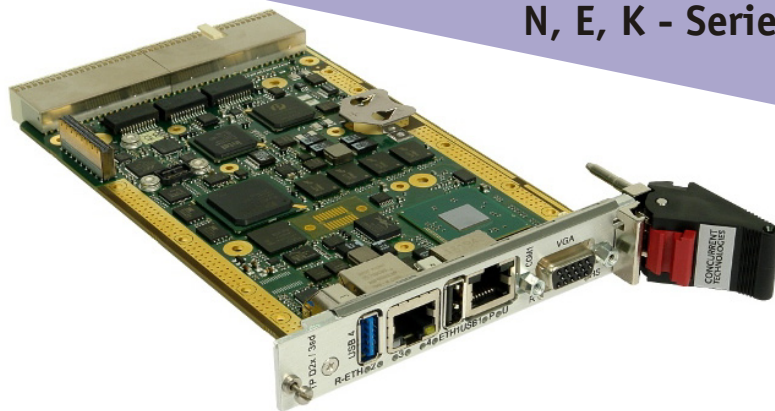


Intel® Atom™ Processor 3U Single Board Computer



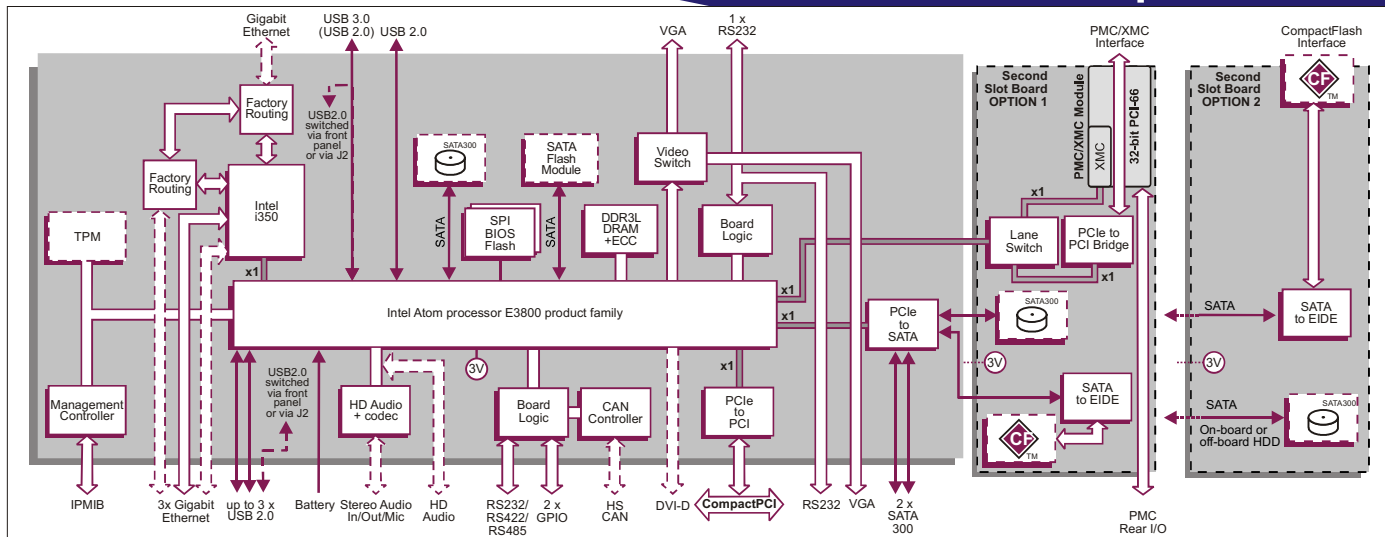
APPLICATIONS

The TP D2x/msd is a PC-compatible low power, high functionality, 3U CompactPCI® board supporting the Intel® Atom™ processor E3800 product family with 4 Gbytes of DDR3L ECC DRAM. This board can support a PMC/XMC site and features a variety of interfaces including user Flash memory, six SATA, up to four Gigabit Ethernet, two serial, four USB, a CANbus and an HD stereo audio interfaces. A Fast Boot software package is also supported. The TP D2x/msd is a commercial board

suitable for a range of environments (air-cooled or fanless) within industrial control, transportation, security, telemetry, scientific and medical applications. Options to operate in temperatures ranging from -40°C to +85°C are available. Ruggedized conduction-cooled, air-cooled or fanless versions are supported. To simplify the board's integration industry standard operating systems are supported.

