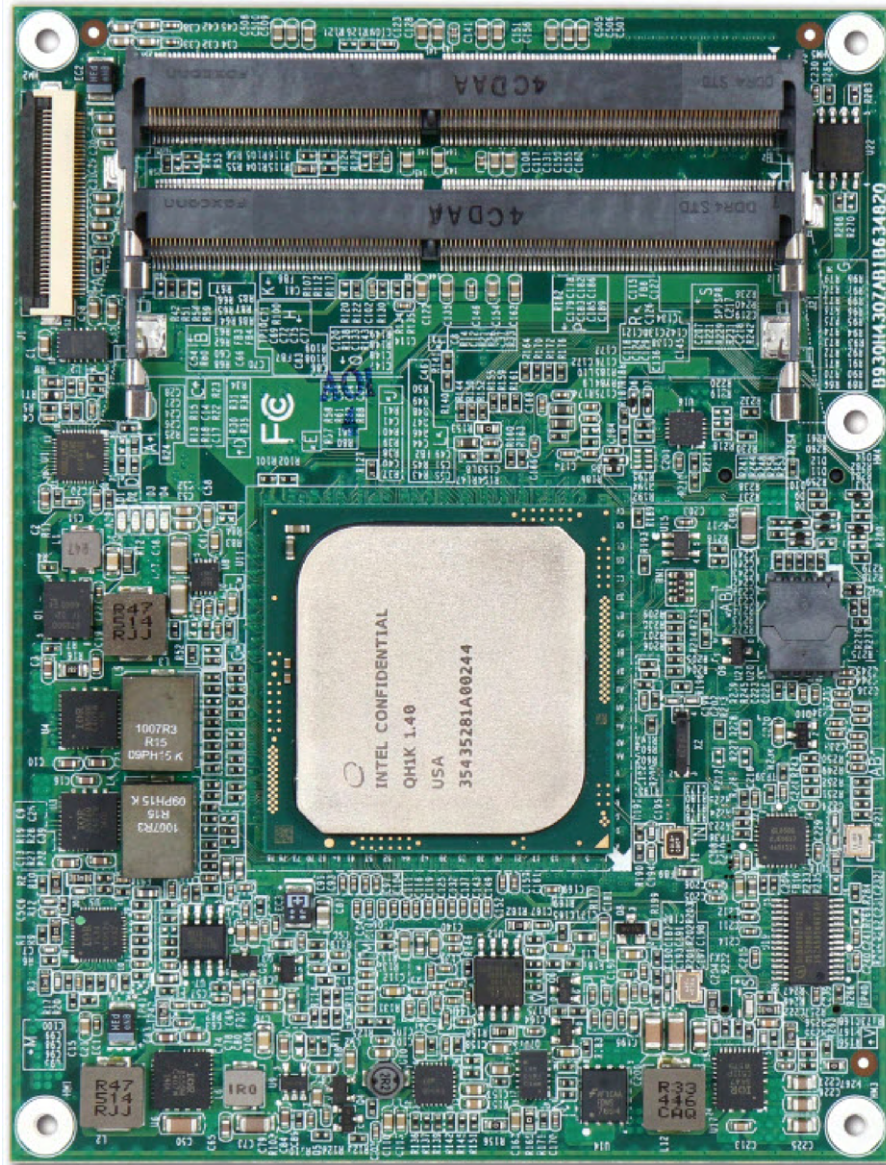




# COM Express™ PCOM-B634VG User's Guide R1.5

## Revision History

| Rev. | Note                                                                                                                                                                                                                                                          | Date     |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| R1.0 | Official release                                                                                                                                                                                                                                              | Apr.2016 |
| R1.1 | Revise support OS format.<br>Add circuit protection design and Type 2 compatible explanation.<br>Replace F/W update photo.<br>Add LPC I/O address.<br>OS Drivers update<br>Add B634 and Cooler net weight<br>Add 3 SODIMM design notification<br>TPM optional | Apr.2016 |
| R1.2 | Pin-out D46,D47,D49,D50 naming correction                                                                                                                                                                                                                     | May.2016 |
| R1.3 | Add PEG configurations.                                                                                                                                                                                                                                       | Aug.2016 |
| R1.4 | PEG configurations update                                                                                                                                                                                                                                     | Sep.2016 |
| R1.5 | Block diagram update<br>Processor list update                                                                                                                                                                                                                 | Nov.2016 |

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# Preface

This PCOM-B634VG User's Guide provides information about the components, features, connectors and BIOS Setup menus available on the PCOM-B634VG. This document should be referred to when designing a COM Express™ application. The other reference documents that should be used include the following:

- ✧ COM Express™ Design Guide
- ✧ COM Express™ Specification

Please contact PORTWELL Sales Representative for above documents.



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# 1 Introduction

PCOM-B634VG adopts Type 6 pin out definition and Basic 125mmX95mm form factor and complies with PICMG COM Express Rev2.1 Specification. PCOM-B634VG is designed with Intel(R) 5th Generation processor, code name Broadwell-DE series.

PCOM-B634VG targets for Networking, Micro server applications. PCOM-B634VG, Portwell's first COM Express Type 6 module product with 10GbE LAN feature. New DDR4 memory technology supports frequency up to 2133MHz and three DDR4 SODIMM sockets allows the memory capacity up to 48GB. PCIE Gen3 x16 is available for accelerating the PCIE device. For security considerations, on board TPM (option) is also designed on PCOM-B634VG.

## 2 Block Diagram

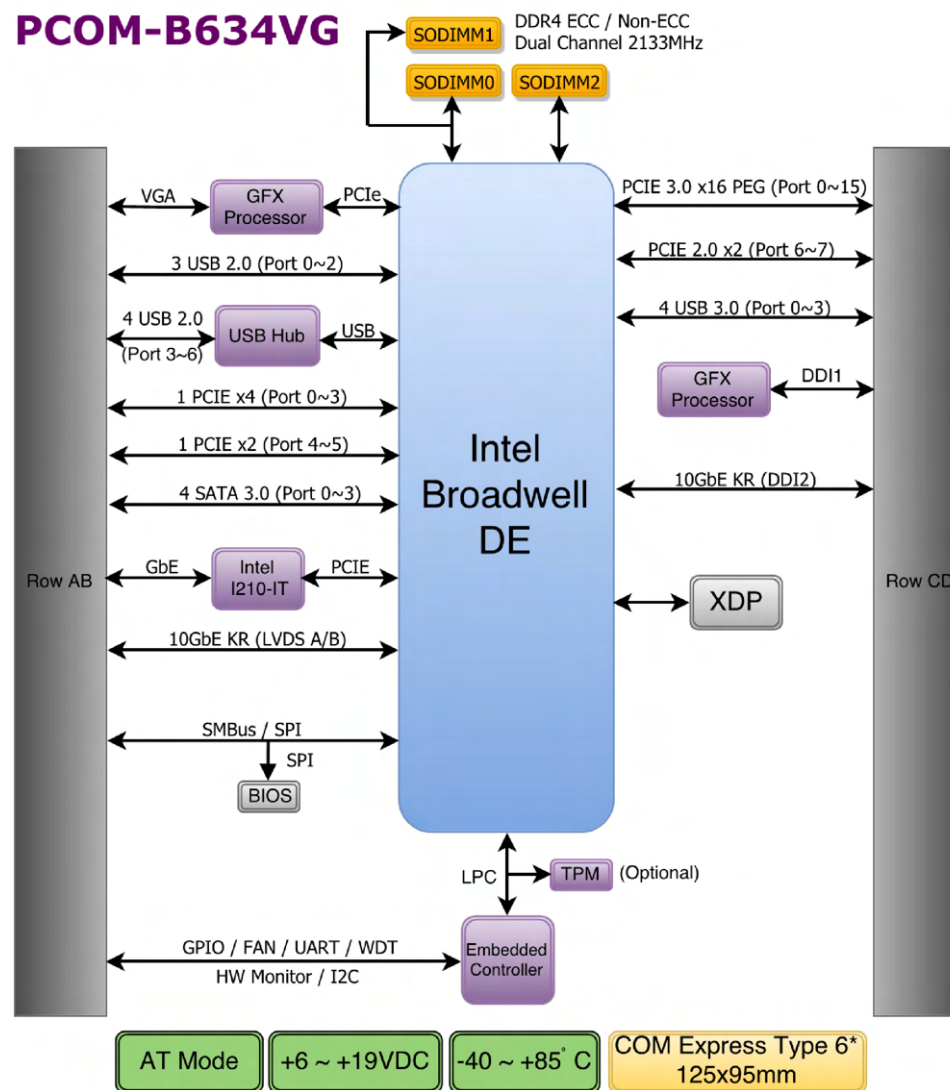


Figure 1 Block Diagram

### 3 Specifications

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product          | ➤ PCOM-B634VG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Form Factor      | ➤ COM Express™ standard pin out Type 6 Rev. 2.1 (Basic size 125 x 95mm / 4.92" x 3.74").                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Processor        | <ul style="list-style-type: none"> <li>➤ <a href="#">Intel® Xeon® Processor D1507</a></li> <li>➤ <a href="#">Intel® Xeon® Processor D1508</a></li> <li>➤ <a href="#">Intel® Xeon® Processor D1517</a></li> <li>➤ <a href="#">Intel® Xeon® Processor D1519</a></li> <li>➤ <a href="#">Intel® Xeon® Processor D-1527</a></li> <li>➤ <a href="#">Intel® Xeon® Processor D-1537</a></li> <li>➤ <a href="#">Intel® Xeon® Processor D-1539</a></li> <li>➤ <a href="#">Intel® Xeon® Processor D-1548</a></li> <li>➤ <a href="#">Intel® Xeon® Processor D-1557</a></li> <li>➤ <a href="#">Intel® Xeon® Processor D-1577</a></li> </ul> |
| BIOS             | ➤ AMI Aptio BIOS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Memory           | <ul style="list-style-type: none"> <li>➤ 3 DDR4 SODIMM socket</li> <li>➤ Support ECC</li> <li>➤ Up to 48GB 2133MHz</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Graphics Options | <ul style="list-style-type: none"> <li>➤ VGA 1920x1440 (Max)</li> <li>➤ HDMI 1920x1440 (Max)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Ethernet         | <ul style="list-style-type: none"> <li>➤ 1GbE (I210IT)</li> <li>➤ 10GbE (SoC KR)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                   |                                                                                                                                                                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Security          | ➤ TPM (Option)                                                                                                                                                                                                                                            |
| I/O               | ➤ 8 PCI Express Gen2 (5.0 GT/s) configuration x1,x2,x4<br>➤ 1 PCI Express x16 (PEG) up to Gen3 (8.0 GT/s) configuration x4, x8, x16 *Note1<br>➤ 7 x USB2.0 (480 Mbps)<br>➤ 4 x USB3.0 (5 Gbps)<br>➤ 4 x SATA3.0 (6 Gbps)<br>➤ GPIO / I2C / 2 UART / SMBus |
| Hardware Monitors | ➤ ITE8528 Embedded Controller, Voltage, Fan and Temperature                                                                                                                                                                                               |
| Power Management  | ➤ ACPI 4.0                                                                                                                                                                                                                                                |
| Environment       | ➤ Operating Temperature -20 ° C ~ +85 ° C (processor dependent)<br>➤ Storage Temperature -20 ° C ~ +85 ° C<br>➤ Relative Humidity 0%~95%                                                                                                                  |

Table 1 PCOM-B634VG SPEC

**\*Note1**

The PEG available lanes configurations are shown below :

|                |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
|----------------|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| 1x16 (Default) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 2x8            | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |   |   |    |    |    |    |    |    |
|                |   |   |   |   |   |   |   |   | 0 | 1 | 2  | 3  | 4  | 5  | 6  | 7  |
| 4x4            | 0 | 1 | 2 | 3 |   |   |   |   | 0 | 1 | 2  | 3  |    |    |    |    |
|                |   |   |   |   | 0 | 1 | 2 | 3 |   |   |    |    | 0  | 1  | 2  | 3  |
| 1x8 + 2x4      | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 | 1 | 2  | 3  |    |    |    |    |
|                |   |   |   |   |   |   |   |   |   |   |    |    | 0  | 1  | 2  | 3  |
| 2x4 + 1x8      | 0 | 1 | 2 | 3 |   |   |   |   | 0 | 1 | 2  | 3  | 4  | 5  | 6  | 7  |
|                |   |   |   |   | 0 | 1 | 2 | 3 |   |   |    |    |    |    |    |    |

## 3.1 PCOM-B634 Processor list

| PCOM-B634VG series          | PCOM-B634VG-D-1507    | PCOM-B634VG-D1508     | PCOM-B634VG-D1517     | PCOM-B634VG-D1519     | PCOM-B634VG-D1527   | PCOM-B634VG-D1537   | PCOM-B634VG-D1539   | PCOM-B634VG-D1548   | PCOM-B634VG-D1557   | PCOM-B634VG-D1577   |
|-----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Ordering P/N                | AB1-3E10              | AB1-3D99              | AB1-3D98              | AB1-3D97              | AB1-3D96            | AB1-3E09            | AB1-3E00            | AB1-3D95            | AB1-3E41            | AB1-3D94            |
| Processor                   | Intel® Pentium® D1507 | Intel® Pentium® D1508 | Intel® Pentium® D1517 | Intel® Pentium® D1519 | Intel® Xeon® D-1527 | Intel® Xeon® D-1537 | Intel® Xeon® D-1539 | Intel® Xeon® D-1548 | Intel® Xeon® D-1557 | Intel® Xeon® D-1577 |
| # of Cores                  | 2                     | 2                     | 4                     | 4                     | 4                   | 8                   | 8                   | 8                   | 12                  | 16                  |
| # of Threads                | 2                     | 4                     | 8                     | 8                     | 8                   | 16                  | 16                  | 16                  | 24                  | 32                  |
| Processor Base Frequency    | 1.20 GHz              | 2.20 GHz              | 1.60 GHz              | 1.50 GHz              | 2.20 GHz            | 1.70 GHz            | 1.60 GHz            | 2.00 GHz            | 1.50 GHz            | 1.30 GHz            |
| Max Turbo Frequency         | 1.20 GHz              | 2.60 GHz              | 2.20 GHz              | 2.10 GHz              | 2.70 GHz            | 2.30 GHz            | 2.20 GHz            | 2.60 GHz            | 2.10 GHz            | 2.10 GHz            |
| Cache                       | 3 MB                  | 3 MB                  | 6 MB                  | 6 MB                  | 6 MB                | 12 MB               | 12 MB               | 12 MB               | 18 MB               | 24 MB               |
| TDP                         | 20 W                  | 25 W                  | 25 W                  | 25 W                  | 35 W                | 35 W                | 35 W                | 45 W                | 45 W                | 45 W                |
| ECC Memory Supported        | Yes                   | Yes                   | Yes                   | Yes                   | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| USB Revision                | 2.0/3.0               | 2.0/3.0               | 2.0/3.0               | 2.0/3.0               | 2.0/3.0             | 2.0/3.0             | 2.0/3.0             | 2.0/3.0             | 2.0/3.0             | 2.0/3.0             |
| Networking Specifications   |                       |                       |                       |                       |                     |                     |                     |                     |                     |                     |
| SFI Interface               | Yes                   | Yes                   | Yes                   | Yes                   | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| KR Interface                | No                    | Yes                   | Yes                   | Yes                   | Yes                 | Yes                 | Yes                 | Yes                 | No                  | Yes                 |
| KR4 Interface               | No                    | No                    | No                    | No                    | No                  | No                  | No                  | No                  | No                  | No                  |
| KX Interface                | Yes                   | Yes                   | Yes                   | Yes                   | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| KX4 Interface               | Yes                   | Yes                   | Yes                   | Yes                   | No                  | No                  | No                  | No                  | No                  | No                  |
| 100Base-T                   | No                    | No                    | No                    | No                    | No                  | No                  | No                  | No                  | No                  | No                  |
| 1000Base-T                  | Yes                   | Yes                   | Yes                   | Yes                   | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| 10GBase-T                   | Yes                   | Yes                   | Yes                   | Yes                   | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| Operating Temperature Range |                       |                       |                       | -40°C to 85°C         |                     |                     | -40°C to 85°C       |                     |                     |                     |

| PCOM-B634VG series                                       | PCOM-B634VG-D-1507 | PCOM-B634VG-D1508 | PCOM-B634VG-D1517 | PCOM-B634VG-D1519 | PCOM-B634VG-D1527 | PCOM-B634VG-D1537 | PCOM-B634VG-D1539 | PCOM-B634VG-D1548 | PCOM-B634VG-D1557 | PCOM-B634VG-D1577 |
|----------------------------------------------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Ordering P/N                                             | AB1-3E10           | AB1-3D99          | AB1-3D98          | AB1-3D97          | AB1-3D96          | AB1-3E09          | AB1-3E00          | AB1-3D95          | AB1-3E41          | AB1-3D94          |
| <b>Advanced Technologies</b>                             |                    |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Intel® Turbo Boost Technology                            | No                 | 2.0               | 2.0               | 2.0               | 2.0               | 2.0               | 2.0               | 2.0               | 2.0               | 2.0               |
| Intel® Hyper-Threading Technology                        | No                 | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |
| Intel® Virtualization Technology (VT-x)                  | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |
| Intel® Virtualization Technology for Directed I/O (VT-d) | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |
| Intel® VT-x with Extended Page Tables (EPT)              | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |
| Intel® TSX-NI                                            | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |
| Intel® 64                                                | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |
| Instruction Set                                          | 64-bit             | 64-bit            | 64-bit            | 64-bit            | 64-bit            | 64-bit            | 64-bit            | 64-bit            | 64-bit            | 64-bit            |
| Instruction Set Extensions                               | AVX 2.0            | AVX 2.0           | AVX 2.0           | AVX 2.0           | AVX 2.0           | AVX 2.0           | AVX 2.0           | AVX 2.0           | AVX 2.0           | AVX 2.0           |
| Idle States                                              | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |
| Enhanced Intel SpeedStep® Technology                     | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |
| Thermal Monitoring Technologies                          | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |
| Intel® AES New Instructions                              | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               |



|                                 |     |     |     |     |     |     |     |     |     |     |
|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Secure Key                      | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Trusted Execution<br>Technology | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Execute Disable Bit             | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| OS Guard                        | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table 2 PCOM-B634 Processor list

