

Intel® Core™ i7 Processor (32nm) 3U Single Board Computer



APPLICATIONS

The TP 702/38x is a PC-compatible high performance, high functionality 3U CompactPCI® board supporting the Intel® Core™ i7 processor up to 2.53 GHz (32nm process technology), the Mobile Intel® QM57 Express chipset and up to 8 Gbytes of DDR3-1066 ECC SDRAM. This single slot board features a variety of interfaces including dual Serial ATA150, dual Gigabit Ethernet, RS-232/422 and USB. The TP 702/38x is capable of operating in temperatures ranging from -40°C to +85°C

HIGHLIGHTS

- 2.53 GHz, 2.0 GHz or 1.06 GHz Intel® Core™ i7 processor:
 - dual-core processor
 - 1066MHz DRAM Bus (800 MHz for 1.06 GHz processor)
 - 4 Mbytes shared last level cache
 - Intel® Hyper-Threading Technology
 - Intel® Turbo Boost technology
 - Intel® 64 Technology (64-bit computing support)
- Up to 8 Gbytes of dual channel DDR3-1066 ECC SDRAM
- 2 x 10/100/1000Mbps Ethernet interfaces accessed via J2
- 5 x Serial ATA channels:
 - 2 x SATA150 channels accessed via J2
 - 1 x SATA300 channel for optional on-board Flash disk
 - 2 x SATA300 channels routed to optional dual flash disk module
- 2 serial channel interfaces accessed via J2
- 2 x USB 2.0 interfaces accessed via J2
- Option for analog graphics via J2
- Watchdog and long duration timer
- CompactPCI controller:
 - operates in the system slot or in a peripheral slot
 - 32-bit at 33/66 MHz CompactPCI interface
- Option to bypass CompactPCI bus (Satellite Mode)
- Extended temperature versions:
 - -25°C to +70°C (E-Series)
 - -40°C to +85°C (K-Series, includes humidity sealant)
- Ruggedized air-cooled version (RA-Series):
 - -40°C to +75°C
 - conformally coated
 - see separate TP 702/38x-RA datasheet
- Ruggedized conduction-cooled version (RC-Series):
 - conduction-cooled to ANSI/VITA 30.1-2002
 - -40°C to +85°C
 - conformally coated
 - see separate TP 702/38x-RC datasheet
- Support for Linux®, Windows® 7, Windows® XP, Windows® XP Embedded, Windows® Server 2003, Windows® Server 2008, QNX®, Solaris® and VxWorks®

where it is suitable for a range of demanding applications within the defense, industrial control, telecomms, telemetry, scientific and aerospace markets. Ruggedized conduction-cooled and ruggedized air-cooled versions are planned. The board is plug compatible with the popular TP 402/35x family. To simplify the board's integration many popular industry standard operating systems are supported.

Central Processor

- 2.53 GHz Intel® Core™ i7-610E processor, 2.0 GHz Intel® Core™ i7-620LE processor or 1.06 GHz Intel® Core™ i7-620UE processor
- common processor features are:-
 - 32nm process technology
 - dual-core processor
 - 4 Mbytes shared last level cache
 - Intel® Hyper-Threading Technology
 - Intel® 64 Technology (64-bit computing)
 - Intel® Turbo Boost technology
 - uses Ball Grid Array package
- processor to DRAM memory, bus speed:-
 - 610E and 620LE - 1066MHz
 - 620UE - 800MHz
- graphics engine, core clock speed:-
 - 610E - 500MHz
 - 620LE - 266MHz
 - 620UE - 166MHz
 - Intel Turbo Boost technology allows faster graphics engine speed depending on the CPU loading
- utilizes Intel® Platform Controller Hub (PCH):-
 - Mobile Intel® QM57 Express chipset

DRAM

- up to 8 Gbytes DDR3-1066 ECC SDRAM:-
 - up to 8 Gbytes soldered on-board
 - single bit error correction
 - peak bandwidth of 17 Gbytes/s
 - dual channel architecture
- accessible from processor or CompactPCI® bus

Hard/Flash Drive Interfaces

- 2 x SATA150 channels accessible via J2
- 1 x SATA300 channel routed to an optional 4 Gbytes NAND Flash Drive Module
- 2 x SATA300 channels to optional Flash Drive Module:-
 - one or two Flash Drives
 - uses XMC connectors (see Note 1)
 - compatible with the TP 402/35x SBC
- Flash drive write protect signal from backplane

Ethernet Interfaces

- 2 x channels supporting:-
 - 10 Base-T, 100 Base-TX, 1000 Base-T
 - implemented by an Intel® 82577 and an Intel® 82574L, via 2 x1 PCI Express® ports
 - both channels accessed via J2

Graphics Interface

- optional analog graphics accessed via J2:-
 - integrated chipset graphics controller
- resolutions up to 2048 x 1536 @ 16M colors
- support for OpenGL 2.0, Windows® and Linux®