HIGHLIGHTS

- Intel® Atom™ processor E3800 product family:
 - 4-core 1.91 GHz (10W) Intel Atom processor E3845
 - 1-core 1.46 GHz (5W) Intel Atom processor E3815
- Low power, e.g. the 1-core board variant is typically 10W
- The board supports air-cooled or fanless versions
- 4 Gbytes DDR3L DRAM with ECC
- Optional Fast Boot solution based on the Intel® Firmware Support Package (Intel® FSP)
- PMC/XMC module interface on optional second slot board with front and rear user I/O:
 - 32 bit, 33/66MHz PCI/PCI-X operation
 - XMC module interface (x1 PCI Express®)
- Up to 4 x 10/100/1000Mbps Ethernet interfaces
- 6 x SATA300 mass storage interfaces:
 - including support for optional CompactFlash® site, SATA Flash Module, up to 2 x 2.5-inch storage drives
- High definition stereo audio
- VGA and DVI-D graphics interface
- Up to 4 x USB2.0 and 1 x USB3.0 interfaces
- 2 x serial channel interfaces
- High speed CANbus controller
- Watchdog and long duration timer
- CompactPCI controller:
 - operates in the system slot or in a peripheral slot
 - PICMG 2.1 R2.0 (Hot-Swap Specification)
 - 32-bit, 33/66 MHz CompactPCI interface
 - option to bypass CompactPCI bus (Satellite Mode)
- IPMI (Intelligent Platform Management Interface):
 - PICMG 2.9 (System Management Specification)
- Optional support for:
 - Built-In Test (BIT) firmware and software
 - board-level security package
 - Trusted Platform Module (TPM)
 - rear I/O via Rear Transition Module (RTM)
- Commercial air-cooled or fanless versions (N, E, K-Series):
 - N: 0°C to +70°C
 - E: -25°C to +70°C
 - K: -40°C to +85°C (includes humidity sealant)
- Ruggedized air-cooled or fanless versions (RA-Series):
 - -40°C to +75°C, conformally coated
- Ruggedized conduction-cooled versions (RC-Series):
 - conduction-cooled to ANSI/VITA 30.1-2002
 - -40°C to +85°C (at card edge), conformally coated
- Support for Windows®, Linux® and VxWorks®
- Front and rear plug compatibility with the popular TP A41/30x family



Central Processor

- Intel® Atom™ processor E3800 product family:
 - 4-core 1.91 GHz (10W) Intel® Atom™ processor E3845
 - 1-core 1.46 GHz (5W) Intel® Atom™ processor E3815
- TP D2x/msd front and rear plug compatibility with the popular TP A41/30x family
- ruggedized versions, see separate datasheets:
 - air-cooled or fanless: TP D2x/msd-RA
 - conduction-cooled: TP D2x/msd-RC

DRAM

- 4 Gbytes soldered DDR3L ECC DRAM:
 - peak bandwidth of 10.6 Gbytes/s
 - single channel architecture

Optional Second Slot Boards

- second slot board, two options (see diagram)
- option 1 supports onboard:
 - PMC/XMC site or 2.5-inch SATA300 mass storage drive (MSD)
 - CompactFlash site
- option 2 supports onboard:
 - SATA300 disk drive (or external MSD)
 - CompactFlash site, accessible via front panel

PMC/XMC Interface

- single PMC/XMC site available on an optional second slot board (option 1 in diagram):
 - 32-bit, 33/66 MHz PCI operation
 - 3.3V and 5V PCI signaling levels
 - XMC (Switched Mezzanine Card) interface supported via x1 PCI Express® port
 - I/O via front panel and 64 I/O signals via J2 on optional second slot board

