/ISRock®

IMB-193

User Manual

Version 1.0
Published April 2016
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Disclaimer:

FC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.
"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

ASRock Website: http://www.asrock.com

CAUTION:

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

Contents

Chapter 1: Introduction

Thank you for purchasing ASRock *IMB-193* motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.

> Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well.
> ASRock website   http://www.asrock.com
> If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
> www.asrock.com/support/index.asp

1.1 Package Contents

ASRock *IMB-193* Motherboard
   (Mini-ITX Form Factor: 6.7-in x 6.7-in, 17.0 cm x 17.0 cm)
ASRock *IMB-193* Driver CD
ASRock *IMB-193* Jumper setting instruction
1 x I/O Panel Shield

1.2 Specifications

Form Factor	Dimensions	Mini-ITX (6.7-in x 6.7-in)
Processor System	CPU	Socket LGA1151 for Intel® Core i7/i5/i3/Celeron (Skylake-S)
	Core Number	(By CPU, Max 4)
	Max Speed	(By CPU)
	L2 Cache	(By CPU)
	Chipset	Intel® H110
	BIOS	UEFI
Expansion Slot	PCIe	1 x PCIe x4 slot
	Mini-PCIe	1 (half size)
	mSATA	1
Memory	Technology	Dual Channel DDR4 2133MHz SDRAM
	Max.	32GB
	Socket	2 x SO-DIMM
Graphics	Controller	Intel® Gen9 Graphics DX 11/12, OGL4.3/4.4
	VRAM	Shared Memory
	VGA	0
	LVDS	0
	HDMI	Supports HDMI 1.4a
	DVI	0
	DisplayPort	Supports DP 1.1a
	Multi Display	Yes (Dual Display)
Ethernet	Ethernet	10/100/1000 Mbps
	Controller	1 x Intel® I219V 1 x Realtek RTL8111G
	Connector	2 x RJ-45
SATA	Max Data Transfer Rate	2 x SATA3 (6.0Gb/s)
Rear I/O	VGA	0
	DVI	0
	HDMI	2
	DisplayPort	1
	Ethernet	2
	USB	4 x USB 3.0
	Audio	2 (Mic-in. Line-out)

	Serial	0
	PS/2	0
Internal Connector	USB	4 x USB 2.0 (2 x 2.54 pitch header)
	LVDS/ inverter	0/0
	eDP	1
	VGA	0
	Serial	4 x RS-232 (COM1 supports RS-232/422/485)
	SATA	2
	mPCIe	1
	Parallel	0
	mSATA	1
	IrDA	0
	GPIO	4 x GPI, 4 x GPO
	SATA PWR Output Con	1
	Speaker Header	1
Watchdog Timer	Interval	1,2…255 Sec
Power Requirements	Input PWR	Only +19V DC-in (DC Jack / 4-pin ATX PWR Con)
	Power On	AT/ATX Supported AT : Directly PWR on as power input ready ATX : Press button to PWR on after power input ready
Environment	Temperature	0ºC – 60ºC

