



UHP112

Two-Port PCI-to-USB OpenHCI Host Controller - Product Brief

Features

- 32-bit, 33 MHz PCI interface compliant with *PCI Local Bus Specification Revision 2.1s*
- Two downstream USB ports
- Full compliance with *Universal Serial Bus Specification Revision 1.1*
- *OpenHCI Open Host Controller Interface Specification for USB Release 1.0a* compatible
- Provides advanced power management capabilities compliant with *PCI Bus Power Management Interface Specification Revision 1.1*
- Fully compatible with *Microsoft Windows** Standard OpenHCD Drivers
- Supports legacy keyboard and mouse devices
- Integrated dual-speed USB transceivers
- 3 V or 5 V switchable PCI signaling
- 100-pin TQFP
- Evaluation kit available

Applications

- Seamless integration with 3 V or 5 V PCI-based computer products
- Supports all USB compliant devices and hubs

Description

The Transdimension's UHP112 provides a single-chip PCI-to-Universal Serial Bus (USB) solution. The UHP112 interfaces directly to any 32-bit 33 MHz PCI bus and is ideal for either onboard applications or add-in card applications. It can easily be configured to communicate in either a 3 V PCI environment or 5 V PCI environment simply by selecting the appropriate communications voltage level on the VIO input pin.

* *Microsoft* and *Windows* are registered trademarks of Microsoft Corporation.

The UHP112 is a 3.3 V device fabricated in 0.35 μm technology. Integrated dual-speed USB transceivers enable a single-chip PCI-to-USB solution.

The UHP112 supports the legacy peripherals feature, as defined in the *OpenHCI Specification Release 1.0a*.

An advanced power management capabilities interface compliant with *PCI Bus Power Management Interface Specification Revision 1.1* is present to offer a variety of power-savings modes to the host system.

The UHP112 provides two downstream USB ports for connectivity with any USB compliant device or hub. Full-speed or low-speed peripherals are supported along with all of the USB transfer types: control, interrupt, bulk, or isochronous. The UHP112's OpenHCI compliance offers significant USB performance benefits and reduced CPU overhead compared to other host controllers.

The UHP112 is fully compatible with the *Microsoft Windows* Standard OpenHCD Drivers.

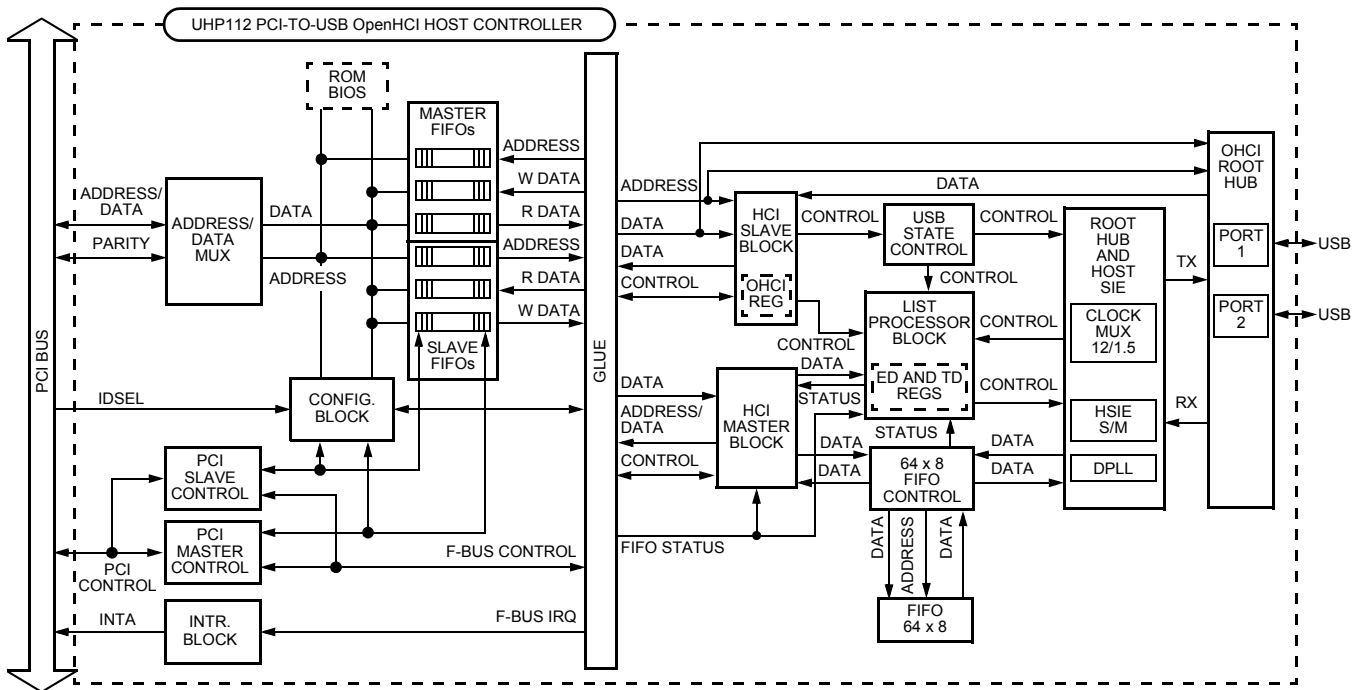
The UHP112 is supported natively as an OHCI compliant host controller under Windows 98, ME, XP and CE, as well as under MacOS and Linux. For customers using other operating systems, SoftConnex Technologies' USBLink Host solution supports a wide range of products, such as AMX, ITRON, Linux, LynxOS, MS-DOS, Nucleus, OS-40, PowerTV, QNX, ThreadX, VRTX and VxWorks.