## 3.2 Supported Operating Systems

The PCOM-B634VG supports the following operating systems.

| Vendor    | Operating System               | Supported |
|-----------|--------------------------------|-----------|
| Microsoft | Windows 7 (32/64bit)           | Yes       |
|           | Windows 8 (32/64bit)           | Yes       |
|           | Windows 8.1 (32/64bit)         | Yes       |
|           | Windows 10 (32/64bit)          | Yes       |
|           | Microsoft Windows 2008 R2 SP1  | Yes       |
|           | Microsoft Windows 2012         | Yes       |
|           | Microsoft Windows 2012 R2      | Yes       |
| Linux     | Fedora 22 (kernel 4.0.4-301)   | Yes       |
|           | Ubuntu 15.04 (kernel 3.11.6.4) | Yes       |

Table 3 Supported OS list

### 3.3 Windows OS driver

Please download the drivers from Portwell download center website [http://www.portwell.tw/support/download\\_center.php](http://www.portwell.tw/support/download_center.php)

| Drivers file name        | Supported Operating Systems                                                                                                                             |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10GLAN_Win7_64           | Windows Server 2008 R2 (64bit)<br>Microsoft Windows 7 (64bit)                                                                                           |
| Chipset_Win7_8_81_32_64  | Microsoft Windows 7 (32/64bit)<br>Microsoft Windows 8 (32/64bit)<br>Microsoft Windows 8.1 (32/64bit)                                                    |
| Graphics_Win7_32_64      | Microsoft Windows 7 (32/64bit)                                                                                                                          |
| Graphics_Win8_81_32_64   | Microsoft Windows 8 / 8.1 (32/64bit)                                                                                                                    |
| Graphic_Windows10_Driver | Microsoft Windows 10 (32/64bit)                                                                                                                         |
| I210LAN_Win7_8_81_32_64  | Microsoft Windows 7 (32/64bit)<br>Microsoft Windows 8 / 8.1 (32/64bit)<br>Windows Server 2008 R2<br>Microsoft Windows 2012<br>Microsoft Windows 2012 R2 |
| XHCI_Win7_32_64          | Microsoft Windows 7 (32/64bit)<br>Windows Server 2008 (32/64bit)                                                                                        |
| 10GLAN_Win8_81_64        | Microsoft Windows 8 / 8.1 (64bit)<br>Microsoft Windows 2012 (64bit)<br>Microsoft Windows 2012 R2 (64bit)                                                |

Table 4 Windows OS driver list

## 3.4 Electrical Characteristics

|               |                                                 |
|---------------|-------------------------------------------------|
| Input voltage | +12VDC (Nominal)<br>+5VDC ~ +13VDC (Wide range) |
| RTC Battery   | 2.3uA                                           |
| Power on mode | AT Mode                                         |

Table 5 Electrical characteristics

PCOM-B634VG Power sequence

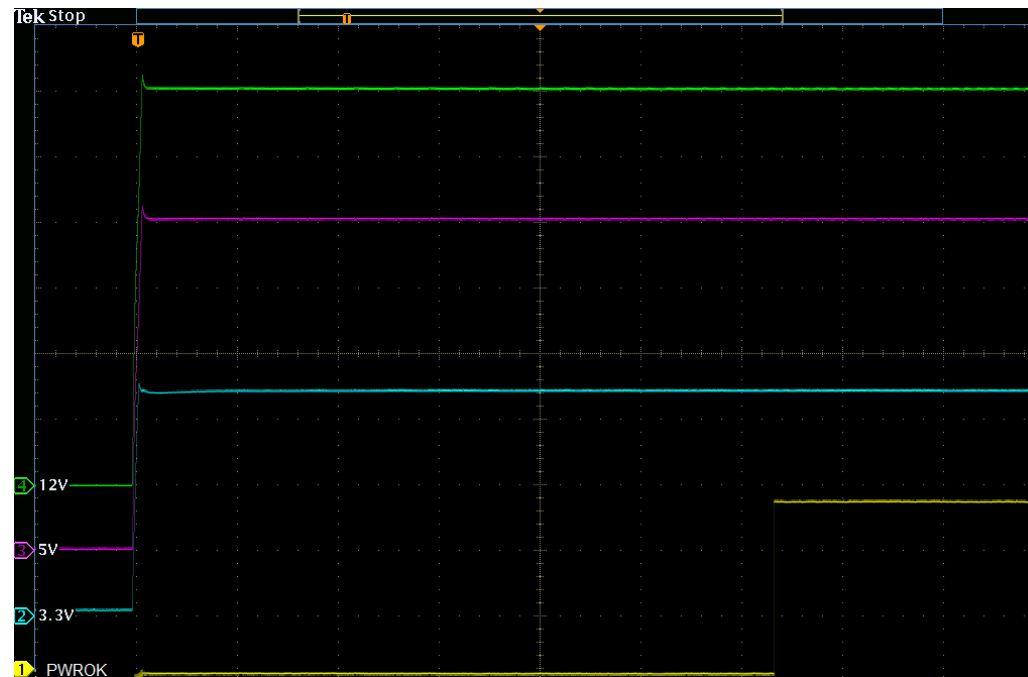


Figure 2 Power on sequence

## Circuit protection design

PCOM-B634VG Type 6 is also compatible with COM Express Type 2 carrier, Schottky diode protection has been design on the COM Express module for Serial Port, FAN(PWMOUT & TACHIN), LID and SLEEP. Considerations must be taken while designing carrier board.

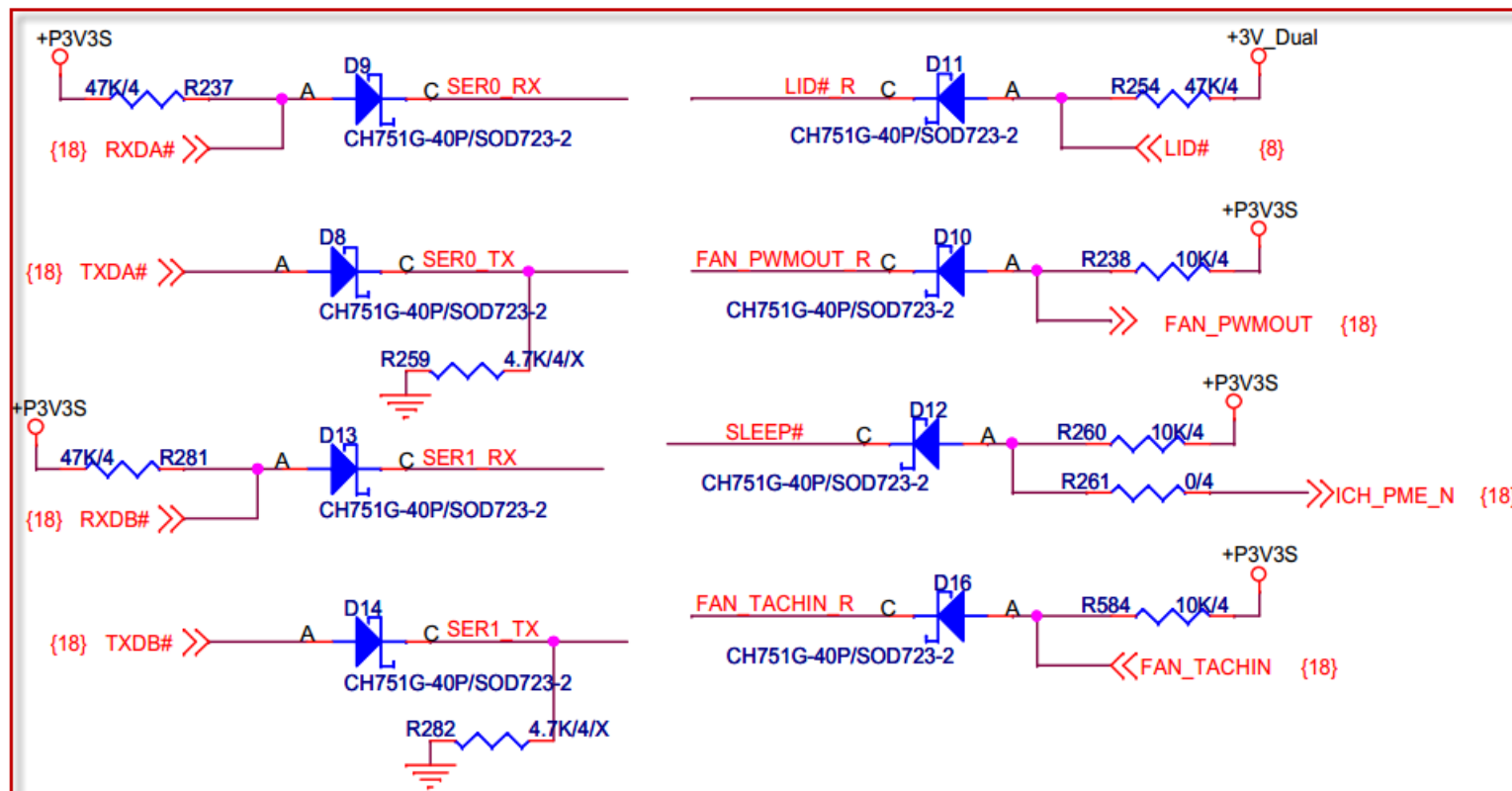


Figure 3 Circuit protection design

## 3.5 Mechanical Dimensions

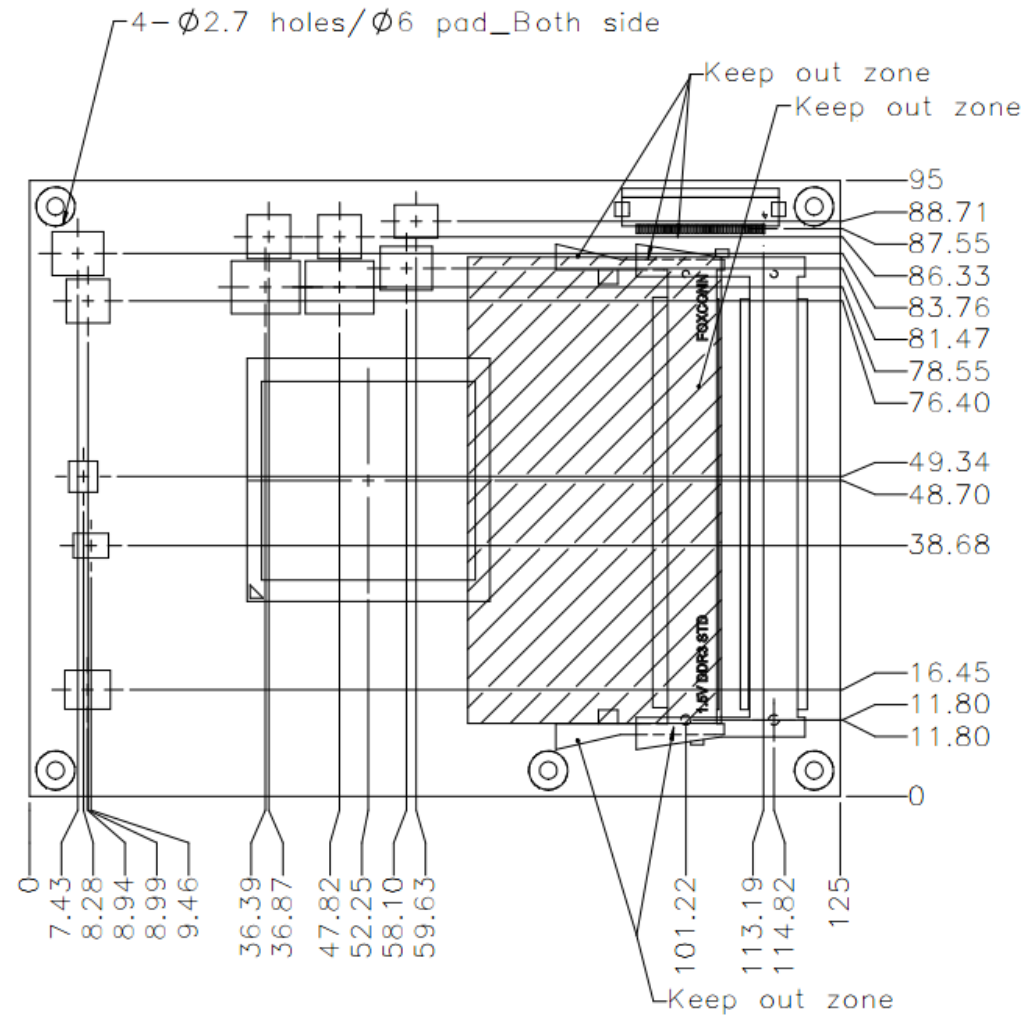
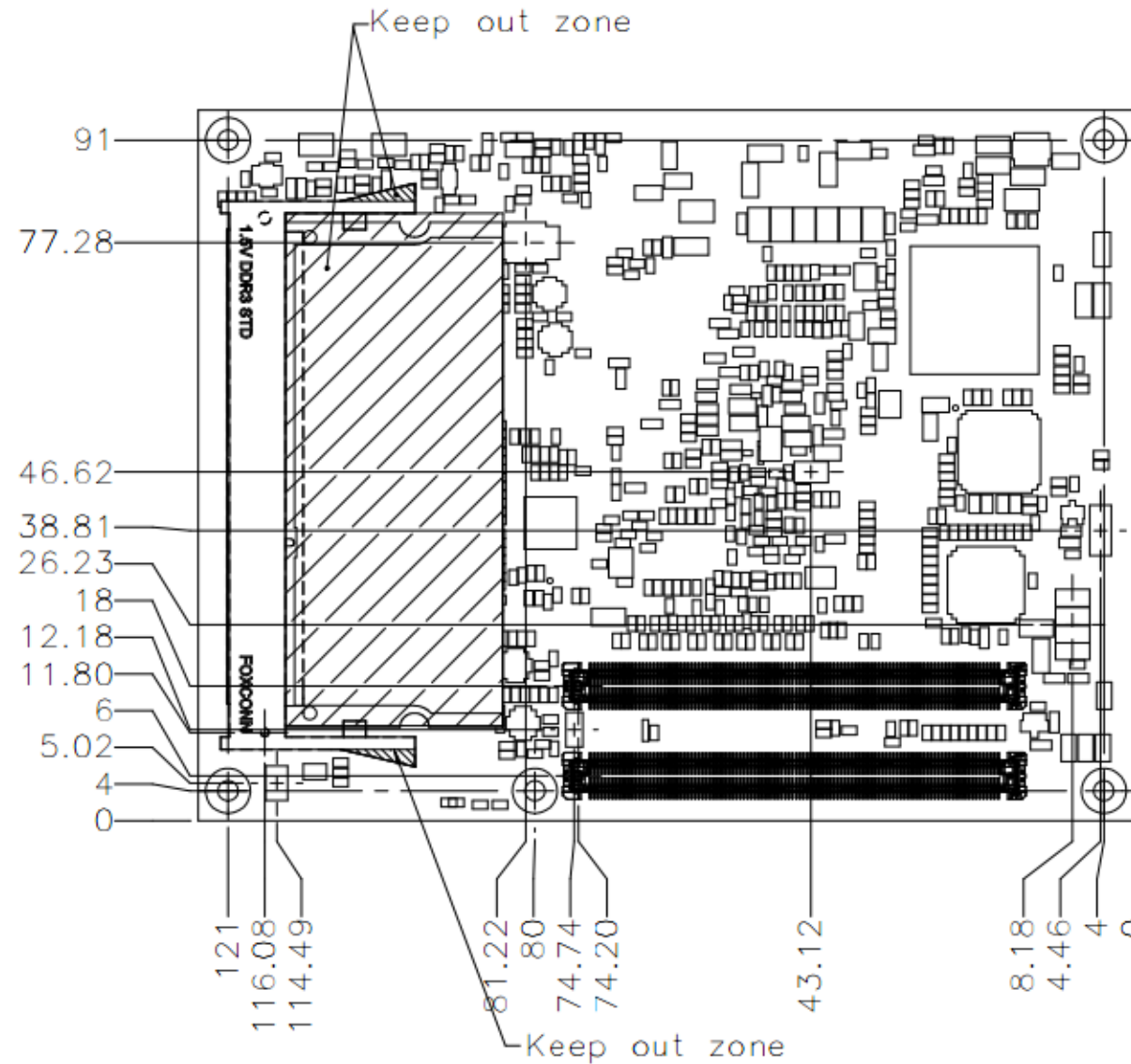


Figure 4 Mechanical Dimensions - Top



**Figure 5 Mechanical Dimensions - Bottom**

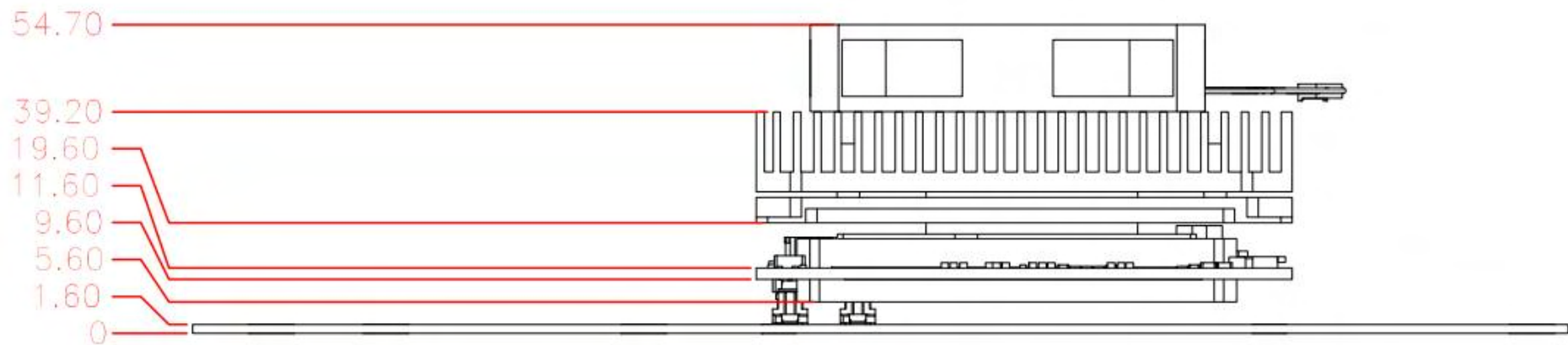


Figure 6 Mechanical Dimensions - Assembly view

Net weight

|                  |               |
|------------------|---------------|
| Module           | 80.0g +/- 2%  |
| Cooler (H/S+FAN) | 441.0g +/- 2% |

Table 6 Weight



## 3.6 3 SODIMM socket design

PCOM-B634 has designed additional Memory SODIMM socket at the bottom, which supports up to DDR4 48GB capacity. Before inserting the DDR4 SODIMM memory, please refer to below SODIMM arrangement and note that, there are 2 SODIMM socket of channel 0, the CH0 SODIMM1 (the bottom one) works only if CH0 SDDIMM0 (the top one) is inserted.