Mass Storage Interfaces

- 4 x SATA300 interfaces:
 - 2 x SATA accessible via J2
 - 1 x SATA routed to an onboard 2.5-inch SATA300 mass storage drive on main board
 - 1 x SATA routed to 2.5-inch SATA300 mass storage drive on both optional second slot boards (uses PMC/XMC site on option 1)
- optional onboard SATA Flash Module, 8 Gbytes minimum
- 1 x SATA to EIDE interface routed to a CompactFlash® site on second slot board options

Ethernet Interfaces

- 4 x channels supporting:
 - 10Base-T, 100Base-TX, 1000Base-T
 - implemented by Intel® Intel® i350
- option for 1 x channel accessed via the front panel RJ45 or via J2
- up to 3 x channels accessed via J2
- front and rear compatibility with TP A41/30x

Stereo Audio

- Intel® High Definition Audio interface via J2:
 - supports on board codec or codec on optional Rear Transition Module (RTM)

Graphics Interface

- analog VGA accessed via a 15-way high density connector on front panel or via J2:
 - resolutions up to 2048 x 1536 @ 16M colors
- DVI-D interface (build option) via J2:
 - resolutions up to 1920 x 1080 @ 60 Hz

Serial Interfaces

- 1 x RS232 serial channel accessed via front panel RJ45 connector or J2:
 - supporting CTS, RTS, DSR, DTR and DCD
- 1 x RS232/422/485 channel accessed via J2:
 - supporting RTS and DTR only
- 16550 compatible UARTs

Other Peripheral Interfaces

- PC Real Time Clock
- long duration timer; watchdog timer
- 1 x USB 3.0 port accessed via the front panel
- up to 3 x USB 2.0 ports accessed via J2:
 - or build option, 1 x USB 2.0 port shared with the USB 3.0 port's front panel connector
- 2 x GPIO signals via J2
- optional High Speed CANbus controller interface

Flash EPROM

- dual 8 Mbytes of BIOS SPI Flash EPROM

Software Support

- supports Windows®, Linux® and VxWorks®

Firmware Support

- Insyde Software InsydeH20™ BIOS
- optional Fast Boot solution based on the Intel® Firmware Support Package (Intel® FSP)
- Intel® Platform Innovation Framework for EFI
- LAN boot firmware included

Optional Built-In Test (BIT) Support

- Power-on BIT (PBIT), Initiated BIT (IBIT), Continuous BIT (CBIT)

Optional Board Security Packages

- Trusted Platform Module (TPM)
- proprietary board-level security features

CompactPCI Interface

- universal signaling support, compliant with PICMG 2.0 R3.0; 3.3V or 5V signaling levels
- 33/66 MHz; 32-bit interface accessed via J1
- operates as a System Slot controller (supporting up to 7 peripheral slots) or operates in a Peripheral Slot
- PICMG 2.1 R2.0 Hot Swap Compliant
- 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
- on-board Baseboard Management Controller
- monitors CPU temperature, voltages and fan
- supports 8 Kbytes of non-volatile memory

Electrical Specification

- typical power consumption is 10W for the 1-core Intel Atom processor E3815 board
- +5V and +3.3V are required

Safety

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

Environmental Specification

- commercial operating temperature:
 - 0°C to +70°C (N-Series)
 - supports air-cooled or fanless versions
- extended operating temperatures:
 - -25°C to +70°C (E-Series)
 - -40°C to +85°C (K-Series)
- storage temperature: -40°C to +85°C
- 5% to 95% Relative Humidity, non condensing (operating or storage):
 - K-Series includes humidity sealant

Mechanical Specification

- 3U form-factor: 3.9 inches x 6.3 inches (100mm x 160mm)
- single or dual slot
- connectors: IEC-1076-4-101 for J1-J2
- 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:
TP D2x/msd-yz	Intel Atom processor E3800 family where x = number of processor cores where m = front panel width style, where s = processor speed variant	d = DRAM size yz = rear I/O configuration

For extended temperature, E-Series and K-Series, or Ruggedized RA and RC-Series please contact your local sales office

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