USBLink Host is also distinguished by the variety of USB devices that it can support, including: printers; audio, communication, human interface and mass storage devices; digital still and video cameras; Hubs; MP3 players; Host to Host cables and Bluetooth connectivity products. In addition, USBLink Host runs on both little endian (x86, ARM, SA, SH, ST) and big endian (PPC, MIPS) processors. For more information, please visit www.softconnex.com.

*SoftConnex Technologies is a wholly owned subsidiary of Transdimension Inc.

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Description (continued)



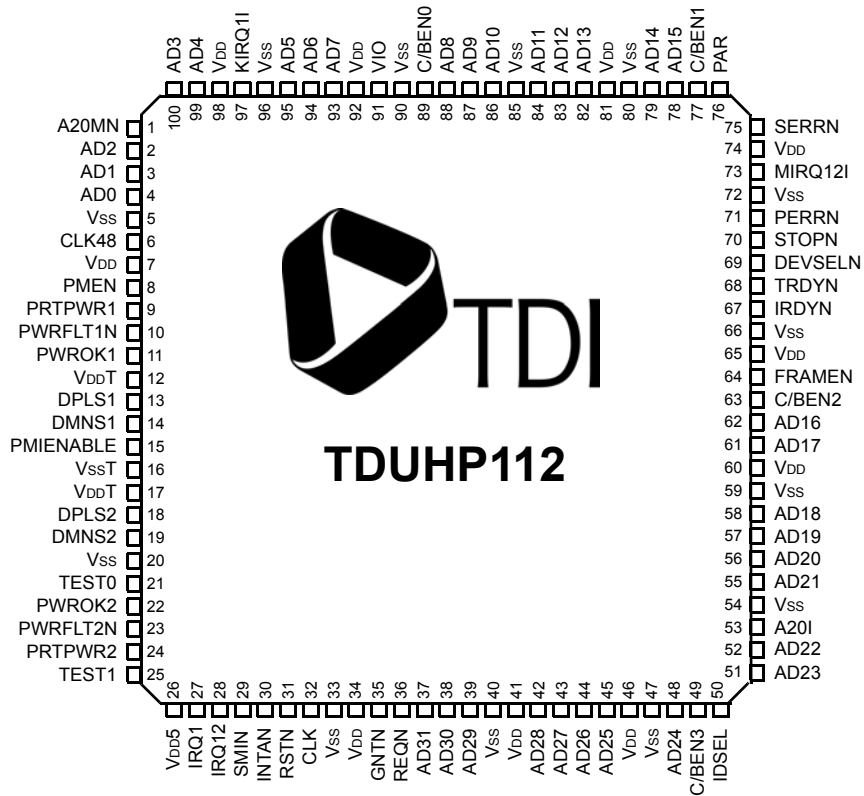
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Figure 1. UHP112 Interconnection Diagram

Applicable Documents and Specifications

- *PCI Local Bus Specification Revision 2.1s.*, June 1, 1995. PCI Special Interest Group.
- *Universal Serial Bus Specification Revision 1.1.*, September 23, 1998. Compaq/Digital Equipment Corporation/IBM PC Company/Intel/Microsoft/NEC/Northern Telecom.
- *OpenHCI Open Host Controller Interface Specification for USB Release 1.0a.*, July 31, 1997. Compaq/Microsoft/National Semiconductor.
- *PCI Bus Power Management Interface Specification Revision 1.1.*, December 18, 1998. PCI Special Interest Group.

