4th Generation Intel® Core™ i7/i5 or Celeron™ Processor SBC supporting up to 2 PMC/XMC sites with option for Dual 10 Gigabit Ethernet interfaces

APPLICATIONS

PP B1x/msd is a 6U CompactPCI® board based on 4th generation Intel® processors for high performance applications with enhanced graphics capabilities. A number of build variants are available including processor choice and memory capacity. PP B1x/msd is designed to enable customers using existing PP 91x/x1x or PP 93x/x1x CompactPCI boards to transition to a new design for long life cycles. As well as offering backwards compatibility, there is a new build

option with J4 connector fitted adding rear graphics and other I/O to support additional functionality for those customers with backplane control. For reliable storage, there are several customer selectable options including on-board CFast and a 2.5-inch drive as well as options for additional SATA based storage via the rear connectors. PP B1x/msd is suitable for a range of applications within the industrial control, telecoms, scientific and transportation markets.

HIGHLIGHTS

- 4th generation Intel® processor:
  - option for 2-core or 4-core Intel® Core™ processor, including Intel® AES New Instructions (AES-NI)
  - option for 2-core Intel® Celeron™ processor
  - includes Intel® Advanced Vector Extensions 2 (AVX2)
- Up to 32 Gbytes of soldered DDR3L-1600 DRAM with ECC
- Up to 4 x external SATA300 interfaces plus optional on-board 2.5-inch SATA600 mass storage drive
- On-board CFast™ site
- Up to 2 x PMC/XMC sites with front and rear I/O:
  - PMC: 32/64-bit, 33/66 MHz PCI, 133 MHz PCI-X™
  - XMC: x8 PCI Express® (Gen 1 and Gen 2)
- Option for 2 x high performance 10 Gigabit Ethernet interfaces via front panel SFP+ interfaces
- Up to 4 x Gigabit Ethernet interfaces supporting:
  - 10BASE-T, 100BASE-TX, 1000BASE-T
  - option for Packet Switching Backplane (PICMG 2.16)
- Up to 3 x independent graphics interfaces, including dual DisplayPort interfaces via front panel
- Up to 3 x RS232 serial interfaces

- Up to 3 x USB connectors via front panel and up to 10 x USB ports via rear I/O
- High definition stereo audio
- CompactPCI® controller:
  - operates in system slot or peripheral slot
  - 32/64-bit at 33/66 MHz CompactPCI interface
- Option to disable CompactPCI bus (Satellite Mode)
- IPMI (Intelligent Platform Management Interface):
  - PICMG 2.9 (System Management Specification)
- Watchdog timer and Long Duration Timer
- Optional support for:
  - Trusted Platform Module (TPM)
  - rear plug compatibility with the popular PP 91x/x1x and PP 93x/x1x families
  - rear I/O via Rear Transition Module (RTM)
- Extended temperature versions (E and K-Series):
  - E: -25°C to +70°C
  - K: -40°C to +85°C (includes humidity sealant)
- Support for Linux®, Windows® and VxWorks®

Central Processor
- 4th generation Intel® processor:
  - → 4-core Intel® Core™ i7-4700EQ CPU up to 3.4 GHz, 6M Last Level cache
  - → 2-core Intel® Core™ i5-4422E CPU up to 2.9 GHz, 3M Last Level cache
  - → 2-core Intel® Celeron™ 2002E CPU 1.5 GHz, 2M Last Level cache
  - → Intel® Advanced Vector Extensions 2
  - → Intel® AES New Instructions (AES not available on Intel Celeron CPU)
- utilizes the Intel® QM87 Platform Controller Hub

DRAM
- 16 or 32 Gbytes soldered DDR3L-1600 ECC DRAM:
  - → 16 Gbytes, all CPUs supported
  - → 32 Gbytes, 4-core Intel Core i7-4700EQ CPU only
  - → single bit error correction
  - → peak bandwidth of 25.6 Gbytes/s
  - → dual channel architecture
- accessible from processor and CompactPCI® bus

