

Intel® Core™ 2 Duo Processor, Dual PMC, Rugged Conduction-Cooled



APPLICATIONS

The PP 452/03x-RC is a PC-compatible, high functionality, dual PMC, single XMC (PCI Express™ Mezzanine Card), ruggedized conduction-cooled CompactPCI® board supporting the Intel® Core™ 2 Duo processor and the Intel® E7520 server class chipset. The processor contains two CPU cores and shared L2 cache. The PP 452/03x features 4 Gbytes DDR2 ECC SDRAM and a variety of I/O interfaces. The PP 452/03x-RC will operate in a system slot, a peripheral slot or independently from the CompactPCI bus. The board supports two Gigabit

Ethernet ports, and is compliant with the PICMG® 2.16 specification. Full system monitoring is provided by the PICMG 2.9 compliant IPMI interface. The PP 452/03x-RC, as a ruggedized conduction-cooled board, is suitable for a range of demanding applications within the defense, industrial control, telemetry, transportation, and aerospace markets. To simplify the board's integration many popular standard operating systems are supported. This board is rear I/O plug compatible with the PP 452/03x and PP 452/03x-RA families.

HIGHLIGHTS

- Ruggedized 6U single board computer:
 - conduction-cooled to IEEE 1101.2
 - supports 2 conduction-cooled PMC modules conforming to ANSI/VITA 20
 - -40°C to +85°C operating temperature, designed to VITA 47 Class C4
 - conformally coated
- 1.5 GHz Intel® Core™ 2 Duo processor:
 - 667 MHz Front Side Bus
 - 4 Mbytes L2 cache
 - Intel® 64 Technology (64-bit computing support)
- 4 Gbytes of dual channel DDR2-400 ECC SDRAM
- 1 x PMC/XMC site and 1 x PMC site, both with rear user I/O:
 - both PMC sites support 32/64-bit; 33/66MHz PCI-X
 - XMC site supports up to x8 PCI Express™
- 2 x SATA150 interfaces via rear
- EIDE onboard mass storage interfaces:
 - onboard soldered Flash drive
 - option for removable Flash drive
 - option for removable CompactFlash® carrier
- 3 x Universal Serial Bus (USB 2.0), 1 x RS232 interfaces
- 2 x 10/100/1000Mbps Ethernet interfaces:
 - Dual Gigabit Packet Switching Backplane (PICMG 2.16)
- Watchdog timer and Long Duration Timer
- CompactPCI controller:
 - operates in system slot or peripheral slot
 - 32/64-bit at 33/66 MHz CompactPCI interface
- Option to bypass CompactPCI bus (Satellite Mode)
- IPMI (Intelligent Platform Management Interface)
- PICMG 2.9 (System Management Specification)
- Single slot (for all option combinations)
- Non-ruggedized air-cooled versions available:
 - see PP 452/03x datasheet
 - rear plug compatible with ruggedized versions
 - useful for bench development
 - use in commercial (non-rugged) applications
- Ruggedized air-cooled version (RA-Series) planned:
 - see PP 452/03x-RA datasheet
 - -40°C to +75°C, conformally coated
- Support for Linux®, Windows® XP, Windows® XP Embedded, Windows® Server 2003, Windows® 2000, QNX®, Solaris™ and VxWorks®

Ruggedized dual PMC/XMC controller

- conduction-cooled to IEEE 1101.2
- supports 2 x conduction-cooled PMC/XMC modules conforming to ANSI/VITA 20
- conformally coated

Central Processor

- Intel® dual-core processor
- 1.5 GHz Intel® Core™ 2 Duo processor L7400:-
 - 4 Mbytes of secondary (L2) on-die cache
 - 667 MHz Front Side Bus
- Intel® 64 Technology (64-bit computing)
- uses µFC-BGA 478 (micro Flip-Chip Ball Grid Array) package
- utilizes Intel® E7520 server class chipset:-
 - uses Intel® 6300ESB I/O Controller Hub
- provision for XDP debug port

SDRAM

- supports 4 Gbytes DDR2-400 ECC SDRAM:-
 - 4 Gbytes soldered on-board
 - up to four bit error correction
 - peak bandwidth of 6.4 Gbytes/s
 - dual channel architecture
- accessible from processor and CompactPCI bus

Mass Storage Interfaces

- 2 x SATA-150 interfaces via J5
- on-board EIDE interfaces:-
 - 4 Gbytes on-board soldered Flash disk
 - option for 4 Gbytes Flash Disk Module
 - option for ruggedized CompactFlash™ carrier (uses PMC site)

Ethernet Interfaces

- 2 x rear interfaces implemented by Intel® 82574L controllers via x1 PCI Express™ links:-
 - support for PICMG 2.16 R1.0 - Packet Switching Backplane (PSB)
- supports 10 Base-T, 100 Base-TX, 1000 Base-T

PMC/XMC Interfaces

- 1 x PMC/XMC site and 1 x PMC site
- common features for both PMC sites:-
 - 32/64-bit, 33/66 MHz PCI/PCI-X operation
 - 3.3V or 5V PCI signaling levels
 - PMC connectors used for rear I/O
- XMC (PCI Express™ Mezzanine Card) site interface supported via x8 PCI Express link

