KINO-PV-D4252/D5252

**Features**

1. Mini-ITX SBC with Intel® Atom™ D525 / D425 processor
2. Support 800MHz DDR3 SO-DIMM socket up to 4GB
3. Support 24-bit dual-channel LVDS resolution up to 1920x1080
4. Complete I/O with eight USB, two SATA 3Gb/s, one CF II, six COM and audio
5. IEI One Key Recovery solution allows you to create rapid OS backup and recovery

**Dimensions** (Unit: mm)

**Packing List**

1 x KINO-PV-D4252/D5252 single board computer
1 x RS-232 cable with bracket (P/N: 19800-000300-100-RS)
1 x SATA with power cable kit (P/N: 32801-000100-100-RS)
1 x I/O shielding (P/N: 45014-0024CO-01-RS) 1 x Mini jumper pack
1 x QIG 1 x Utility CD

**Part No.** Description

KINO-PV-D4252-L2-R10 Mini ITX SBC with Intel® Atom™ D525 1.8GHz, DDR3, VGA/18+48-bit LVDS, Dual GbE, Audio, USB2.0, SATA 3Gb/s, RoHS
KINO-PV-D5252-L2-R10 Mini ITX SBC with Intel® Atom™ D525 1.8GHz, DDR3, VGA/18+48-bit LVDS, Dual GbE, Audio, USB2.0, SATA 3Gb/s, RoHS
KINO-PV-D4252-R10 Mini ITX SBC with Intel® Atom™ D425 1.8GHz, DDR3, VGA/18 LVDS, Dual GbE, Audio, USB2.0 and SATA 3Gb/s, RoHS
KINO-PV-D4252T-R10 Mini ITX SBC with Intel® Atom™ D425 1.8GHz, DDR3, VGA/18 LVDS, Dual GbE, Audio, USB2.0 and SATA 3Gb/s, TPM, RoHS

**Power Consumption**

12V/1.5A (Mini ITX with Atom™ D525 1.8GHz, DDR3, VGA/18+48-bit LVDS, Dual GbE, Audio, USB2.0 and SATA 3Gb/s, RoHS)

**Software**

12V/0.5A (Mini ITX with Atom™ D525 1.8GHz, DDR3, VGA/18 LVDS, Dual GbE, Audio, USB2.0 and SATA 3Gb/s, RoHS)

**Terminal Block**

CPU: Intel® Atom™ D525 dual-core processor 1.8GHz/1MB L2 cache

Chipset: ICH8M

BIOS: UEFI BIOS

Memory:

- Two 204-pin 800MHz DDR3 SDRAM SO-DIMMs supported (System max. 4GB) for D525/D425
- Support for CRT hot plug

Display Interface:

- Analog CRT up to 2048x1536 for D525/ D425
- Support for CRT hot plug
- 18-bit single-channel LVDS, resolution support up to WXGA 1366x768 or XGA 1024x768
- 24-bit dual-channel LVDS by Novatek 68667UFG, resolution support up to 1920x1080

Ethernet:

- Dual GbE by Realtek RTL8111E, LAN1 with ASF 2.0 support

I/O Interfaces:

- 5 x RS-232
- 1 x RS-232/422/485 (COM2) with Auto Flow control
- 1 x LPT
- 1 x 6-pin header for KB/MS
- 2 x SATA 3Gb/s
- 8 x USB 2.0
- 1 x CF Type II
- 2 x SATA 3Gb/s
- 8 x USB 2.0
- 1 x CF Type II
- 2 x SATA 3Gb/s
- 8 x USB 2.0
- 1 x CF Type II
- 2 x SATA 3Gb/s
- 8 x USB 2.0

Digital I/O:

- 8-bit digital I/O, 4-bit input / 4-bit output

Expansion:

- 1 x PCI slot
- 1 x PCIe x1 slot
- 1 x PCIe Mini card slot (PCIe x1 slot)
- 1 x PCIe Mini card slot (PCIe + USB + SATA signal) support IEI mini DOM

Audio:

- Realtek ALC 888 HD codec

Watchdog Timer:

- Software programmable support 1~255 sec. system reset

Power Supply:

- 12V, 1ATX power mode
- 1 x external DIN 4-pin DC jack
- 1 x internal 2 x 2-pin power connector
- 1 x 4-pin wall connector

Super IO:

- Fintek F81865

FAN Connector:

