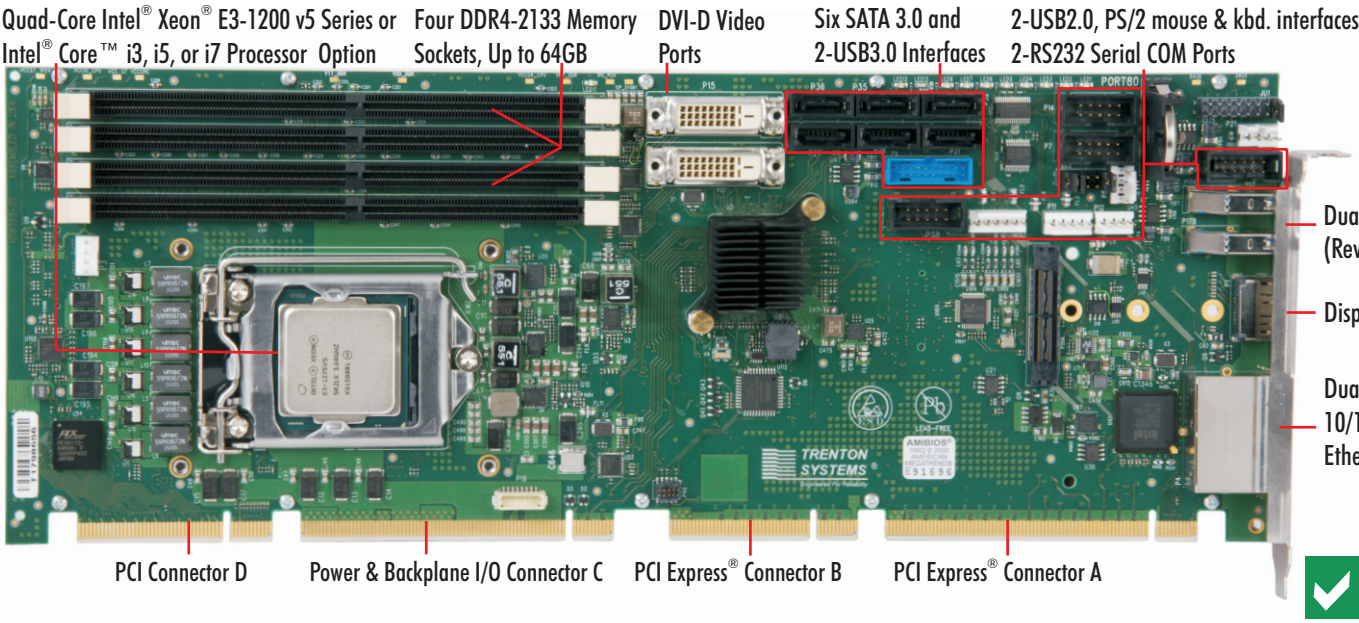
TKL8255

SYSTEM HOST BOARD PRODUCT DATA SHEET

TKL8255 delivers expanded video and data storage support



RoHS Compatible

Trenton's TKL8255 single board computer delivers the performance of Intel Xeon E3-1200 v6 series processors to the PICMG 1.3 standard. Leveraging advanced peripheral interconnect topologies and multimedia interfaces, the TKL8255 ensures PICMG 1.3-based systems will outperform for years to come while maintaining legacy compatibility.

