

**Overview:**

The **VRM-CCD-X** 3U, Advanced CompactPCI CPU board is scalable from the ULV Celeron® M processor up to the 2.0GHz Pentium®M, and provided with 2GB dual channel capable DDR2 RAM, the **VRM-CCD-X** is a versatile 4HP/3U CompactPCI® CPU board, designed especially for systems which require high performance at low power consumption. The chipset is based on PCI Express technology and has a powerful dual-screen integrated graphics accelerator. The DVI-I video interface allows for simultaneous attached of both, advanced (digital) and legacy (analog) flat panel displays and CRT monitors (D-SUB connector optionally). The **VRM-CCD-X** is equipped with two independent PCIe Gigabit Ethernet controllers for high speed communication. Seven USB 2.0 ports are provided for attachment of peripheral devices. In addition, an onboard CF socket accommodates either a CompactFlash memory card or Microdrive®. As an alternate, an 1.8" hard disk module is available as on-board mass-storage device (option). A local expansion interface connector may be used to directly attach a mezzanine companion board for audio and legacy support, which can carry in addition a 2.5" IDE hard disk drive. As an option, a rear I/O transition module is available to the **VRM-CCD-X**, which provides the Serial ATA connectors (2 x SATA, 2 x eSATA).

Features:

- **FORM FACTOR:** CompactPCI Single size CompactPCI style Eurocard (160x100mm²), front panel width 4HP (20.3mm)
- **PROCESSOR:** Designed for Intel® Pentium® M Micro FC-BGA 479 processors (90nm Dothan), maximum junction temperature 100°C
 - VRM-CCD-2: 1.0GHz ULV Celeron®M (Dothan 373), 400 MHz FSB, 512KB L2 cache, 5W
 - VRM-CCD-3: 1.4GHz LV Pentium®M (Dothan 738), 400 MHz FSB, 2MB L2 cache, 10W
 - VRM-CCD-6: 2.0GHz Pentium®M (Dothan 760), 533MHz FSB, 2MB L2 cache, 27W
- **CHIPSET:** Intel® i915GM (Alviso) chipset consisting of:
 - 82915GM Graphics/Memory Controller Hub (GMCH) with Intel® Graphics Media Accelerator (GMA) 900
 - 82801FB I/O Controller Hub (ICH6)
 - 82802 Compatible Firmware Hub (FWH)
- **MEMORY:** Dual 200-pin SO-DIMM socket, DDR2 533 SDRAM, 2 x 1GB maximum, symmetric dual channel capable
- **VIDEO I/O:**
 - Analog monitor and digital flat-panel display support by DVI-I connector (front panel), up to 2048x1536 pixel 16M colors @ 75MHz refresh rate (analog), up to 1600 x 1200 pixel 16M colors @60Hz (digital), incorporates PanelLink Digital technology (Silicon Image).
 - Front panel option: D-Sub (female HD15) VGA connector available, replaces DVI-I connector
 - Rear I/O option: Analog video across J2/P2 (VRM-CCT-RIO rear I/O transition module)
 - Dual screen capable 2x1600x1200 pixel (one display attached to front panel, the other to back panel, or both to the front by means of a DVI-I splitter cable)
- **USB I/O:** All ports over-current protected, data transfer rate of up to 480Mbps, conforming to USB2.0:
 - 2 x USB type A connector (front panel)
 - 3 x USB ports J2/P2 Rear I/O option (VRM-CCT-RIO rear transition module)
 - 2 x USB expansion interface option (VRM-CCA/VRM-CCB mezzanine companion boards)
 - USB flash drive module C15-DON option (stick on-board module)
- **ETHERNET:** Dual 10/100/1000Mbps Gigabit Ethernet controller, accessible via RJ45 jacks from the front panel, or as an option across J2/P2 with attached VRM-CCT-RIO rear I/O transition module
- **MEZZANINE I/O:**
 - On-board LPC/USB/AC97 Super-I/O, USB and audio expansion interface connector
 - ATA/IDE expansion connector
 - High Speed PCI Express expansion connector
 - Suitable VRM-CCA/VRM-CCB/VRM-CCE, C20-1-CFA, C10-2-CFA and C15-Don mezzanine companion boards/access. available
- **PATA (IDE):**
 - Ultra ATA/100 connector, handover to VRM-CCA/VRM-CCB/VRM-CCE mezzanine expansion board with optional on-board 2.5" hard disk drive or external device
 - Compact Flash socket C10-1-CFA supplied for a CFA ATA memory card or Microdrive®
 - Option 1.8" on-board hard disk module C10-2-CFA replaces Compact Flash facility.