- 1 x 4-pin CPU fan
- 1 x 3-pin system fan

Power Consumption:

- 12V/1.5A (Mini ITX with Atom™ D525 1.8GHz, DDR3, VGA/18+48-bit LVDS, Dual GbE, Audio, USB2.0 and SATA 3Gb/s, RoHS)

Temperature:

- -20°C ~ 70°C with free air, -20°C ~ 70°C with force air for D525 processor
- -20°C ~ 70°C with free air, -20°C ~ 70°C with force air for D425 processor

Humidity:

- Operation: 5% ~ 95% non-condensing

Weight:

- GW: 800g / NW: 340g

**Part No. Description**

KINO-PV-D4252-L2-R10 Mini ITX SBC with Intel® Atom™ D525 1.8GHz, DDR3, VGA/18+48-bit LVDS, Dual GbE, Audio, USB2.0 and SATA 3Gb/s, RoHS
KINO-PV-D5252-L2-R10 Mini ITX SBC with Intel® Atom™ D525 1.8GHz, DDR3, VGA/18+48-bit LVDS, Dual GbE, Audio, USB2.0 and SATA 3Gb/s, RoHS
KINO-PV-D4252-R10 Mini ITX SBC with Intel® Atom™ D425 1.8GHz, DDR3, VGA/18 LVDS, Dual GbE, Audio, USB2.0 and SATA 3Gb/s, RoHS
KINO-PV-D4252T-R10 Mini ITX SBC with Intel® Atom™ D425 1.8GHz, DDR3, VGA/18 LVDS, Dual GbE, Audio, USB2.0 and SATA 3Gb/s, TPM, RoHS

**Power Consumption**

- 12V@1.95A (Intel® Atom™ D525 1.8GHz with DDR3 1GB*2)

**Temperature**

- -20°C ~ 70°C with free air, -20°C ~ 70°C with force air for D525 processor
- -20°C ~ 70°C with free air, -20°C ~ 70°C with force air for D425 processor

**Humidity**

- Operation: 5% ~ 95% non-condensing

**Weight**

- GW: 800g / NW: 340g
Embedded Dual Core Atom

New Atom™ Platform

<table>
<thead>
<tr>
<th>Generation</th>
<th>Pentium M / Celeron M</th>
<th>3 chipsets Atom</th>
<th>2 chipsets Dual Core Atom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>Banias</td>
<td>Dothan</td>
<td>Atom N270</td>
</tr>
<tr>
<td>TDP</td>
<td>5.5W ~ 27W</td>
<td>2.5W</td>
<td>D510 13W/ D410/ N450</td>
</tr>
<tr>
<td>Platform</td>
<td>852GM/855GME</td>
<td>915GME</td>
<td>852GM/855GME</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>South Bridge</th>
<th>ICH7M</th>
<th>ICH8M</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI-Express</td>
<td>4 lanes, PCI Express 1.1</td>
<td>6 lanes, PCI Express 1.1</td>
</tr>
<tr>
<td>PCI</td>
<td>PCI Rev 2.3 @ 33MHz up to 4 Bus Masters</td>
<td>PCI Rev 2.3 @ 33MHz up to 2 Bus Masters</td>
</tr>
<tr>
<td>I/O</td>
<td>8 x USB 2.0, 2 x SATA, 1 x IDE, AC97, HD Audio</td>
<td>10 x USB 2.0, 3 x SATA II, 1 x IDE, HD Audio</td>
</tr>
<tr>
<td>TDP</td>
<td>1.7W</td>
<td>2.4W</td>
</tr>
</tbody>
</table>