- Multi-core Kaby Lake-S processors for reliable performance
- Full x4 PCIe M.2 Slot delivers max. bandwidth to PCIe SSDs
- All-digital display interfaces for graphically-intensive applications
- 5-year product warranty maximizes system ROI
- On-board RAID supports a 6-drive SATA/600 storage array
- Deployment risks lowered with extended-life board design

LONG-LIFE EMBEDDED PROCESSOR OPTIONS:

Quad-Core Intel® Xeon® E3-1200 v6 Series, 3.3GHz - 3.8GHz*
Intel® Core™ i7 - 7700T quad-core 2.9GHz processor without ECC*
Intel® Core™ i5 - 7500T quad-core 2.7GHz processor without ECC*
Intel® Core™ i3 - 7101TE dual-core 3.4GHz processor with ECC*
Processor Package: LGA1151

*Higher speed processors as available

The validated processor options on the TKL8255 feature the 14nm Intel® Micro-Architecture formally known as Kaby Lake-S. These validated processors offer improved graphical performance, greater power efficiency and enhanced platform and system memory security. Additional supported features include:

- Intel® AES-NI for encryption acceleration and data security

PLATFORM CONTROLLER HUB (PCH):

The Intel® C236 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.

VIDEO INTERFACES:

The processor's integrated graphics controller dynamically utilizes a portion of the system memory as required by application software. The Intel® Xeon® E3-1200 v6 series features Intel® HD GT2 Graphics while the 7th Generation Intel® Core™ processors offer Intel® HD Graphics 630. Both processor types support max. video resolutions of 4096x2304 @60Hz. Independent DisplayPort and DVI interfaces are available, with the DisplayPort on the SHB's I/O bracket and the 2, DVI-D connectors onboard. Use Trenton dual DVI-D connector I/O bracket (part no. 198-500001176-00) for simplified DVI video integration.

PCI EXPRESS® 3.0 INTERFACES:

Trenton's TKL8255 SHB is compatible with PICMG® 1.3 compliant backplanes. SHB backplane edge connectors A & B includes either a x16 (A0) or two x8 PCI Express® 3.0 links (A0 & A2) or one x8 and 2 x4 (A0, A2 & A3) links, plus an additional x4 PCIe link (B0) and eight PCIe reference clocks are also supplied on these edge connectors. SHB-to-backplane links are automatically configured to operate as either PCIe 3.0, 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 cards, and the PCIe lane traces are routed to reduce latency.

ADDITIONAL INTERFACES:

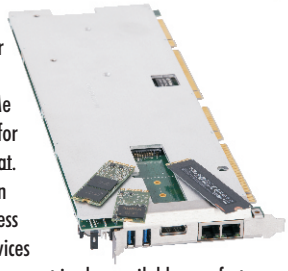
PCI - Edge Connector D - 32-bit/33MHz

The number, type and combination of PCI Express and PCI interfaces available on the TKL8255 enable system designers to develop solutions that meet a variety of application requirements in many diverse embedded computing markets.

DDR4-2133 SYSTEM MEMORY INTERFACE:

The DDR4-2133 memory interface is made up of two, dual-channel interfaces with a peak memory interface bandwidth per channel of 34.1GB/s when using PC4-17000 DIMMs. The SHB is optimized for use with DDR4, unbuffered ECC, PC4-14900 or PC4-17000 DIMMs. Maximum memory capacity is 64GB is when using standard, 16GB DDR4 DIMMs and 32GB with 8GB DDR4 DIMMs.

NVMe M.2 DRIVE SUPPORT & BACKER PLATE:



The rear of the TKL8255 SHB features a M.2 connector driven by a x4 PCIe 3.0 link interface for high speed NVMe SSD storage modules keyed for the Socket 3/M module format. The M.2 default configuration supports the fastest PCI Express implementation of NVMe devices possible. SATA M.2 interface support is also available as a factory configuration option: contact Trenton for SATA M.2 details. The M.2 slot is fully accessible with the TKL8255's full-length backer plate installed for ease of maintenance. The backer plate maximizes system integrity by ensuring proper SHB alignment within the computer chassis, and aids in the safe insertion and removal of the SHB from the system. The backer plate reduces board flex while protecting sensitive board components.

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

Two Gigabit Ethernet 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 connects P18 to an Ethernet LAN connector mounted into an I/O plate.

