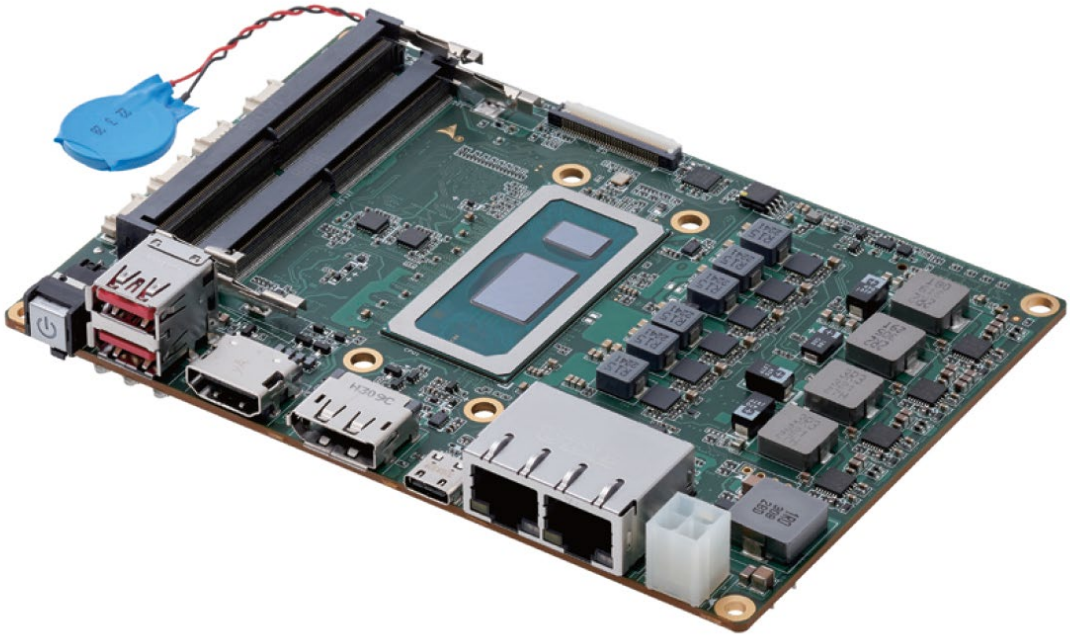
SBC35-RPL

User's Manual

3.5" Single Board Computer with
13th Gen Intel® Core™ i7/i5/i3 or Celeron Processor



Manual Rev.: 1.1
Revision Date: December 03, 2024
Part Number: 50M-47300-1010

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Leading EDGE COMPUTING

Preface

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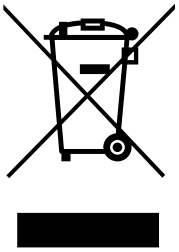
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Revision History

Revision	Description	Date
1.0	Initial release	2024-05-30
1.1	Specifications, block diagram, and Mechanical layout updated	2024-12-03

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1 Introduction

ADLINK SBC35-RPL is a 3.5-inch single board computer powered by 13th GenIntel® Core™ i7/i5/i3 processor (formerly Raptor-Lake-P). It includes a dual-channel DDR5 4800MHz memory of up to 64GB, 2x GbE ports (1x 1G + 1x 2.5G), and provides support for four independent displays (eDP/LVDS, HDMI, DP, USB Type-C). Additionally, it offers 1x PCIe x4, 1x PCIe x1, 1x USB3.0/2.0, LPC, and 3.3V expansions. TPM is optional.

1.1 Packing List

- SBC35-RPL motherboard
- M.2 screw kit (Part Number: 58-10515-0000)
- Thermal kit (Part Number: 58-10514-0000)

1.2 Optional Accessories

- CPU cooler for 28W CPU (Part Number: 32-21014-0000-A0)
- Passive Heatsink for 15W CPU (Part Number: 32-21015-0000-A0)
- USB 2.0 Type A connector (Part Number: 30-21363-0000-A0)
- RS-232x2 + RS-232/485/422x2 (Part Number: 30-21534-0010-A0)
- DI/Dox8-bits + Audio + USB2.0x2 (Part Number: 30-22122-0000-A0)
- SATA + SATA Power (Part Number: 30-22121-0000-A0)
- 4-pin to DC jack cable (Part Number: 30-22238-0000-A0)
- SBC35-RPL LVDS FPC (Part Number: 91-49076-0010)

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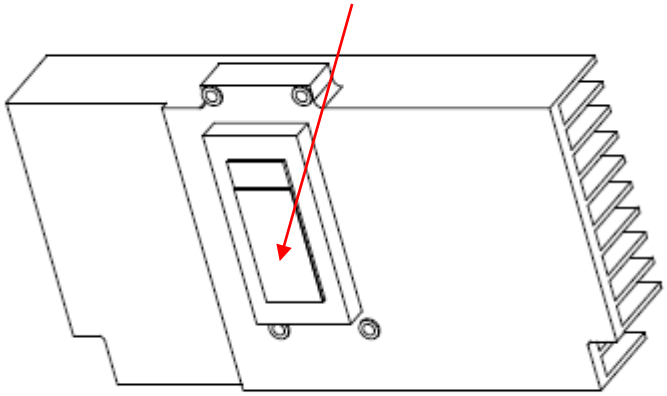
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2 Quick Installation