1.3 Motherboard Layout
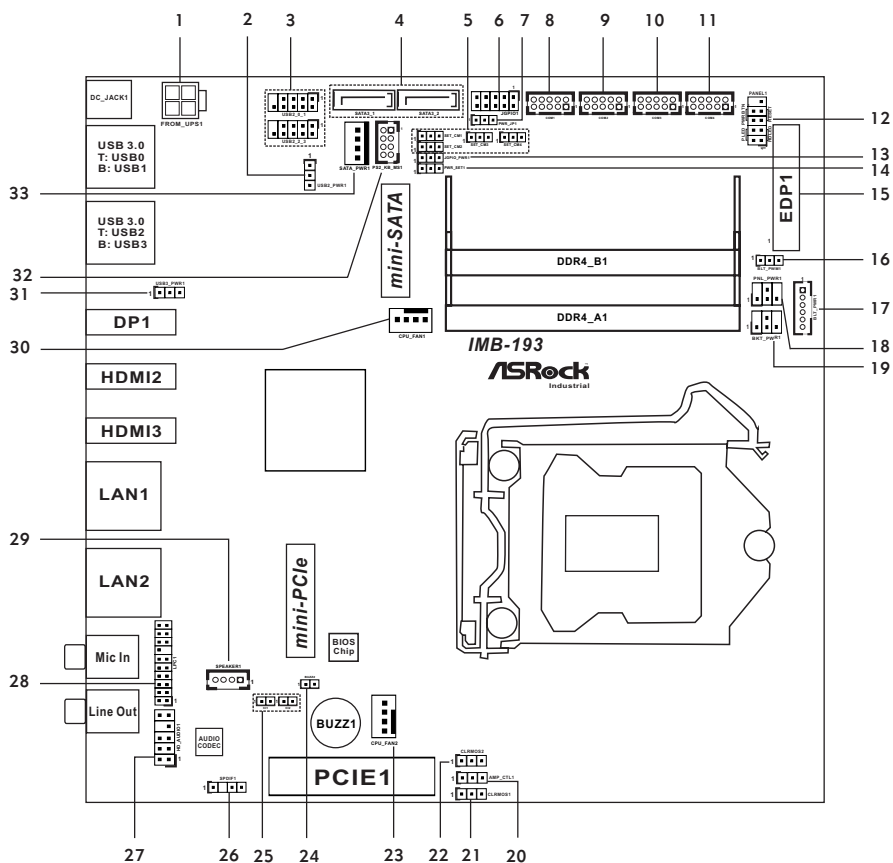
1 : ATX Power Connector

2 : USB2.0 Switch Header

3 : USB2.0 Headers (USB2_0_1, USB2_2_3)

4 : SATA3 Connectors (SATA3_1, SATA3_2)

5 : COM1, 2, 3, 4 PWR Setting Jumpers

6 : Digital Input / Output Pin Header

7 : ATX/AT Mode Jumper (PWR_JP1)

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9 : COM Port Header (COM2)

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1	DC Jack (+19V only) (DC_JACK1)	
2	USB 3.0 Ports (USB3_0_1)	
3	USB 3.0 Ports (USB3_2_3)	
4	DisplayPort (DISPLAY1)	
5	HDMI Port (HDMI2)	

6	HDMI Port (HDMI3)	
7	LAN RJ-45 Port*	
8	LAN RJ-45 Port*	
9	Microphone (Pink)	
10	Line out (Lime)	
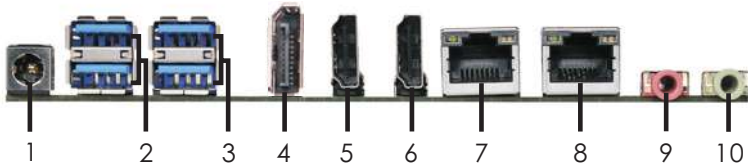
1 DC Jack (+19V only) (DC_JACK1)　　**6** HDMI Port (HDMI3)
2 USB 3.0 Ports (USB3_0_1)　　**7** LAN RJ-45 Port*
3 USB 3.0 Ports (USB3_2_3)　　**8** LAN RJ-45 Port*
4 DisplayPort (DISPLAY1)　　**9** Microphone (Pink)
5 HDMI Port (HDMI2)　　**10** Line out (Lime)

* There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.

LAN Port LED Indications

Activity/Link LED		SPEED LED	
Status	**Description**	**Status**	**Description**
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Off	100Mbps connection
On	Link	Green	1Gbps connection

SPEED LED   ACT/LINK LED

LAN Port

Chapter 2: Installation

This is a Mini-ITX form factor (6.7" x 6.7", 17.0 x 17.0 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

> Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

2.1 Screw Holes

Place screws into the holes to secure the motherboard to the chassis.

> Do not over-tighten the screws! Doing so may damage the motherboard.

2.2 Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.

> Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply.
> Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.3 Installation of Memory Modules (SO-DIMM)

IMB-193 provides two 204-pin DDR4 (Double Data Rate 4) SO-DIMM slots.

Step 1.   Align a SO-DIMM on the slot such that the notch on the SO-DIMM
matches the break on the slot.
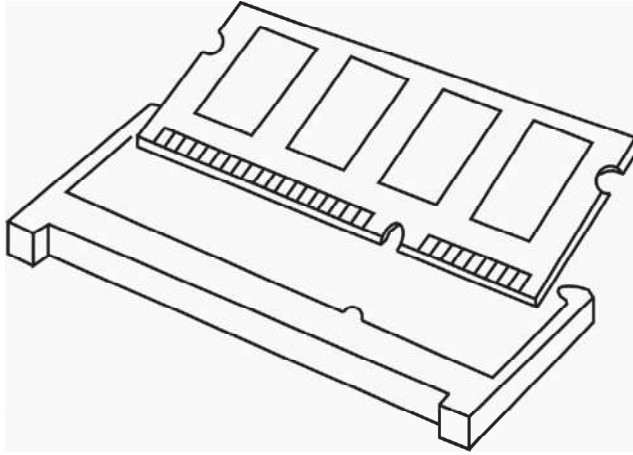
1. The SO-DIMM only fits in one correct orientation. It will cause permanent damage
to the motherboard and the SO-DIMM if you force the SO-DIMM into the slot at
incorrect orientation.
2. Please do not intermix different voltage SO-DIMMs on this motherboard.

