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P2A Daughtercard

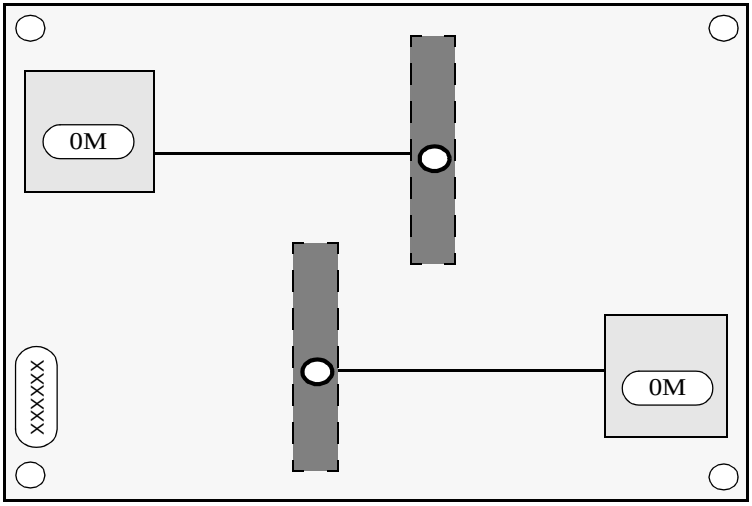
VME RACE 1.0 Two-processor PowerPC Daughtercard

P2A Daughtercard Overview

The P2A daughtercard has two RACEway nodes and mounts on a motherboard. Each node consists of an ASIC, DRAM, and one PowerPC processor. Each PowerPC processor contains processing, memory, and I/O. (One P2A model supports only a 100 MHz 603e processor type; the other P2A model supports either a 603e or a 200 MHz 603p processor type.)

Layout

Figure applies to models: MV, NW, SZ



0M — Node memory size label

XXXXXX — Serial number label (first two digits = model)

Daughtercard connector (on opposite side of board)

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Indicators

None.

Switches

None.

P2A Daughtercard Specifications

Physical Dimensions

Dimensions (mm): 112.65 x 127 (4.435" x 5.0")

Weight (gm): approx. 198 (approx. 7 oz)

Slot-to-Slot spacing (mm): 20.3 (0.8")

Node type: processor

Processor: PowerPC-603e-100 only or PowerPC-603e-100 / PowerPC-603p-200

Number of processors: 2

DRAM (Mbytes per processor): 8, 16, 32, or 64

Electrical Specifications

Input voltage (Vdc ±5%): 3.3 for 603e-only model;
5V and 3.3V for 603e / 603p model.

Input current in amps (maximum): 4.5

Power dissipation:

Commercial models: (W maximum @ 5.0 Vdc): 15
(W maximum, total @ 3.3Vdc and 5.0Vdc): 22

Industrial model (VD): (W maximum @ 5.0 Vdc): 10

Environmental Specifications

Commercial Models:

Operating temperature range (°C): 0 to 40 (inlet air temp)

Storage temperature range (°C): -40 to +85

Cooling requirements: (see motherboard device note)

Relative humidity (% noncondensing): 10 to 90

Altitude (ft above sea level): 0 to 10,000

Industrial Model (VD):

Operating temperature range (°C): -25 to 55

Storage temperature range (°C): -55 to 85

Cooling requirements: (see motherboard device notes)

Relative humidity (% noncondensing): 5 to 95

Altitude (ft above sea level): 0 to 30,000 (operating) and 0 to 50,000 (storage)

P2A Daughtercard Installation

Jumpers

None.

Assembly

Caution: Align connectors carefully, to avoid bending pins. **Also note** that daughtercard connectors with bent pins often bend the pins on other daughtercard connectors plugged into them later, causing the problem to **propagate**.

Daughtercard Removal

When removing daughtercards from motherboards, work slowly and make sure to keep the daughtercard parallel to the motherboard.

Caution: Avoid pivoting or rocking as much as possible, since this can damage the connectors.

P2A Daughtercard Configuration

The following sections provide configuration file directives used for this specific device. For general information about creating configuration files and the meaning of the configuration directives, see the *Mercury System Manager's Guide.* For configuration information for MC / OS 4.3.0 or earlier, use the online manual pages available through the manmc utility.