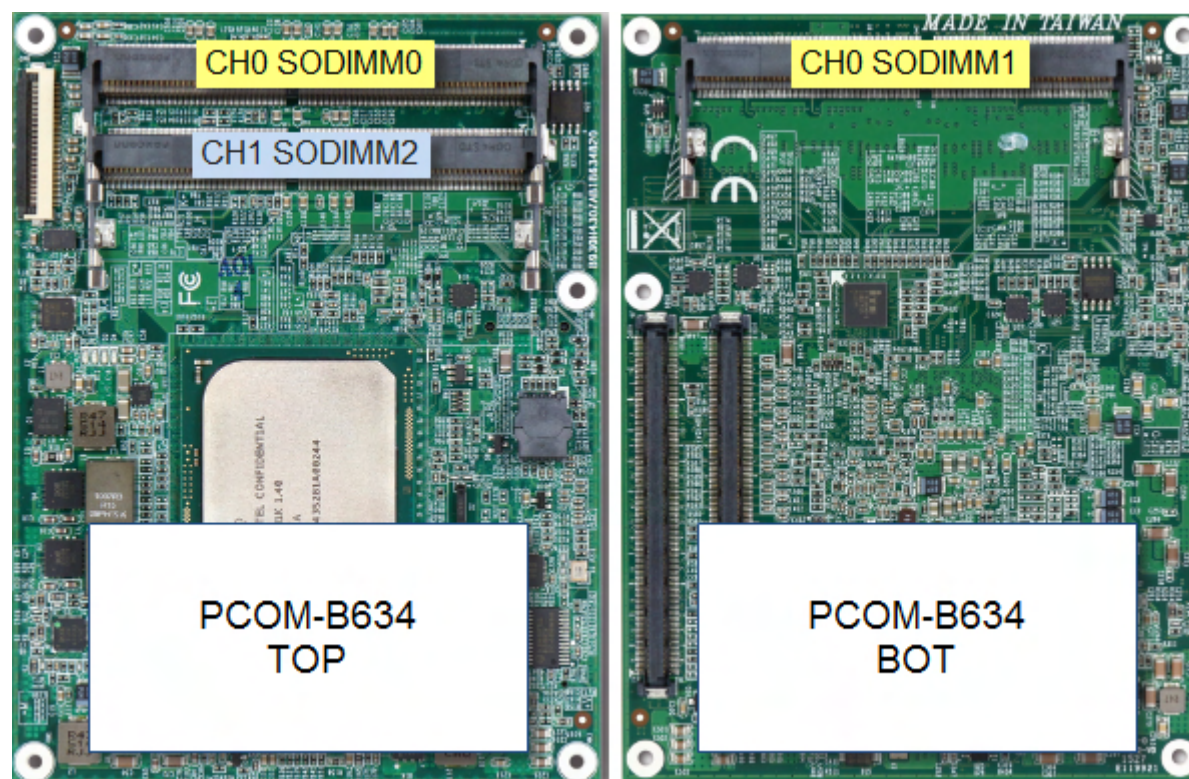


Figure 7 SODIMM socket design

## 3.7 Environmental Specifications

|                       |                                    |
|-----------------------|------------------------------------|
| Storage Temperature   | -20°C ~85°C                        |
| Operation Temperature | -20°C ~+85°C (Processor dependent) |
| Storage Humidity      | 0%~95%                             |
| Operation Humidity    | 0%~95%                             |

Table 7 Environmental Specifications

## 3.8 Ordering Guide

### PCOM-B634VG

| Product           | Ordering P/N | Status    |
|-------------------|--------------|-----------|
| PCOM-B634VG-D1507 | AB1-3E10     | Available |
| PCOM-B634VG-D1508 | AB1-3D99     | Available |
| PCOM-B634VG-D1517 | AB1-3D98     | Available |
| PCOM-B634VG-D1519 | AB1-3D97     | Available |
| PCOM-B634VG-D1527 | AB1-3D96     | Available |
| PCOM-B634VG-D1537 | AB1-3E09     | Available |
| PCOM-B634VG-D1539 | AB1-3E00     | Available |
| PCOM-B634VG-D1548 | AB1-3D95     | Available |
| PCOM-B634VG-D1557 | AB1-3E41     | Available |
| PCOM-B634VG-D1577 | AB1-3D94     | Available |

Table 8 Ordering Guide - PCOM-B634VG

### Accessory

|                    |           |           |
|--------------------|-----------|-----------|
| PCOM-B634VG Cooler | B9971340  | Available |
| PCOM-C609          | AB1-3D19Z | Available |

Table 9 Ordering Guide - Accessory

PCOM-C609 - PCOM-B634VG Evaluation carrier (EVA Board)

PCOM-C609 is designed for functions verification of PCOM-B634VG, which 10GbE function pin is defined by Portwell. Please contact Portwell for detail PCOM-C609 User's Guide.

## 4 Heat sink / Cooler

Heat sink Dimensions

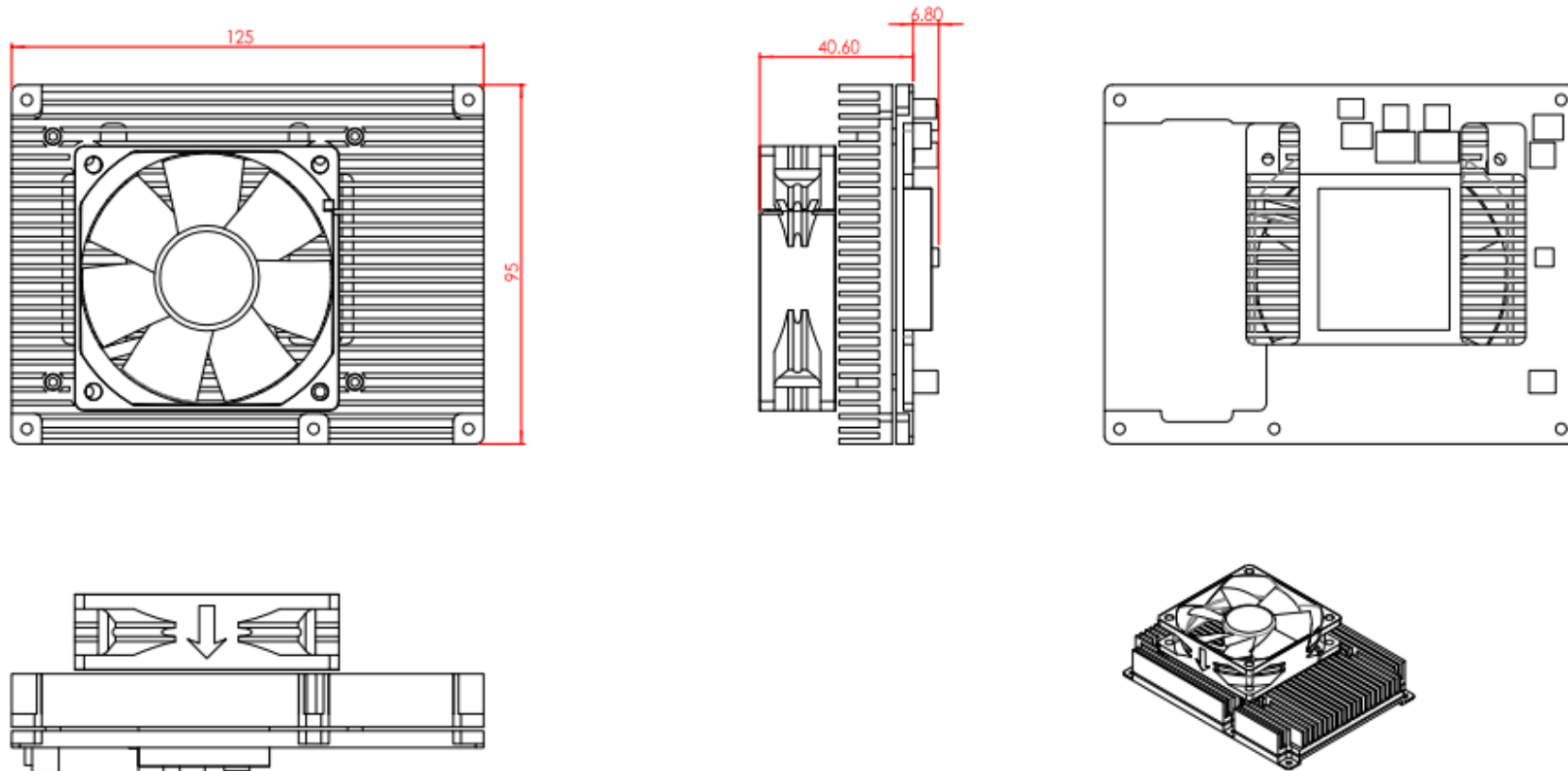


Figure 8 Heat sink / cooler mechanical dimensions

## 4.1 H/S Assembly guide

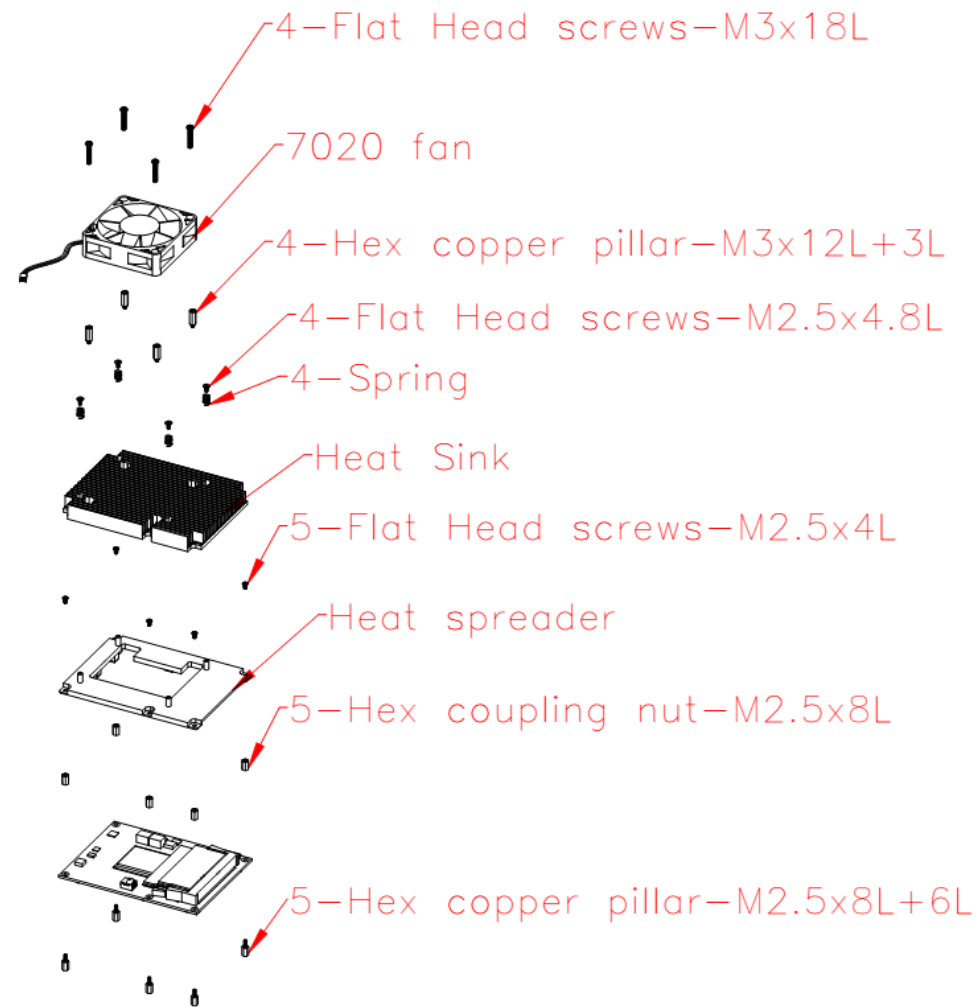


Figure 9 H/S Assembly guide

## 4.2 Packaging

| Package                                  | Appearance                                                                                                                                                                                                                                                                        | Size          |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Anti-Static bubble bag                   |  A black anti-static bubble bag with a yellow label in the center. The label features a triangle with a lightning bolt and the text "ATTENTION" and "ELECTROSTATIC SENSITIVE DEVICES".          | 180x135mm     |
| White Paper Box                          |  A white paper box with its lid open, showing a black anti-static bubble bag inside.                                                                                                            | 210x151x40mm  |
| Shipping Box<br>(10 pcs White paper box) |  A large cardboard shipping box filled with 10 white paper boxes, each containing an anti-static bubble bag. The boxes are arranged in a single row, and each has a yellow label on the front. | 595x300x195mm |

## 5 Signal Descriptions and Pin out Tables

Signal Tables Terminology Descriptions

|        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I      | Input to the Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| O      | Output from the Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| I/O    | Bi-direction input / output signal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| OD     | Open Drain output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| CMOS   | Logic input or output. Input thresholds and output levels shall be 80% of supply rail for high side and 20% of the relevant supply rail for low side.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| PCIE   | PCI Express compatible differential signal. Please refer to the PCI Express Specification for details. PCIE transmit pins (Module outputs) shall be AC coupled on the Module. PCIE receive pins (Module inputs) shall be DC coupled on the COM Express® Module and shall be assumed to be AC coupled off Module, close to the signal source. If the target PCI Express device resides on the Carrier Board, the Module PCIE receive lanes (target PCIE device transmit lanes) shall be AC coupled near the device on the Carrier Board. If the Carrier Board implements a PCIE slot, then these signals shall be AC coupled on the add-in card, not on the Carrier Board. |
| SATA   | SATA compatible differential signal. Please refer to the SATA Specification for details. All COM Express® SATA signals shall be AC coupled on the Module.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| LVDS   | Low Voltage Differential Signal – 330mV nominal; 450mV maximum differential signal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Analog | Inputs and Outputs used for LAN, and VGA are analog signals.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PU     | Pull-up resistor on PCOM-B634VG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| PD     | Pull-down resistor on PCOM-B634VG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Table 10 Signal Tables Terminology Descriptions

**<Caution>**

10GbE pin definition is not defined in COM Express specification rev2.0, below 10GbE pin out is defined by Portwell itself. Please contact Portwell for more information while designing your own carrier.

