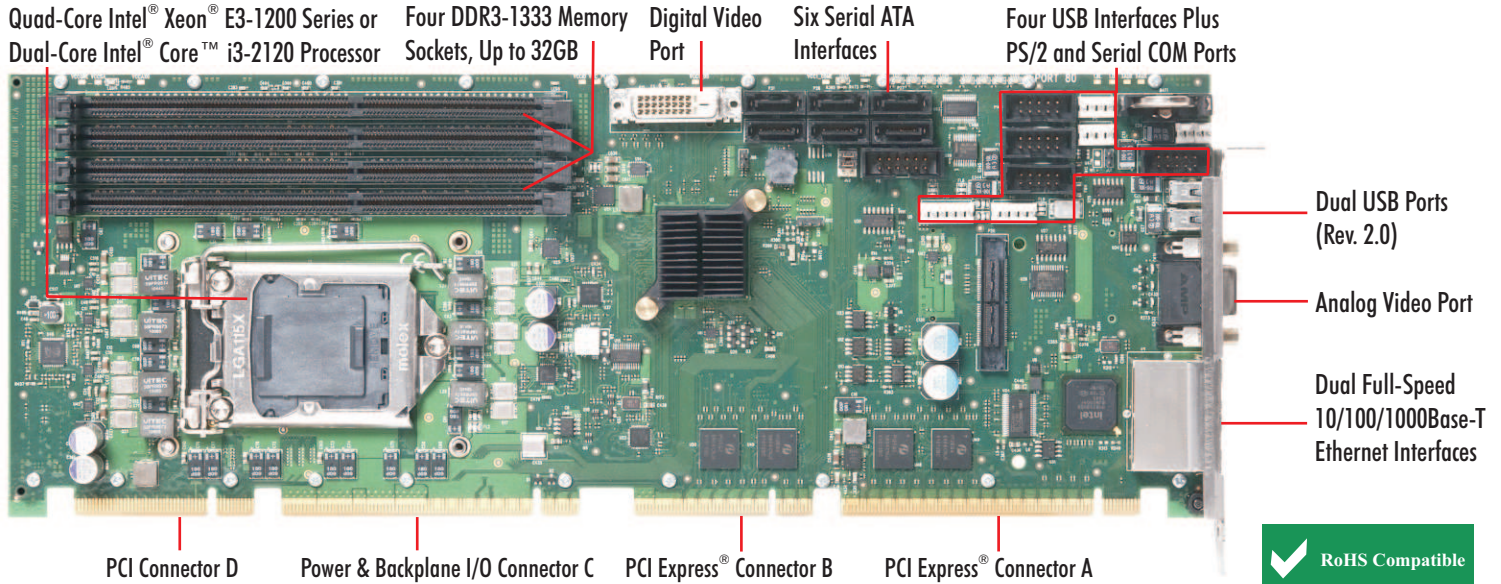


### SYSTEM HOST BOARD SUPPORTS FLEXIBLE SYSTEM DESIGNS



Trenton's TSB7053 single board computer is packed with features that enable engineers to design industrial computer system solutions that support a wide range of applications. Here's a brief list of the SBC highlights:

- System performance boost with Sandy Bridge micro-architecture
- Processor features and on-board TPM enhance system security
- Network interfaces & storage maximizes system capability
- Digital and analog video ports deliver system flexibility
- 5-year product warranty maximizes system ROI
- Deployment risks lowered with extended-life board design

#### PROCESSORS:

Quad-Core Intel® Xeon® E3-1200 Series, 3.1GHz - 3.4GHz  
 Intel® Core™ i7 - 2600 & Intel® Core™ i5 - 2400, quad-core  
 3.4GHz and 3.1GHz processors without ECC  
 Intel® Core™ i3 - 2120, dual-core 3.1GHz processor with ECC  
 Processor Package: LGA1155 \*Higher speed processors as available

Trenton's TSB7053 features the 2nd generation Intel® Core™ and Intel® Xeon® processors developed under the Sandy Bridge micro-architecture. These processors offer improved system performance and enhanced platform security. Here's a compelling list of CPU features supported on the TSB7053:

- Extended-life, embedded components provide longevity
- Enhanced graphics controller supports multiple video ports
- Full Intel® AMT 7.0 support for remote platform access and control functions including remote KVM redirection

#### PLATFORM CONTROLLER HUB (PCH):

The Intel® C206 is a Platform Controller Hub or PCH that takes the place of the traditional multi-component chipset. The PCH design approach saves power while providing enhanced system host board I/O, PCI Express and Ethernet interface capabilities.