Embedded Intel® Atom™ Family

<table>
<thead>
<tr>
<th>Platform</th>
<th>Navy Pier DDR2</th>
<th>Luna Pier DDR2</th>
<th>Luna Pier DDR3</th>
<th>Luna Pier DDR3</th>
<th>Luna Pier DDR3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch Date</td>
<td>2008‘Q2</td>
<td>2010‘Q3</td>
<td>2010‘Q4</td>
<td>2010‘Q4</td>
<td>2010‘Q4</td>
</tr>
<tr>
<td>CPU/Chipset</td>
<td>Atom N270 1.6GHz</td>
<td>Atom 1.66GHz Dual Core/D510</td>
<td>Atom 1.6GHz Single Core/D425</td>
<td>Atom 1.6GHz Single Core/D525</td>
<td>Atom 1.66GHz Single Core/N455</td>
</tr>
<tr>
<td>FSB</td>
<td>533MHz</td>
<td>1024KB</td>
<td>512KB</td>
<td>1024KB</td>
<td>512KB</td>
</tr>
<tr>
<td>TDP</td>
<td>6.5W (2.5W Atom + 4W 945GSE)</td>
<td>13W</td>
<td>10W</td>
<td>13W</td>
<td>6.5W</td>
</tr>
<tr>
<td>L2 Cache</td>
<td>512KB</td>
<td>512KB</td>
<td>512KB</td>
<td>512KB</td>
<td></td>
</tr>
<tr>
<td>Supported Memory</td>
<td>DDR2 (400/533MHz) up to 2GB</td>
<td>DDR2 (533/667MHz) up to 4GB</td>
<td>DDR3 (667/800MHz) up to 4GB</td>
<td>DDR3 (667MHz) up to 2GB</td>
<td></td>
</tr>
<tr>
<td>Graphic</td>
<td>VGA, HDTV (1080i)</td>
<td>VGA (2048x1536)</td>
<td>VGA (1400x1050)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>Dual 18bit LVDS (36bit), SDVO</td>
<td>Single 18bit LVDS (1366x768)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graphics</td>
<td>Gen3.5, 133MHz, GMA960</td>
<td>Gen 3.5, 400MHz, GMA3150</td>
<td>Gen 3.5, 200MHz, GMA3150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cores</td>
<td>DirectX9c, OpenGL 1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D525/D425/N455 Embedded Low Power DDR3 Solution

D525/D425/N455: The Intel® Atom™ processor D425 and D525/N455 series integrates the graphics, display, and DDR3 memory controller with a processor specifically designed for affordable, entry-level basic computing.

Features
- DDR3 support up to 4GB by UEFI BIOS
  - Power saving more than 30% compared to DDR2
  - Higher bandwidth performance, up to 2133 MT/s standardized
- UEFI BIOS
  - Boot time under 10 seconds for fast boot
  - Support HDD capacities more than 2.2 TB
  - Support Dual ranks x16 DDR3 Memory up to 2GB per DIMM, system up to 4GB
- New graphics performance
  - The GPU contains the 3rd generation graphics core GMA3150 support DX9*, MPEG2 Hardware Acceleration
  - VGA resolution up to 2048x1536 MHz
  - Single 18bit LVDS resolution up to 1366x768MHz

2 Chipsets Solution

Intel® D525 Series DDR3 Block Diagram

- DDR3 support up to 4GB by UEFI BIOS
- UEFI BIOS
- New graphics performance

About IIE-2011-V10
Fanless design
IEI provides two fanless heatsink choices for the D525/D425/N455 SBCs
- D525 series with 20mm heatsink
- D425/N455 with 15mm heatsink
A. 20mm height heatsink with bracket preinstalled for D525 series products

B. 15mm height heatsink with bracket preinstalled for D425/N455 series products

Dual Core Atom DDR3 solution
Pentium M replacement platform
D525: Intel® Dual Core™ Atom™ with DDR3 supported, performance 1.1x better than Intel® D510 (DDR2 Dual Core™ Atom™)

Single Core Atom DDR3 solution
Celeron M replacement platform
D425/N455 integrated Intel® Graphic GMA3150 graphics core, graphics performance 50% better than Celeron® M with 852GM

IEI Capture Card Solutions
IEI provides complete video/audio capture card solutions to fulfill the demands of various applications.
The latest HDC solutions are capable of compressing and decompressing full HD video (1920x1080) in real-time using the H.264 codec.
The IEI IVC series provides standard-definition (SD) video resolution with standard or MP3 audio capture capability for better sound quality.

H.264 Hardware Compression Solution
Supports high definition video resolution up to 1920 x 1080
HDMI Interface DVI Interface SDI Interface
HDC-304E HDC-401E HDC-502E
HDC-302E HDC-401E HDC-501ER
HDC-301E HDC-402E
HDC-301

Software Compression Solution
Supports standard definition video resolution up to 720 x 480 NTSC/720 x 576 PAL
PCIe type PCIe type PCIe type
IVC-E604 IVC-E768 IVC-T604
IVC-E608 IVC-E768 IVC-T608
IVC-268G IVC-168G
IVC-268G

