() IDT.

QUICKSWITCH[®] PRODUCTS HIGH-SPEED CMOS QUICKSWITCH 8-BIT BUS SWITCH

FEATURES:

- Enhanced N channel FET with no inherent diode to Vcc
- 5 Ω bidirectional switches connect inputs to outputs
- Pin compatible with 74F244, 74FCT244, and 74FCT244T
- · Zero propagation delay, zero ground bounce
- · Undershoot clamp diodes on all switch and control inputs
- Available in QSOP, SOIC, and TSSOP packages

APPLICATIONS:

- · Hot-swapping, hot-docking
- Voltage translation (5V to 3.3V)
- · Power conservation
- Capacitance reduction and isolation
- Logic replacement (data processing)
- Clock gating
- · Bus switching and isolation

FUNCTIONAL BLOCK DIAGRAM

DESCRIPTION:

The QS3244 provides a set of eight high-speed CMOS TTL-compatible bus switches in a pinout compatible with 74FCT244, 74F244, 74ALS/AS/ LS244 8-bit drivers. The low ON resistance (5 Ω) of the 3244 allows inputs to be connected to outputs without adding propagation delay and without generating additional ground bounce noise. The two enable (\overline{xG}) signals turn the switches on similar to the \overline{xG} signals of the 74'244.

QuickSwitch devices provide an order of magnitude faster speed than conventional logic devices.

The QS3244 is characterized for operation at -40°C to +85°C.





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INDUSTRIAL TEMPERATURE RANGE

FEBRUARY 2011

INDUSTRIAL TEMPERATURE RANGE

PIN CONFIGURATION



QSOP/ SOIC/ TSSOP TOP VIEW

ABSOLUTE MAXIMUM RATINGS(1)

Symbol	Description	Max	Unit
VTERM ⁽²⁾	Supply Voltage to Ground	–0.5 to +7	V
VTERM ⁽³⁾	DC Switch Voltage Vs	–0.5 to +7	V
VTERM ⁽³⁾	DC Input Voltage VIN	–0.5 to +7	V
VAC	AC Input Voltage (pulse width ≤20ns)	-3	V
Ιουτ	DC Output Current	120	mA
Рмах	Maximum Power Dissipation (T _A = 85°C)	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.

Vcc terminals.
All terminals except Vcc .

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

Pins	Тур.	Max. ⁽¹⁾	Unit
Control Inputs	3	5	рF
Quickswitch Channels (Switch OFF)	5	7	pF

NOTE:

1. This parameter is guaranteed but not production tested.

PIN DESCRIPTION

Pin Names	Description
1G, 2G	Output Enable
Ax, Yx	Data I/Os

FUNCTION TABLE(1)

1G	2G	1A, 1Y I/Os	2A, 2Y I/Os
Н	Н	Disconnected	Disconnected
L	Н	1Ax = 1Yx	Disconnected
Н	L	Disconnected	2Ax = 2Yx
L	L	1Ax = 1Yx	2Ax = 2Yx

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 $+85^{\circ}$ C, Vcc = 5V ± 5%

Symbol	Parameter	Test Conditions	Min.	Typ. ⁽¹⁾	Max.	Unit
Vih	Input HIGH Voltage	Guaranteed Logic HIGH for Control Inputs	2	—	—	V
VIL	InputLOWVoltage	Guaranteed Logic LOW for Control Inputs	—	-	0.8	V
lin	InputLeakageCurrent(Control Inputs)	$0V \le VIN \le VCC$	—	—	±1	μA
loz	Off-State Current (Hi-Z)	$0V \le VOUT \le VCC$, Switches OFF	—	—	±1	μA
Ron	Switch ON Resistance	Vcc = Min., VIN = 0V, ION = 30mA	—	5	7	Ω
		Vcc = Min., VIN = 2.4V, ION = 15mA	—	10	12	
Vp	Pass Voltage ⁽²⁾	VIN = Vcc = 5V, IOUT = -5µA	3.7	4	4.2	V

NOTES:

1. Typical values are at Vcc = 5V and TA = 25° C.

2. Pass voltage is guaranteed but not production tested.

TYPICAL ON RESISTANCE vs VIN AT Vcc = 5V



VIN (Volts)

POWER SUPPLY CHARACTERISTICS

Symbol	Parameter	Test Conditions ⁽¹⁾	Max.	Unit
ICCQ	Quiescent Power Supply Current	Vcc = Max., VIN = GND or Vcc, f = 0	3	μA
Δ lcc	Power Supply Current per Control Input HIGH ⁽²⁾	Vcc = Max., VIN = 3.4V, f = 0	2.5	mA
ICCD	Dynamic Power Supply Current per MHz ⁽³⁾	Vcc = Max., A and Y Pins Open, Control Inputs 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 TTL-driven input (VIN = 3.4V, control inputs only). A and Y pins do not contribute to Δ Icc.

3. This current applies to the control inputs only and represents the current required to switch internal capacitance at the specified frequency. The A and Y inputs generate no significant AC or DC currents as they transition. This parameter is guaranteed but not production tested.

SWITCHING CHARACTERISTICS OVER OPERATING RANGE

 $T_A = -40^{\circ}C \text{ to } +85^{\circ}C, V_{CC} = 5V \pm 5\%$

 $C_{LOAD} = 50 pF$, $R_{LOAD} = 500 \Omega$ unless otherwise noted.

Symbol	Parameter	Min. ⁽¹⁾	Тур.	Max.	Unit
tPLH tPHL	Data Propagation Delay ⁽²⁾ Ax to Yx	_	—	0.25 ⁽³⁾	ns
tPZL tPZH	Switch Turn-On Delay TG, ZG to Yx	0.5		5.6	ns
tPLZ tPHZ	Switch Turn-OffDelay ⁽²⁾ TG, ZG to Yx	0.5		5.2	ns

NOTES:

1. Minimums are guaranteed but not production tested.

2. This parameter is guaranteed but not production tested.

3. 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.

ORDERING INFORMATION



Datasheet Document History

Pg. 5

02/14/2011

Updated the ordering information by removing the "IDT" notation, non RoHS part and by adding Tape and Reel information.



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