3245MTCX	-40 to +85°C	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide	Tape and Reel

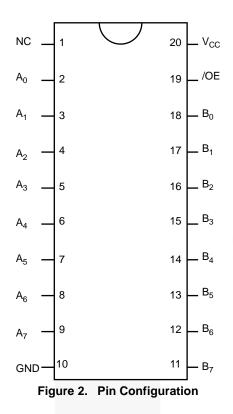
All packages are lead free per JEDEC: J-STD-020B standard.

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

# Logic Diagram



# **Pin Configuration**



# **Pin Descriptions**

Pin #	Pin Names	Description
1	NC	No Connnect
19	/OE	Bus Switch Enable
2,3,4,5,6,7,8,9	A <sub>0</sub> ,A <sub>1</sub> ,A <sub>2</sub> ,A <sub>3</sub> ,A <sub>4</sub> ,A <sub>5</sub> ,A <sub>6</sub> ,A <sub>7</sub>	Bus A
10	GND	Ground
11,12,13,14,15,16,17,18	B <sub>7</sub> ,B <sub>6</sub> ,B <sub>5</sub> ,B <sub>4</sub> ,B <sub>3</sub> ,B <sub>2</sub> ,B <sub>1</sub> ,B <sub>0</sub>	Bus B
20	V <sub>CC</sub>	Supply Voltage

# Truth Table

Input /OE	Function
LOW	Connect
HIGH	Disconnect

### **Absolute Maximum Ratings**

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Min.	Max.	Unit
V <sub>CC</sub>	Supply Voltage	-0.5	7.0	V
Vs	DC Switch Voltage	-0.5	7.0	V
V <sub>IN</sub>	DC Input Voltage <sup>(1)</sup>	-0.5	7.0	V
I <sub>IK</sub>	DC Input Diode Current, V <sub>IN</sub> < 0V		-50	mA
lout	DC Output Sink Current		128	mA
$I_{CC}$ / $I_{GND}$	DC V <sub>CC</sub> / GND Current		±100	mA
T <sub>STG</sub>	Storage Temperature Range	-65	+150	°C

Note:

1. The input and output negative voltage ratings may be exceeded if the input and output diode current ratings are observed.

### **Recommended Operating Conditions**

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to Absolute Maximum Ratings.

Symbol	Parameter		Min.	Max.	Unit
Vcc	Power Supply Operating		4.0	5.5	V
V <sub>IN</sub>	Input Voltage		0	5.5	V
Vout	Output Voltage		0	5.5	V
	t Input Disc and Fall Time	Switch Control Input <sup>(2)</sup>	0	5	ns/V
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time Switch I/O		0	DC	ns/ v
T <sub>A</sub>	Operating Temperature, Free Air		-40	+85	°C

Note:

2. Unused control inputs must be held HIGH or LOW. They may not float.

# **DC Electrical Characteristics**

Typical values are at  $V_{CC} = 5.0V$  and  $T_A = 25^{\circ}C$ .

Cumbal	Devementer	Conditions		T <sub>A</sub> =-40 to +85°C			Units
Symbol	Symbol Parameter Conditions		V <sub>cc</sub> (V)	Min.	Тур.	Max.	Units
VIK	Clamp Diode Voltage	I <sub>IN</sub> = -18mA	4.5			-1.2	V
V <sub>IH</sub>	High-Level Input Voltage		4.0 to 5.5	2.0			V
V <sub>IL</sub>	Low-Level Input Voltage		4.0 to 5.5			0.8	V
I <sub>IN</sub>	Input Leakage Current	$0 \le V_{IN} \le 5.5 V$	5.5			±1.0	μA
I <sub>OZ</sub>	Off-state Leakage Current	$0 \le A, B \le V_{CC}$	5.5			±1.0	μA
	Switch On Resistance <sup>(3)</sup>	$V_{IN} = 0V, I_{IN} = 64mA$	4.5		4	7	
Р		$V_{IN} = 0V, I_{IN} = 30mA$	4.5		4	7	0
R <sub>ON</sub>	Switch On Resistance	$V_{IN} = 2.4V, I_{IN} = 15mA$	4.5		8	15	<u> </u>
		$V_{IN} = 2.4V, I_{IN} = 15mA$	4.0		11	20	
Icc	Quiescent Supply Current	$V_{IN} = V_{CC} \text{ or } GND,$ $I_{OUT} = 0$	5.5			3	μA
$\Delta I_{CC}$	Increase in I <sub>CC</sub> per Input	One Input at 3.4V, Other Inputs at $V_{CC}$ or GND	5.5			2.5	mA

Note:

3. Measured by the voltage drop between the A and B pins at the indicated current through the switch. On resistance is determined by the lower of the voltages on the A or B pins.

# AC Electrical Characteristics

 $T_A = -40$  to +85°C,  $C_L = 50$ pF, and  $R_U = R_D = 500\Omega$ .