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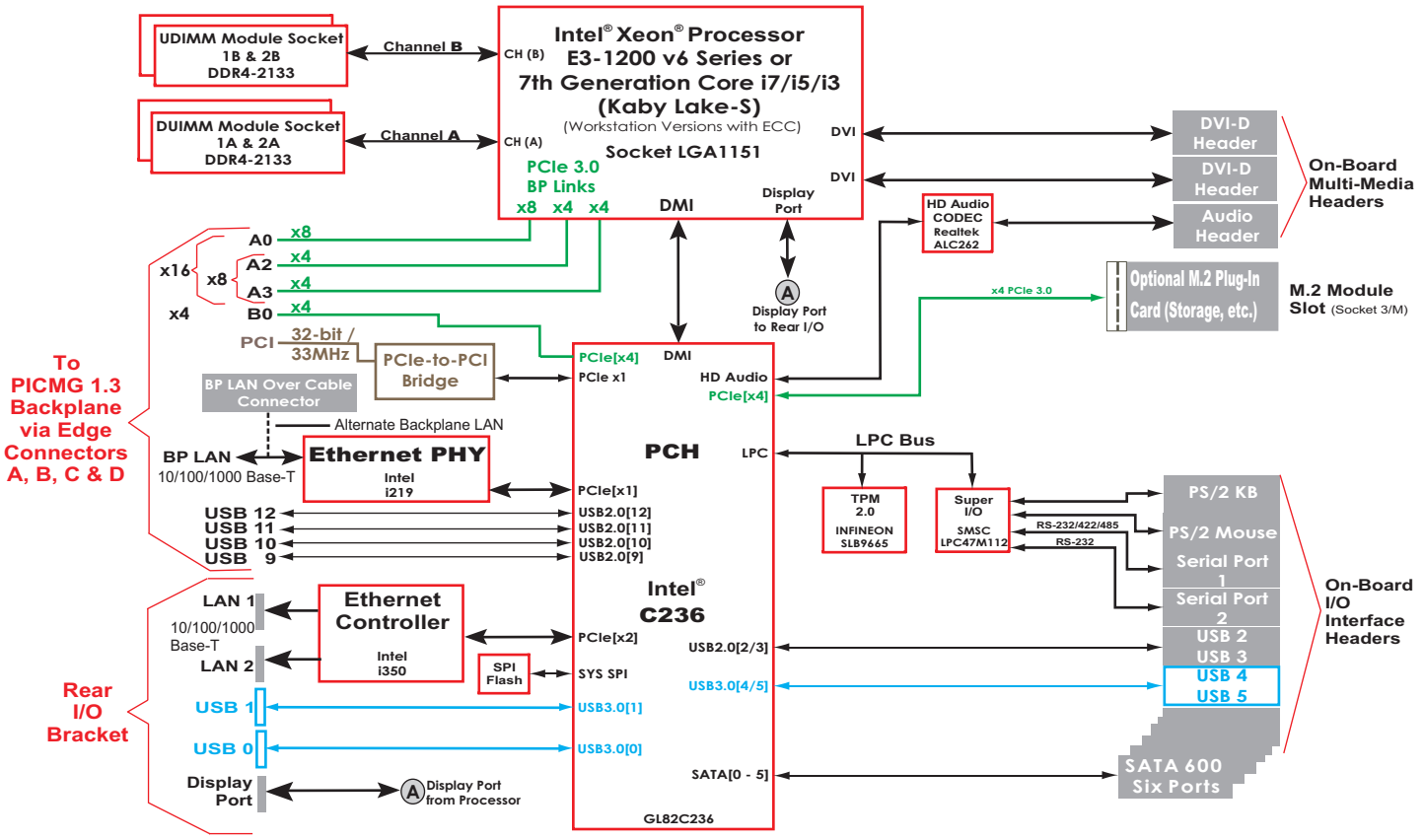

UNIVERSAL SERIAL BUS INTERFACES (USB 3.0 & 2.0):

There are ten USB interfaces available on the TKL8255 SHB. USB ports 0 and 1 are located on the I/O bracket and support USB 3.0 & 2.0 devices as does on-board header P6 which supports USB ports 4 & 5. On-board header ports 2 and 3, and backplane interface ports 8, 9, 10 and 11; routed to the SHB's edge connector C, support USB 2.0 devices.