#### THREE ETHERNET INTERFACES - 10/100/1000BASE-T:

The TSB7053 supports three Gigabit Ethernet interfaces. Two ports are located on the board's I/O bracket and a third LAN is routed for use on cable header P18 or as a PICMG 1.3 backplane interface via SHB edge connector C. Trenton has a 24" (610mm) Ethernet LAN cable available (part no. 193-500001150-00) for use with header P18 that has the mating P18 connector on one end and an Ethernet LAN connector mounted into an I/O plate on the other. This third Ethernet LAN will be useful in systems requiring Intel® AMT 7.0 support.

#### PCI EXPRESS® 2.0/1.1 INTERFACES:

Trenton's TSB7053 SHB supports PICMG® 1.3 server or graphics-class systems with either a x16 or two x8 PCI Express® links. An additional x4 PCIe link and eight PCIe reference clocks are also supplied on edge connectors A & B of the SHB. Trenton's optional IOB33 can be used on the board to provide an additional x4 PCIe link to a backplane. The TSB7053 automatically configures all direct PCIe links out the processors to operate as either PCIe 2.0 or PCIe 1.1 link interfaces based on the type of PCI Express endpoints such as option cards, PCIe switches and bridge chips. The SHB features PCI Express auto-negotiation for x1, x4, x8 and x16 PCIe card communications and PCIe 2.0 link repeaters for maximum signal integrity.

#### PCI EXPRESS INTERFACE CONFIGURATIONS:

PCI Express - Edge Connectors A & B

- One x16 or two x8 links, plus one x4 link
- Eight reference clocks
- 32-bit/33MHz

PCI - Edge Connector D

PCI Express - (IOB33/PCIe Expansion)

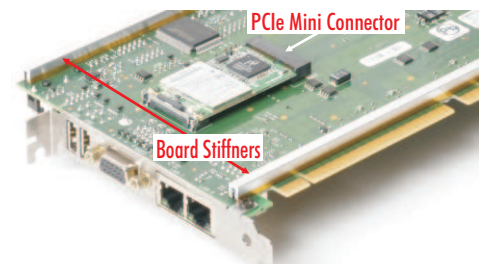
- One x4 link

The number, type and combination of PCI Express and PCI interfaces available on the TSB7053 enable system designers to develop solutions that meet a variety of application requirements in many diverse embedded computing markets.

#### DDR3-1333 MEMORY INTERFACE:

The DDR3-1333 memory interface is made up of two, dual-channel interfaces with two channels on each Intel® Xeon® processor E3-1200 series. The TSB7053 uses unbuffered ECC, PC3-8500 or PC3-10600 DDR3 DIMMs. A maximum memory capacity of 32GB is supported when using standard 8GB DDR3 DIMMs and 16GB with 4GB DDR3 DIMMs. The peak memory interface bandwidth per channel is 21GB/s when using the PC3-10600 DIMMs.