| PCOM-B634 Pin out<br>(Original Type 6 pin definition) |                     |     |                    |     |                             |     |                               |
|-------------------------------------------------------|---------------------|-----|--------------------|-----|-----------------------------|-----|-------------------------------|
| Pin                                                   | Row A               | Pin | Row B              | Pin | Row C                       | Pin | Row D                         |
| A1                                                    | GND(FIXED)          | B1  | GND(FIXED)         | C1  | GND(FIXED)                  | D1  | GND(FIXED)                    |
| A2                                                    | GBE0_MDI3-          | B2  | GBE0_ACT#          | C2  | GND                         | D2  | GND                           |
| A3                                                    | GBE0_MDI3+          | B3  | LPC_FRAME#         | C3  | USB_SSRX0-                  | D3  | USB_SSTX0-                    |
| A4                                                    | GBE0_LINK100#       | B4  | LPC_AD0            | C4  | USB_SSRX0+                  | D4  | USB_SSTX0+                    |
| A5                                                    | GBE0_LINK1000#      | B5  | LPC_AD1            | C5  | GND                         | D5  | GND                           |
| A6                                                    | GBE0_MDI2-          | B6  | LPC_AD2            | C6  | USB_SSRX1-                  | D6  | USB_SSTX1-                    |
| A7                                                    | GBE0_MDI2+          | B7  | LPC_AD3            | C7  | USB_SSRX1+                  | D7  | USB_SSTX1+                    |
| A8                                                    | GBE0_LINK#          | B8  | N/A<br>(LPC_DRQ0#) | C8  | GND                         | D8  | GND                           |
| A9                                                    | GBE0_MDI1-          | B9  | N/A<br>(LPC_DRQ1#) | C9  | USB_SSRX2-                  | D9  | USB_SSTX2-                    |
| A10                                                   | GBE0_MDI1+          | B10 | LPC_CLK            | C10 | USB_SSRX2+                  | D10 | USB_SSTX2+                    |
| A11                                                   | GND(FIXED)          | B11 | GND(FIXED)         | C11 | GND(FIXED)                  | D11 | GND(FIXED)                    |
| A12                                                   | GBE0_MDI0-          | B12 | PWRBTN#            | C12 | USB_SSRX3-                  | D12 | USB_SSTX3-                    |
| A13                                                   | GBE0_MDI0+          | B13 | SMB_CLK            | C13 | USB_SSRX3+                  | D13 | USB_SSTX3+                    |
| A14                                                   | N/A<br>(GBE0_CTREF) | B14 | SMB_DAT            | C14 | GND(FIXED)                  | D14 | GND(FIXED)                    |
| A15                                                   | SUS_S3#             | B15 | SMB_ALERT#         | C15 | KX4_TX0_P0<br>(DDI1_PAIR6+) | D15 | DDI1_CTRLCLK_AUX+             |
| A16                                                   | SATA0_TX+           | B16 | SATA1_TX+          | C16 | KX4_TX0_N0<br>(DDI1_PAIR6-) | D16 | DDI1_CTRLCLK_AUX-             |
| A17                                                   | SATA0_TX-           | B17 | SATA1_TX-          | C17 | N/A                         | D17 | LAN_12C_SDA1_1P0V<br>(RSVD15) |
| A18                                                   | SUS_S4#             | B18 | SUS_SATA           | C18 | N/A                         | D18 | LAN_12C_SCL1_1P0V<br>(RSVD15) |
| A19                                                   | SATA0_RX+           | B19 | SATA1_RX           | C19 | PCIE_RX6+                   | D19 | PCIE_TX6+                     |
| A20                                                   | SATA0_RX-           | B20 | SATA1_RX           | C20 | PCIE_RX6-                   | D20 | PCIE_TX6-                     |



|     |                        |     |                       |     |                                        |     |                                 |
|-----|------------------------|-----|-----------------------|-----|----------------------------------------|-----|---------------------------------|
| A21 | GND(FIXED)             | B21 | GND(FIXED)            | C21 | GND(FIXED)                             | D21 | GND(FIXED)                      |
| A22 | SATA2_TX+              | B22 | SATA3_TX+             | C22 | PCIE_RX7+                              | D22 | PCIE_TX7+                       |
| A23 | SATA2_TX-              | B23 | SATA3_TX-             | C23 | PCIE_RX7-                              | D23 | PCIE_TX7-                       |
| A24 | SUS_S5#                | B24 | PWR_OK                | C24 | DDI1_HPD                               | D24 | LAN_I2C_SDA0_1P0V<br>(RSVD15)   |
| A25 | SATA2_RX+              | B25 | SATA_RX+              | C25 | KX4_TX0_P1<br>(DDI1_PAIR4+)            | D25 | LAN_I2C_SCL0_1P0V<br>(RSVD15)   |
| A26 | SATA2_RX-              | B26 | SATA_RX-              | C26 | KX4_TX0_N1<br>(DDI1_PAIR4-)            | D26 | DDI1_PAIR0+                     |
| A27 | BATLOW#                | B27 | WDT                   | C27 | RSVD15                                 | D27 | DDI1_PAIR0-                     |
| A28 | (S)ATA_ACT#            | B28 | N/A<br>(AC/HDA_SDIN2) | C28 | RSVD15                                 | D28 | RSVD15                          |
| A29 | N/A<br>(AC/HDA_SYNC)   | B29 | N/A<br>(AC/HDA_SDIN1) | C29 | KX4_TX0_P2<br>(DDI1_PAIR5+)            | D29 | DDI1_PAIR1+                     |
| A30 | N/A<br>(AC/HDA_RST#)   | B30 | N/A<br>(AC/HDA_SDIN0) | C30 | KX4_TX0_N2<br>(DDI1_PAIR5-)            | D30 | DDI1_PAIR1-                     |
| A31 | GND(FIXED)             | B31 | GND(FIXED)            | C31 | GND(FIXED)                             | D31 | GND(FIXED)                      |
| A32 | N/A<br>(AC/HDA_BITCLK) | B32 | SPKR                  | C32 | KX4_TX0_P3<br>(DDI2_CTRLCLK_AUX+)      | D32 | DDI1_PAIR2+                     |
| A33 | N/A<br>(AC/HDA_SDOOUT) | B33 | I2C_OK                | C33 | KX4_TX0_N3<br>(DDI2_CTRLCLK_AUX-)      | D33 | DDI1_PAIR2-                     |
| A34 | BIOS_DIS0#             | B34 | I2C_DAT               | C34 | LAN_PORT1_SPEED<br>(DDI2_DDC_AUX_SEL)  | D34 | DDI1_DDC_AUX_SEL                |
| A35 | THRMTRIP#              | B35 | THRM#                 | C35 | LAN_PORT1_ACTVT<br>(RSVD15)            | D35 | GND(FIXED)<br>( )               |
| A36 | USB6-                  | B36 | N/A<br>(USB7-)        | C36 | N/A<br>(DDI3_CTRLCLK_AUX+)             | D36 | DDI0_TXP3                       |
| A37 | USB6+                  | B37 | N/A<br>(USB7+)        | C37 | LAN_PORT0_SPEED<br>(DDI3_CTRLCLK_AUX-) | D37 | DDI0_TXN3                       |
| A38 | USB_6_7_OC#            | B38 | USB_4_5_OC#           | C38 | LAN_PORT0_ACTVT<br>(DDI3_DDC_AUX_SEL)  | D38 | GND(FIXED)                      |
| A39 | USB4-                  | B39 | USB5-                 | C39 | KX4_TX1_P3<br>(DDI2_PAIR0+)            | D39 | SEPP0_KR_TX1_P<br>(DDI2_PAIR0+) |
| A40 | USB4+                  | B40 | USB5+                 | C40 | KX4_TX1_N3<br>(DDI3_PAIR0-)            | D40 | SEPP0_KR_TX1_N<br>(DDI2_PAIR0-) |

|     |              |     |              |     |                             |     |                                 |
|-----|--------------|-----|--------------|-----|-----------------------------|-----|---------------------------------|
| A41 | GND          | B41 | GND(FIXED)   | C41 | GND(FIXED)                  | D41 | GND(FIXED)                      |
| A42 | USB2-        | B42 | USB3-        | C42 | KX4_TX1_P2<br>(DDI3_PAIR1+) | D42 | SEPP0_KR_TX0_P<br>(DDI2_PAIR1+) |
| A43 | USB2+        | B43 | USB3+        | C43 | KX4_TX1_N2<br>(DDI3_PAIR1-) | D43 | SEPP0_KR_TX0_N<br>(DDI2_PAIR1-) |
| A44 | USB_2_3_OC#  | B44 | USB_0_1_OC#  | C44 | N/A                         | D44 | GND(FIXED)<br>(DDI2_HPD)        |
| A45 | USB0-        | B45 | USB1-        | C45 | RSVD15                      | D45 | GND(FIXED)<br>(RSVD15)          |
| A46 | USB0+        | B46 | USB1+        | C46 | KX4_TX1_P1<br>(DDI3_PAIR2+) | D46 | SEPP0_KR_RX0_N<br>(DDI2_PAIR2+) |
| A47 | VCC_RTC      | B47 | EXCD1_PERST# | C47 | KX4_TX1_N1<br>(DDI3_PAIR2-) | D47 | SEPP0_KR_RX0_P<br>(DDI2_PAIR2-) |
| A48 | EXCD0_PERST# | B48 | EXCD1_CPPE#  | C48 | RSVD15                      | D48 | GND(FIXED)<br>(RSVD15)          |
| A49 | EXCD0_CPPE#  | B49 | SYS_RESET#   | C49 | KX4_TX1_P0<br>(DDI3_PAIR3+) | D49 | SEPP0_KR_RX1_P<br>(DDI2_PAIR3+) |
| A50 | LPC_SERIRQ   | B50 | CB_RESET#    | C50 | KX4_TX1_N0<br>(DDI3_PAIR3-) | D50 | SEPP0_KR_RX1_N<br>(DDI2_PAIR3-) |
| A51 | GND(FIXED)   | B51 | GND(FIXED)   | C51 | GND(FIXED)                  | D51 | GND(FIXED)                      |
| A52 | PCIE_TX5+    | B52 | PCIE_RX5+    | C52 | PEG_RX0+                    | D52 | PEG_TX0+                        |
| A53 | PCIE_TX5-    | B53 | PCIE_RX5-    | C53 | PEG_RX0-                    | D53 | PEG_TX0-                        |
| A54 | GP10         | B54 | GPO1         | C54 | TYPE0#                      | D54 | PEG_LANE_RV#                    |
| A55 | PCIE_TX4+    | B55 | PCIE_RX4+    | C55 | PEG_RX1+                    | D55 | PEG_TX1+                        |
| A56 | PCIE_TX4-    | B56 | PCIE_RX4-    | C56 | PEG_RX1-                    | D56 | PEG_TX1-                        |
| A57 | GND          | B57 | GPO2         | C57 | TYPE1#                      | D57 | TYPE2#                          |
| A58 | PCIE_TX3+    | B58 | PCIE_RX3+    | C58 | PEG_RX2+                    | D58 | PEG_TX2+                        |
| A59 | PCIE_TX3-    | B59 | PCIE_RX3-    | C59 | PEG_RX2-                    | D59 | PEG_TX2-                        |
| A60 | GND(FIXED)   | B60 | GND(FIXED)   | C60 | GND(FIXED)                  | D60 | GND(FIXED)                      |

|     |                             |     |                              |     |            |     |            |
|-----|-----------------------------|-----|------------------------------|-----|------------|-----|------------|
| A61 | PCIE_TX2+                   | B61 | PCIE_RX2+                    | C61 | PEG_RX3+   | D61 | PEG_TX3+   |
| A62 | PCIE_TX2-                   | B62 | PCIE_RX2-                    | C62 | PEG_RX3-   | D62 | PEG_TX3-   |
| A63 | GPI1                        | B63 | GPO3                         | C63 | RSVD15     | D63 | RSVD15     |
| A64 | PCIE_TX1+                   | B64 | PCIE_RX1+                    | C64 | RSVD15     | D64 | RSVD15     |
| A65 | PCIE_TX1-                   | B65 | PCIE_RX1-                    | C65 | PEG_RX4+   | D65 | PEG_TX4+   |
| A66 | GND                         | B66 | WAKE0#                       | C66 | PEG_RX4-   | D66 | PEG_TX4-   |
| A67 | GPI2                        | B67 | WAKE1#                       | C67 | RSVD15     | D67 | GND        |
| A68 | PCIE_TX0+                   | B68 | PCIE_RX0+                    | C68 | PEG_RX5+   | D68 | PEG_TX5+   |
| A69 | PCIE_TX0-                   | B69 | PCIE_RX0-                    | C69 | PEG_RX5-   | D69 | PEG_TX5-   |
| A70 | GND(FIXED)                  | B70 | GND(FIXED)                   | C70 | GND(FIXED) | D70 | GND(FIXED) |
| A71 | N/A<br>(LVDS_A0+)           | B71 | N/A<br>(LVDS_B0+)            | C71 | PEG_RX6+   | D71 | PEG_TX6+   |
| A72 | KX_RX1_P3<br>(LVDS_A0-)     | B72 | KX4_RX0_N2<br>(LVDS_B0-)     | C72 | PEG_RX6-   | D72 | PEG_TX6-   |
| A73 | KX_RX1_N3<br>(LVDS_A1+)     | B73 | KX4_RX0_P2<br>(LVDS_B1+)     | C73 | GND        | D73 | GND        |
| A74 | N/A<br>(LVDS_A1+)           | B74 | N/A<br>(LVDS_B0-)            | C74 | PEG_RX7+   | D74 | PEG_TX7+   |
| A75 | KX_RX1_P2<br>(LVDS_A2+)     | B75 | KX4_RX0_N1<br>(LVDS_B0+)     | C75 | PEG_RX7-   | D75 | PEG_TX7-   |
| A76 | KX_RX1_N2<br>(LVDS_A2-)     | B76 | KX4_RX0_P1<br>(LVDS_B2-)     | C76 | GND        | D76 | GND        |
| A77 | GND(FIXED)<br>(LVDS_VDD_EN) | B77 | N/A<br>(LVDS_B3+)            | C77 | RSVD15     | D77 | RSVD15     |
| A78 | KX_RX1_P1<br>(LVDS_A3+)     | B78 | KX4_RX0_N3<br>(LVDS_B3-)     | C78 | PEG_RX8+   | D78 | PEG_TX8+   |
| A79 | KX_RX1_N1<br>(LVDS_A3-)     | B79 | KX4_RX0_P3<br>(LVDS_BKLT_EN) | C79 | PEG_RX8-   | D79 | PEG_TX8-   |
| A80 | GND(FIXED)                  | B80 | GND(FIXED)                   | C80 | GND(FIXED) | D80 | GND(FIXED) |
| A81 | KX_RX1_P0<br>(LVDS_A_CK+)   | B81 | KX4_RX0_N0<br>(LVDS_B_CK+)   | C81 | PEG_RX9+   | D81 | PEG_TX9+   |
| A82 | KX_RX1_N0<br>(LVDS_A_CK-)   | B82 | KX4_RX0_P0<br>(LVDS_B_CK-)   | C82 | PEG_RX9-   | D82 | PEG_TX9-   |

|      |                       |      |                         |      |            |      |            |
|------|-----------------------|------|-------------------------|------|------------|------|------------|
| A83  | N/A<br>(LVDS_I2C_CK)  | B83  | N/A<br>(LVDS_BKLT_CTRL) | C83  | RSVD15     | D83  | RSVD15     |
| A84  | N/A<br>(LVDS_I2C_DAT) | B84  | VCC_5V_SBY              | C84  | GND        | D84  | GND        |
| A85  | GPI3                  | B85  | VCC_5V_SBY              | C85  | PEG_RX10+  | D85  | PEG_TX10+  |
| A86  | N/A<br>(RSVD15)       | B86  | VCC_5V_SBY              | C86  | PEG_RX10-  | D86  | PEG_TX10-  |
| A87  | N/A<br>(eDP_HDP)      | B87  | VCC_5V_SBY              | C87  | GND(FIXED) | D87  | GND(FIXED) |
| A88  | PCIE_CLK_REF+         | B88  | BIOS_DIS1#              | C88  | PEG_RX11+  | D88  | PEG_TX11+  |
| A89  | PCIE_CLK_REF-         | B89  | VGA_RED                 | C89  | PEG_RX11-  | D89  | PEG_TX11-  |
| A90  | GND(FIXED)            | B90  | GND(FIXED)              | C90  | GND(FIXED) | D90  | GND(FIXED) |
| A91  | SPI_POWER             | B91  | VGA_GRN                 | C91  | PEG_RX12+  | D91  | PEG_TX12+  |
| A92  | SPI_MISO              | B92  | VGA_BLU                 | C92  | PEG_RX12-  | D92  | PEG_TX12-  |
| A93  | GPO0                  | B93  | VGA_HSYNC               | C93  | GND        | D93  | GND        |
| A94  | SPI_CLK               | B94  | VGA_VSYNC               | C94  | PEG_RX13+  | D94  | PEG_TX13+  |
| A95  | SPI_MOSI              | B95  | VGA_I2C_CK              | C95  | PEG_RX13-  | D95  | PEG_TX13-  |
| A96  | N/A<br>(TPM_PP)       | B96  | VGA_DAT                 | C96  | GND(FIXED) | D96  | GND(FIXED) |
| A97  | TYPE10#               | B97  | SPI_CS#                 | C97  | RSVD15     | D97  | RSVD15     |
| A98  | SER0_TX               | B98  | RSVD15                  | C98  | PEG_RX14+  | D98  | PEG_TX14+  |
| A99  | SER0_RX               | B99  | RSVD15                  | C99  | PEG_RX14-  | D99  | PEG_TX14-  |
| A100 | GND(FIXED)            | B100 | GND(FIXED)              | C100 | GND(FIXED) | D100 | GND(FIXED) |

|      |            |      |            |      |            |      |            |
|------|------------|------|------------|------|------------|------|------------|
| A101 | SER1_TX    | B101 | FAN_PWNOUT | C101 | PEG_RX15+  | D101 | PEG_TX15+  |
| A102 | SER1_RX    | B102 | FAN_TACHIN | C102 | PEG_RX15-  | D102 | PEG_TX15-  |
| A103 | LID#       | B103 | SLEEP#     | C103 | GND        | D103 | GND        |
| A104 | VCC_12V    | B104 | VCC_12V    | C104 | VCC_12V    | D104 | VCC_12V    |
| A105 | VCC_12V    | B105 | VCC_12V    | C105 | VCC_12V    | D105 | VCC_12V    |
| A106 | VCC_12V    | B106 | VCC_12V    | C106 | VCC_12V    | D106 | VCC_12V    |
| A107 | VCC_12V    | B107 | VCC_12V    | C107 | VCC_12V    | D107 | VCC_12V    |
| A108 | VCC_12V    | B108 | VCC_12V    | C108 | VCC_12V    | D108 | VCC_12V    |
| A109 | VCC_12V    | B109 | VCC_12V    | C109 | VCC_12V    | D109 | VCC_12V    |
| A110 | GND(FIXED) | B110 | GND(FIXED) | C110 | GND(FIXED) | D110 | GND(FIXED) |

Table 11 Pin out description

## 6 BIOS Setup Items

PCOM-B634VG is equipped with the AMI BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, PCOM-B634VG communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

## 6.1 Entering Setup -- Launch System Setup

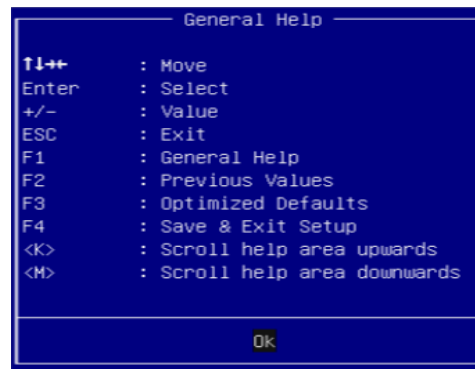
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key will enter BIOS setup screen.