Symbol	Parameter	Conditions	$V_{\rm CC} = 4.5 - 5.5 V$ $V_{\rm CC} = 4.0 V$	= 4.0V	Unito	Figure		
Symbol	Falameter	Conditions	Min.	Max.	Min.	Max.	Units	Figure
t <sub>PHL</sub> , t <sub>PLH</sub>	Propagation Delay Bus-to-Bus <sup>(4)</sup>	V <sub>IN</sub> = Open		0.25		0.25	ns	Figure 3 Figure 4
t <sub>PZH</sub> ,t <sub>PZL</sub>	Output Enable Time	$V_{IN} = 7V$ for $t_{PZL}$ $V_{IN} = Open$ for $t_{PZH}$	1.5	5.9		6.4	ns	Figure 3 Figure 4
t <sub>PHZ</sub> , t <sub>PLZ</sub>	Output Disable Time		1.5	6.0		5.7	ns	Figure 3 Figure 4

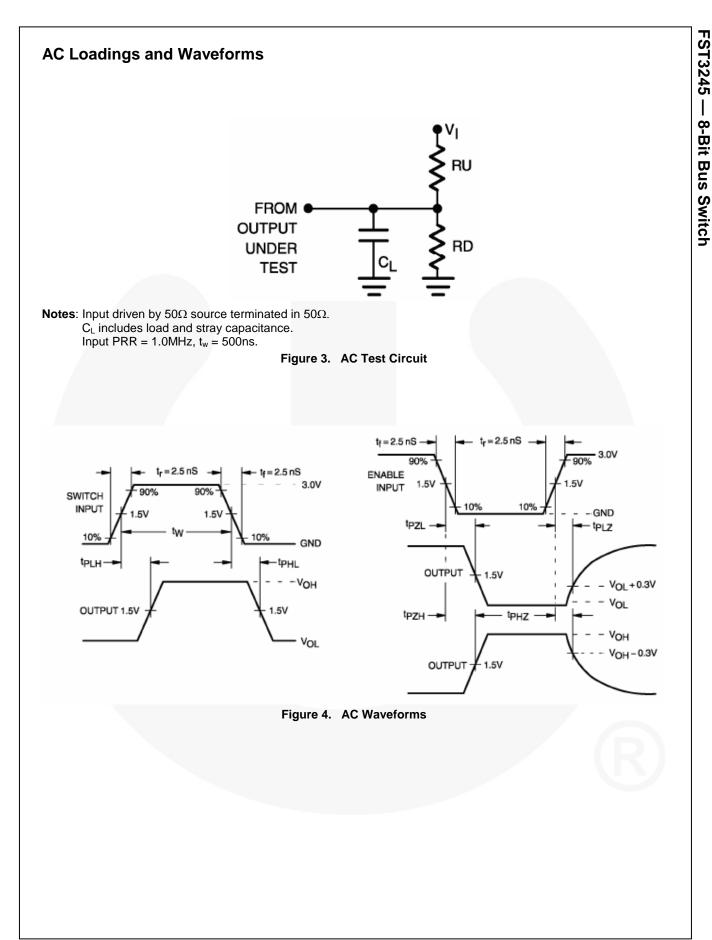
Note:

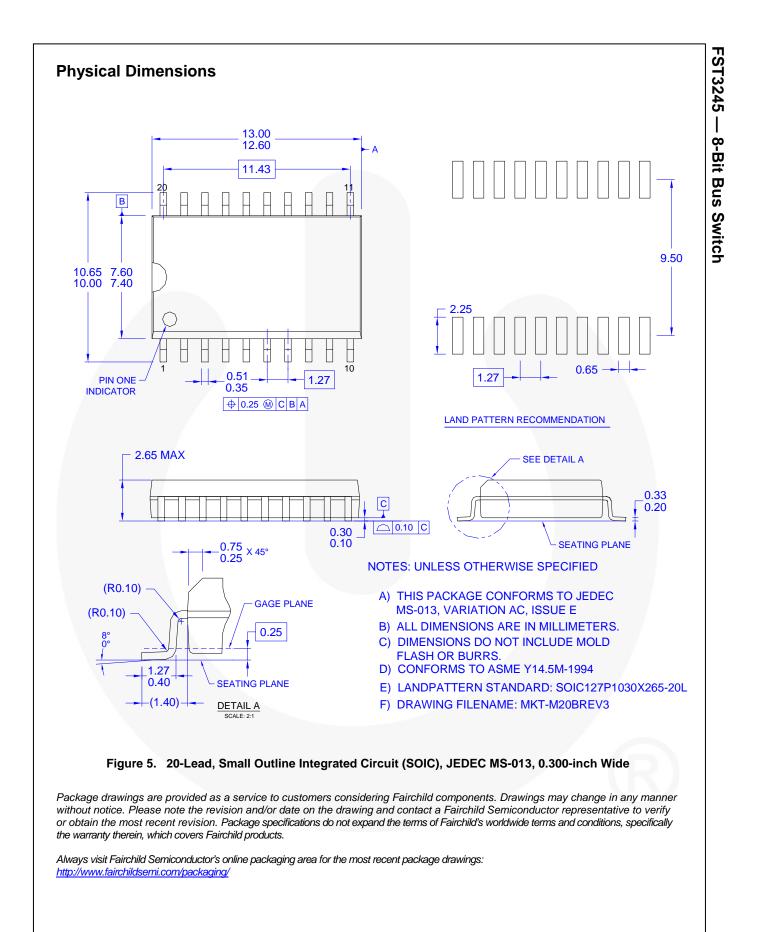
4. This parameter is guaranteed by design, but is not tested. The bus switch contributes no propagation delay other than the RC delay of the typical on resistance of the switch and the 50pF load capacitance when driven by an ideal voltage source (zero output impedance).