Step 2.   Firmly insert the SO-DIMM into the slot until the retaining clips at both
ends fully snap back in place and the SO-DIMM is properly seated.

2.4 Expansion Slots (mini-PCIe, mini-SATA and PCI Express Slots)

There is 1 mini-PCIe slot, 1 mini-SATA slot and 1 PCI Express slot on this motherboard.

mini-PCIe slot:

           MINI_PCIE1 (mini-PCIe slot; half size) is used for PCI Express mini cards.

mini-SATA slot:

           MINI_SATA1 (mini-SATA slot; full size) is used for mSATA cards.

PCIE slot: PCIE1 (PCIE x4 slot) is used for PCI Express x4 lane width cards.

Installing an expansion card

Step 1.   Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

Step 2.   Remove the system unit cover (if your motherboard is already installed in a chassis).

Step 3.   Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

Step 4.   Align the card connector with the slot and press firmly until the card is completely seated on the slot.

Step 5.   Fasten the card to the chassis with screws.

Step 6.   Replace the system cover.

2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is "Short". If no jumper cap is placed on pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins.

Short   Open
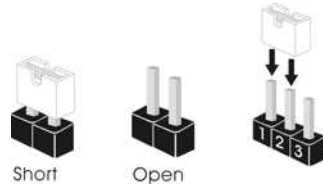
Jumper	Setting	Description
Clear CMOS Jumper (3-pin CLRCMOS1) (see p.8, No. 21)	1_2 Default 2_3 Clear CMOS	

Note: CLRCMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, user default profile and MAC address will be cleared only if the CMOS battery is removed.

(3-pin CLRCMOS2)
(see p.8, No. 22)

Note: If you short pin1 and pin2 on CLRMOS2 and want to clear the CMOS, please follow the above procedures (same as CLRMOS1). If you short pin2 and pin3 on CLRMOS2 and power off the DC +19V power supply, you will clear the CMOS.

AT/ATX Mode Select (3-pin PWR_JP1) (see p.8, No. 7)	1 2 3	1-2 : AT Mode 2-3 : ATX Mode

Digital Input / Output Power Select (3-pin JGPIO_PWR1) (see p.8, No. 13)	1 2 3	1-2 : +12V 2-3 : +5V

Digital Input / Output Default Value Setting   1-2 : Pull-High (+3V)

(3-pin JGPIO_SET1)   2-3 : Pull-Low

(see p.8, No. 14)

1 2 3

Speaker Control

(3-pin AMP_CTL1)

(see p.8, No. 20)

1 2 3

PIN	Signal Name
1	GPIO_VOL_DW
2	GND
3	GPIO_VOL_UP

Backlight Control Level (CON_LBKLT_CTL)   1-2 : +3.3V

(3-pin BLT_PWM1)   2-3 : +5V

(see p.8, No. 16)

1 2 3

Panel Power Select

(4-pin PNL_PWR1)

(see p.8, No. 18)

1
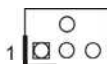
PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
2	NC	4	+12V	6	NC
1	+3.3V	3	LCD_VCC	5	+5V

Backlight Power Select

(4-pin BKT_PWR1)

(see p.8, No. 19)

1
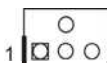
PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
2	NC	4	+VIN	6	NC
1	+5V	3	LCD_BLT_VCC	5	+12V

USB2.0 Switch Header   1-2 : +5V

(3-pin USB2_PWR1)   2-3 : +5VSB

(see p.8, No. 2)

1 2 3

USB3.0 Switch Header   1-2 : +5V

(3-pin USB3_PWR1)   2-3 : +5VSB

(see p.8, No. 31)

1 2 3

COM1, 2, 3, 4 PWR Setting Jumpers   1-2 : +5V

(3-pin SET_CM1, SET_CM2, SET_CM3, SET_CM4)   2-3 : +12V

(see p.8, No. 5)

1 2 3

2.6 Onboard Headers and Connectors

Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

CPU Fan Connectors
(4-pin CPU_FAN1)
(see p.8 No. 30)

GND
+12V
FAN_SPEED
FAN_SPEED_CONTROL
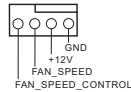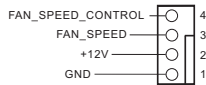
Please connect the CPU fan cable to the connector and match the black wire to the ground pin.