### **Press <Del> to enter SETUP**

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

### **Press <F1> to Run General Help or Resume**

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.



## 6.2 Main

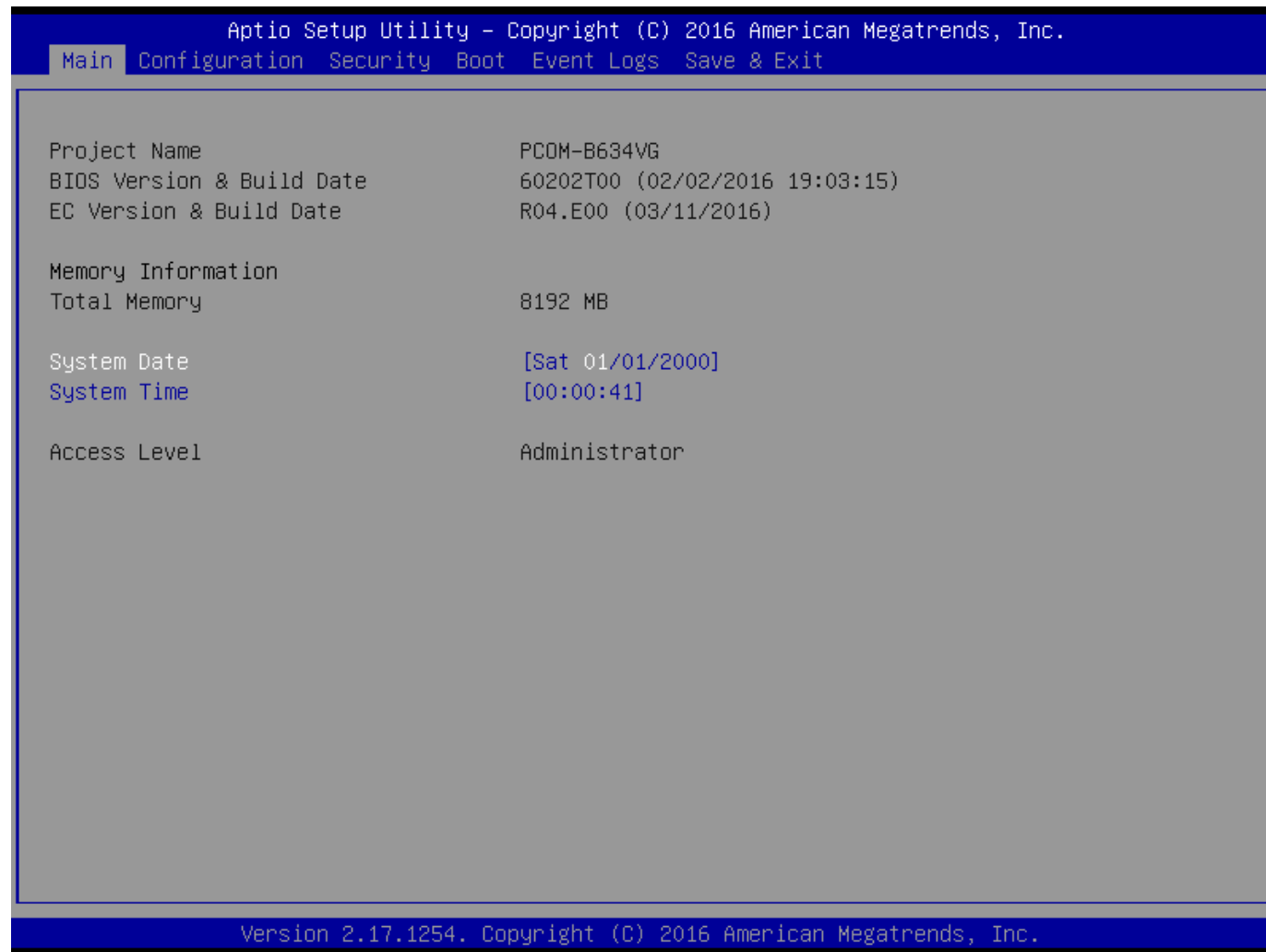


Figure 10 BIOS MAIN



## 6.3 Configuration

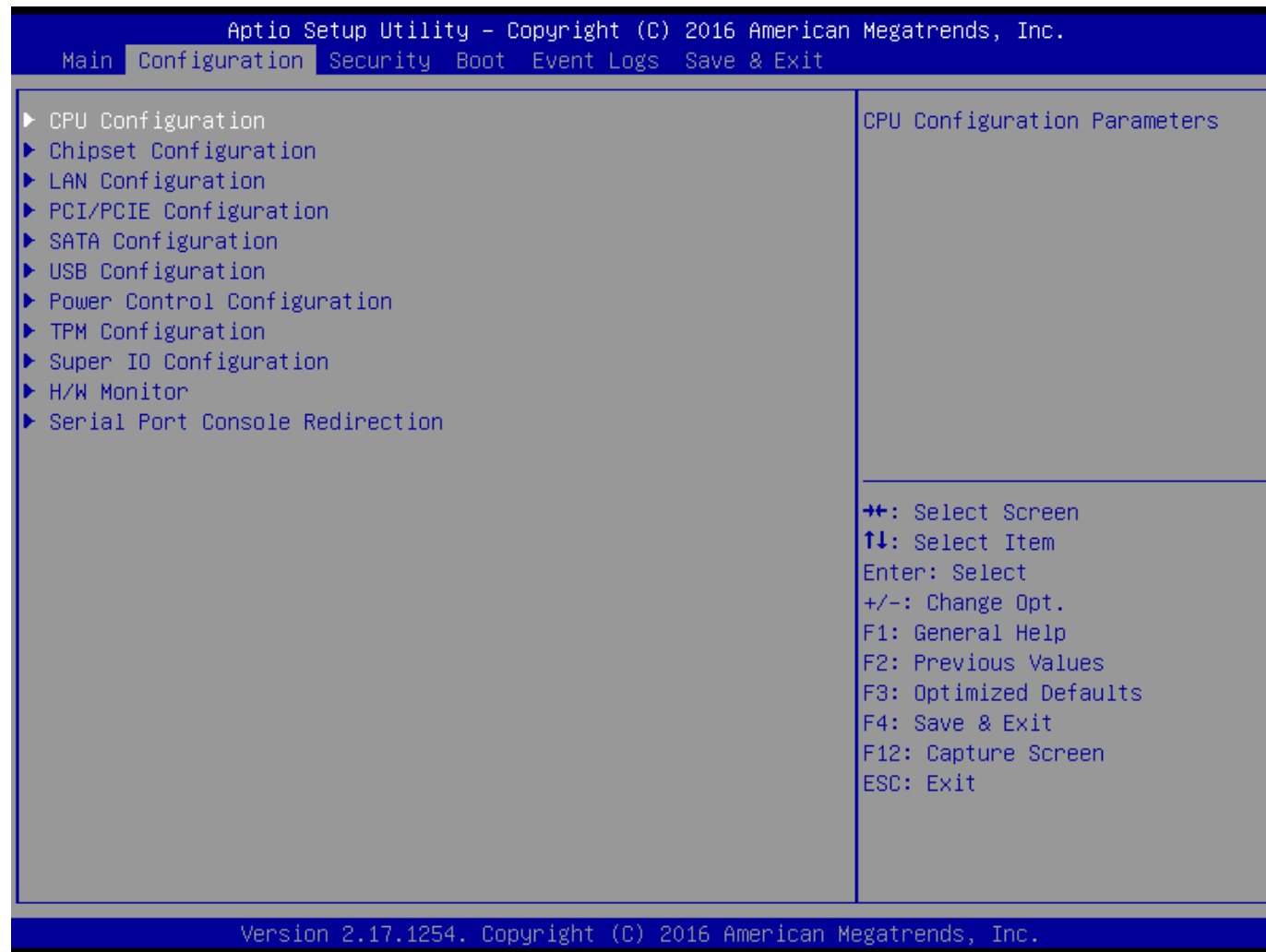


Figure 11 BIOS CONFIGURATION

## CPU



Figure 12 BIOS CPU

## Chipset



Figure 13 BIOS Chipset

## LAN

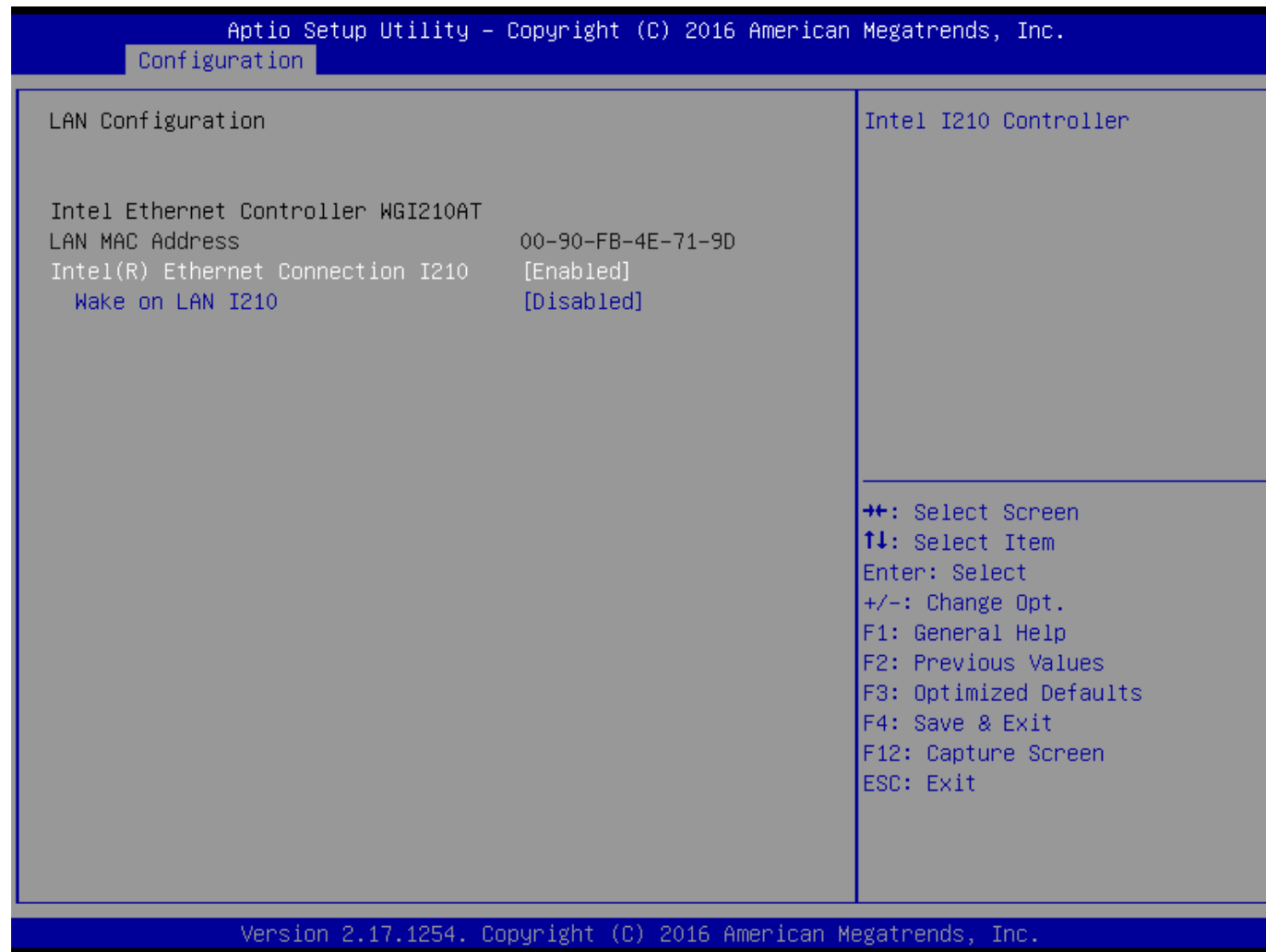


Figure 14 LAN

## PCIE

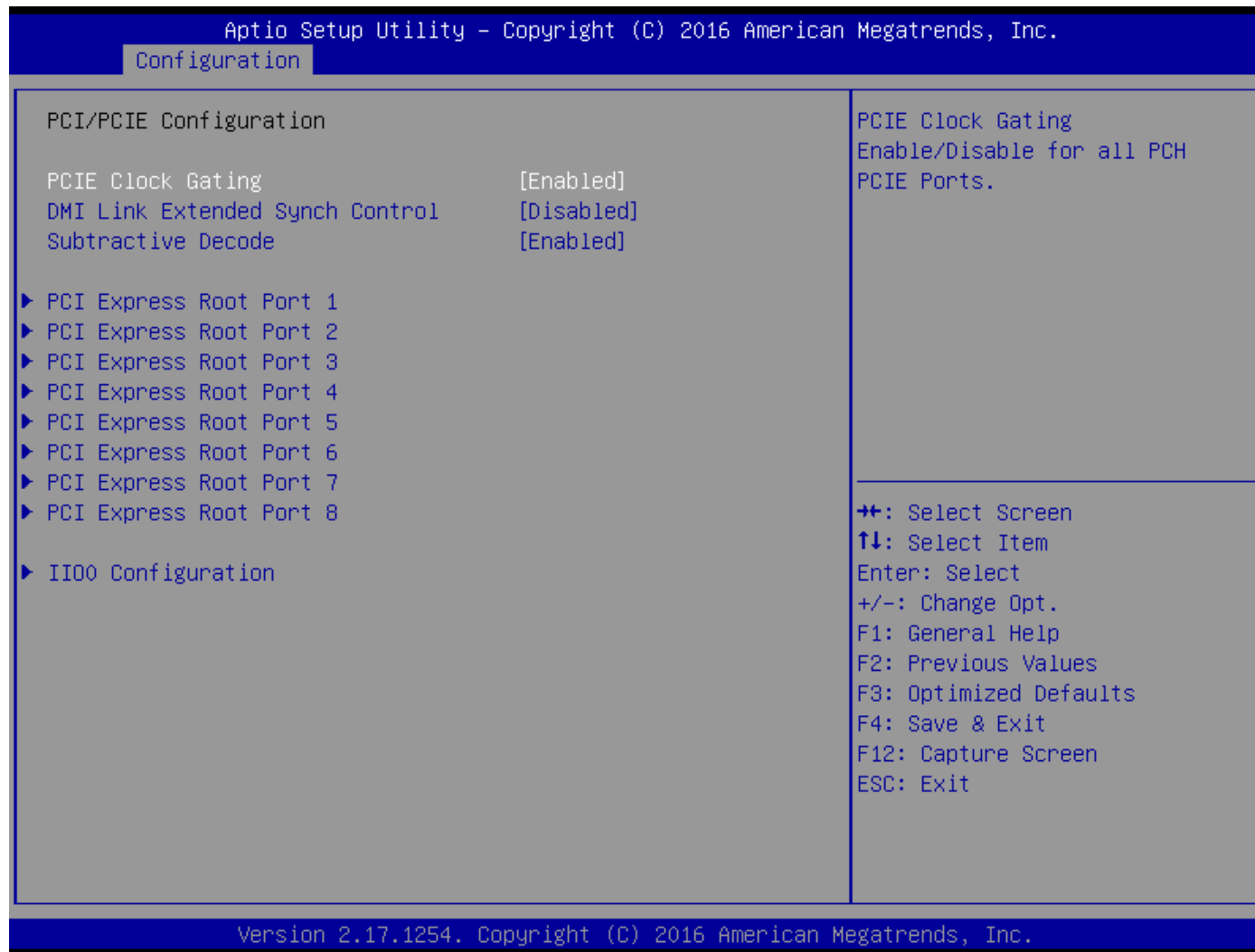


Figure 15 PCIE

## SATA

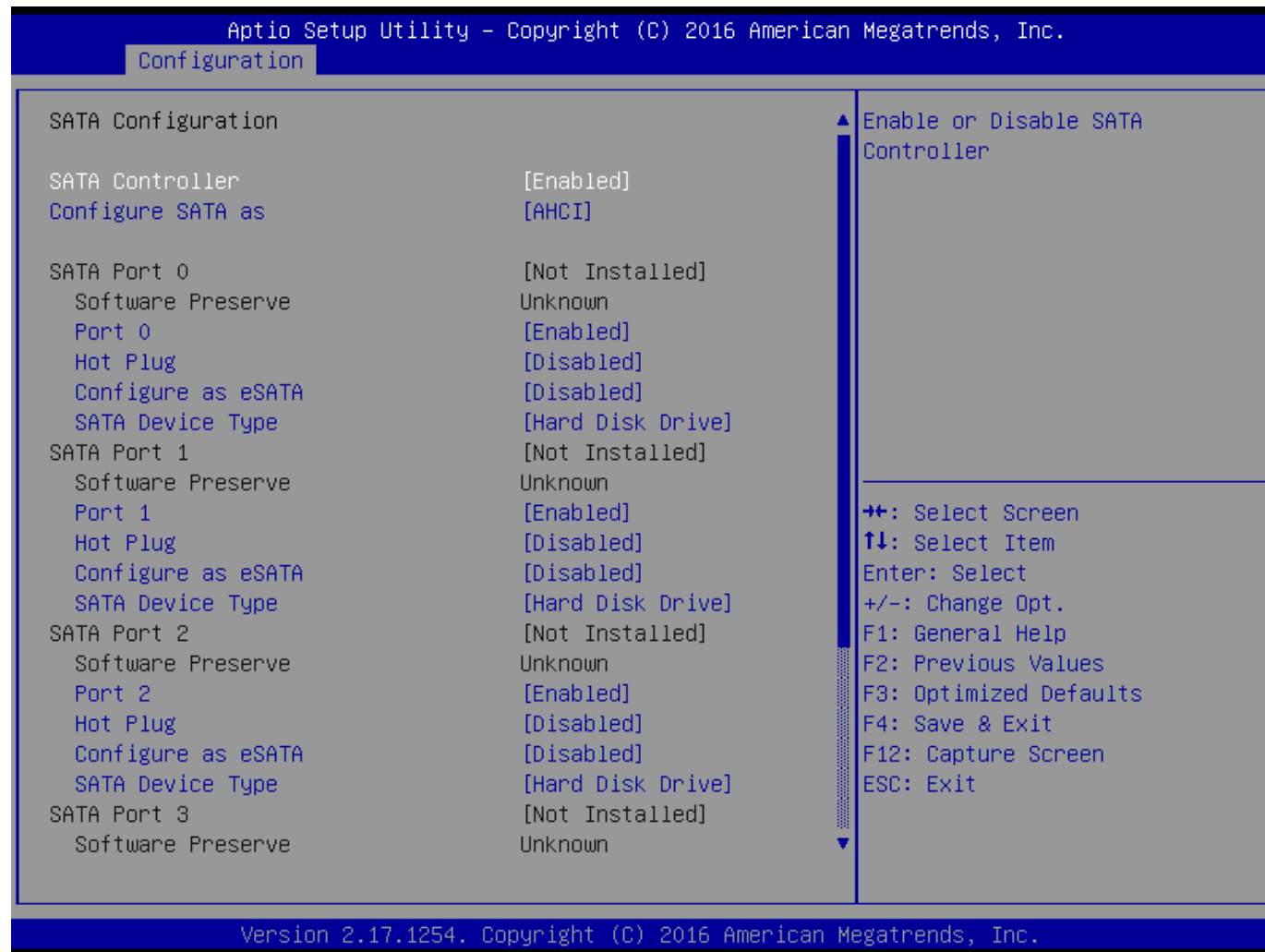


Figure 16 BIOS SATA

## USB



Figure 17 BIOS USB

## Power control

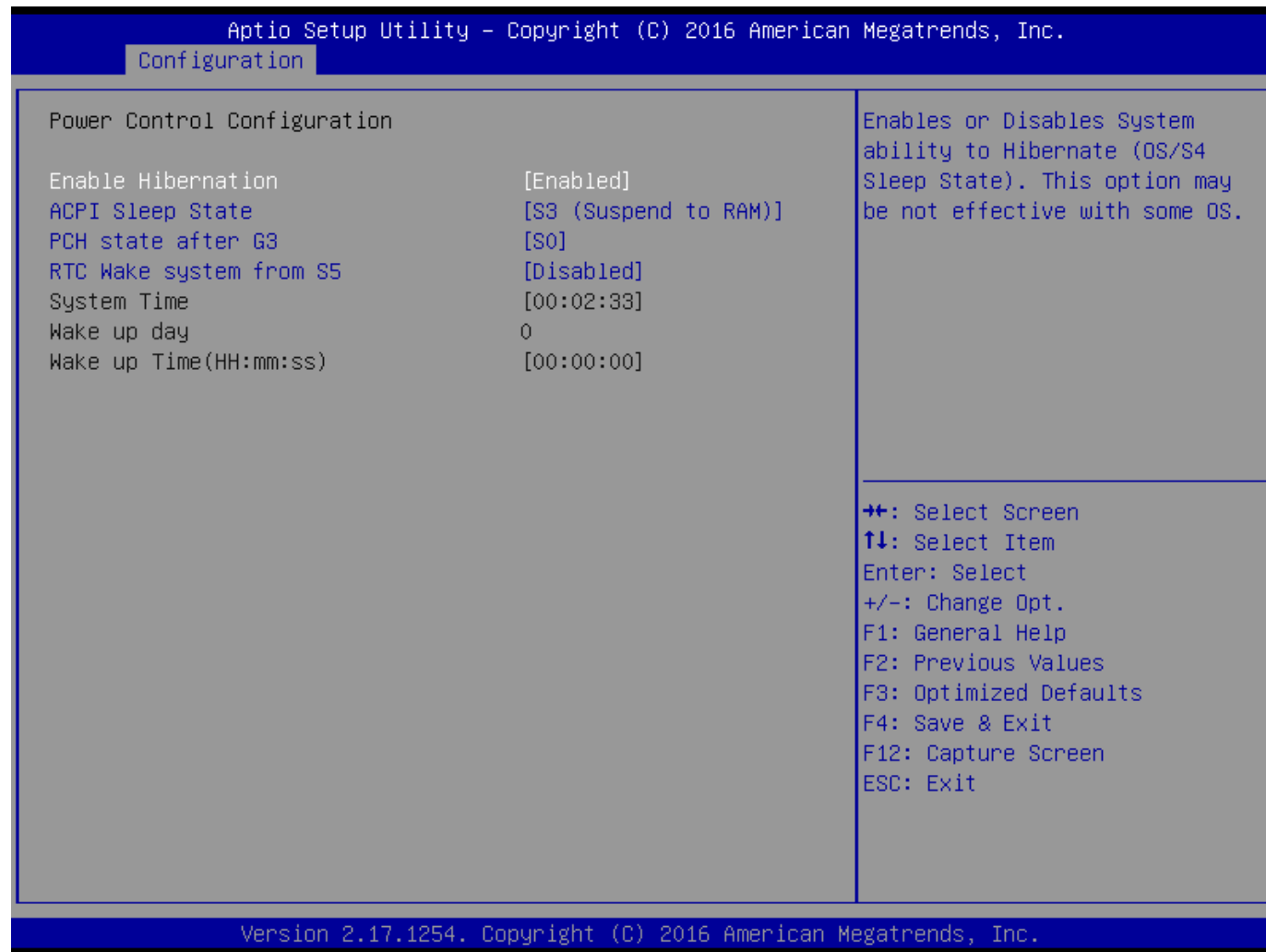


Figure 18 BIOS POWER CONTROL



## TPM

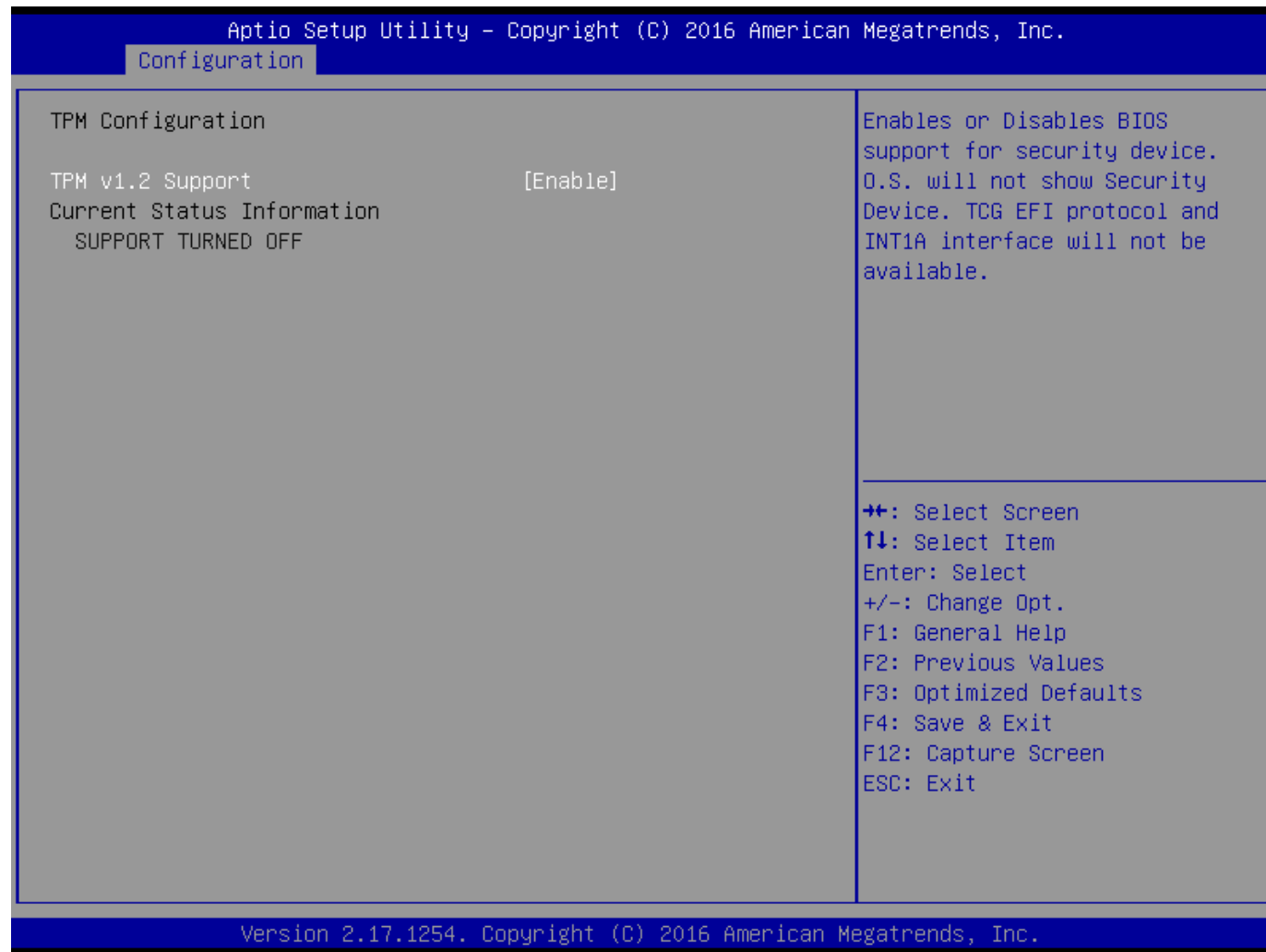


Figure 19 BIOS TPM