Long Distance High Quality Extension Solution
SDI Interface
HD-SDI-BOX

H.263/ MPEG4 Hardware Compression Solution
PCI type IVC-8371P
PM-1059

2011 new feature in standard definition compression capture card
1. Single card with 8 channels capture up to 128 channels.
2. Direct PCIe bus with better bandwidth flow.
3. Better power consumption.
5. MP3 quality audio capture

Direct PCIe Solution
2010 PCIe Bridge Solution
2011 Direct PCIe Solution
**UEFI Introduction**

- **UEFI (Unified Extensible Firmware Interface)** BIOS is a next-generation BIOS firmware based on UEFI specifications and the Intel® Platform Innovation Framework for EFI.
- **UEFI BIOS** can be expanded by using a variety of drivers, development tools, support utilities and pre-boot application (PBA) solutions.

**UEFI Architecture**

This figure shows a block diagram level architecture of the framework design.

**Legacy BIOS V.S. UEFI**

<table>
<thead>
<tr>
<th>Language</th>
<th>Legacy BIOS</th>
<th>UEFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assembly</td>
<td>C (99%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource</th>
<th>Legacy BIOS</th>
<th>UEFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interrupt</td>
<td>Driver/Protocols</td>
</tr>
<tr>
<td></td>
<td>Hardcode Memory Access</td>
<td>Hardcode I/O Access</td>
</tr>
<tr>
<td></td>
<td>Hardcode Memory Access</td>
<td>Hardcode I/O Access</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Processor</th>
<th>Legacy BIOS</th>
<th>UEFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x86 16-bits</td>
<td>CPU Protected Mode (Flat Mode)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target</th>
<th>Legacy BIOS</th>
<th>UEFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Binary Code</td>
<td>Removable Binary Drivers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expand</th>
<th>Legacy BIOS</th>
<th>UEFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hook Interrupt</td>
<td>Load Driver</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OS Bridge</th>
<th>Legacy BIOS</th>
<th>UEFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACPI (SMI, INT Service)</td>
<td>RunTime Driver Service</td>
</tr>
<tr>
<td></td>
<td>ACPI (SMI)</td>
<td>(ACPI EFI Protocol Driver)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3rd Party ISV &amp; IHV</th>
<th>Legacy BIOS</th>
<th>UEFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Fully Supported</td>
<td>Easily Supports Multi Platforms</td>
</tr>
</tbody>
</table>

The architecture represents a structured implementation composed primarily of the following:

- Foundation code that binds the pieces together
- Modular elements of code that perform the functional job of enumerating and initializing the platform

**UEFI Benefits**

- **Expansibility**
  ODM/OEM and customers can add their own PBA easily. PBA can be integrated in BIOS flash or placed in external mass storage devices.

- **Migration ability**
  Drivers, PBA can be migrated easily from one platform to another because of the highly modularized design on a unified framework.

**IEI UEFI BIOS Features**

1. **Familiarity**
   Providing advanced UEFI functionality with a familiar BIOS setup interface.

2. **Compatibility**
   Designed to extend BIOS compatibility into UEFI solutions. Supporting legacy Option Rom binaries and operating systems requiring a legacy BIOS runtime interface.

3. **Functionality**
   (1) Compliant with ISMM H/W monitor utility
   (2) Dynamic LOGO
   (3) Fast boot
   (4) ICP Standard Feature – AT/ATX, WDT, DIO
   (5) BIOS setup with touch device support
   (6) HDD/Storage support over 2.2TB with 64-bit operation system

4. **Extensibility**
   The option to add and execute pre-boot applications (PBA) in a protected hidden partition
   (1) HDD Security
   (2) Shell Environment
   (3) Pre-boot Messenger (Third Party)
   (4) Pre-boot Network Browser (Third Party)
   (5) Pre-boot Antivirus (Third Party)

**IEI Products with UEFI BIOS**

1. **C206/Q67/B65, QM67/HM65, QM57/HM55 chips**
   SPCE-C2060, PCIE-Q670, IMBA-C2060, IMBA-Q670, IMB-C2060, IMB-Q670, KINO-QM670, KINO-QM57A, KINO-HM551, NOVA-HM551, NANO-QM57A, NANO-HM551

2. **G41 chipset family**
   IMBA-G410, IMBA-S412ISA, KINO-G410

3. **D525/D425/N455 family**
   UEFI BIOS has better compatibility with the dual ranks x16 DRAM memory module of the D425/D525/N455 series
The IEI recovery CD includes system recovery software developed by IEI using Windows PE 2.0. The recovery CD helps create full system backup and restore from system failures. Users don’t need to buy additional system backup and recovery tools.