Mass Storage Interfaces
- up to 4 x SATA interfaces accessed via J5:
  - → 2 x SATA300 interfaces
  - → up to 2 x SATA300 interfaces - user selectable, as alternatives to USB 3.0 ports
- 1 x SATA600 supports an on-board CFast™ site
- 1 x SATA supports an optional on-board 2.5 inch SATA600 mass storage (utilizes PMC/XMC site 1)

Gigabit Ethernet Interfaces
- up to 4 x 1 Gigabit Ethernet interfaces:
  - → supporting 10BASE-T, 100BASE-TX, 1000BASE-T
- 1 x front panel interface via an RJ45 connector
- 2 x rear interfaces via J3:
  - → support for PICMG® 2.16 R1.0 - Packet Switching Backplane (build option) or via an optional Rear Transition Module (RTM)
- 1 x rear interface via optional J4
- implemented by an Intel® i350-AM4 controller

10 Gigabit Ethernet Interfaces (option)
- build option (N-Series operating temperature only) for 2 x high performance 10 Gigabit Ethernet interfaces via front panel SFP+ modules
- only available with single PMC/XMC site build option

PMC/XMC Interface(s)
- build option for single or dual PMC/XMC interfaces
- PMC/XMC site 1 (available as build option):
  - → front panel I/O
  - → PMC/XMC P14 rear I/O via J5
- PMC/XMC site 2 (always available):
  - → front panel I/O
  - → PMC/XMC P24 rear I/O via J3
- PMC site(s) support:
  - → 32/64-bit, 33/66MHz PCI bus
  - → 64-bit, 133MHz PCI-X™ bus
  - → 5V and 3.3V signaling
- XMC site(s) support:
  - → x8 PCI Express® port (Gen 1 and Gen 2)
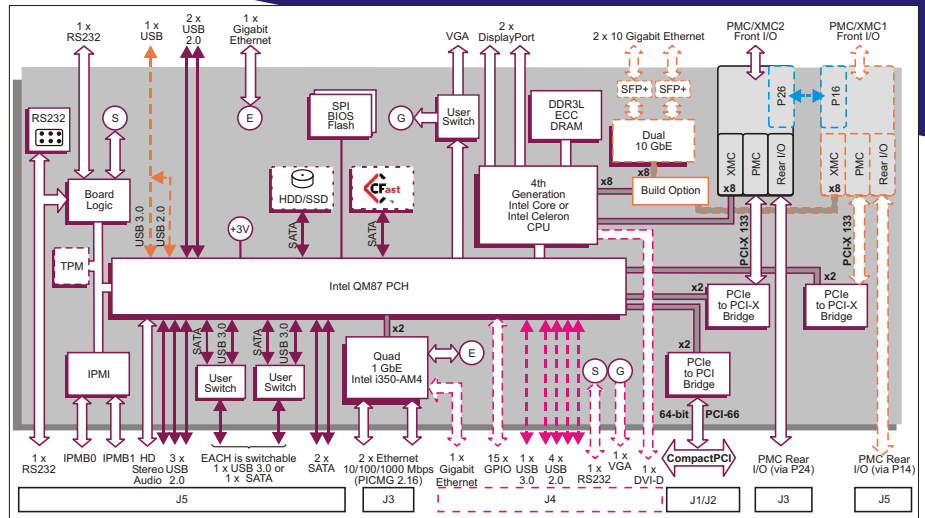 - → powered from 5V supply

Stereo Audio
- Intel® High Definition Audio via J5:
  - → optional CoDec on optional RTM

SPI Flash EPROM
- dual 8 Mbytes of BIOS SPI Flash EPROM

Optional Board Security Hardware
- Trusted Platform Module (TPM)

