

QUICKSWITCH[®] PRODUCTS HIGH-SPEED CMOS QUICKSWITCH 32-BIT MULTIWIDTH™ BUS SWITCHES

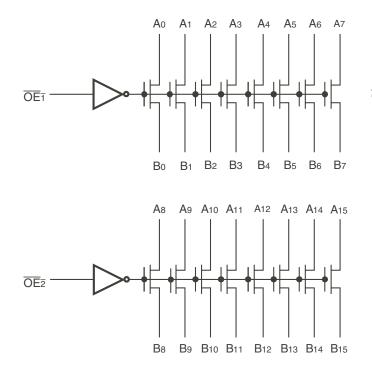
FEATURES:

- · Enhanced N channel FET with no inherent diode to Vcc
- · Bidirectional switches connect inputs to outputs
- · Zero propagation delay, zero ground bounce
- Internal 25Ω resistors for low noise
- Flow-through pinout for easy layout
- · Undershoot clamp diodes on all switch and control inputs
- TTL-compatible control inputs
- Available in 80-pin MilliPaQ[™] package

APPLICATIONS:

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

FUNCTIONAL BLOCK DIAGRAM



The QS34X2245 is a member of the MultiWidth[™] family of QuickSwitch devices and provides a set of 32 high-speed CMOS compatible bus switches

DESCRIPTION:

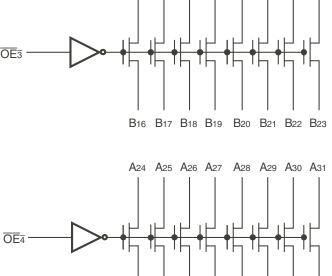
in a flow-through pinout. This device is available in the MillipaQ package, the worlds first small outline 32-bit solution. The low ON-resistance of the QS34X2245 allows inputs to be connected to outputs without adding propagation delay and without generating additional ground bounce noise. Internal 25Ω resistors reduce reflection noise in high-speed applications. When Output Enable (OEn) is low, the switches are turned on, connecting bus A to bus B. When OEn is high, the switches are turned off. This device is ideally suited for 32/64 bit applications where board space is at a premium.

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

The QS34X2245 is characterized for operation at -40°C to +85°C.

A16 A17 A18 A19 A20 A21 A22 A23

B24 B25 B26 B27 B28 B29 B30 B31



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INDUSTRIAL TEMPERATURE RANGE

AUGUST 2012

PIN CONFIGURATION

	I			1
NC		1	80	Vcc
A0		2	79	OE1
A1		3	78	B 0
A2		4	77	B1
Аз		5	76	B2
A4		6	75	B 3
A5		7	74	B4
A6		8	73	B5
A7		9	72	B 6
GND		10	71	B 7
NC		11	70	Vcc
A8		12	69	
A9		13	68	B8
A10		14	67	B 9
A11		15	66	B10
A12		16	65	B11
A13		17	64	B12
A14		18	63	B13
A15		19	62	B14
GND		20	61	B15
NC		21	60	
A16		22	59	
A17		23	58	Б В16
A18		24	57	B17
A19		25	56	Б В18
A20		26	55	В19
A21		27	54	B20
A22		28	53	B21
A23		29	52	B22
GND		30	51	В23
NC		31	50	
A24		32	49	
A25		33	48	Б В24
A26		34	47	B25
A27		35	46	Б В26
A28		36	45	B27
A29		37	44	B28
A30		38	43	B29
A31		39	42	B30
GND		40	41	B31
			-	Γ

MILLIPAQ 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 \leq 20ns)	-3	V
Ιουτ	DC Output Current	120	mA
Рмах	X Maximum Power Dissipation (TA =70°C)		W
Tstg	Storage Temperature	–65 to +150	°C

NOTE:

 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 = 1.0MHz, VIN = 0V, VOUT = 0V)

Pins	Тур.	Max. ⁽¹⁾	Unit
Control Pins	3	4	рF
Quickswitch Channels (Switch OFF)	7	8	pF

NOTE:

1. This parameter is measured at characterization but not tested.

PIN DESCRIPTION

Pin Names	Description
OEn	OutputEnable
An	Data I/Os
Bn	Data I/Os

FUNCTION TABLE(1)

