The NVIDIA Tesla™ C2050 and C2070 Computing Processors fuel the transition to parallel computing and bring the performance of a small cluster to the desktop.

Based on the next-generation CUDA™ architecture codenamed "Fermi", the 20-series family of Tesla GPUs support many "must have" features for technical and enterprise computing including C++ support, ECC memory for uncompromised accuracy and scalability, and a 7X increase in double precision performance compared Tesla 10-series GPUs. The Tesla C2050 and C2070 GPUs are designed to redefine high performance computing and make supercomputing available to everyone.

Compared to the latest quad-core CPUs, Tesla C2050 and C2070 Computing Processors deliver equivalent supercomputing performance at 1/10th the cost and 1/20th the power consumption.

**TECHNICAL SPECIFICATIONS**

**FORM FACTOR**
- 9.75" PCIe x16 form factor

**# OF TESLA GPUs**
- 1

**# OF CUDA CORES**
- 448

**FREQUENCY OF CUDA CORES**
- 1.15 GHz

**DOUBLE PRECISION FLOATING POINT PERFORMANCE (PEAK)**
- 515 Gflops

**SINGLE PRECISION FLOATING POINT PERFORMANCE (PEAK)**
- 1.03 Tflops

**TOTAL DEDICATED MEMORY**
- Tesla C2050: 3GB GDDR5*
- Tesla C2070: 6GB GDDR5*

**MEMORY SPEED**
- 1.5 GHz

**MEMORY INTERFACE**
- 384-bit

**MEMORY BANDWIDTH**
- 144 GB/sec

**POWER CONSUMPTION**
- 247W TDP

**SYSTEM INTERFACE**
- PCIe x16 Gen2

**THERMAL SOLUTION**
- Active Fansink

**SOFTWARE DEVELOPMENT TOOLS**
- CUDA C/C++, Fortran, OpenCL
- DirectCompute Toolkits
- NVIDIA Parallel Nsight™ for Visual Studio

*Note: With ECC on, a portion of the dedicated memory is used for ECC bits, so the available user memory is reduced by 12.5%. (e.g. 3 GB total memory yields 2.625 GB of user available memory.)

NVIDIA TESLA™ C2050 / C2070 GPU COMPUTING PROCESSOR
SUPERCOMPUTING AT 1/10TH THE COST

BIO SCIENCE

FINANCE

MEDICAL
**FEATURES AND BENEFITS**

<table>
<thead>
<tr>
<th><strong>GPUs POWERED BY THE FERMI-GENERATION OF THE CUDA ARCHITECTURE</strong></th>
<th>Delivers cluster performance at 1/10(^{th}) the cost and 1/20(^{th}) the power of CPU-only systems based on the latest quad core CPUs.</th>
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<tbody>
<tr>
<td><strong>448 CUDA CORES</strong></td>
<td>Delivers up to 515 Gigaflops of double-precision peak performance in each GPU, enabling a single workstation to deliver a Teraflop or more of performance. Single precision peak performance is over a Teraflop per GPU.</td>
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<td><strong>ECC MEMORY</strong></td>
<td>Meets a critical requirement for computing accuracy and reliability for workstations. Offers protection of data in memory to enhance data integrity and reliability for applications. Register files, L1/L2 caches, shared memory, and DRAM all are ECC protected.</td>
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<td><strong>DESKTOP CLUSTER PERFORMANCE</strong></td>
<td>Solves large-scale problems faster than a small server cluster on a single workstation with multiple GPUs.</td>
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<td><strong>UP TO 6GB OF GDDR5 MEMORY PER GPU</strong></td>
<td>Maximizes performance and reduces data transfers by keeping larger data sets in local memory that is attached directly to the GPU.</td>
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<td><strong>NVIDIA PARALLEL DATACACHE™</strong></td>
<td>Accelerates algorithms such as physics solvers, ray-tracing, and sparse matrix multiplication where data addresses are not known beforehand. This includes a configurable L1 cache per Streaming Multiprocessor block and a unified L2 cache for all of the processor cores.</td>
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<td><strong>NVIDIA GIGATHREAD™ ENGINE</strong></td>
<td>Maximizes the throughput by faster context switching that is 10X faster than previous architecture, concurrent kernel execution, and improved thread block scheduling.</td>
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<td><strong>ASYNCHRONOUS TRANSFER</strong></td>
<td>Turbocharges system performance by transferring data over the PCIe bus while the computing cores are crunching other data. Even applications with heavy data-transfer requirements, such as seismic processing, can maximize the computing efficiency by transferring data to local memory before it is needed.</td>
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<tr>
<td><strong>CUDA PROGRAMMING ENVIRONMENT WITH BROAD SUPPORT OF PROGRAMMING LANGUAGES AND APIs</strong></td>
<td>Choose C, C++, OpenCL, DirectCompute, or Fortran to express application parallelism and take advantage of the &quot;Fermi&quot; GPU’s innovative architecture. NVIDIA Parallel Nsight tool is available for Microsoft Visual Studio developers.</td>
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<tr>
<td><strong>HIGH SPEED, PCIE GEN 2.0 DATA TRANSFER</strong></td>
<td>Maximizes bandwidth between the host system and the Tesla processors. Enables Tesla systems to work with virtually any PCIe-compliant host system with an open PCIe x16 slot.</td>
</tr>
</tbody>
</table>

**DRIVERS AND DOWNLOADS**

- Tesla C2050/C2070 is supported under:
  - Linux 32-bit and 64-bit
  - Windows XP, Windows Vista, Windows 7 (32-bit and 64-bit)
- Vertical Solutions and Software page:
  - www.nvidia.com/object/vertical_solutions.html
- Software for Tesla C2050 / C2070:
  - Software development tools is available at www.nvidia.com/object/tesla_software.html

**SUPPORT**

- **HARDWARE SUPPORT**
  For RMA requests, replacements and warranty issues regarding your NVIDIA based product, please contact the reseller that you purchased it from.
- **KNOWLEDGEBASE**
  Our knowledgebase is available online 24x7x365 and contains answers to the most common questions and issues: www.nvidia.custhelp.com/cgi-bin/nvidia.cfg/php/enduser/std_alp.php
- **USER FORUMS**
  Discuss Tesla products, talk about CUDA development, and share interesting issues, tips and solutions with your fellow NVIDIA Tesla users on the CUDA discussion forums: wwwforums.nvidia.com
- **PRE-PURCHASING SUPPORT**
  Pre-purchasing support is available to assist you in deciding which Tesla unit to purchase for your application: www.nvidia.com/object/tesla_assistance.html

To learn more about NVIDIA Tesla, go to www.nvidia.com/tesla

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