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PCA-6194

LGA 775 Intel® Core™ 2 Duo / Pentium® D / Pentium® 4 / Celeron® D Processor Card with PCI-ISA Bus / IPMI / VGA / DVI / Dual Gigabit LAN

User Manual

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Memory Compatibility

Table 1.1: PCA-6194 Memory Tested for Compatibility

| Brand | Size | Speed | Type | Memory |
|------------------|-------|----------|------|---|
| Apacer | 1GB | DDR2 533 | DDR2 | SAMSUNG K4T51083QB-ZKD5 (128x4) |
| | 256MB | DDR2 533 | DDR2 | SAMSUNG 443 K4T56083QF-GCD5 (32x8) |
| Transcend | 512MB | DDR2 533 | DDR2 | ELPIDA E5108AB-5C-E (64x8) |
| | 1GB | DDR2 533 | DDR2 | ELPIDA E5108AB-5C-E (64x8) |
| DSL | 512MB | DDR2 533 | DDR2 | infineon HYB18T512 800AF37 FSS43331 (64x8) |
| | 1GB | DDR2 533 | DDR2 | ELPIDA E5108AE-5C-E (64x8) |
| Apacer (RoHS) | 1GB | DDR2 533 | DDR2 | ELPIDA E5108AG-5C-E (64x8) |
| | 512MB | DDR2 667 | DDR2 | ELPIDA E5108AG-6E-E (64x8) |
| Transcend (RoHS) | 1GB | DDR2 667 | DDR2 | ELPIDA E5108AG-6E-E (64x8) |
| | 256MB | DDR2 533 | DDR2 | infineon HYB18T512160AF3.7 3VV21710 (32x16) |
| | 512MB | DDR2 533 | DDR2 | SEC K4T51083QC ZCD5 (64X8) |
| | 1GB | DDR2 533 | DDR2 | SEC K4T51083QC ZCD5 (64X8) |
| | 512MB | DDR2 667 | DDR2 | SEC K4T51083QC ZCE6 (64x8) |
| | 512MB | DDR2 667 | DDR2 | Micron 5XB32D9DCL (64x8) |
| | 1GB | DDR2 667 | DDR2 | SEC K4T51083QE ZCE6 (64x8) |
| Transcend (RoHS) | 2GB | DDR2 667 | DDR2 | Micron 7HE12 D9HNL (128x8) |
| | 1GB | DDR2 800 | DDR2 | ProMOS V59C1512804QBF25 (64x8) |
| DSL | 2GB | DDR2 667 | DDR2 | SAMSUNG K4T1G084QA-ZCE6 (128x8) |
| | 1GB | DDR2 667 | DDR2 | ELPIDA E5108AGBG-6E-E (64x8) |
| DSL | 1GB | DDR2 800 | DDR2 | ELPIDA E5108AHSE-8E-E (64x8) |

Network Feature Comparison

Table 1.2: PCA-6194 comparison table

| LAN/Model | PCA-6194F | PCA-6194G2 | PCA-6194VG |
|----------------------|------------------|-------------------|-------------------|
| LAN1: Intel® 82566DM | Yes | Yes | Yes |
| LAN2: Intel® 82573V | Yes | Yes | No |
| IPMI | Yes | No | No |
| DVI | Yes | No | No |

Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, type of PC, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

Before you begin installing your single board computer, please make sure that the following materials have been shipped:

- PCA-6194 Intel® Core™ 2 Duo/Pentium® D/Pentium® 4/Celeron® D processor-based single board computer
- 1 PCA-6194 startup manual
- 1 CD with driver utility and manual (in PDF format)
- 1 FDD cable P/N: 1700340640
- 1 Ultra ATA 66/100 HDD cable P/N: 1701400452
- 2 Serial ATA HDD data cable P/N: 1700003194
- 2 Serial ATA HDD power cable P/N: 1703150102
- 1 Printer (parallel) port & COM port cable kit P/N: 1701260305
- 1 Dual COM port cable kit (Dual LAN Port version only) P/N: 1701092300
- 1 Y cable for PS/2 keyboard and PS/2 mouse P/N: 1700060202
- 1 ATX 12V power converter cable P/N: 170304015K
- 1 DVI cable (PCA-6194F & PCA-6194G2-D0 only) P/N: 1700000821
- 1 USB cable with 4 ports P/N: 1700002314
- 1 warranty card P/N: 2190000902

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the PCA-6194 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the PCA-6194, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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CHAPTER

1

Hardware Configuration

Chapter 1 Hardware Configuration

1.1 Introduction

The PCA-6194 is designed with the Intel® Q965 chipset and ICH8DO (I/O controller) to support Core™ 2 Duo, Dual-Core Pentium® D / Pentium® 4 / Celeron® D processors with a 533/800/1066 MHz front side bus and DDR2 533/667/800 MHz memory up to 8 GB. It follows the PICMG 1.0 specification and is the best solution for high-performance computing and applications in which a wide I/O bandwidth is demanded.