## Super IO

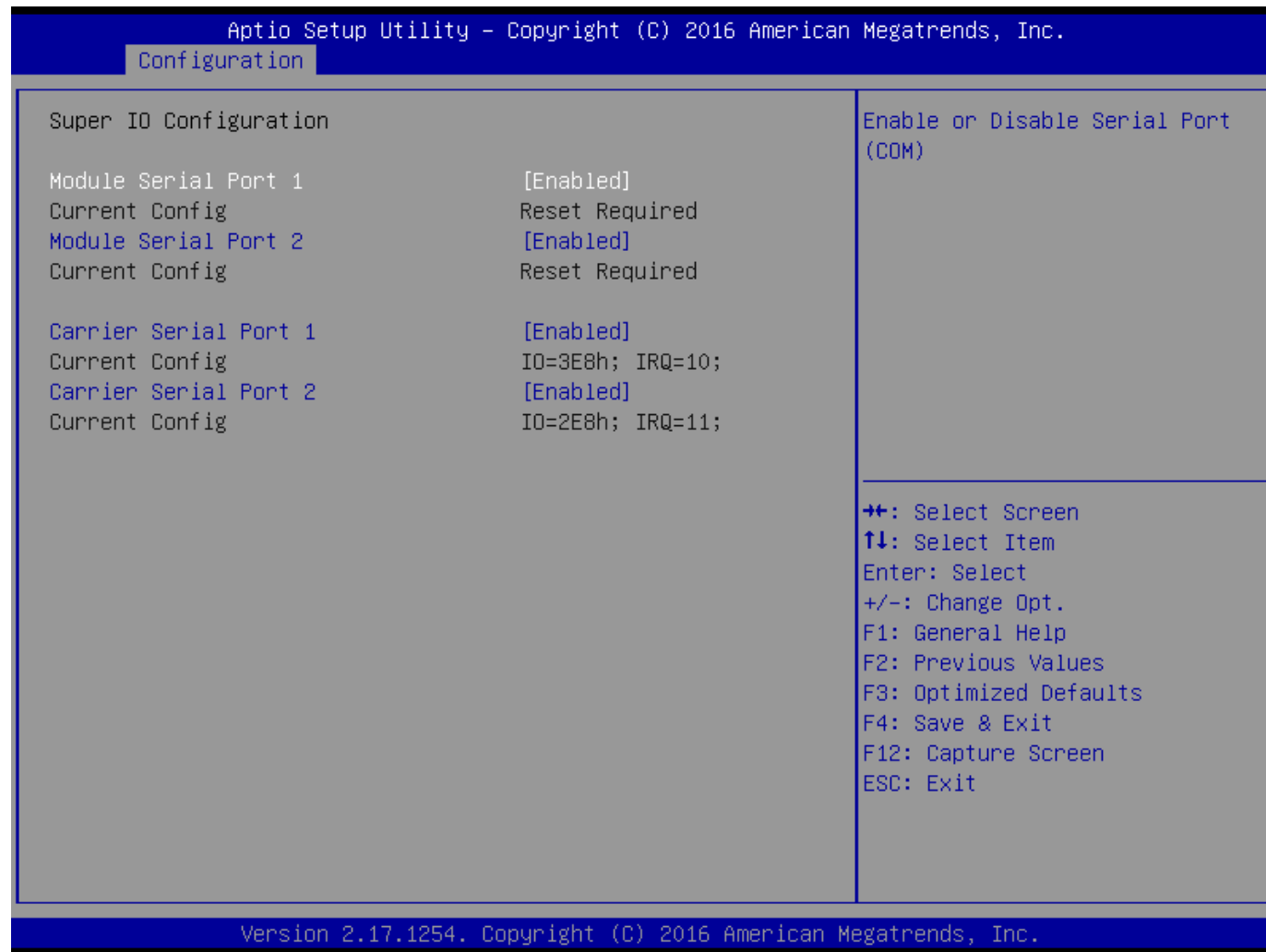


Figure 20 BIOS SUPER IO

## HW Monitor

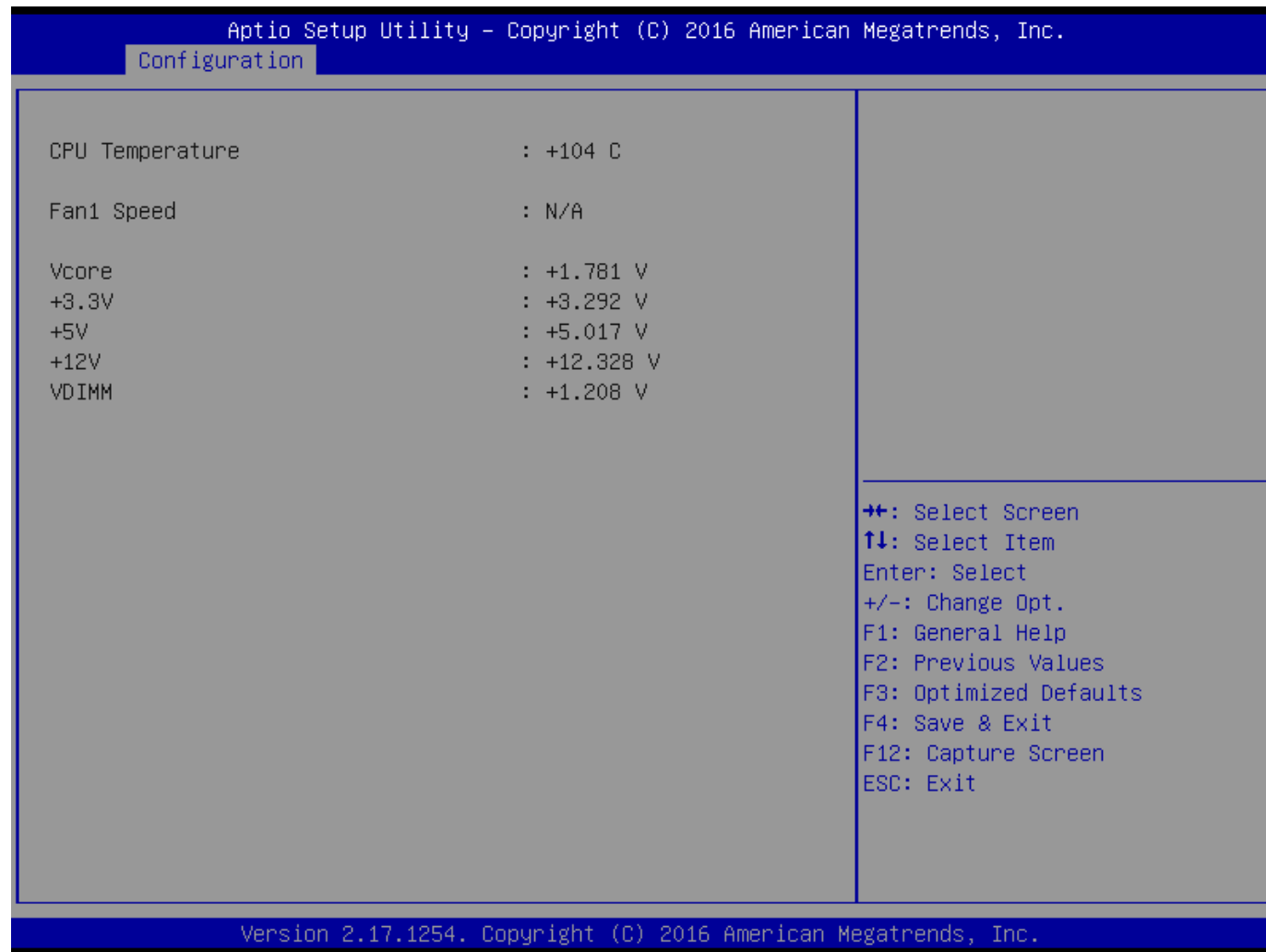


Figure 21 BIOS HW MONITOR

## Serial Port

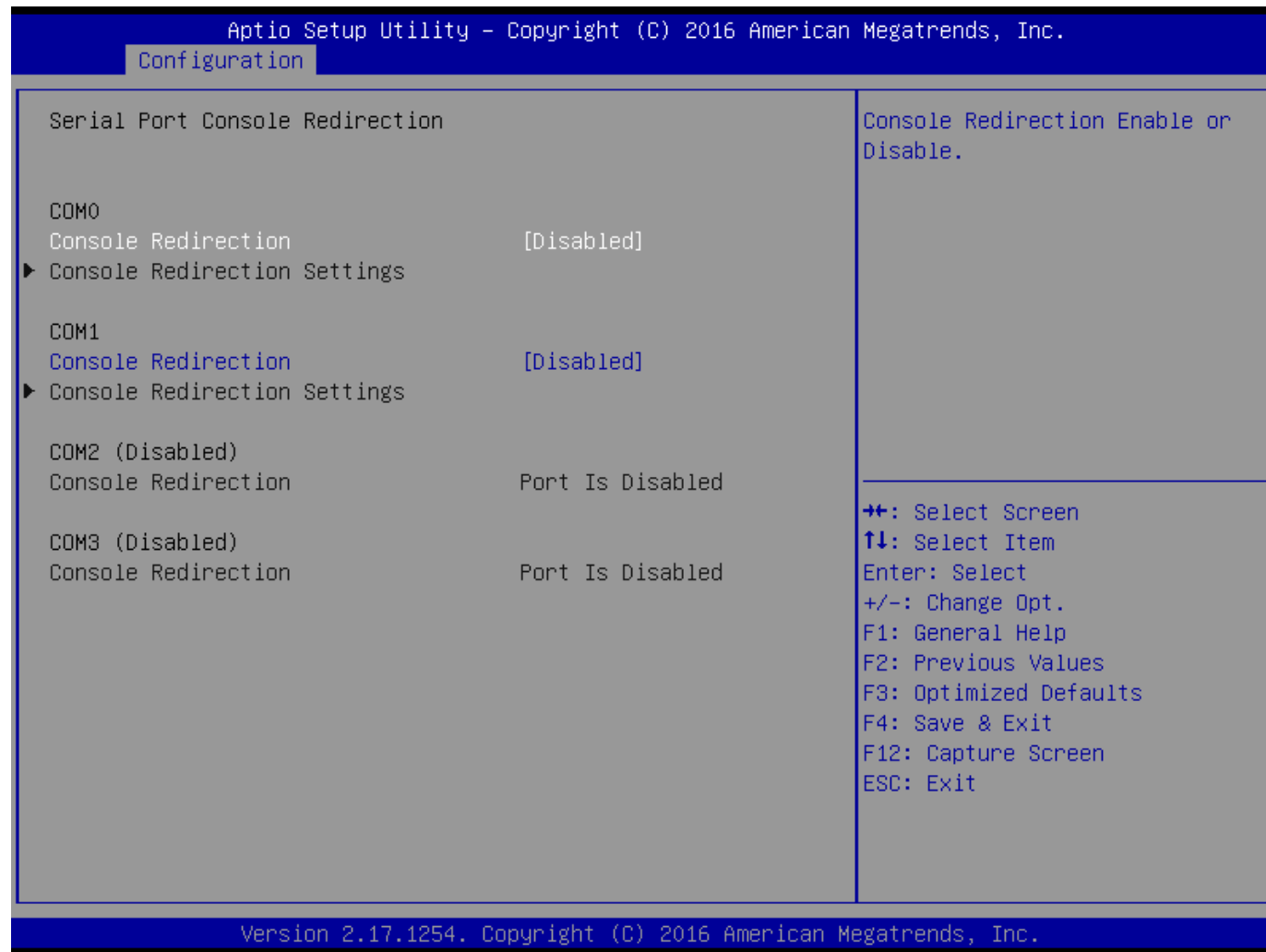


Figure 22 BIOS SERIAL PORT

## Security

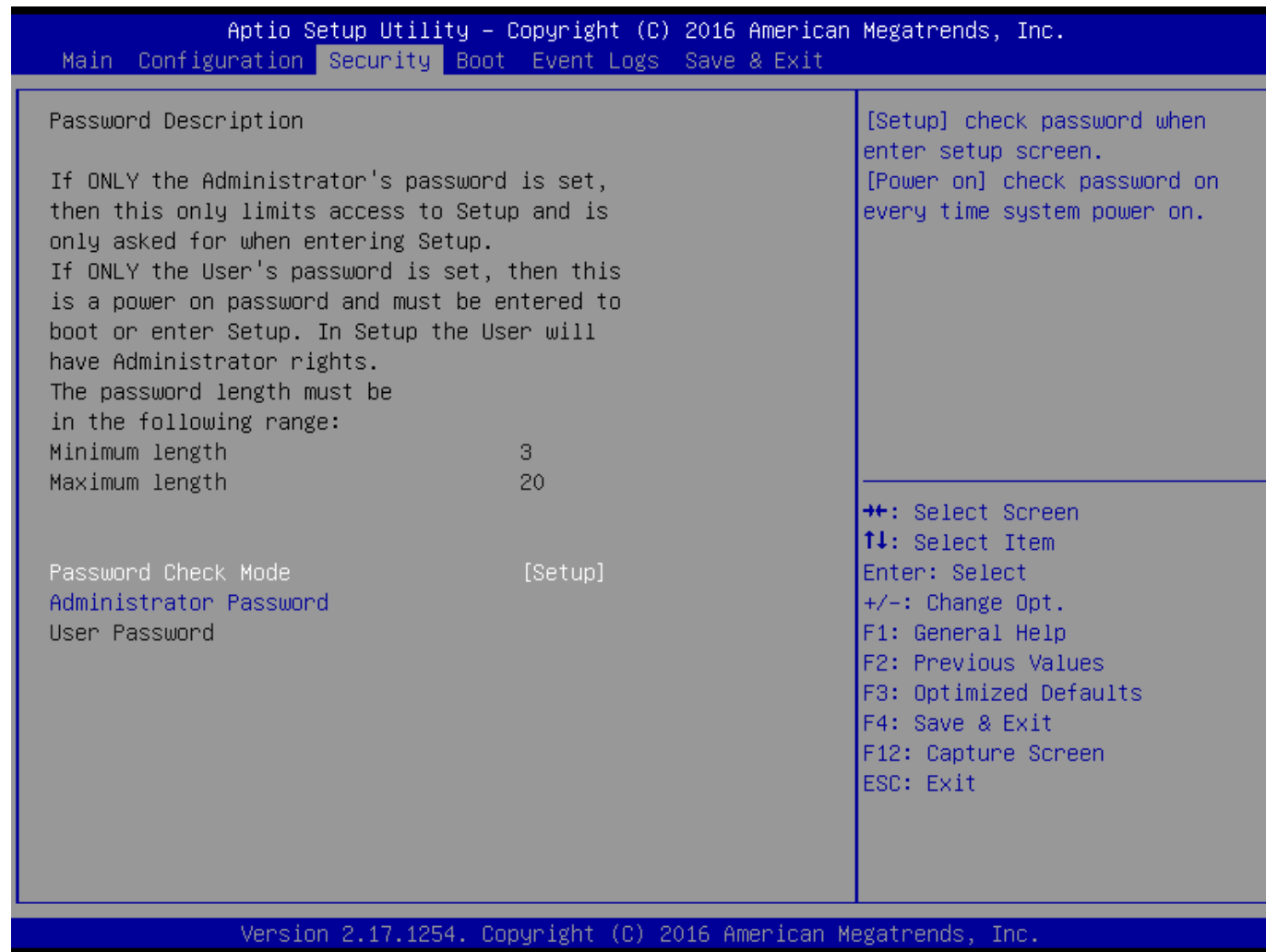


Figure 23 BIOS Security

## 6.4 Boot

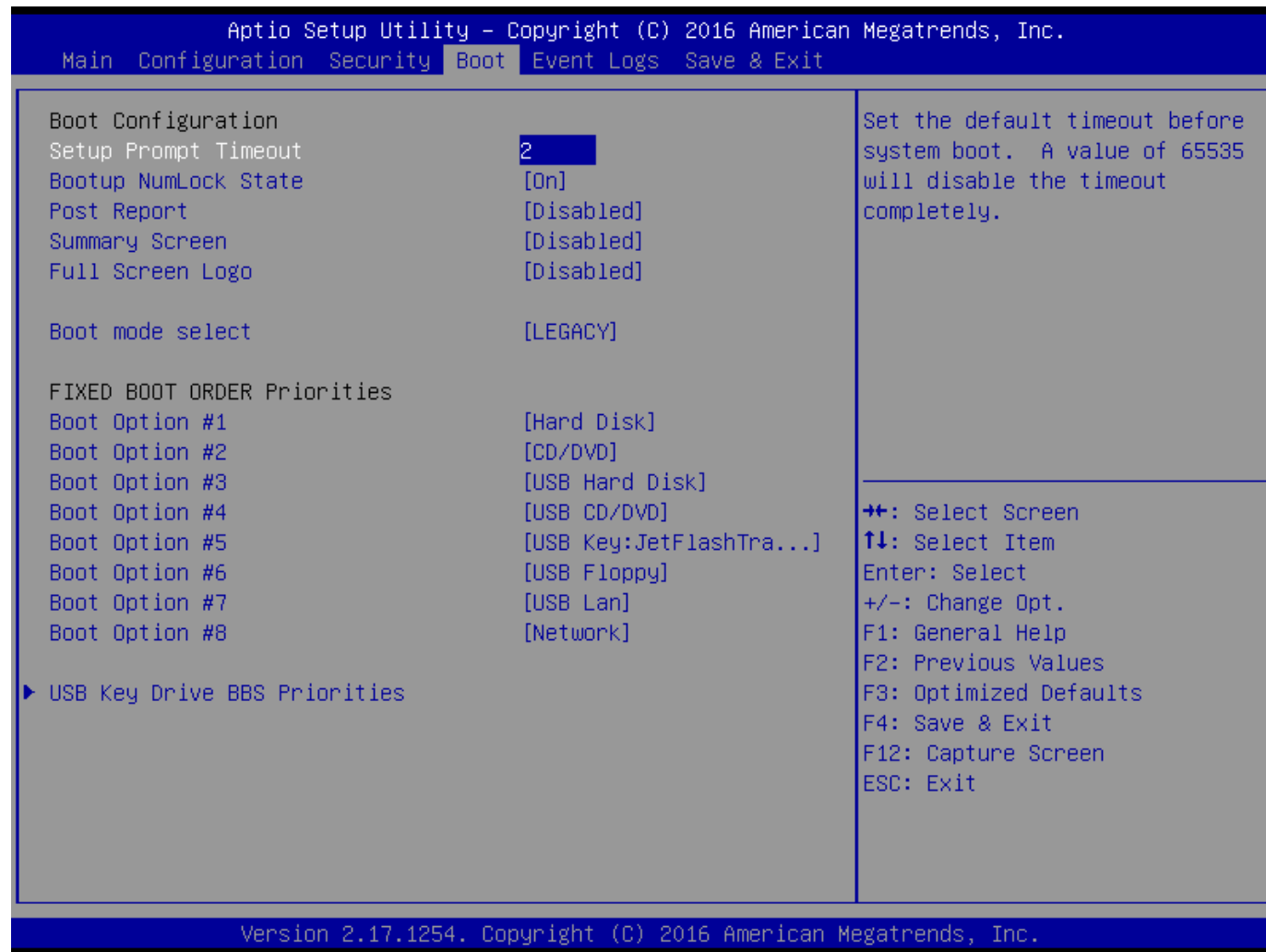


Figure 24 BIOS BOOT

## 6.5 Event Logs



Figure 25 BIOS Event Logs

## 6.6 Save & Exit



Figure 26 BIOS SAVE & EXIT



## 7 System Resources

### LPC

| Device                        | I/O Address   | Note                          |
|-------------------------------|---------------|-------------------------------|
| Embedded Controller (ITE8528) | 0x6E / 0x6F   | EC Address                    |
|                               | 0x62 / 0x66   | EC ACPI CMD Port              |