Pin Information (continued)



5-7220a

Figure 2. Pin Diagram (100-Pin TQFP)

Pin Information (continued)

Table 1. Numeric Pin Cross Reference

Pin	Symbol*	Pin	Symbol*	Pin	Symbol*	Pin	Symbol*
1	A20MN	26	VDD5	51	AD23	76	PAR
2	AD2	27	IRQ1	52	AD22	77	C/BEN1
3	AD1	28	IRQ12	53	A20I	78	AD15
4	AD0	29	SMIN	54	Vss	79	AD14
5	Vss	30	INTAN	55	AD21	80	Vss
6	CLK48	31	RSTN	56	AD20	81	VDD
7	VDD	32	CLK	57	AD19	82	AD13
8	PMEN	33	Vss	58	AD18	83	AD12
9	P RTPWR1	34	VDD	59	Vss	84	AD11
10	PWRFLT1N	35	GNTN	60	VDD	85	Vss
11	PWROK1	36	REQN	61	AD17	86	AD10
12	VDDT	37	AD31	62	AD16	87	AD9
13	DPLS1	38	AD30	63	C/BEN2	88	AD8
14	DMNS1	39	AD29	64	FRAMEN	89	C/BEN0
15	PMIENABLE	40	Vss	65	VDD	90	Vss
16	VssT	41	VDD	66	Vss	91	VIO
17	VDDT	42	AD28	67	IRDYN	92	VDD
18	DPLS2	43	AD27	68	TRDYN	93	AD7
19	DMNS2	44	AD26	69	DEVSELN	94	AD6
20	Vss	45	AD25	70	STOPN	95	AD5
21	TEST0	46	VDD	71	PERRN	96	Vss
22	PWROK2	47	Vss	72	Vss	97	KIRQ1I
23	PWRFLT2N	48	AD24	73	MIRQ12I	98	VDD
24	P RTPWR2	49	C/BEN3	74	VDD	99	AD4
25	TEST1	50	IDSEL	75	SERRN	100	AD3

* Active-low signals within this document are indicated by an N following the symbol names.

Pin Information (continued)

Table 2. Pin Descriptions

Pin	Symbol*	Type	Description
1	A20MN	Output/Open Drain	Legacy Gate A20 Output (Active-Low).
2	AD2	Bidir	PCI Address/Data Bit.
3	AD1	Bidir	PCI Address/Data Bit.
4	AD0	Bidir	PCI Address/Data Bit.
5	Vss	Power	Device Ground.
6	CLK48	Input	USB Clock (48 MHz).
7	VDD	Power	Device Power (3.3 V).
8	PMEN	Output/Open Drain	Power Management Event (Active-Low).
9	PRTPWR1	Bidir	Port 1 Power. Logic output expected to turn on port 1 power. Bootstrap low for high active. Bootstrap high for low active.
10	PWRFLT1N	Input	Port 1 Power Fault (Active-Low). Logic input indicates an overcurrent fault on port 1.
11	PWROK1	Input	Port 1 Power OK. Analog or digital input to inform the UHP112 that USB port 1 power is stable (when >4 V).
12	VDDT	Power	Transceiver Power (3.3 V).
13	DPLS1	Bidir	Differential USB Port 1 Signals.
14	DMNS1	Bidir	
15	PMIENABLE	Input	Power Management Interface Enable Input (Active-High).
16	VsST	Power	Transceiver Ground.
17	VDDT	Power	Transceiver Power (3.3 V).
18	DPLS2	Bidir	Differential USB Port 2 Signals.
19	DMNS2	Bidir	
20	Vss	Power	Device Ground.
21	TEST0	Input	Test 0. For device testing. Connect this to ground during normal use. Connect to logic high for NAND tree mode. See NAND Tree Mode on page 2-32.
22	PWROK2	Input	Port 2 Power OK. Analog or digital input to inform the UHP112 that USB port 2 power is stable (when >4 V).
23	PWRFLT2N	Input	Port 2 Power Fault (Active-Low). Logic input indicates an overcurrent fault on port 2.
24	PRTPWR2	Bidir	Port 2 Power. Logic output expected to turn on port 2 power. Bootstrap low for high active. Bootstrap high for low active.
25	TEST1	Input	Test 1. For device testing. Tie this to ground during normal use. Connect to logic high for NAND tree mode. See the NAND Tree Mode section on page 2-32.
26	VDD5	Power	5 V Power for 5 V PCI Operation. 5 V must be present on this pin while selecting either 3 V PCI or 5 V PCI operation with the VIO pin. See PCI Connection Instructions section on page 2-26.
27	IRQ1	Output/Open Drain	System Keyboard Interrupt (Active-High).
28	IRQ12	Output/Open Drain	System Mouse Interrupt (Active-High).
29	SMIN	Output/Open Drain	System Management Interrupt (Active-Low).
30	INTAN	Output/Open Drain	PCI Interrupt (Active-Low).
31	RSTN	Input	PCI Reset (Active-Low). Also the chip reset.
32	CLK	Input	PCI Clock. 33 MHz input clock.