Serial Interface

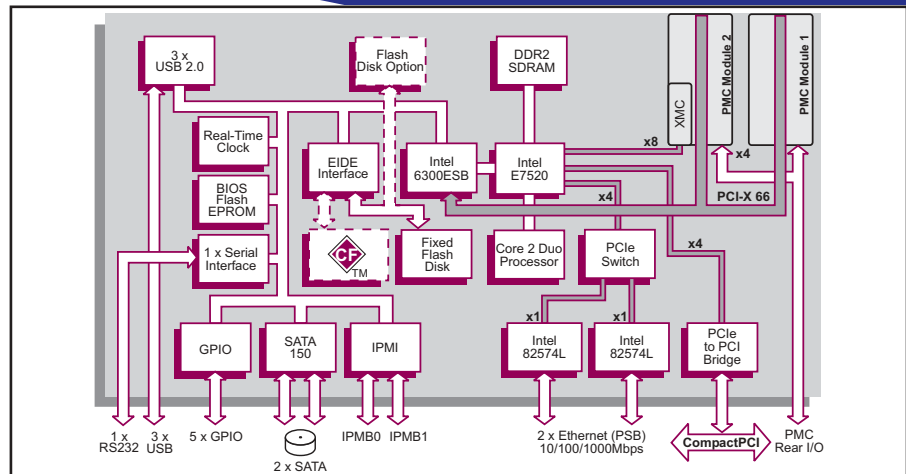
- 1 x RS232 serial channels:-
 - Tx, Rx, RI, CTS, RTS, DSR, DTR and DCD signals via J5
- 16550 compatible UART

Other Peripheral Interfaces

- PC Real Time Clock (Year 2000 compliant)
- watchdog timer
- 1 x 32-bit Long Duration Timer with processor interrupt capability
- system fan monitor; CPU temperature monitor; voltages monitor:-
 - accessible via IPMI
- 5 GPIO signals accessed via J5
- 3 x USB 2.0 interfaces accessed via J5
- independent legacy speaker output via J3

Flash EPROM

- 1 Mbyte of BIOS Flash EPROM - 8-bits wide



Firmware Support

- Phoenix® Server BIOS
- comprehensive Power-On Self-Test (POST)
- LAN boot firmware included

Software Support

- support for Linux®, Windows® XP, Windows® XP Embedded, Windows® Server 2003, Windows® 2000, QNX®, Solaris™ and VxWorks®

CompactPCI Interface

- compliant with PICMG 2.0 R3.0; 3.3V or 5V signaling levels (universal signaling support)
- 33/66 MHz, 32/64-bit interface accessed via J1/J2 connectors
- PCI Express to PCI bridge for off-board accesses
- J4 connector not fitted
- PICMG 2.1 R2.0 Hot Swap compliant
- operates as a System Slot controller or in a Peripheral slot
- option to disable CompactPCI interface (Satellite Mode):-
 - receives power from CompactPCI bus
 - board can be hot swapped

IPMI

- PICMG 2.9 R1.0 (System Management Specification):-
 - implements the IPMB0 interface
 - implements an IPMB1 interface
- on-board Baseboard Management Controller
- supports 8 Kbytes of non-volatile memory

Electrical Specification

- +5V@3.1A (typical at 1.5 GHz with 4 Gbytes DRAM); +5% / -3%
- +3.3V@5.5A; +5% / -3%
- +12V@0.01A; -12V@0.01A
- +12V and -12V routed to PMC slots

Safety

- PCB (PWB) manufactured with flammability rating of 94V-0

Environmental Specification

- operating temperatures (VITA 47 Class CC4):-
 - -40°C to +85°C

- storage temperatures (VITA 47 Class C4)
 - -55°C to +105°C
- 5% to 95% Relative Humidity, non condensing (operating and storage)
- altitude (operating):
 - -1,000 to 50,000 feet (-305 to 15,240 metres)
- ruggedized and commercial air-cooled versions, see separate datasheets
 - rear plug compatible
 - commercial: PP 452/03x (available)
 - air-cooled: PP 452/03x-RA (planned)

Mechanical Specification

- 6U form-factor: 9.2inches x 6.3inches (233mm x 160mm)
- single-slot: 0.8inches (20.3mm)
- connectors: IEC-1076-4-101 for J1-J5
- operating shock (VITA 47, conduction-cooled): 40g, 11ms, 1/2 sine
- operating random vibration (VITA 47 Class V3): PSD increasing at +3dB/octave (5Hz to 100Hz) PSD = 0.1 g²/Hz (100Hz to 1kHz) PSD decreasing at -6dB/octave (1kHz to 2kHz)

(PSD = Power Spectral Density)



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ORDERING INFORMATION

| Order Number | Product Description (Hardware) |
|-----------------|---|
| PP 452/031-xyRC | 1.5 GHz Core 2 Duo Processor L7400 ruggedized conduction-cooled SBC |

Replace the order number suffix (xy) with selections from the following:

- where x =
- 1 - 3.3V PMC, Ethernet via rear panel
 - 2 - 3.3V PMC, Ethernet via PICMG 2.16
 - 3 - 5V PMC, Ethernet via rear panel
 - 4 - 5V PMC, Ethernet via PICMG 2.16

- where y = memory size
- 2 - reserved
 - 3 - 4 Gbytes

| | |
|-----------------|---|
| AD 200/002-10RC | Ruggedized Dual CompactFlash Carrier |
| AD 230/001-04RC | Ruggedized EIDE 4Gbytes Flash Disk Module |