#### PCI EXPRESS® MINI CARD SUPPORT & BOARD STIFFENER BARS:



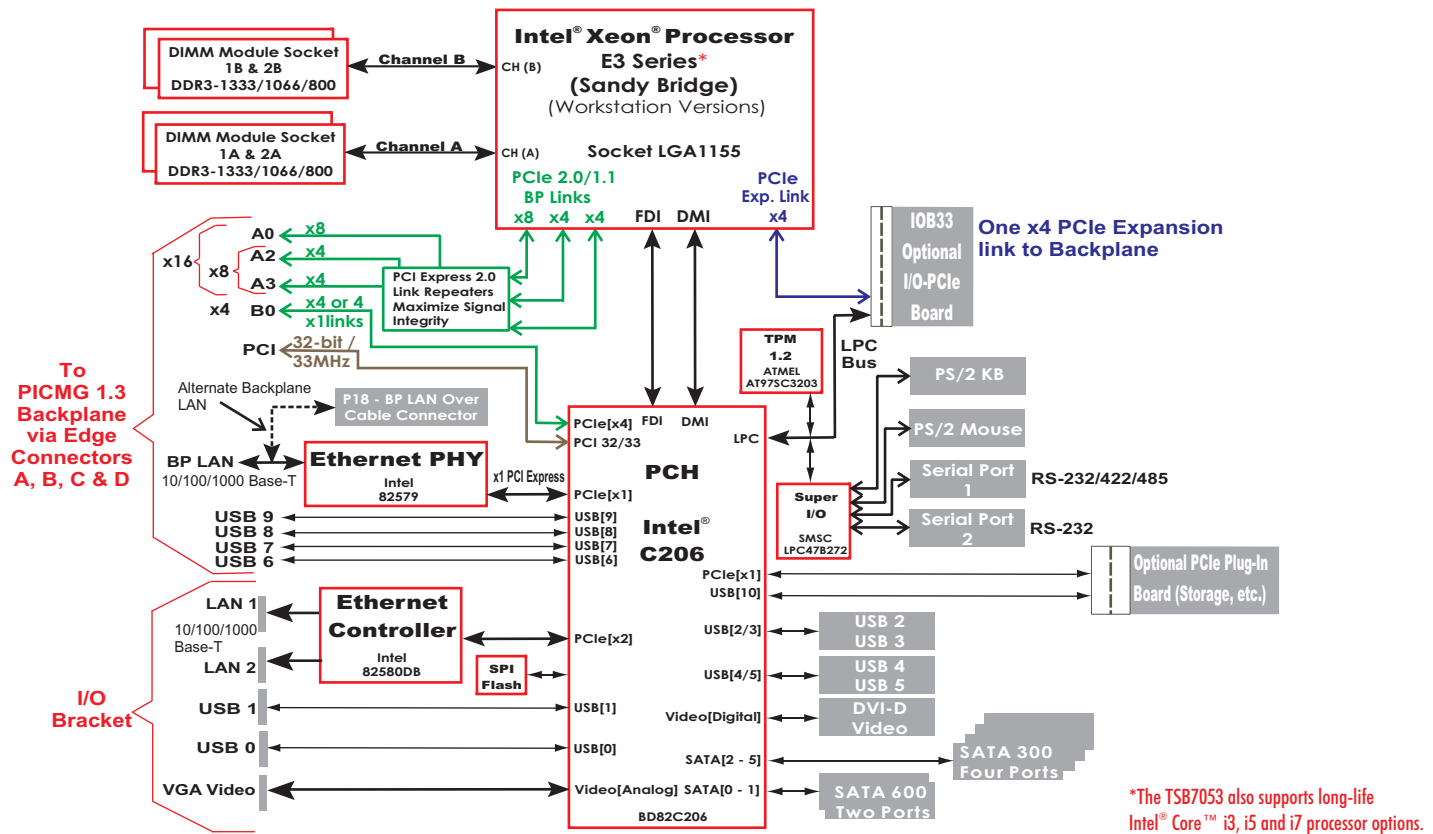
The rear of the TSB7053 SHB features a PCIe mini-connector that supports industry standard PCI Express Mini Cards. Standard PCIe mini cards are available to add WiFi capability to system designs or for additional SSD storage, video or I/O.

Two stiffener bars located on the back of the TSB7053 maximize system integrity by ensuring proper SHB alignment within the card guides of the computer chassis. The stiffeners provide reliable SHB operation by protecting sensitive board components from mechanical damage and assist in the safe insertion and removal of the SHB from the system.

#### BIOS (FLASH):

The board uses Aptio® 4.x BIOS from AMI and the BIOS resides in a SPI Flash device to simplify field upgrades and BIOS customization.





\*The TSB7053 also supports long-life Intel® Core™ i3, i5 and i7 processor options.

## SERIAL ATA/600 & 300 PORTS:

An integrated Serial ATA (SATA) controller in the Intel® C206 features two SATA ports with data transfer rates up to 600MB/s and four additional ports that transfer data at 300MB/s. Independent SATA drive operation and RAID drive array configurations are supported.