SERIAL ATA/600 PORTS:

An integrated Serial ATA (SATA) controller in the Intel® C236 Platform Controller Hub features six SATA ports with data transfer rates up to 600MB/s. The TKL8255 supports independent SATA drive operation and RAID storage array configurations.

ADDITIONAL PRODUCT FEATURES:

I/O Features:

- Two on-board RS232 headers (one RS232/422/485) plus PS/2 mouse and PS/2 keyboard interface connections
- Optional AUD6777 routes analog audio to I/O bracket
  AUD6777 Trenton part number 9200677700

Security and Reliability:

- The TKL8255 provides a programmable watchdog timer with programmable timeout periods of 100 msec to three minutes via board component U8. When enabled, the WDT generates a system reset at the selected timeout period. WDT control is supplied via the General Purpose IO pins from the Intel® C236 Platform Controller Hub (PCH).
- The TKL8255 supports Trusted Platform Module (TPM) specification 2.0

Contact Trenton Systems Support for application specific deployment information.

BIOS (FLASH):

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

APPLICATION CONSIDERATIONS:

Power Requirements:

Typical Values* - Static Desktop (Idle) with 32GB of system memory

CPU	Intel® No.	+5V	+12V	+3.3V
3.8GHz	E3-1275 v6	0.59A	1.74A	2.25A
3.7GHz	E3-1245 v6	0.62A	1.77A	2.24A
3.3GHz	E3-1225 v6	0.58A	1.74A	2.22A
2.9GHz	Core i7-7700T	0.63A	1.80A	2.25A
2.7GHz	Core i5-7500T	0.62A	1.74A	2.21A
3.4GHz	Core i3-7101TE[D]	0.65A	1.74A	2.24A

Typical Values - 100% Stress State with 32GB of system memory

CPU	Intel® No.	+5V	+12V	+3.3V
3.8GHz	E3-1275 v6	0.73A	8.66A	2.29A
3.7GHz	E3-1245 v6	0.75A	8.00A	2.31A
3.3GHz	E3-1225 v6	0.68A	6.53A	2.22A
2.9GHz	Core i7-7700T	0.74A	5.77A	2.28A
2.7GHz	Core i5-7500T	0.73A	5.51A	2.24A
3.4GHz	Core i3-7101TE[D]	0.70A	5.20A	2.27A

D = Dual-core CPU, all other processors are quad-core. NOTE: All SHB processor options support Intel® Hyper-Threading except the Intel® Xeon® E3-1225 v6 & Intel® Core™ i5-7500T
*Actual power numbers will vary as a function of the system application.

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 TKL8255 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	Max.TDP	Intel® No.*
92825507200000	3.8GHz	73W	E3-1275 v6
92825507300000	3.7GHz	73W	E3-1245 v6
92825507700000	3.3GHz	73W	E3-1225 v6[N]
92825508600000	2.9GHz	35W	Core i7-7700T[C]
92825509100000	2.7GHz	35W	Core i5-7500T[C, N]
92825509700000	3.4GHz	35W	Core i3-7101TE[D]

* = All CPU options are embedded CPUs, D = Dual-Core CPU, C = Processor does not support ECC Memory, N = Processor does not support Intel® Hyper-Threading, TDP = Thermal Design Power rating

STANDARDS:

- PCI Express® Base Specifications 3.0, 2.0 and 1.1
- SHB Express®System Host Board PCI Express Specification - PCI Industrial Computer Manufacturers Group (PICMG®) 1.3

AGENCY APPROVALS:

Designed for UI60950, 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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