**IEI Recovery Kit**

- **System Recovery**
  - User Calamity
  - Recovery system
  - Normal

- **System Backup**
  - Backup system
  - New image

- **Recovery Partition**
  - MBR
  - OS Backup
  - Partition 1: Operating System
  - Partition 2: Recovery Kit (iei.gho [Factory Default], iei_user.gho [User’s Image])

**IEI Recovery Solution Advantages:**
- No need to make recovery discs or follow trivial imaging procedures
- Simple steps to backup or restore the system. No IT personnel required.
- Backup/Restore system easily through unique multi-menu
- One key to make recovery disc
- One key to restore system

**Suggestion:** Over 4GB storage capacity

**IEI Certified Sticker**

The IEI recovery CD is only for IEI products. A message warns, “you are an illegal user” when using the CD on non-IEI products. This protection is detected through the BIOS of the IEI boards.

**Support OS List**

<table>
<thead>
<tr>
<th>Windows® XP</th>
<th>Windows® Vista</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows® 7</td>
<td>Windows® CE 5.0</td>
</tr>
<tr>
<td>Windows® CE 6.0</td>
<td>Windows® XP Embedded</td>
</tr>
</tbody>
</table>

**Linux OS**
1. Red Hat RHEL- 5.4
2. Fedora Core 7, 8, 10, 11, 12
3. Ubuntu 6.10, 7.10, 8.10
4. Debian 4.0, 5.0
5. SuSe 11.2
Rapid Imaging / Migration Through One Touch Hot Key

Neither specialized IT staff nor consultants are required in order to implement the system imaging and data migration. Just press the F3 key to get access to the recovery menu. The one key operation simplifies the imaging or migration process to help IT staff get the system up and running quickly.

- **One-Key Recovery**
  - Factory restore: restore your system to default setting (iei.gho)
  - Restore your last backup: recover the last system configuration (iei_user.gho)

- **One-Key Backup**
  Backup your operating system to the secure hidden partition. You can create your own ghost image as “iei_user.gho” including your application programs set-ups.

**Benefits**

**Remote Maintenance Reduces the Cost of IT Infrastructure**
All migration tasks can be performed remotely from a central management console. This reduces the need for physical visits which saves time and money.

1. Alert
   - When the system is infected by virus or a blue screen appears

2. Use the recovery tool to restore your OS at the local site

3. Remote Troubleshooting

EASY WAY

www.ieiworld.com
IEI Intelligent System Management Module

What is the IEI Intelligent System Management Module (iSMM)?

IEI iSMM is a system health supervision API which utilizes sensor chips on IEI motherboards to track system and CPU temperatures, voltages, cooling fan speed, WDT and Digital I/O set up status. By quickly capturing and reporting system health data, users can prevent disasters such as system instability or damage.

Features

- External and on-chip voltages data feedback
- CPU and system temperature data feedback
- Cooling fan speed data feedback
- Cooling fan speed controlled by PWM/On-Off/Automatic Mode
- Warning signals by beeper and sound effect
- WDT Test
- Programmable Digital I/O
- System health configurations save and load

Available models

iSMM support below super I/O:

1. Winbond W83627
2. Winbond W83697
3.ITE IT8712
4.ITE IT8718
5. Fintek F81216D
6. Fintek F81865
7. SMSC SCH311x

Available operation system

a. Windows XP
b. Windows Vista
c. Windows 7

Note: Please disable the UAC function before installing iSMM software under Windows Vista and Windows 7.

Advantages

Know that your system is running within safe limits
Prevent disasters such as system instability or damage.

Architecture

User Model
User App

Kemel Model
API
IEI API provides a quick and easy tool for developing applications for your customers

iSMM Library / DLL

iSMM Device Driver

Hardware
Hardware Monitor Controller

CPU ThermDiode/Thermistor
Voltage Planes
FAN#1~~#N
Warning Signal

Available models

1. Winbond W83627
2. Winbond W83697
3. ITE IT8712
4. ITE IT8718
5. Fintek F81216D
6. Fintek F81865
7. SMSC SCH311x

Available operation system

a. Windows XP
b. Windows Vista
c. Windows 7

Note: Please disable the UAC function before installing iSMM software under Windows Vista and Windows 7.