(4-pin CPU_FAN2)
(see p.8 No. 23)

FAN_SPEED_CONTROL — 4
FAN_SPEED — 3
+12V — 2
GND — 1

Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

Digital Input / Output Pin Header
(10-pin JGPIO1)
(see p.8, No. 6)

9   1

10   2
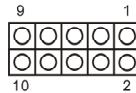
PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
9	JGPIO_ PWR	7	SIO_ GP27	5	SIO_ GP26	3	SIO_ GP25	1	SIO_ GP24
10	GND	8	SIO_ GP23	6	SIO_ GP22	4	SIO_ GP21	2	SIO_ GP20

Chassis Intrusion Headers
(2-pin CI1, CI2: see p.8, No. 25)

1

GND
Signal

This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.
Close: Active Case Open
Open: Normal

COM Port Headers

(10-pin COM1: see p.8, No. 8)

(10-pin COM2: see p.8, No. 9)

(10-pin COM3: see p.8, No. 10)

(10-pin COM4: see p.8, No. 11)

2

1
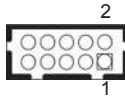
PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
10	N/A	8	CCTS#	6	DDSR#	4	DDTR#	2	RRXD
9	+5V	7	RRTS#	5	GND	3	TTXD	1	DDCD#

This motherboard supports RS232/422/485 on COM1 port. Please refer to below table for the pin definition. In addition, COM1 port (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to page 30 for details.

COM1 Port Pin Definition

PIN	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	RX+	N/A
3	TXD	TX+	RTX+
4	DTR	RX-	N/A
5	GND	GND	GND
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	N/A	N/A
9	+5V	+5V	+5V
10	N/A	N/A	N/A

System Panel Header

(9-pin PANEL1)

(see p.8, No. 12)

GND
GND — RESET#
PWRBTN# — GND
PLED- — HDLED-
PLED+ — HDLED+

1
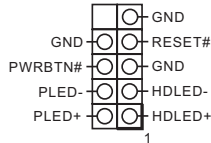
This header accommodates several system front panel functions.

Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

PWRBTN (Power Switch):
Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assign-ments are matched correctly.

SATA3 Connectors

(SATA3_1, SATA3_2: see p.8, No. 4)

SATA3_1   SATA3_2
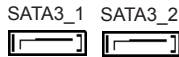
These two Serial ATA3 (SATA3) connectors support SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

USB 2.0 Headers

(9-pin USB2_0_1, USB2_2_3:

see p.8, No. 3)
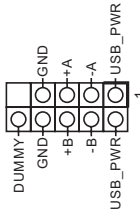
There are two headers on this motherboard. Each USB 2.0 header can support two ports.

Front Panel Audio Header

(9-pin HD_AUDIO1)

(see p.8 No. 27)

OUT_RET
J_SENSE
MIC_RET
PRESENCE#
GND
OUT2_L
OUT2_R
MIC2_R
MIC2_L
1
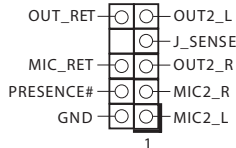
This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

18

1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
   A. Connect Mic_IN (MIC) to MIC2_L.
   B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
   C. Connect Ground (GND) to Ground (GND).
   D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
   E. To activate the front mic.
      Go to the "FrontMic" Tab in the Realtek Control panel. Adjust "Recording Volume".

