

QUICKSWITCH® PRODUCTS 3.3V QUAD ACTIVE HIGH SWITCH FOR HOT SWAP APPLICATIONS (HOTSWITCH™)

IDTQS3VH126

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
- Low Ron 4Ω typical
- Flat Ron characteristics from 0 5V
- Rail-to-rail switching 0 5V
- Bidirectional dataflow with near-zero delay: no added ground bounce
- · 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 and SOIC 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

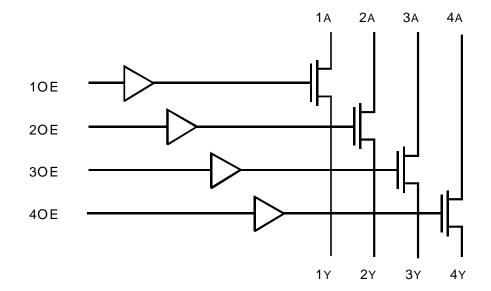
DESCRIPTION:

The QS3VH126 bus switch is specially designed for a hot-swapping environment. The QS3VH126 has very low ON resistance, resulting in under 250ps propagation delay through the switch. The switches can be turned ON under the control of individual LVTTL-compatible active high Output Enable signals for bidirectional data flow with no added delay or ground bounce. In the ON state, the switches can pass signals up to 5V. 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 QS3VH126 ideal for hot-swapping applications.

The QS3VH126 is characterized for operation from -40°C to +85°C.

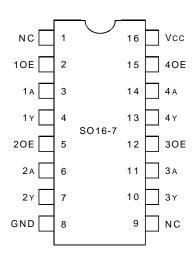
FUNCTIONAL BLOCK DIAGRAM



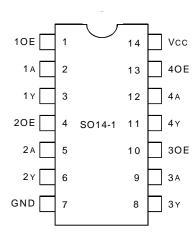
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PIN CONFIGURATION



QSOP TOP VIEW



SOIC 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
V out	DC Output Current	120	mA
Рмах	Maximum Power Dissipation	0.5	W
Tstg	Storage Temperature	-65 to +150	°C

NOTES:

- 1. 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
Cı/o	Quickswitch Channels (Switch OFF)	4	6	pF

NOTE:

1. This parameter is guaranteed but not production tested.

PIN DESCRIPTION

Pin Names	I/O	Description	
1a - 4a	I/O	Bus A	
1y - 4y	I/O	Bus Y	
10E - 40E		Output Enable	

FUNCTION TABLE(1)

0E	Α	Υ	Function	
Н	Н	Н	Connect	
Н	Ш	L	Connect	
L	Х	Χ	Disconnect	

NOTE:

- 1. H = HIGH Voltage Level
 - L = LOW Voltage Level
 - X = Don't Care

DC ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE

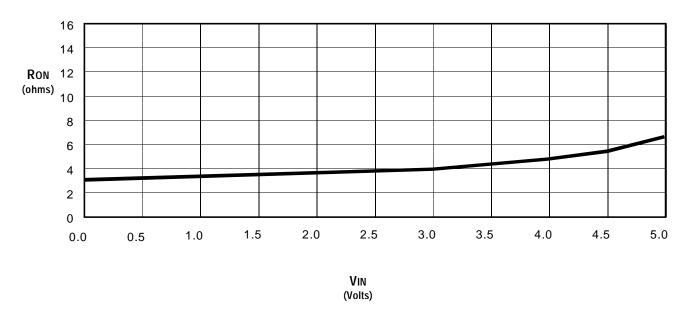
Following Conditions Apply Unless Otherwise Specified:

Industrial: TA = -40°C to +85°C, VCC = $3.3V \pm 0.3V$

Symbol	Parameter	Test Conditions	Min.	Typ. ⁽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	_	_	8.0	V
lin	Input Leakage Current (Control Inputs)	0V ≤ VIN ≤ VCC	_	_	±1	μA
loz	Off-State Current (Hi-Z)	0V ≤ Vouт ≤ Vcc, Switches OFF	_	_	±1	μA
Ron	Switch ON Resistance	Vcc = Min, Vin = 0V, Ion = 30mA		4	6	Ω
		VCC = Min, VIN = 2.4V, ION = 15mA	_	5	8	