|                               | 0x200 / 0x201 | EC BRAM Port for I2C function |
|                               | 0x1300~0x13FF | EC LPC IO Space               |
|                               | 0x3F8~0x3FF   | EC UART1                      |
|                               | 0x2F8~0x2FF   | EC UART2                      |
| Carrier SIO                   | 0x2E / 0x2F   | W83627UGH Address             |
|                               | 0x3F0~0x3F8   | SIO UART1                     |
|                               | 0x2F0~0x2F8   | SIO UART3                     |

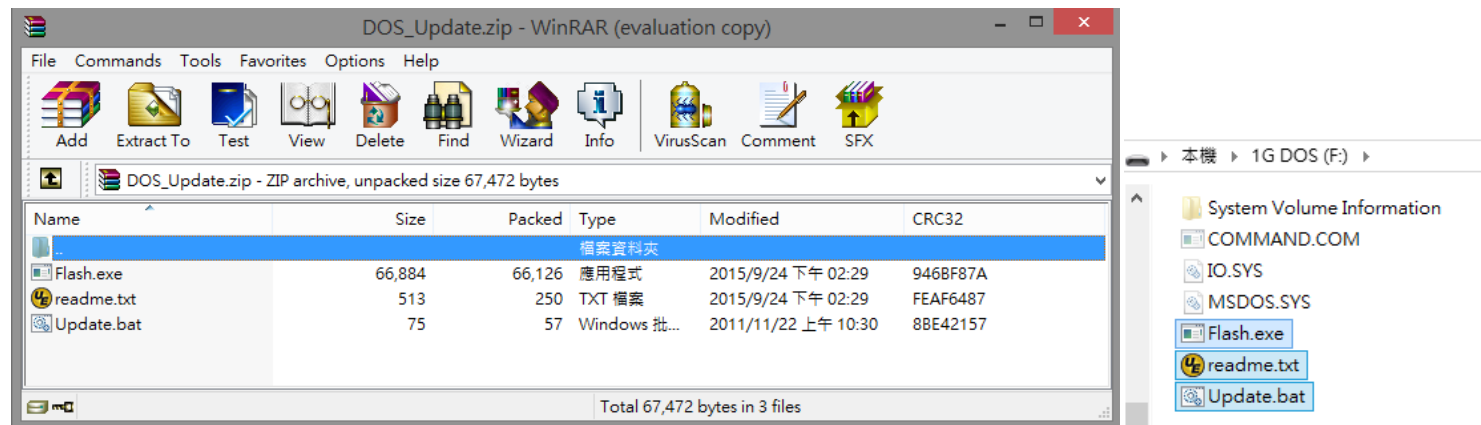
Table 12 System Resources

## 8 BIOS Update

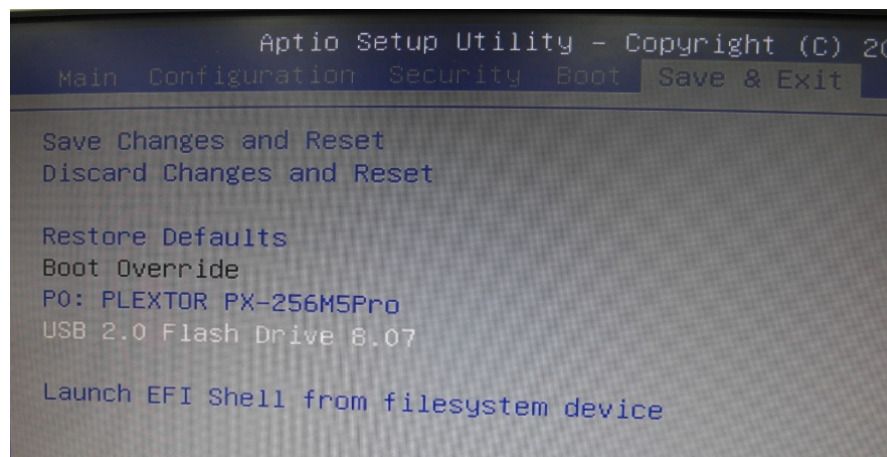
### BIOS/EC DOS Update SOP process

Step 1. Create a DOS USB DOK. (Must be FAT or FAT32 format).

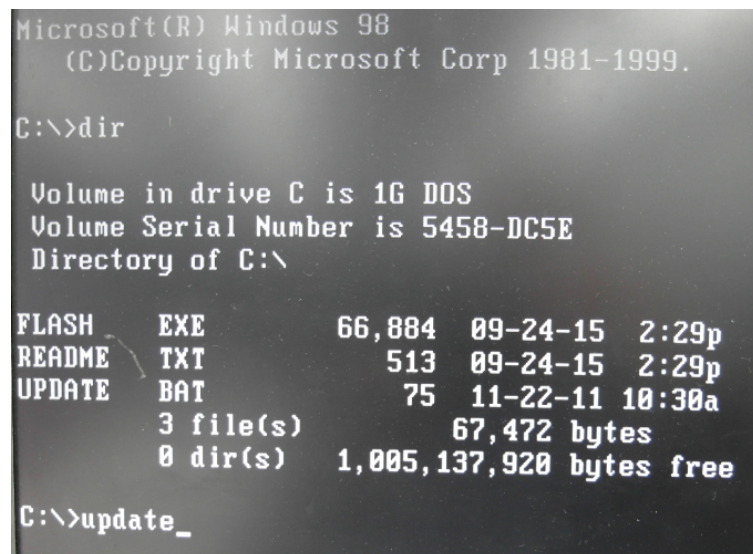
Step 2. Unzip update file to the DOS USB DOK.