LPC Header

(19-pin LPC1)

(see p.8, No. 28)
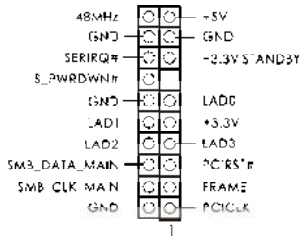
This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

ATX Power Connector

(4-pin FROM_UPS1)

(see p.8 No. 1)
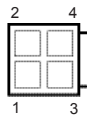
Please connect a DC 19V power supply to this connector.
1-2: GND
3-4: DC Input (+19V only)

PS2 Keyboard/Mouse Header

(8-pin PS2_KB_MS1)

(see p.8 No. 32)

PIN	Signal Name
1	KBCLK
2	+5V
3	KBDATA
4	+5V
5	MSDATA
6	GND
7	MSCLK
8	GND

eDP Connector

(40-pin EDP1)

(see p.8 No. 15)

PIN	Signal Name
40	NA
39	LCD_BLT_VCC
38	LCD_BLT_VCC
37	LCD_BLT_VCC
36	LCD_BLT_VCC
35	SMB_CLK
34	SMB_DATA
33	CON_LBKLT_CTL
32	CON_LBKLT_EN
31	GND
30	GND
29	GND
28	GND
27	eDP_HPD_CON
26	GND
25	GND
24	GND
23	GND
22	NA
21	LCD_VCC
20	LCD_VCC
19	LCD_VCC
18	LCD_VCC
17	GND
16	eDP_AUX#_CON
15	eDP_AUX_CON
14	GND
13	eDP_TX0_CON
12	eDP_TX#0_CON
11	GND
10	eDP_TX1_CON
9	eDP_TX#1_CON
8	GND
7	eDP_TX2_CON
6	eDP_TX#2_CON
5	GND
4	eDP_TX3_CON
3	eDP_TX#3_CON
2	GND
1	NA

SATA Power Connector

(SATA_PWR1)

(see p.8 No. 33)
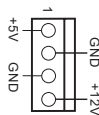
Please connect a SATA
power cable to this connector.

HDMI_SPDIF Header

(3-pin HDMI_SPDIF1)

(see p.8, No. 26)
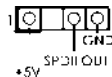
HDMI_SPDIF header, providing
SPDIF audio output to HDMI
VGA card, allows the system to
connect HDMI Digital TV/
projector/LCD devices. Please
connect the HDMI_SPDIF
connector of HDMI VGA card to
this header.

Backlight Power Connector

(8-pin BLT_PWR1)

(see p.8, No. 17)

1

PIN	Signal Name
1	GND
2	GND
3	BL CTL
4	BL EN
5	LCD_BLT_VCC
6	LCD_BLT_VCC

3W Audio AMP Output Wafer

(4-pin SPEAKER1)

(see p.8 No. 29)

1

PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
4	SPK R-	3	SPK R+	2	SPK L+	1	SPK L-

Buzzer

(2-pin BUZZ2)

(see p.8 No. 24)

1

Chapter 3: UEFI SETUP UTILITY

3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

> Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Main	To set up the system time/date information
Advanced	To set up the advanced UEFI features
H/W Monitor	To display current hardware status
Security	To set up the security features
Boot	To set up the default system device to locate and load the Operating System
Exit	To exit the current screen or the UEFI SETUP UTILITY

Use < ← > key or < → > key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F7>	Discard changes
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	To jump to the Exit Screen or exit the current screen

3.2 Main Screen

When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.
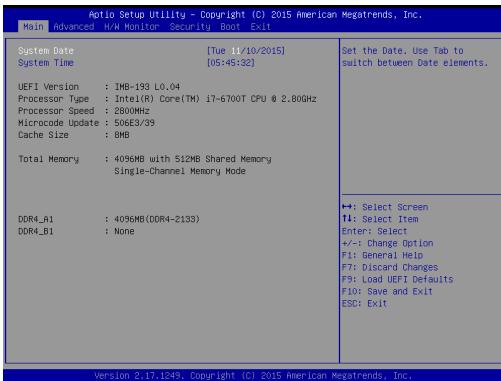
3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, ACPI Configuration and USB Configuration.
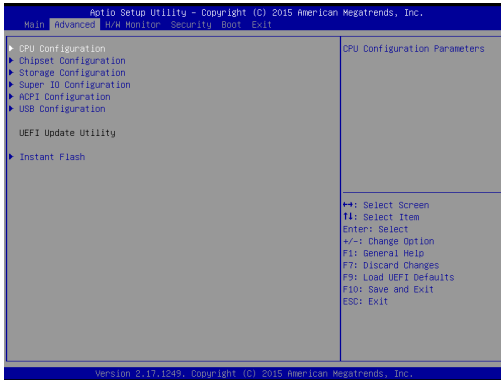
> Setting wrong values in this section may cause the system to malfunction.

Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes.

3.3.1 CPU Configuration

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
        Advanced

  Intel(R) Core(TM) i7-6700T CPU @ 2.80GHz                    Intel Hyper Threading
  Microcode Revision             506E3 39                     Technology allows multiple
  Max CPU Speed                  2800 MHz                      threads to run on each core,
  Min CPU Speed                  800 MHz                       so that the overall
  Processor Cores                4                             performance on threaded
                                                               software is improved.
  Intel Hyper Threading Technology    [Enabled]
  Active Processor Cores              [All]
  CPU C States Support                [Enabled]
   Enhanced Halt State(C1E)           [Auto]
   CPU C3 State Support               [Auto]
   CPU C6 State Support               [Auto]
   CPU C7 State Support               [Auto]
   Package C State Support            [Enabled]
                                                              ↔: Select Screen
  Intel SpeedStep Technology          [Enabled]               ↑↓: Select Item
  Intel Turbo Boost Technology        [Enabled]               Enter: Select
  CPU Thermal Throttling              [Enabled]               +/-: Change Option
  No-Execute Memory Protection        [Enabled]               F1: General Help
  Intel Virtualization Technology     [Enabled]               F7: Discard Changes
  Hardware Prefetcher                 [Enabled]               F9: Load UEFI Defaults
  Adjacent Cache Line Prefetch        [Enabled]               F10: Save and Exit
                                                              ESC: Exit



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Intel Hyper Threading Technology

To enable this feature, a computer system with an Intel processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft$^®$ Windows$^®$ 7 / 8 / 8.1 / 10 is required. Set to [Enabled] if using Microsoft$^®$ Windows$^®$ 7, 8, 8.1, 10 or Linux kernel version 2.4.18 or higher. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

Active Processor Cores

Select the number of cores to enable in each processor package.

CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

Enhanced Halt State (C1E)

Enable Enhanced Halt State (C1E) for lower power consumption.

CPU C3 State Support

Enable C3 sleep state for lower power consumption.

CPU C6 State Support

Enable C6 deep sleep state for lower power consumption.

CPU C7 State Support

Enable C7 deep sleep state for lower power consumption.

Package C State Support

Enable CPU, PCIe, Memory, Graphics C State Support for power saving.

Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options:

[Enabled] and [Disabled]. If you install Windows® 7 / 8 / 8.1 / 10 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.

Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

Intel Turbo Boost Technology

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

CPU Thermal Throttling

You may select [Enabled] to enable CPU internal thermal control mechanism to keep the CPU from overheating.

No-Execute Memory Protection

No-Execution (NX) Memory Protection Technology is an enhancement to the IA-32 Intel Architecture. An IA-32 processor with "No Execute (NX) Memory Protection" can prevent data pages from being used by malicious software to execute codes. This option will be hidden if the current CPU does not support No-Excute Memory Protection.

Intel Virtualization Technology

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.

Hardware Prefetcher

Use this item to turn on/off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch

Use this item to turn on/off prefetching of adjacent cache lines.

3.3.2 Chipset Configuration

Primary Graphics Adapter

This allows you to select [Onboard] or [PCI Express] as the boot graphic adapter priority. The default value is [PCI Express].

Top of Lower usable DRAM

Set the maximum value of TOLUD. Set this item to Dynamic to allow TOLUD to adjust automatically based on the largest MMIO length of the installed graphic controller.

VT-d

Use this to enable or disable Intel® VT-d technology (Intel® Virtualization Technology for Directed I/O). The default value of this feature is [Disabled].

PCIE1 Link Speed

Select the link speed for PCIE1.

Share Memory

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

IGPU Multi-Moniter

Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enabled at all times.

Onboard LAN1

This allows you to enable or disable the Onboard LAN1 feature.

Onboard LAN2

This allows you to enable or disable the Onboard LAN2 feature.

Onboard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

Front Panel

Select [HD] or [AC 97] for the onboard HD Audio Front Panel.

Deep Sleep

Mobile platforms support Deep S4/S5 in DC only and desktop platforms support Deep S4/S5 in AC only. The default value is [Disabled].

eDP Panel BackLight Brightness

The default value is [Level 5].

Primary IGFX Boot Display

Use this to select primary internal graphics boot display. The default value is [VBIOS Default].

