

QUICKSWITCH[®] PRODUCTS 3.3V 8-BIT BUS SWITCH FOR HOT SWAP APPLICATIONS (HOTSWITCH[™])

FEATURES:

- N channel FET switches with no parasitic diode to Vcc
 - No DC path to Vcc or GND
 - 5V tolerant in OFF and ON state
- 5V tolerant I/Os
- Bidirectional dataflow with near-zero delay: no added ground bounce
- Low RON 4Ω typical
- Flat RON characteristics from 0 5V
- Rail-to-rail switching 0 5V
- Excellent RON matching between channels
- Vcc operation: 2.3V to 3.6V
- High bandwidth up to 500MHz
- LVTTL-compatible control Inputs
- Undershoot Clamp Diodes on all switch and control Inputs
- Low I/O capacitance, 4pF typical
- Available in QSOP, SOIC, and TSSOP packages

APPLICATIONS:

- PCI/Compact PCI hot-swapping
- 10/100 Base-T, Ethernet LAN switch
- Low distortion analog switch
- Replaces mechanical relay
- ATM 25/155 switching

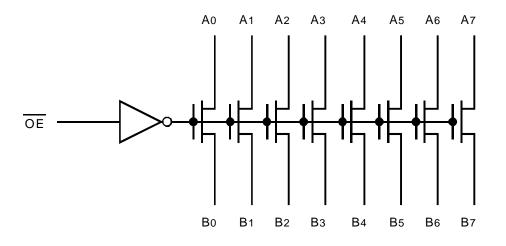
FUNCTIONAL BLOCK DIAGRAM

DESCRIPTION:

The QS3VH245 HotSwitch 8-bit bus switch is specially designed for a hot-swapping environment. The QS3VH245 has very low ON resistance, resulting in under 250ps propagation delay through the switch. The switches can be turned ON under the control of the LVTTL-compatible Output Enable signal for bidirectional data flow with no added delay or ground bounce. In the OFF and ON states, the switches are 5V-tolerant. In the OFF state, the switches offer very high impedence at the terminals.

The combination of near-zero propagation delay, high OFF impedance, and over-voltage tolerance makes the QS3VH245 ideal for hot-swapping applications. The low ON resistance of the QS3VH245 makes it ideal for PCI and Compact PCI hot-swapping environments.

The QS3VH245 is characterized for operation from -40°C to +85°C.

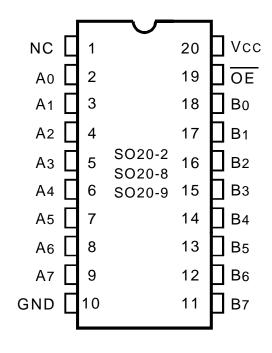


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PIN CONFIGURATION



QSOP, SOIC, TSSOP TOP VIEW

ABSOLUTE MAXIMUM RATINGS(1)

Symbol	Description	Max.	Unit
V _{TERM} (2)	Supply Voltage to Ground	– 0.5 to 4.6	V
VTERM ⁽³⁾	DC Switch Voltage Vs	– 0.5 to 5.5	V
VTERM(3)	DC Input Voltage VIN	– 0.5 to 5.5	V
VAC	AC Input Voltage (pulse width ≤20ns)	- 3	V
Vout	DC Output Current	120	mA
Рмах	Maximum Power Dissipation	0.5	W
Tstg	Storage Temperature	-65 to 150	°C

NOTES:

- Stresses greater than those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.
- 2. Vcc terminals.
- 3. All terminals except Vcc.

CAPACITANCE (TA = +25°C, f = 1MHz, VIN = 0V, VOUT = 0V)

Symbol	Parameter ⁽¹⁾	Тур.	Max.	Unit
CIN	Control Inputs	3	5	pF
Ci/o	Quickswitch Channels (Switch OFF)	4	6	pF

NOTE:

1. This parameter is guaranteed but not production tested.

PIN DESCRIPTION

Pin Names	Description
ŌĒ	Output Enable
An	Data I/Os
Bn	Data I/Os

FUNCTION TABLE (1)

OE	Outputs	
Н	Disconnected	
L	An = Bn	

NOTE:

1. H = HIGH Voltage Level

L = LOW Voltage Level

DC ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE

Following Conditions Apply Unless Otherwise Specified: Industrial: TA = -40°C to +85°C, Vcc = $3.3V \pm 0.3V$

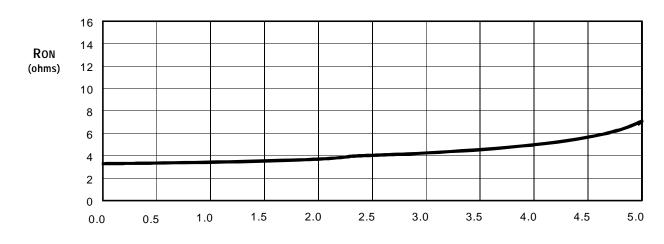
Symbol	Parameter	Test Conditions	Min.	Тур. ⁽¹⁾	Max.	Unit
Vih	Input HIGH Voltage	Guaranteed Logic HIGH for Control Inputs	2	—	_	V
VIL	Input LOW Voltage	Guaranteed Logic LOW for Control Inputs	_	_	0.8	V
lin	Input Leakage Current (Control Inputs)	$0V \le \overline{OE} \le Vcc$	_	—	±1	μA
loz	Off-State Current (Hi-Z)	$0V \le A, B \le Vcc, Switches OFF$	_	_	±1	μA
Ron	Switch ON Resistance ⁽²⁾	Vcc = Min., VIN = 0V, ION = 30mA	_	4	6	Ω
		Vcc = Min., VIN = 2.4V, ION = 15mA	_	5	8	