The PCA-6194 supports IPMI 2.0 for enhanced system management. With this feature users may manage and monitor the system health status remotely. Another remote management port allows users to monitor the system health status and control the system remotely through standard SNMP/HTTP protocols when used with Advantech's ACMM-1000 and SNMP-1000 Intelligent System Manager modules.

The PCA-6194 offers a high-performance cost-saving integrated graphics unit, built into the Intel® Q965 chipset, and features the unique Intel® Extreme Graphics architecture to maximize VGA performance and share up to 256 MB of system memory. In addition, the PCA-6194 has a single/dual Gigabit Ethernet LAN via dedicated PCI Express x 1 bus, which offers bandwidths up to 500 MB/sec., eliminating the network data flow bottlenecks, and incorporating Gigabit Ethernet to operate at 1000 Mbps. High reliability and outstanding performance make the PCA-6194 the ideal platform for industrial networking applications.

By using the Intel® ICH8DO chipset, the PCA-6194 offers six on-board SATA2 interfaces (bandwidth = 300 MB/sec) with software RAID 0, 1, 5, 10 functions; and six USB 2.0 connections. These powerful I/O capabilities ensure even more reliable data storage capabilities and suitable for work with high-speed I/O peripherals.

The ICH8DO provides a new high definition audio interface. Combined with Advantech's PCA-AUDIO-HDA1E module, the PCA-6194 offers excellent audio functions for the industrial environment.

The PCA-6194 is designed with considerations for extended reliability, and is built especially to suit demanding industrial environments. The CMOS data backup and restore function protects the BIOS setup data from loss due to battery failure. A 256-level watchdog timer prevents the system from hanging up if a program cannot be executed normally.

The PCA-6194 also adopts Advantech's unique patented "Sleep Mode Control Circuit" for AT Power Mode. With this thoughtful design, users need NOT clear the CMOS after the system enters S3 mode. With all these excellent features and outstanding performance, the PCA-6194 is definitely the ideal platform for today's industrial applications.

1.2 Features

- Supports LGA 775 Intel® Core 2 Duo / Pentium D / Pentium 4 / Celeron D FSB 1066/800/533 MHz processors
- Supports Dual-channel DDR II 800/667/533 SDRAM up to 8 GB
- Dual Gigabit Ethernet via two PCI Express x1 port
- Supports IPMI 2.0 with on board BMC module
- 6 SATA II HDDs
- Supports software SATA Raid 0, 1, 5 & 10
- 6 USB 2.0 ports
- 2 COM ports. COM2 port can be configured to support RS-232/422/485 through a pin header
- CMOS automatic backup and restore to prevent accidental data loss of BIOS setup

1.3 Specifications

1.3.1 System

- **CPU:** Intel® LGA 775 Core™ 2 Duo, Pentium D, Pentium 4, Celeron D up to 2.66/3.6/3.8/3.33 GHz, FSB 533/800/1066 MHz.
- **L2 Cache:** CPU has built-in 4 MB (for Core™ 2 Duo), 2 x 1024KB/2 x 2048KB (for Pentium D CPU), 1024KB/2048KB (for Pentium 4 CPU), 256KB/512 KB (For Celeron D CPU) full-speed L2 cache.
- **BIOS:** Award Flash BIOS (16 Mb Flash via SPI bus)
- **System Chipset:** Intel Q965 with ICH8DO
- **SATA/EIDE hard disk drive interface:** Six on-board SATA2 connectors with data transmission rate up to 300 MB/s and supporting Advanced Host controller interface (AHCI) technology. One on-board IDE connector supporting up to two enhanced IDE devices. Supports PIO mode 4 (16.67MB/s data transfer rate) and ATA 33/66/100 (33/66/100MB/s data transfer rate.)