3.3.3 Storage Configuration

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
     Advanced

SATA Controller(s)                    [Enabled]            Enable/disable the SATA
SATA Mode Selection                   [AHCI]               controllers.
SATA Aggressive Link Power            [Disabled]
Management
Hard Disk S.M.A.R.T                    [Enabled]

▶ SATA3_1 : Not Detected
▶ SATA3_2 : Not Detected
▶ MINI_SATA1 : Not Detected

                                                           ↔: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Option
                                                           F1: General Help
                                                           F7: Discard Changes
                                                           F9: Load UEFI Defaults
                                                           F10: Save and Exit
                                                           ESC: Exit

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SATA Controller(s)

Use this item to enable or disable the SATA Controller feature.

SATA Mode Selection

Use this to select SATA mode. The default value is [AHCI Mode].

> AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

SATA Aggressive Link Power Management

Use this item to configure SATA Aggressive Link Power Management.

Hard Disk S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

3.3.4 Super IO Configuration


```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
    Advanced

 ▶ COM1 Configuration                               Set Parameters of COM1
 ▶ COM2 Configuration
 ▶ COM3 Configuration
 ▶ COM4 Configuration

   WDT Timeout Reset                 [Disabled]




                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Option
                                                    F1: General Help
                                                    F7: Discard Changes
                                                    F9: Load UEFI Defaults
                                                    F10: Save and Exit
                                                    ESC: Exit


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```

COM1 Configuration

Use this to set parameters of COM1. Select COM1 port type: [RS232], [RS422] or [RS485].

COM2 Configuration

Use this to set parameters of COM2.

COM3 Configuration

Use this to set parameters of COM3.

COM4 Configuration

Use this to set parameters of COM4.

Watchdog Configuration

Use this to set the Watch Dog Timer.

3.3.5 ACPI Configuration

```
        Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
    Advanced

Suspend to RAM                      [Auto]              It is recommended to select
ACPI HPET Table                     [Enabled]           auto for ACPI S3 power saving.

PS/2 Keyboard Power On              [Disabled]
PCIE Devices Power On               [Disabled]
RTC Alarm Power On                  [By OS]
USB Keyboard/Remote Power On        [Disabled]
USB Mouse Power On                  [Disabled]



                                                        ↔: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Option
                                                        F1: General Help
                                                        F7: Discard Changes
                                                        F9: Load UEFI Defaults
                                                        F10: Save and Exit
                                                        ESC: Exit


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```
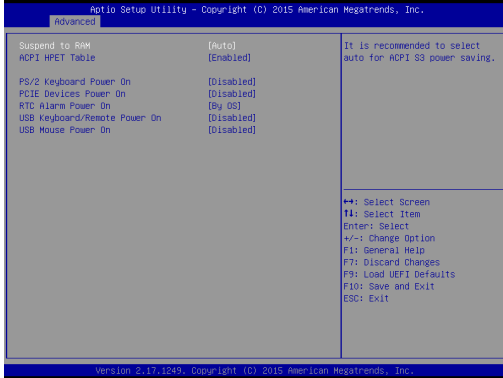
Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

ACPI HPET Table

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

PS/2 Keyboard Power On

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

PCIE Devices Power On

Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

USB Keyboard/Remote Power On

Use this item to enable or disable USB Keyboard/Remote to power on the system.

USB Mouse Power On

Use this item to enable or disable USB Mouse to power on the system.

3.3.6 USB Configuration

Legacy USB Support

    Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto] and [UEFI Setup Only]. The default value is [Enabled]. Please refer to below descriptions for the details of these four options:

    [Enabled] - Enables support for legacy USB.

    [Auto] - Enables legacy support if USB devices are connected.

    [UEFI Setup Only] - USB devices are allowed to use only under UEFI setup and Windows / Linux OS.

PS/2 Simulator

    Enable this item for the complete USB keyboard legacy support for non-USB aware operating system.

3.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.
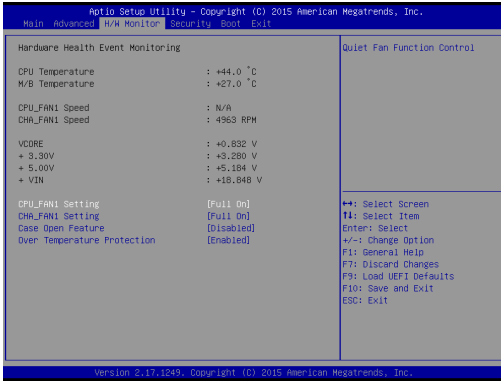
CPU_FAN1 Setting

This allows you to set CPU fan 1's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

CHA_FAN1 Setting

This allows you to set chassis fan 1's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

Case Open Feature

This allows you to enable or disable case open detection feature. The default is value [Disabled].