## UNIVERSAL SERIAL BUS INTERFACES (USB 2.0):

There are ten USB 2.0 interfaces on the TSB7053 SHB. USB ports 0 and 1 are located on the I/O bracket, on-board headers contain ports 2, 3, 4 and 5, while ports 6, 7, 8 and 9 are routed to the SHB's edge connector C for use on backplanes that support the optional PICMG 1.3 USB interface capability.

## VIDEO:

The integrated graphics controller of the board's processor dynamically utilizes a portion of the system memory based on the OS and the amount of memory installed. The Intel® Xeon® E3-1200 series features Intel® HD Graphics P3000 to support maximum video resolutions of 2560 x 1600. Two independent video interfaces are available to the system designer with the I/O bracket supporting an analog video port while the on-board DVI-D connector supports digital video.

## ADDITIONAL PRODUCT FEATURES:

### I/O Features:

- Optional I/O and PCIe expansion board provides:
  - x4 PCIe link routing to backplane PCIe Expansion Slot via an optional IOB33 plug-in module
  - Two high-speed serial ports RS232 & RS232/422/485
  - PS/2 mouse and keyboard interface headers
- The TSB7053 provides a programmable watchdog timer with programmable timeout periods of 100 msec, 1 second, 10 seconds or 1 minute via board component U13. When enabled the WDT generates a system reset. WDT control is supplied via the General Purpose IO pins from the Intel® C206 Platform Controller Hub (PCH).

## APPLICATION CONSIDERATIONS:

### Power Requirements:

Typical Values - Static Desktop (Idle) with 16GB of system memory

CPU	Intel® No.	+5V	+12V	+3.3V
3.4GHz	E3-1275	0.68A	1.54A	2.79A
3.4GHz	Core i7-2600	0.72A	1.56A	2.81A
3.1GHz	E3-1225	0.67A	1.54A	2.77A
3.1GHz	Core i5-2400	0.73A	1.56A	2.81A
3.3GHz	Core i3-2120 <sup>0</sup>	0.71A	1.36A	2.68A

Typical Values - 100% Stress State with 16GB of system memory

CPU	Intel® No.	+5V	+12V	+3.3V
3.4GHz	E3-1275	0.78A	5.68A	2.92A
3.4GHz	Core i7-2600	0.81A	5.85A	2.94A
3.1GHz	E3-1225	0.75A	5.24A	2.89A
3.1GHz	Core i5-2400	0.81A	5.08A	2.91A

### Temperature/Environment:

- Operating Temperature: 0° to 50° C.
- Air Flow Requirement: 350LFM continuous airflow
- Storage Temperature: -40° to 70° C.
- Humidity: 5% to 90% non-condensing

### Mechanical:

The standard active cooling solution used on the TSB7053 enables placement of option cards approximately 2.15" (54.61mm) away from the top component side of the SHB. Contact Trenton for a system engineering consultation if your application needs a lower profile cooling solution. The overall board dimensions are 13.330" (33.858cm) L x 4.976" (12.639cm) H.

## ORDERING INFORMATION:

Part Number	CPU Speed	Intel® No.*
392705303400000	3.4GHz	E3-1275
392705300400000	3.4GHz	Core i7-2600
392705304200000	3.1GHz	E3-1225 <sup>#</sup>
392705301200000	3.1GHz	Core i5-2400 <sup>#</sup>
392705302200000	3.3GHz	Core i3-2120 <sup>0</sup>

(xG = Memory)

## STANDARDS:

- PCI Express® Base Specifications 2.0 and 1.1
- SHB Express® System Host Board PCI Express Specification - PCI Industrial Computer Manufacturers Group (PICMG®) 1.3

## AGENCY APPROVALS:

UL60950, CAN/CSA C22.2 No. 60950-00, EN55022:1998 Class B, EN61000-4-2:1995, EN61000-4-3:1997, EN61000-4-4:1995, EN61000-4-5:1995, EN61000-4-6:1996, EN61000-4-11:1994

The stated processing, memory and communication interface speeds and bandwidths are component maximums; actual system performance may vary.

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