- **Floppy disk drive interface:** Supports one floppy disk drive, 5¼" (360 KB and 1.2 MB) or 3½" (720 KB, 1.44 MB). BIOS enable/disable

1.3.2 Memory

- **RAM:** Up to 8 GB in four 240-pin DIMM sockets. Supports dual-channel DDRII 533/667/800 SDRAM.

1.3.3 VGA interface

- **Controller:** Intel Q965 chipset integrated
- **Display memory:** Share system memory up to 256 MB
- **Resolution:** up to 2048x1536 @ 75Hz

1.3.4 Input/Output

- **Bus interface:** PICMG 1.0 compliant PCI/ISA bus interface.
- **PCI Bus:** 32-bit / 33 MHz
- **ISA bus:** Supports ISA high drive (ITE IT8888 PCI-to-ISA bridge)
- **Enhanced parallel port:** Configured to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports:** Two serial ports on-board pin header, COM2 port can be configured for support RS-232/422/485.
- **Keyboard and PS/2 mouse connector:** One 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An on board keyboard pin header connector is also available
- **USB port:** Supports up to six USB 2.0 ports with transmission rate up to 480Mbps.
- **Audio:** PCA-6194 can provide audio with the optional PCA-AUDIO-HDA1E audio extension module

1.3.5 Ethernet LAN

- Supporting single/dual 10/100/1000Base-T Ethernet port(s) via PCI Express x1 bus which provides 500 MB/s data transmission rate.
- **Controller:**
 - LAN 1: Intel® 82566DM (G2 version or VG version)
 - LAN 2: Intel® 82573V (G2 Version)

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels)

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- **Storage temperature:** -20 ~ 70° C (-4 ~ 158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +3.3V, +5V, +12V, +5VSBY
- **Power consumption:**
Configuration 1: Intel Pentium D 960 (3.60 GHz, 130 W) & 4 GB of DDRII 800
Configuration 2: Intel Core 2 Duo E6700 (2.66 GHz, 65W) & 4 GB of DDRII 800
- **Test program:** Intel Max power 100% + BurnIn Test 4.0
 - +12 V Config1: 13 A / Config2: 6.6 A
 - +5 V 10 A
 - +3.3 V 0 A
 - +5 VSB 0.7 A
 - 12 V 0 A
 - 5 V 0 A
- **Board size:** 338 x 122 mm (13.3" x 4.8")
- **Board weight:** 0.5 kg (1.2 lb)

1.4 Jumpers and Connectors

Connectors on the PCA-6194 single board computer link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.1: Jumpers

| Label | Function |
|----------|-----------------------------------|
| CMOS1 | CMOS Clear |
| JWDT1 | Watchdog timer output selection |
| JSETCOM2 | COM2 RS 232/422/485 mode selector |

Table 1.2: Connectors

| Label | Function |
|---------|---|
| IDE1 | Primary IDE connector |
| FDD1 | Floppy Drive Connector |
| LPT1 | Parallel port |
| VGA1 | VGA1 VGA connector |
| VCN1 | DVI connector |
| COM1 | Serial port: COM1 (9-pin connector) |
| COM2 | Serial port: COM2 (9-pin connector) |
| KBMS1 | PS/2 keyboard and mouse connector |
| KBMS2 | External keyboard/mouse connector |
| ATX1 | ATX 12V Auxiliary power connector (for CPU) |
| CPUFAN1 | CPU1 fan connector |
| ATXF1 | ATX feature connector |
| JFP1 | Power and Reset Button connector |
| JFP2 | HDD LED/SNMP Smbus/Speaker connector |
| JFP3 | Power LED and keyboard lock connector |
| JIR | Reserved |

Table 1.2: Connectors

| Label | Function |
|--------------|--|
| JOBS1 | HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm |
| LAN1~2 | Giga LAN RJ45 connectors |
| IPMB1 | IPMB connector |
| HDAUD1 | Hi-definition audio link connector |
| SATA1~6 | Serial ATA1~6 |
| LANLED1 | LAN1 and LAN2 LED connector |
| BMC1 | BMC connector |
| USB1~3 | USB port pin headers |
| SPI | BIOS SPI Interface |
| GPIO1 | GPIO pin header (SMD pitch-2.0 mm) |
| JCASE1 | Case open |