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Pin Information (continued)

Table 2. Pin Descriptions (continued)

Pin	Symbol*	Type	Description
33	VSS	Power	Device Ground.
34	VDD	Power	Device Power (3.3 V).
35	GNTN	Input	PCI Grant Signal (Active-Low).
36	REQN	Output/3-State	PCI Request Signal (Active-Low).
37	AD31	Bidir	PCI Address/Data Bit.
38	AD30	Bidir	PCI Address/Data Bit.
39	AD29	Bidir	PCI Address/Data Bit.
40	VSS	Power	Device Ground.
41	VDD	Power	Device Power (3.3 V).
42	AD28	Bidir	PCI Address/Data Bit.
43	AD27	Bidir	PCI Address/Data Bit.
44	AD26	Bidir	PCI Address/Data Bit.
45	AD25	Bidir	PCI Address/Data Bit.
46	VDD	Power	Device Power (3.3 V).
47	VSS	Power	Device Ground.
48	AD24	Bidir	PCI Address/Data Bit.
49	C/BEN3	Bidir	PCI Command/Byte Enable.
50	IDSEL	Bidir	PCI ID Select.
51	AD23	Bidir	PCI Address/Data Bit.
52	AD22	Bidir	PCI Address/Data Bit.
53	A20I	Input	Legacy Gate A20 Input.
54	VSS	Power	Device Ground.
55	AD21	Bidir	PCI Address/Data Bit.
56	AD20	Bidir	PCI Address/Data Bit.
57	AD19	Bidir	PCI Address/Data Bit.
58	AD18	Bidir	PCI Address/Data Bit.
59	VSS	Power	Device Ground.
60	VDD	Power	Device Power (3.3 V).
61	AD17	Bidir	PCI Address/Data Bit.
62	AD16	Bidir	PCI Address/Data Bit.
63	C/BEN2	Bidir	PCI Command/Byte Enable.
64	FRAMEN	Bidir	PCI Frame (Active-Low).
65	VDD	Power	Device Power (3.3 V).
66	VSS	Power	Device Ground.
67	IRDYN	Bidir	PCI Initiator Ready (Active-Low).
68	TRDYN	Bidir	PCI Target Ready (Active-Low).
69	DEVSELN	Bidir	PCI Device Select (Active-Low).
70	STOPN	Bidir	PCI Stop (Active-Low).
71	PERRN	Bidir	PCI Parity Error (Active-Low).
72	VSS	Power	Device Ground.
73	MIRQ12I	Input	Legacy Mouse Controller Interrupt Input.
74	VDD	Power	Device Power (3.3 V).

* Active-low signals within this document are indicated by an N following the symbol names.

Pin Information (continued)

Table 2. Pin Descriptions (continued)

Pin	Symbol*	Type	Description
75	SERRN	Output/Open Drain	PCI System Error (Active-Low).
76	PAR	Bidir	PCI Parity.
77	C/BEN1	Bidir	PCI Command/Byte Enable.
78	AD15	Bidir	PCI Address/Data Bit.
79	AD14	Bidir	PCI Address/Data Bit.
80	Vss	Power	Device Ground.
81	VDD	Power	Device Power (3.3 V).
82	AD13	Bidir	PCI Address/Data Bit.
83	AD12	Bidir	PCI Address/Data Bit.
84	AD11	Bidir	PCI Address/Data Bit.
85	Vss	Power	Device Ground.
86	AD10	Bidir	PCI Address/Data Bit.
87	AD9	Bidir	PCI Address/Data Bit.
88	AD8	Bidir	PCI Address/Data Bit.
89	C/BEN0	Bidir	PCI Command/Byte Enable.
90	Vss	Power	Device Ground.
91	VIO	Power	Voltage I/O. This signal is used to indicate to the UHP112 the PCI signaling interface to use (3 V or 5 V PCI signaling). A 3 V on VIO will indicate 3 V PCI signaling while 5 V on VIO will indicate 5 V PCI signaling. This pin may be connected directly to the PCI VIO signal.
92	VDD	Power	Device Power (3.3 V).
93	AD7	Bidir	PCI Address/Data Bit.
94	AD6	Bidir	PCI Address/Data Bit.
95	AD5	Bidir	PCI Address/Data Bit.
96	Vss	Power	Device Ground.
97	KIRQ11	Input	Legacy Keyboard Controller Interrupt Input.
98	VDD	Power	Device Power (3.3 V).
99	AD4	Bidir	PCI Address/Data Bit.
100	AD3	Bidir	PCI Address/Data Bit.

* Active-low signals within this document are indicated by an N following the symbol names.

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