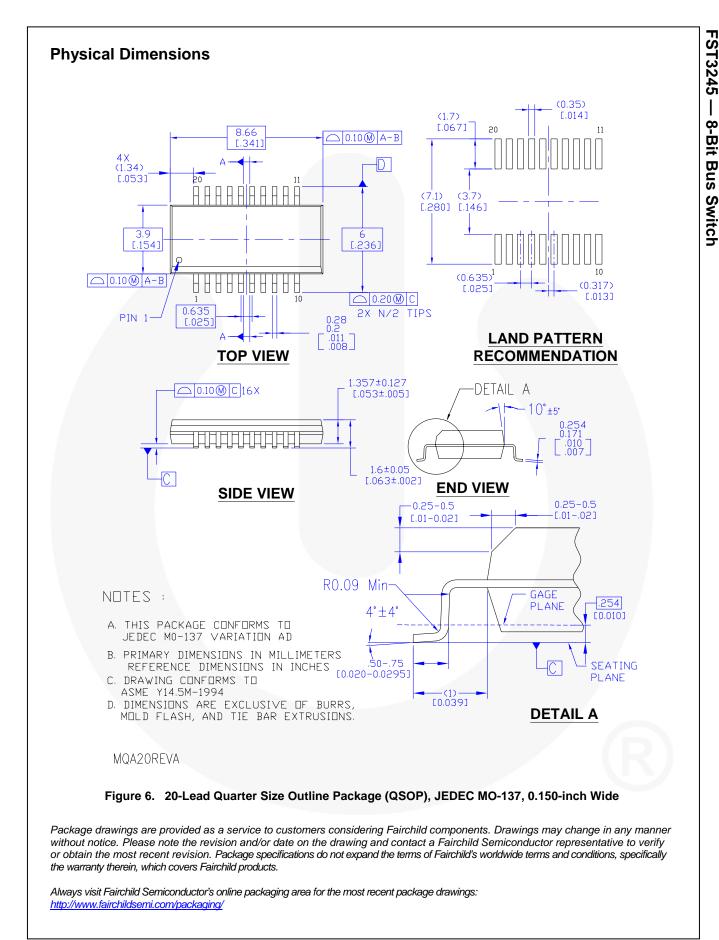
#### Capacitance

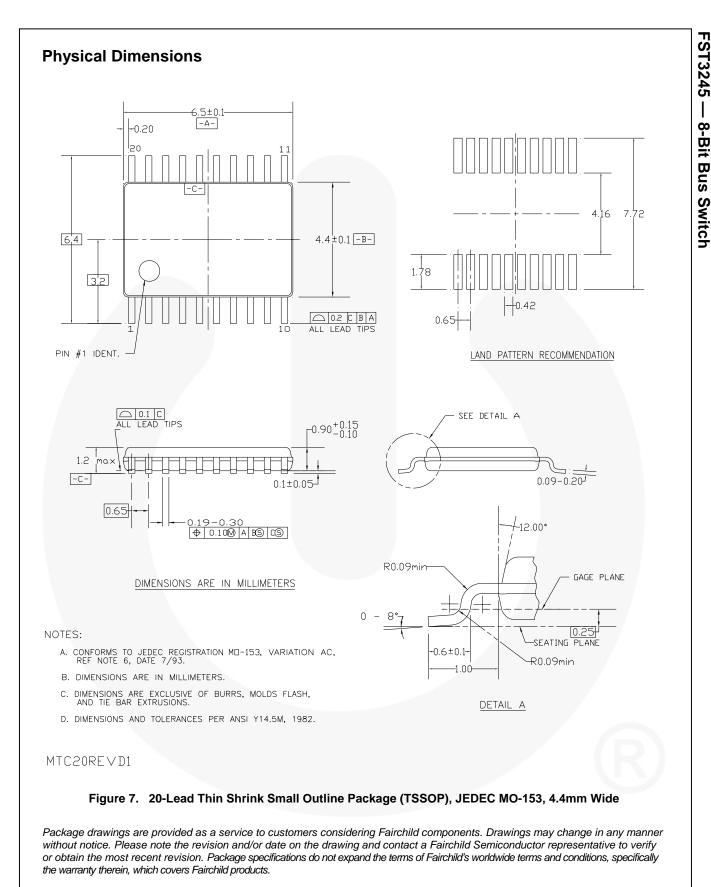
 $T_A = +25^{\circ}C$ , f = 1MHz. Capacitance is characterized, but not tested.

Symb	ool	Parameter	Conditions	Тур.	Units
CIN	l	Control Pin Input Capacitance	$V_{CC} = 5.0V$	3	pF
CI/C	)	Input/Output Capacitance	V <sub>CC</sub> , /OE = 5.0V	5	pF









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