NOTES:

1. Typical values are at Vcc = 3.3V and TA = 25°C.

2. Ron guaranteed but not production tested.

TYPICAL ON RESISTANCE vs Vin AT Vcc = 3.3V



VIN (Volts)

POWER SUPPLY CHARACTERISTICS

Symbol	Parameter	Test Conditions ⁽¹⁾	Max.	Unit
Icco	Quiescent Power Supply Current	Vcc = Max., VIN = GND or Vcc, f = 0	3	mA
ΔΙCC	Power Supply Current ^(2, 3) per Input HIGH	Vcc = 3.6V., VIN = 3V, f = 0 per Control Input	30	μA
ICCD	Dynamic Power Supply Current per MHz (4)	Vcc = 3.6V., A and B Pins Open, per Control Input Toggling @ 50% Duty	0.25	mA/MHz
		Cycle		

NOTES:

1. For conditions shown as Min. or Max., use the appropriate values specified under DC Electrical Characteristics.

2. Per input driven at the specified level. A and B pins do not contribute to $\Delta Icc.$

3. This parameter is guaranteed but not tested.

4. This parameter represents the current required to switch internal capacitance at the specified frequency. The A and B inputs do not contribute to the Dynamic Power Supply Current. This parameter is guaranteed but not production tested.

SWITCHING CHARACTERISTICS OVER OPERATING RANGE

 $T_A = -40^{\circ}C \text{ to } +85^{\circ}C$

Symbol	Parameter	Min. ⁽³⁾	Тур.	Max.	Unit
tplh tphl	Data Propagation Delay ^(1,2) An to/from Bn			0.25	ns
tpzl tpzн	Switch Turn-On Delay OE to An/Bn	1.5	_	9	ns
tplz tphz	Switch Turn-Off Delay ⁽¹⁾ OE to An/Bn	1.5	_	8	ns
f CONTROL	Operating Frequency - Enable ^(1,4)		—	1	MHz

NOTES:

3. Minimums are guaranteed but not production tested.

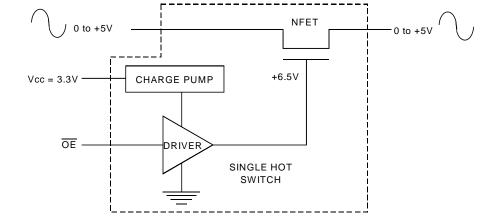
4. Maximum toggle frequency for \overline{OE} control input.

^{1.} This parameter is guaranteed but not production tested.

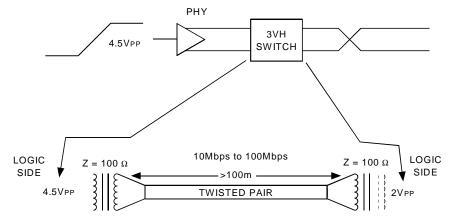
^{2.} The bus switch contributes no propagation delay other than the RC delay of the ON resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.25ns at CL = 50pF. Since this time constant is much smaller than the rise and fall times of typical driving signals, it adds very little propagation delay to the system. Propagation delay of the bus switch, when used in a system, is determined by the driving circuit on the driving side of the switch and its interaction with the load on the driven side.

SOME APPLICATIONS FOR HOTSWITCH PRODUCTS

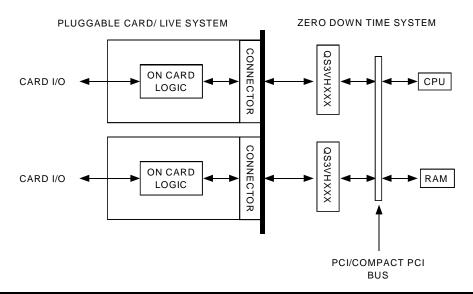
RAIL-TO-RAIL SWITCHING



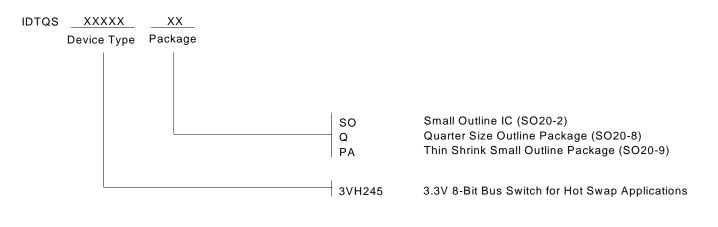
FAST ETHERNET DATA SWITCHING (LAN SWITCH)



HOT SWAPPING: PCI/COMPACT PCI



ORDERING INFORMATION





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