1.5 Board Layout: Jumper and Connector Locations

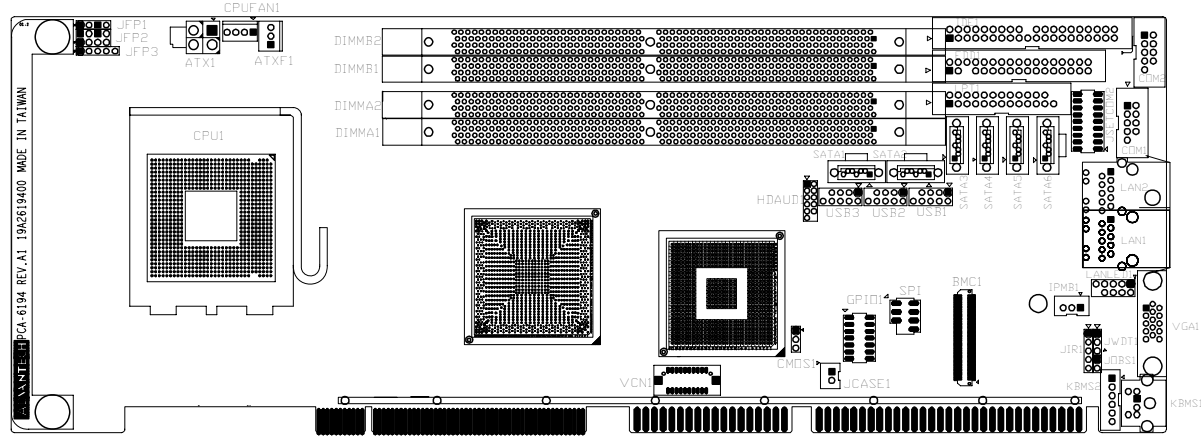


Figure 1.1: Jumper and Connector Locations

1.6 PCA-6194 Block Diagram

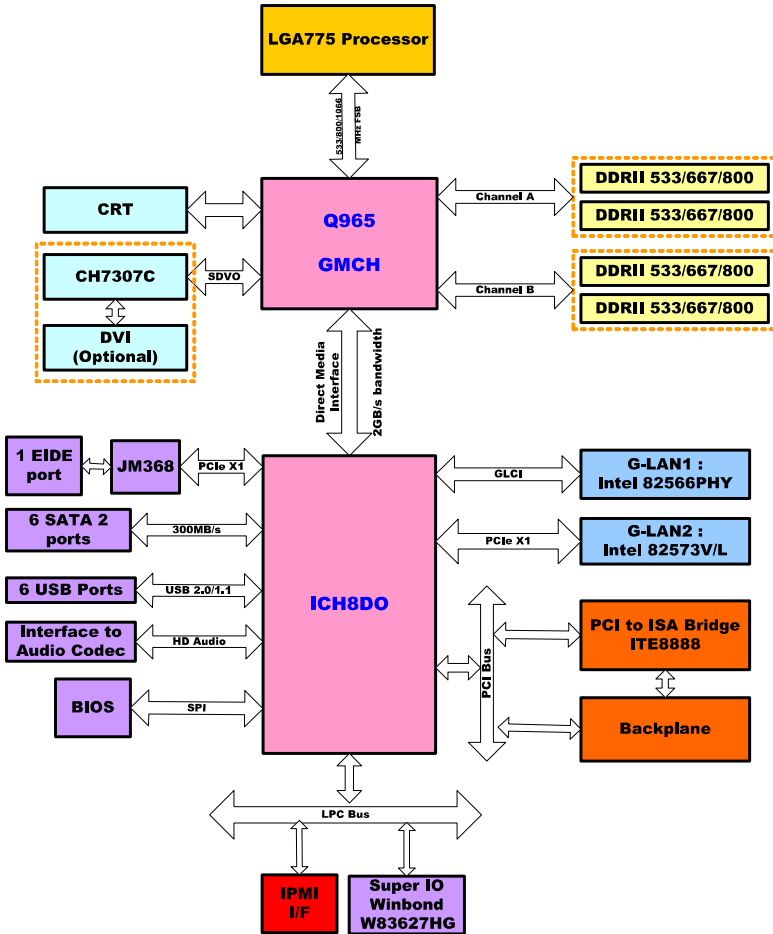


Figure 1.2: PCA-6194 Block Diagram