Board Directive

board P2A8B *user-assigned-name* [*optional_attributes*]
board P2A16B *user-assigned-name* [*optional_attributes*]
board P2A32B *user-assigned-name* [*optional_attributes*]
board P2A64B *user-assigned-name* [*optional_attributes*]

where:

user-assigned-name

A name assigned by the user.

optional attributes

num_dma_transfers=*num_transfers*

The maximum number of DMA transfers that can be performed concurrently. The default is 5000; this is intentionally high so users do not hit a limit. If more memory must be freed, replace the default with a number appropriate to the application. This attribute can be set differently for each of the two nodes on the daughtercard by using num_dma_transfers_A and num_dma_transfers_B.

num_dma_transfers_A=*num_transfers*

The maximum number of DMA transfers that can be performed concurrently on the A node. The default value is num_dma_transfers.

num_dma_transfers_B=*num_transfers*

The maximum number of DMA transfers that can be performed concurrently on the B node. The default value is num_dma_transfers.

max_mappings=*remote_map_size*

The maximum size in bytes of remote mappings the node can perform. This attribute is used to calculate the size for the node hash table. The default value for max_mappings is 0. The default yields a hash table entry size that is 1 / 64th of the memory size. This attribute can be individually sized for the nodes using max_mappings_A and max_mappings_B.

max_mappings_A=*remote_map_size*

The maximum size in bytes of remote mappings allowed for node A. The default value is max_mappings.

max_mappings_B=*remote_map_size*

The maximum size in bytes of remote mappings allowed for node B. The default value is max_mappings.

Connect Directive

connect *user-assigned-name1.connector1 user-assigned-name2.connector2*

where:

user-assigned-name1
user-assigned-name2

Two names assigned by the user in a board directive: one for the P2A and the other for the hardware device being connected to.

connector1
connector2

Two connectors, one being a connector on the P2A and the other a connector on the hardware device being connected to. The P2A connector can be:

DC_A—Node connector 1

DC_B—Node connector 2

CE Directive

For MC / OS 5.6.0 and later:

CE *user-assigned-name.cpu* ceid=*id*

For earlier versions of MC / OS:

CE *user-assigned-name.cpu* ce_type=CE_PRACE ceid=*id*

where:

user-assigned-name

The name assigned to the P2A by the user in the board directive.

cpu

Two CE directives, one for each of the following processors, are required:

CPU_A

CPU_B

ceid=*id*

The processor's ceid.

P2A Daughtercard Diagnostics

Diagnostics tool DMC supports the following test phases and tests on this hardware device. For test descriptions, see the *Mercury System Manager's Guide*.

Also, see the *Hardware Device Note* for each daughtercard, motherboard and interlink in the system.

CE Phase

Memory tests

ECC test

Timer test

Interrupt test

FIFO test

FFT test

P2A Daughtercard Reference

Address Space

Local DRAM

The CPU can address all available local DRAM.

MEM_RACEWAY (SLAVE)

A RACEway master can access all available DRAM. The RACEway master has access to the ASIC's control registers.

MEM_RACEWAY (MASTER)

Each processor can map up to fourteen 256-Mbyte pages of external RACEway memory. Two pages are reserved for the operating system, leaving

twelve for user mappings of external memory. Each page has an associated mapping register. Each external memory page can map only one external slave. Each DMA controller can map up to 256 megabytes of external memory per transfer (this does not use any of the page registers).

`Driver`

Virtual addresses 0x70000000 through 0x7FFFFFFF are reserved for loading user-defined driver processes.

Files

`${MC_ROOT_DIR}/etc/desc/P2A8B.desc`

Hardware description file for this device with 8MB DRAM per node.

`${MC_ROOT_DIR}/etc/desc/P2A16B.desc`

Hardware description file for this device with 16MB DRAM per node.

`${MC_ROOT_DIR}/etc/desc/P2A32B.desc`

Hardware description file for this device with 32MB DRAM per node.

`${MC_ROOT_DIR}/etc/desc/P2A64B.desc`

Hardware description file for this device with 64MB DRAM per node.

`${MC_ROOT_DIR}/etc/desc/P2A.desc`

Generic hardware description file for this device.

`${MC_ROOT_DIR}/etc/desc/ppc_node.desc`

Generic Power PC hardware description file.

See Also

Developer's Guide: PowerPC Node Architecture

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