Serial Interfaces

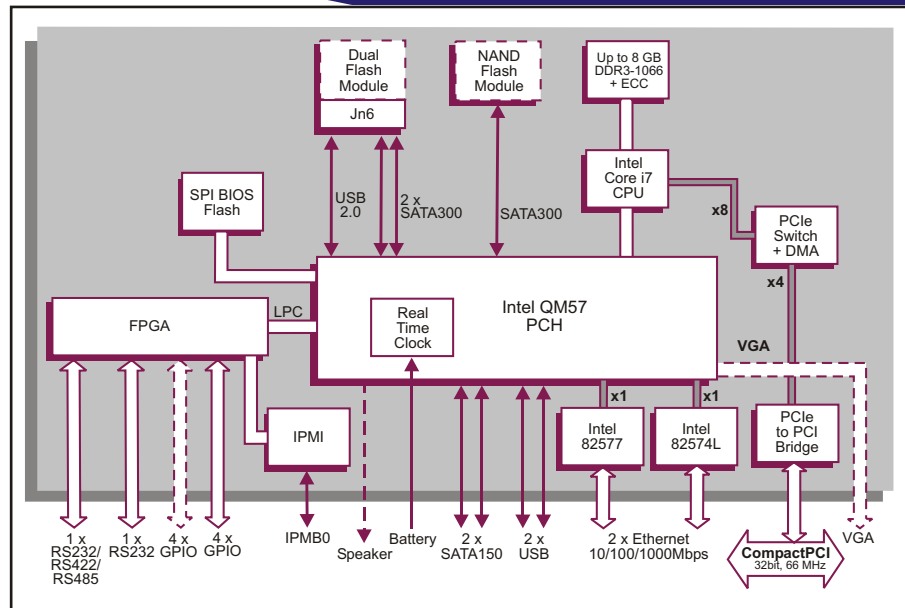
- 2 serial interfaces accessible via J2
- 1 x RS-232 interface supporting Tx and Rx
- 1 x RS-232 interface supporting Tx, Rx, RI, CTS, RTS, DSR, DTR and DCD or 1 x RS-422/RS-485 supporting Tx and Rx
- 16550 compatible UARTs

Flash EPROM

- 8 Mbytes of BIOS Flash EPROM

Firmware Support

- UEFI-compliant BIOS with legacy mode support
- comprehensive Power-On Self-Test (POST)
- LAN boot firmware included



Software Support

- support for Linux®, Windows® 7, Windows® XP, Windows® XP Embedded, Windows® Server 2003, Windows® Server 2008, QNX®, Solaris® and VxWorks®

Other Peripheral Interfaces

- PC-compatible Real Time Clock
- long duration timer and watchdog timer
- option for legacy speaker interface via J2
- 2 x USB 2.0 interfaces, both accessed via J2
- external battery supply for RTC and BIOS data
- option for 4 or 8 GPIO signals via J2
- system fan monitor; CPU temperature monitor; voltages monitor; all accessible via IPMI

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
- PCI Express link from processor via PCIe-PCI bridge for off-board accesses:-
 - DMA hardware support included
- operates as a System Slot controller (supporting up to 7 peripheral slots) or operates in a Peripheral Slot:-
 - supports hot-swapping peripheral boards
 - PICMG 2.1 R2.0 Hot Swap Specification
- 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 Spec.):-
 - implements the IPMB0 interface
- on-board Baseboard Management Controller
- supports 8 Kbytes of non-volatile memory

Safety

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

Electrical Specification (estimated)

- estimated typical power is 35W to 40W
- +5V @ tbdA (typical 2.53 GHz with 4Gbytes DRAM)
- +3.3V @ tbdA
- +12V and -12V not required
- all voltages are tolerant to ±5%

Environmental Specification

- operating temperatures:-
 - 0°C to +55°C (N-Series)
 - -25°C to +70°C (E-Series: 2.0 GHz or 1.06 GHz)
 - -40°C to +85°C (K-Series: 2.0 GHz or 1.06 GHz)
- storage temperature: -40°C to +85°C
- 5% to 95% Relative Humidity, non condensing (operating or storage):-
 - K-Series includes humidity sealant
- ruggedized versions, see separate datasheets:-
 - rear plug compatible
 - conduction-cooled: TP 702/38x-RC
 - air-cooled: TP 702/38x-RA

Mechanical Specification

- 3U form-factor: 3.9-inches x 6.3-inches (100mm x 160mm)
- single slot
- connectors: IEC-1076-4-101 for J1-J2
- shock: 20g, 11ms, ½ sine (operating); 30g, 11ms, ½ sine (non-operating)
- vibration: 5Hz-2000Hz at 2g, 0.38mm peak displacement (operating); 5Hz-2000Hz at 5g, 0.76mm peak displacement (non-operating)

I/O Compatible with the TP 402/35x

- rear I/O compatible with the popular TP 402/35x

Note 1: The XMC connectors are provided for the SATA Flash Disk Module only. The CPU heatsink for air-cooled boards can not support an XMC module. The conduction-cooled board (RC-Series) can support an optional XMC module (see TP 702/38x-RC datasheet).

ORDERING INFORMATION

Order Number Product Description (Hardware)

TP 702/381-xy	1.06 GHz Intel® Core™ i7-620UE processor
TP 702/382-xy	2.0 GHz Intel® Core™ i7-620LE processor
TP 702/383-xy	2.53 GHz Intel® Core™ i7-610E processor

For the order number suffix (xy) options please contact your local sales office:

where x = I/O

x - rear I/O configurations

where y = SDRAM size

y - up to 8 Gbytes SDRAM

For accessories please contact your local sales office.

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