Serial Interfaces
- up to 3 x RS232 serial interfaces:
  - → 1 x Tx/Rx interface accessed via a 60-way high-density connector on front panel
  - → 1 x serial interface via on-board header or J5
  - → 1 x serial interface via optional J4
- J5 (or onboard header) and J4 interfaces support Tx, Rx, RI, CTS, RTS, DSR, DTR and DCD
- 16550 compatible UARTs

Graphics Interfaces
- up to three independent graphics interfaces
- 2 x DisplayPort graphics interfaces via a front panel 60-way high-density connector:
  - → up to 2560 x 1600 @ 60Hz
- DVI-D graphics interface via optional J4:
  - → up to 1920 x 1200 @ 16M colors
- VGA graphics interface via front panel, user switchable to optional J4:
  - → up to 1920 x 1200 @ 16M colors
- support for Microsoft® DirectX 11.1
- support for OpenGL 3.0, Windows® and Linux®

Other Peripheral Interfaces
- PC Real Time Clock
- watchdog timer; 32-bit Long Duration Timer with processor interrupt ability; chipset timer
- voltages monitor; CPU temperature and board temperature monitors; all accessible via IPMI
- up to 3 x USB ports via the front panel I/O:
  - → 2 x USB 2.0 ports accessed via a 60-way high-density connector
  - → 1 x USB 3.0/2.0 port accessed via a USB connector (single PMC/XMC site option)
- 3 x USB 2.0 ports accessed via J5
- up to 2 x USB 3.0 ports accessed via J5 - user selectable, as alternatives to SATA300 ports
- 5 x USB ports accessed via optional J4:
  - → including 1 x USB 3.0 port
- 15 x GPIO signals accessed via optional J4
- independent legacy speaker output via J3

IPMI
- PICMG 2.9 R1.0 (System Management):
  - → implements IPMB0/IPMB1 interfaces
- Baseboard Management Controller
- supports 8 Kbytes of non-volatile memory

Software Support
- support for Linux®, Windows® and VxWorks®

Firmware Support
- Insyde Software InsydeH20™ BIOS:
  - → includes Compatibility Support Module
- based upon Intel® Platform Innovation Framework for EFI
- Power-On Self-Test (POST)
- LAN boot firmware included

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
- PICMG 2.1 R2.0 Hot Swap compliant
- operates as 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

Safety
- PCB (PWB) manufactured with a flammability rating of UL94V-0

Electrical Specification
- typical current figures (Based on 4-core CPU 8 GBytes DRAM and dual PMC/XMC sites)
  - → +5V @ 7.1A
  - → +3.3V @ 4.7A
- +12V and -12V are not required, but are routed to PMC/XMC site(s)

Environmental Specification
- operating temperatures:
  - → 0°C to +55°C (N-Series)
  - → -25°C to +70°C (E-Series: Selected CPU)
  - → -40°C to +70°C (K-Series: Selected CPU)
  - → -40°C to +85°C (K-Series: Selected CPU)
- non-operating temperature: -40°C to +85°C
- 5% to 95% Relative Humidity, non condensing (operating or non-operating):
  - → K-Series includes humidity sealant

Mechanical Specification
- 6U form-factor: 9.2 inches x 6.3 inches (233mm x 160mm)
- single slot: 0.8 inches (20.3mm)
- connectors: IEC-1076-4-101 for J1-J5
- operating shock: 20g, 11ms, ½ sine
- operating vibration: 5Hz-2000Hz at 2g, 0.38mm peak displacement

ORDERING INFORMATION

Order Number	Product Description (Hardware)		
		For the order number suffix (d-yz) options please contact your local sales office:	
		where d = DRAM size	where yz = I/O Configuration
PP B1x/msd-yz	4th generation Intel Core (or Celeron) processor, N-Series where x = 2-core or 4-core processor type where m = front panel type, where s = processor speed option	d = up to 32 Gbytes DRAM	yz = rear I/O configuration

For accessories or extended temperature E and K-Series please contact your local sales office.