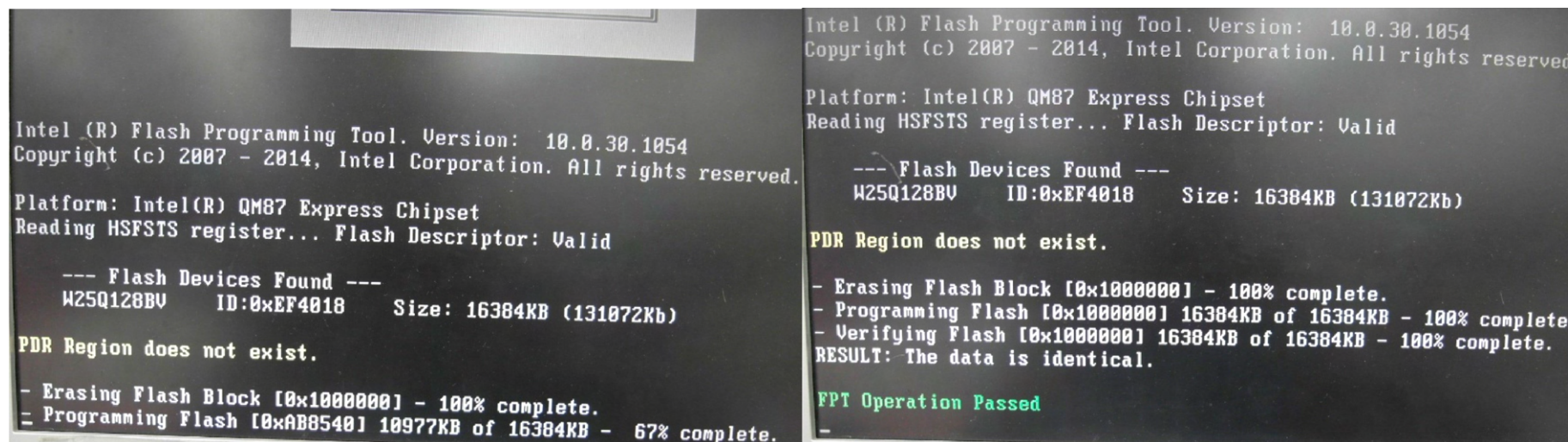
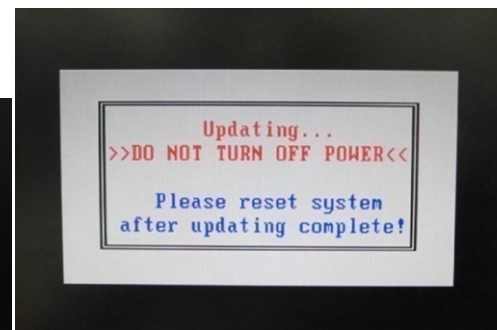
Step 3. Plug the DOS USB DOK into the target system and boot from the DOS USB DOK.



Step 4. Under the update file folder, type command : "update" and press enter.



Step 5. The update process will start and you can see the updating progress. Once finished, please power off and restart the system.

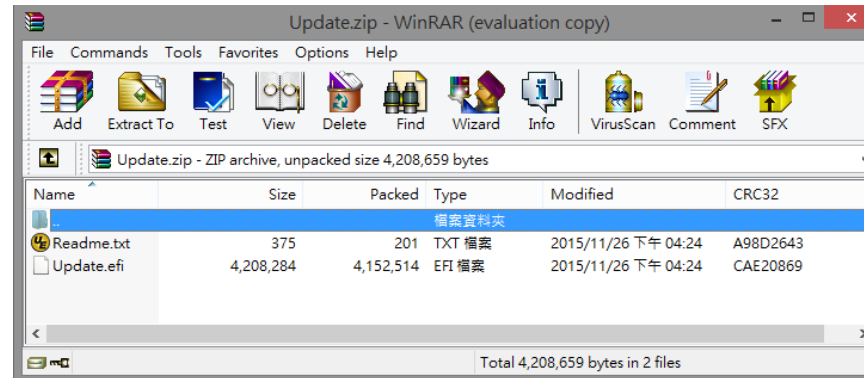


<End of BIOS/EC DOS update process>

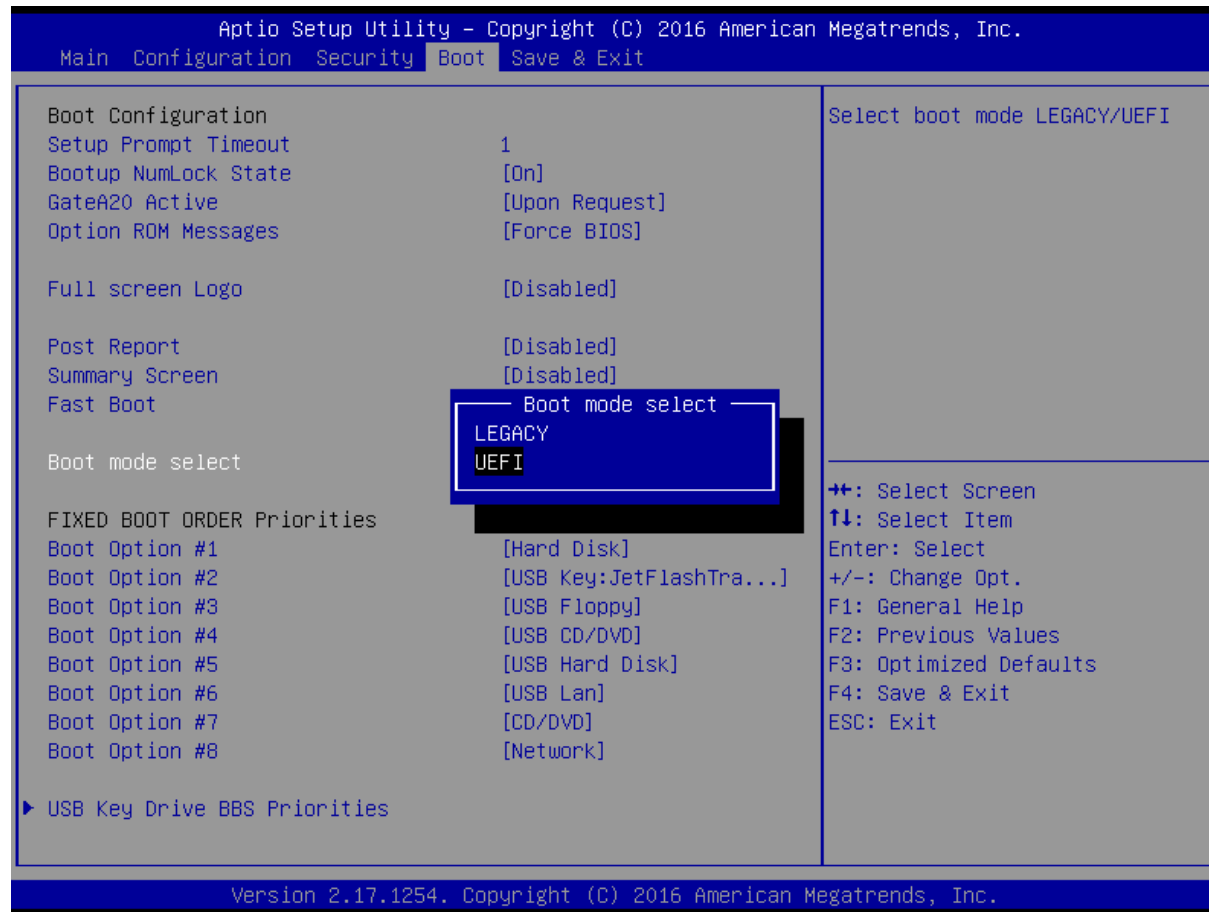
## BIOS/EC UEFI Update SOP process

Step 1. Prepare a USB DOK. (Must be FAT or FAT32 format).

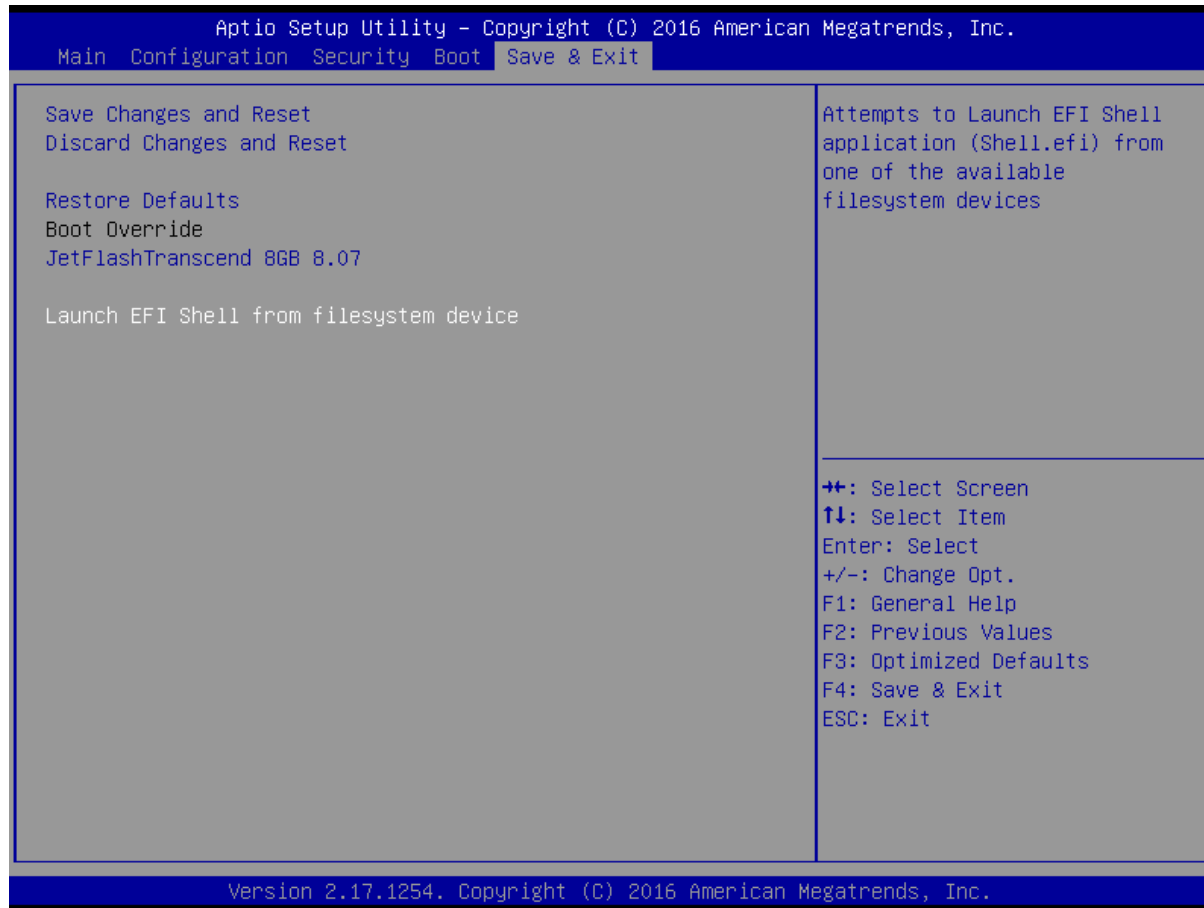
Step 2. Unzip update file to the USB DOK.



Step 3. Select UEFI boot mode in the BIOS boot menu and save, then restart the system.



Step 4. Plug the USB DOK into the target system and boot from UEFI Shell.





Step 5. Under the UEFI shell, direct to your USB DOK, below is an example uses fs0. Then direct to the folder with updated file and type command : "update" and press enter.

```
EFI Shell version 2.40 [5.10]
Current running mode 1.1.2
Device mapping table
fs0 :Removable HardDisk - Alias hd18a0c0b blk0
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x2,0x0)/HD(1,MBR,0xEB7B8CCE,0x3F,0x1E17C1)
blk0 :Removable HardDisk - Alias hd18a0c0b fs0
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x2,0x0)/HD(1,MBR,0xEB7B8CCE,0x3F,0x1E17C1)
blk1 :HardDisk - Alias (null)
      PciRoot(0x0)/Pci(0x1F,0x2)/Sata(0x0,0xFFFF,0x0)/HD(1,MBR,0x4E243949,0x800,0x61A8000)
blk2 :HardDisk - Alias (null)
      PciRoot(0x0)/Pci(0x1F,0x2)/Sata(0x0,0xFFFF,0x0)/HD(2,MBR,0x4E243949,0x61A8800,0x136EE000)
blk3 :HardDisk - Alias (null)
      PciRoot(0x0)/Pci(0x1F,0x2)/Sata(0x0,0xFFFF,0x0)/HD(3,MBR,0x4E243949,0x19896800,0x445C000)
blk4 :BlockDevice - Alias (null)
      PciRoot(0x0)/Pci(0x1F,0x2)/Sata(0x0,0xFFFF,0x0)
blk5 :Removable BlockDevice - Alias (null)
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x2,0x0)

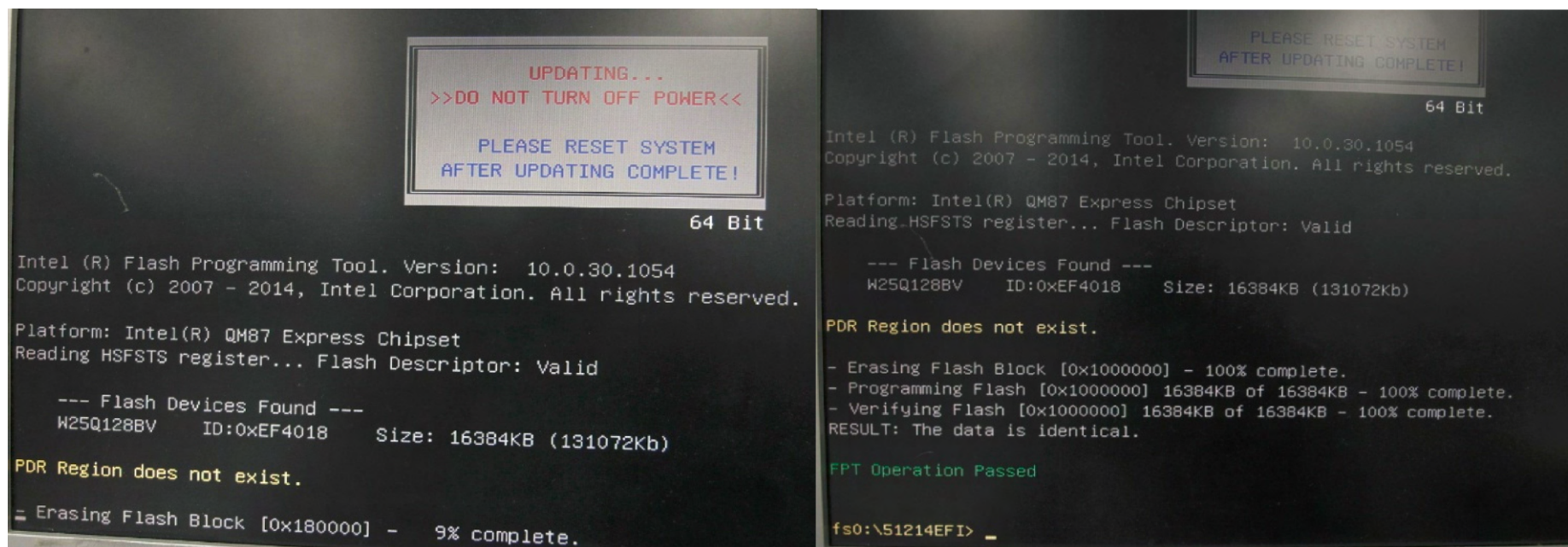
Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell> fs0: _
```

```
EFI Shell version 2.40 [5.10]
Current running mode 1.1.2
Device mapping table
fs0 :Removable HardDisk - Alias hd18a0c0b blk0
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x2,0x0)/HD(1,MBR,0xEB7B8CCE,0x3F,0x1E17C1)
blk0 :Removable HardDisk - Alias hd18a0c0b fs0
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x2,0x0)/HD(1,MBR,0xEB7B8CCE,0x3F,0x1E17C1)
blk1 :HardDisk - Alias (null)
      PciRoot(0x0)/Pci(0x1F,0x2)/Sata(0x0,0xFFFF,0x0)/HD(1,MBR,0x4E243949,0x800,0x61A8000)
blk2 :HardDisk - Alias (null)
      PciRoot(0x0)/Pci(0x1F,0x2)/Sata(0x0,0xFFFF,0x0)/HD(2,MBR,0x4E243949,0x61A8800,0x136EE000)
blk3 :HardDisk - Alias (null)
      PciRoot(0x0)/Pci(0x1F,0x2)/Sata(0x0,0xFFFF,0x0)/HD(3,MBR,0x4E243949,0x19896800,0x445C000)
blk4 :BlockDevice - Alias (null)
      PciRoot(0x0)/Pci(0x1F,0x2)/Sata(0x0,0xFFFF,0x0)
blk5 :Removable BlockDevice - Alias (null)
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x2,0x0)

Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell> fs0:
fs0:\> cd 51214EFI
fs0:\51214EFI> update _
```



Step 6. The updating process will start and you can see the updating progress. Once finished, please power off and restart the system.



<End of BIOS/EC UEFI update process>

## 9 PORTWELL Software Tool

### PORTWELL Evaluation Tool (PET)

The PORTWELL Evaluation Tool (PET) is an API which PORTWELL's customers can access the GPIO, I2C, SMBus, etc under Windows and Linux OS. For more information please contact PORTWELL.

### PORTWELL BIOS web Tool (PBT)

The PORTWELL BIOS web Tool (PBT) is a brand new on-line utility innovated by PORTWELL. PBT now is available for PORTWELL's premiere customers who are able to [add customized BIOS logo](#) and [change BIOS default settings](#) on American Megatrends (AMI) BIOS. Please contact PORTWELL for more information.

### PORTWELL EC Auto Test Tool (PECAT)

The PORTWELL EC Auto Test Tool (PECAT) is a brand new utility innovated by PORTWELL. PECAT now is available for PORTWELL's premiere customers, who are able to [Test Embedded Controller Function](#) in UEFI Mode. Please contact PORTWELL for more information.

## 10 Industry Specifications

The list below provides links to industry specifications that apply to PORTWELL modules.

Low Pin Count Interface Specification, Revision 1.0 (LPC) <http://www.intel.com/design/chipsets/industry/lpc.htm>

Universal Serial Bus (USB) Specification, Revision 2.0 <http://www.usb.org/home>

PCI Specification, Revision 2.3 <https://www.pcisig.com/specifications>

Serial ATA Specification, Revision 3.0 <http://www.serialata.org/>

PICMG® COM Express Module™ Base Specification <http://www.picmg.org/>

PCI Express Base Specification, Revision 2.0 <https://www.pcisig.com/specifications>