Features cont.:

- SATA: Triple-channel Serial ATA I/F available for J2/P2 rear I/O option, suitable rear I/O transition module VRM-CCT-RIO (2 x system-internal SATA, 1 x eSATA for attachment of external devices)
- CompactPCI: ICH6 integrated 32-bit PCI bridge, 133MBps CPCI master
- PCI Express: 1-Lane PCIe connector (option) for VRM-CCE and future mezzanine companion boards
- J2/P2 Rear I/O:
 - 3 x Serial ATA (SATA), 2 x system internal SATA connectors, 1 x external eSATA connector
 - GB Ethernet (switched by BIOS between front panel I/O and rear I/O)
 - 3 x USB
 - VGA Analog Video (option), or GPIO
 - Keyboard, mouse
 - Com1 (TTL Level)
 - Suitable rear I/O transition modules VRM-CCT-RIO available
- BIOS: Phoenix BIOS with enhancements, 8MBit Flash memory, Updates available upon request
- DRIVERS: Intel graphics drivers, Intel networking drivers
- TYPICAL POWER REQUIREMENTS

Board	+3.3v +0.17v/-0.1v		+5v +0.25v/-0.15v	
	Max Power LFM/HFM ¹	WinXp Idle LFM/HFM ¹	Max Power LFM/HFM ¹	WinXP Idle LFM/HFM ¹
VRM-CCD-2	2.7A ²	2.2A ²	1.2A ²	0.5A ²
VRM-CCD-3	2.9A/2.9A	2.2A/2.2A	1.2A/2.4A	0.7A/0.9A
VRM-CCD-6	3.0A/3.3A	2.3A/2.3A	1.2A/5.2A	0.7A/1.6A

- THERMAL CONDITIONS/ENVIRONMENTAL CONDITIONS:
 - Operating Temperature: 0°C ... +60°C
 - Storage Temperature: -40°C. ...+85°C, max gradient 5°C/min
 - Humidity: 5%... 95%, non condensing
 - Altitude: -300m...+3000m
 - Shock: 15g 0.33ms, 6g 6ms
- Vibration: 1g 5-2000Hz
- EC REGULATIONS: EN55022, EN55024, EN60950-1 (UL60950-1/EC60950-1), 2002/95/EC (RoHS)
- MTBF: (Typical Performance Rating Measured with PCMark2002 under WindowsXP,1G DDR2 533)

Board	Processor	CPU/Mem Score
VRM-CCD-2	1.0GHz ULV Celeron® M (Dothan 373)	4735/8642
VRM-CCD-3	1.4GHz LV Pentium® M (Dothan 738)	
VRM-CCD-6	2.0GHz Pentium® M (Dothan 760)	

¹ Intel SpeedStep® Frequency Modes. LFM: Low Frequency Mode, HFM: High Frequency Mode

² The ULV Celeron® processor on VRM-CCD-2 does not support Intel SpeedStep® (always High Frequency Mode)

Ordering options:

- VRM-CCD-2(R):** 3U/4HP CPCI CPU Board, 1.0GHz ULV Celeron® M (Dothan 373), 1GB (2x 512MB) DDR2 SDRAM, CompactFlash Adapter (C10-1-CFA)
- VRM-CCD-3(R):** 3U/4HP CPCI CPU Board, 1.4GHz LV Pentium® M (Dothan 738), 1GB (2 x 512MB) DDR2 SDRAM, CompactFlash Adapter
- VRM-CCD-6(R):** 3U/4HP CPCI CPU Board, 2.0GHz LV Pentium® M (Dothan 760), 1GB (2 x 512MB) DDR2 SDRAM, CompactFlash Adapter
- VRM-CCD-H:** Option on board 1.8" hard disk drive module (C10-2-CF replaces Compact Flash slot).
- VRM-CCD-Z2:** 2GB (2 x 1GB) DDR2 SDRAM option (replacement for 2 x 512MB memory modules)
- VRM-CCA-1:** 3U CompactPCI Super-I/O module, local expansion board complementing the VRM-CCD, front panel width 4HP, with keyboard/mouse, RS-232, optional audio connectors & AC'97 Codec, mounting on top or bottom of the VRM-CCD.
- VRM-CCA-8-HD:** Optional hard disk drive, on-board mounting on top of VRM-CCA
- VRM-CCB-1:** 3U Super I/O module, local expansion board complementing the VRM-CCD, front panel width 4HP, 2 x USB, 1 x RS-232, PS/2 MS/KB, mounting on top or bottom of the VRM-CCD.
- VRM-CCB-2:** 3U Super I/O module, local expansion board complementing the VRM-CCD, front panel width 4HP, 2 x RS-232, PS/2 MS/KB, mounting on top or bottom of the VRM-CCD.
- VRM-CCB-8-HD:** Optional hard disk drive, on-board mounting on top of the VRM-CCB
- VRM-CCE-1:** 3U Super I/O module, local mezzanine expansion board complementing the VRM-CCD, front panel width 4HP, 3 x RS232, 2 x USB, 2 x 1394A FireWire 400Mbps, mounting on top of the VRM-CCD
- VRM-CCE-8-HD:** Optional hard disk drive, on-board mounting on top of the CCE
- VRM-CCT-1-RIO:** Rear I/O transition module for VRM-CCD with SATA connectors
- VRM-CR9-5-ADAPT:** Mechanical kit, expands the VRM-CCD front panel to 6U full height.