NOTE:

TYPICAL ON RESISTANCE vs Vin AT Vcc = 3.3V



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

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
Δlcc	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 Y Pins Open, per Control Input Toggling @ 50% Duty Cycle	0.25	mA/MHz

NOTES:

- 1. For conditions shown as Min. or Max., use the appropriate values specified under DC Electrical Characteristics.
- 2. Per LVTTL-driven-control-input. A and Y pins do not contribute to Δlcc.
- 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 Y inputs do not contribute to the Dynamic Power Supply Current. This parameter is guaranteed but not production tested.

SWITCHING CHARACTERISTICS OVER OPERATING RANGE

 $T_A = -40^{\circ}C \text{ to } +85^{\circ}C, V_{CC} = 3.3V \pm 0.3V$

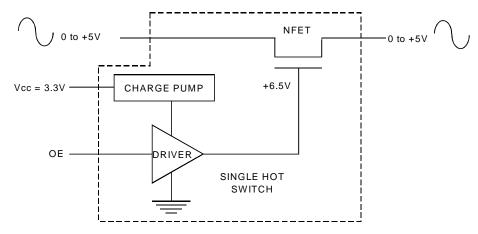
CLOAD = 50pF, RLOAD = 500Ω , unless otherwise noted

Symbol	Parameter	Min. ⁽³⁾	Тур.	Max.	Unit
tplh	Data Propagation Delay ^(1,2)	_	_	0.2	ns
t PHL	A to Y				
tpzL	Switch Turn-On Delay	1.5	_	9	ns
tpzh	OE to xA/xY				
tplz	Switch Turn-Off Delay ⁽¹⁾	1.5	_	8	ns
t PHZ	OE to xA/xY				
foe	Operating Frequency - Enable ^(1,4)	_	_	1	MHz

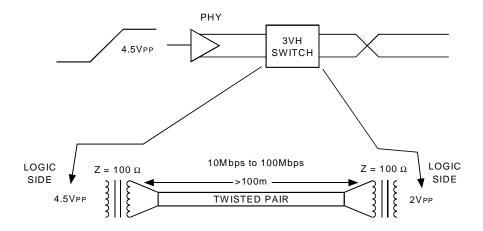
NOTES:

- 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 0.2ns at C_L = 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.
- $3. \ \ \mbox{Minimums are guaranteed but not production tested}.$
- 4. Maximum toggle frequency for OE control input.

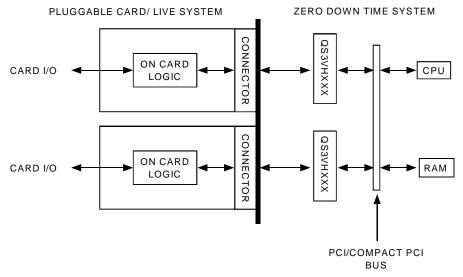
SOME APPLICATIONS FOR HOTSWITCH PRODUCTS



Rail-to-Rail Switching

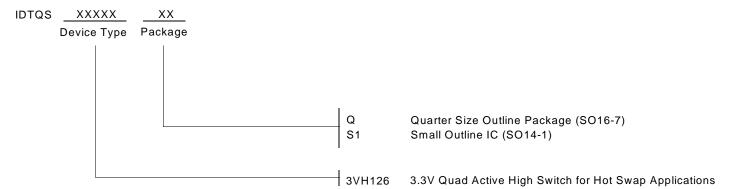


Fast Ethernet Data Switching (LAN Switch)



Hot-Swapping: PCI / Compact PCI

ORDERING INFORMATION





CORPORATE HEADQUARTERS
2975 Stender Way

2975 Stender Way Santa Clara, CA 95054 for SALES: 800-345-7015 or 408-727-6116 fax: 408-492-8674 www.idt.com for Tech Support: logichelp@idt.com (408) 654-6459