Clear Status

This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

Over Temperature Protection

Use this to enable or disable Over Temperature Protection. The default value is [Enabled].

3.5 Security Screen

In this section, you may set, change or clear the supervisor/user password for the system.
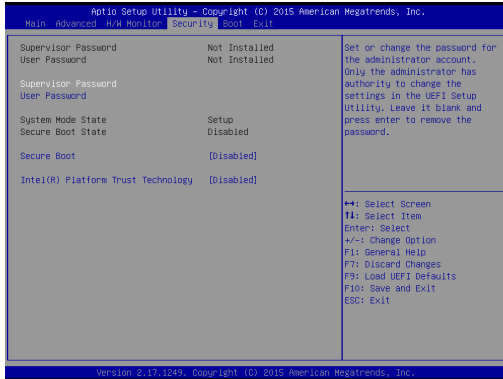
Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

Enable to support Windows 8.1 / 8 Secure Boot.

Intel(R) Platform Trust Technology

Enable/disable Intel PTT in ME. Disable this option to use discrete TPM Module.

3.6 Boot Screen

In this section, it will display the available devices on your system for you to config-
ure the boot settings and the boot priority.

```
                    Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc.
     Main  Advanced  H/W Monitor  Security  Boot  Exit

       Boot Option Priorities                              Boot From Onboard LAN


       Boot From Onboard LAN              [Disabled]

       Setup Prompt Timeout              1
       Bootup Num-Lock                   [On]
       Boot Beep                         [Disabled]
       Full Screen Logo                  [Disabled]

     ▶ CSM(Compatibility Support Module)


                                                          ↔: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Option
                                                          F1: General Help
                                                          F7: Discard Changes
                                                          F9: Load UEFI Defaults
                                                          F10: Save and Exit
                                                          ESC: Exit



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```

Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key.
65535(0XFFFF) means indefinite waiting.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock
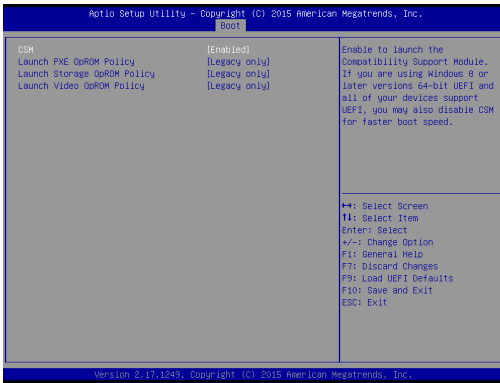function after boot-up.

Boot Beep

Select whether the Boot Beep should be turned on or off when the
system boots up. Please note that a buzzer is needed.

Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

CSM (Compatibility Support Module)

CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test. If you are using Windows® 8.1 / 8 64-bit and all of your devices support UEFI, you may also disable CSM for faster boot speed.

Launch PXE OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Do not launch?

Launch Storage OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Do not launch?

Launch Video OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Do not launch?

3.7 Exit Screen

Save Changes and Exit

> When you select this option, it will pop-out the following message, "Save configuration changes and exit setup?" Select [OK] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

> When you select this option, it will pop-out the following message, "Discard changes and exit setup?" Select [OK] to exit the UEFI SETUP UTILITY without saving any changes.

Discard Changes

> When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] to discard all changes.

Load UEFI Defaults

> Load UEFI default values for all the setup questions. F9 key can be used for this operation.

Launch EFI Shell from filesystem device

> Attempts to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.

Chapter 4: Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 10 / 10 64-bit / 8.1 / 8.1 64-bit / 8 / 8 64-bit / 7 / 7 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer your OS documentation for more information.

4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASRSETUP.EXE" from the BIN folder in the Support CD to display the menus.

4.2.2 Drivers Menu

The Drivers Menu shows the available device's drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

4.2.4 Contact Information

If you need to contact ASRock or want to know more about ASRock, you're welcome to visit ASRock's website at http://www.asrock.com; or you may contact your dealer for further information.