ŌĒn	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 = $5.0V \pm 5\%$

Symbol	Parameter	Test Conditions	Min.	Typ. ⁽¹⁾	Max.	Unit
Vih	Input HIGH Level	Guaranteed Logic HIGH for Control Pins	2	_	_	V
VIL	Input LOW Level	Guaranteed Logic LOW for Control Pins	_	—	0.8	V
lin	Input LeakageCurrent (Control Inputs) ⁽²⁾	$0V \le VIN \le VCC$	_	_	±1	μA
loz	Off-State Output Current (Hi-Z)	$0V \le VOUT \le VCC$, Switches OFF	_	_	±1	μA
Ron ⁽³⁾	Switch ON Resistance	Vcc = Min., VIN = 0V, ION = 30mA	18	23	35	Ω
		Vcc = Min., VIN = 2.4V, ION =15mA	18	25	40	
VP	Pass Voltage ⁽²⁾	$V_{IN} = V_{CC} = 5V$, Iout = -5 μ A	3.7	4	4.2	V

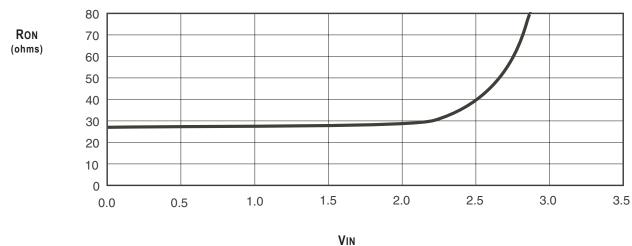
NOTES:

1. Typical values are at Vcc = 5.0V, TA = 25°C.

2. Pass Voltage is guaranteed but not production tested.

3. Rout changed on March 8, 2002. See rear page for more information.

TYPICAL ON RESISTANCE vs Vin AT Vcc = 5V



VIN (Volts)

POWER SUPPLY CHARACTERISTICS

Symbol	Parameter	Test Conditions ⁽¹⁾	Max.	Unit
lccq	Quiescent Power Supply Current	Vcc = Max., VIN = GND or Vcc, f = 0	12	μA
Δlcc	Power Supply Current per Control Input HIGH (2)	Vcc = Max., VIN = 3.4V, f = 0	1.5	mA
ICCD	Dynamic Power Supply Current per MHz ⁽³⁾	Vcc = Max., A and B pins open	0.25	mA/MHz
		Control Inputs Toggling at 50% Duty Cycle		

NOTES:

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

2. Per TLL driven input (VIN = 3.4V, control inputs only). A and B pins do not contribute to △lcc.

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 B inputs generate no significant AC or DC currents as they transition. This parameter is guaranteed but not production tested.

SWITCHING CHARACTERISTICS OVER OPERATING RANGE

 $T_A = -40^{\circ}C$ to +85°C, Vcc = 5.0V ± 5%;

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

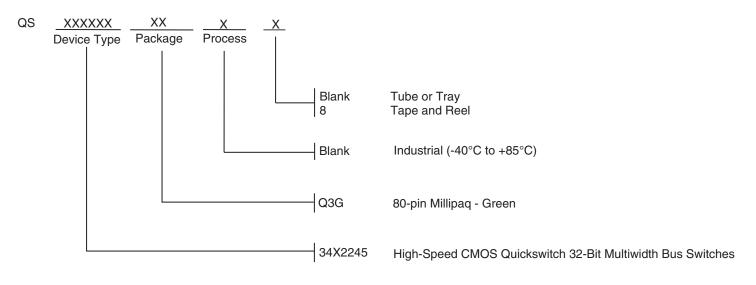
Symbol	Parameter	Min. ⁽¹⁾	Тур.	Max.	Unit
tPLH	Data Propagation Delay ^(1,2)	—	—	1.25	ns
tPHL	An to/from Bn				
tPZL	Switch Turn-on Delay	0.5	—	6.6	ns
tРZH	OE to An/Bn				
tPLZ	Switch Turn-off Delay ⁽¹⁾	0.5	_	5.2	ns
tPHZ	OE to An/Bn				

NOTES:

1. Minimums are 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 1.25ns for 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.

ORDERING INFORMATION



As per PCN L0201-02, the Output Resistance (Ron) specifications have changed as of March 8, 2002. The original specifications were:

Parameter	Description	Min.	Тур.	Max.	Unit
Ron	Vcc = Min, VIN = 0V, ION = 30mA	20	28	40	Ω
	Vcc = Min, VIN = 2.4V, ION = 15mA	20	35	48	

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TOYOSU FORESIA, 3-2-24 Toyosu, Koto-ku, Tokyo 135-0061, Japan www.renesas.com

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