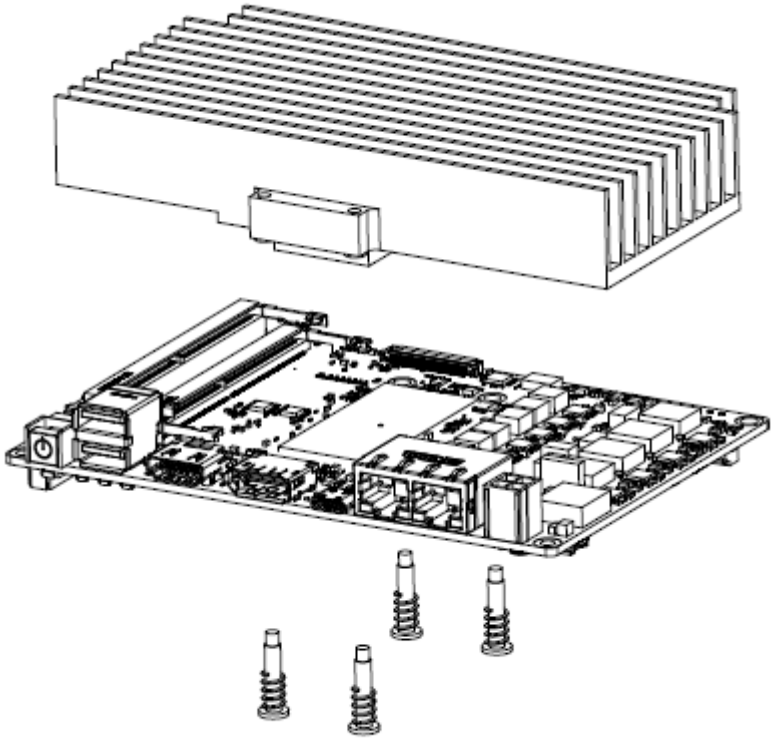
This chapter covers how to assmelbe cooling solutions and M.2 expansion modules for the ADLINK SBC35-RPL.

2.1 Assembling Passive Heatsink for 15W SKU

1. Remove the plastic seal from the thermal pad.



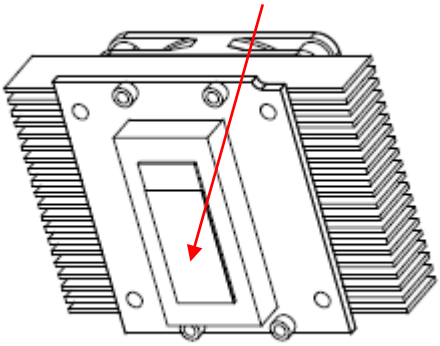
2. Assemble and secure the heatsink using the screws provided, as illustrated below.



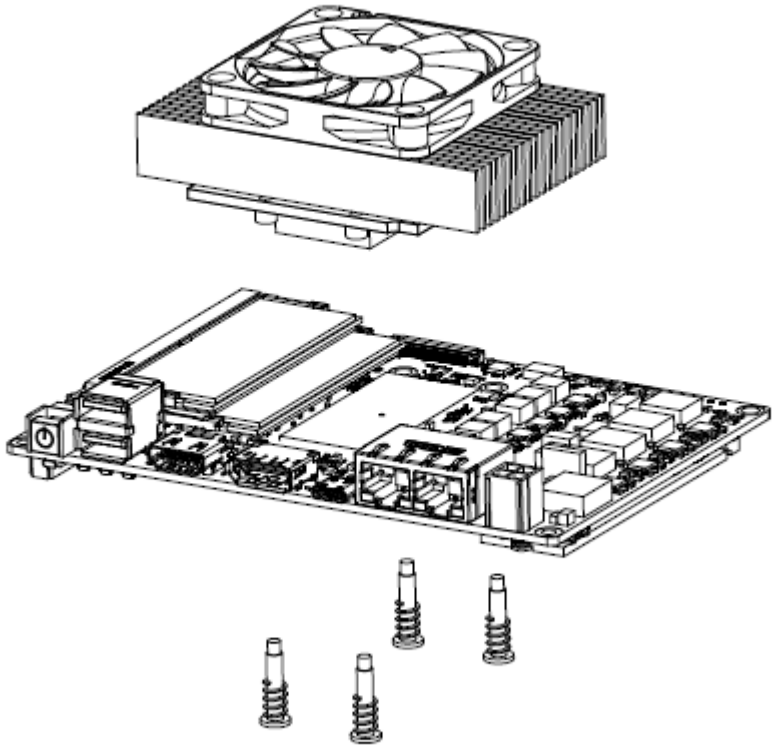
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2.2 Assembing Cooler Solution for 28W SKU

1. Remove the plastic seal from the thermal pad.



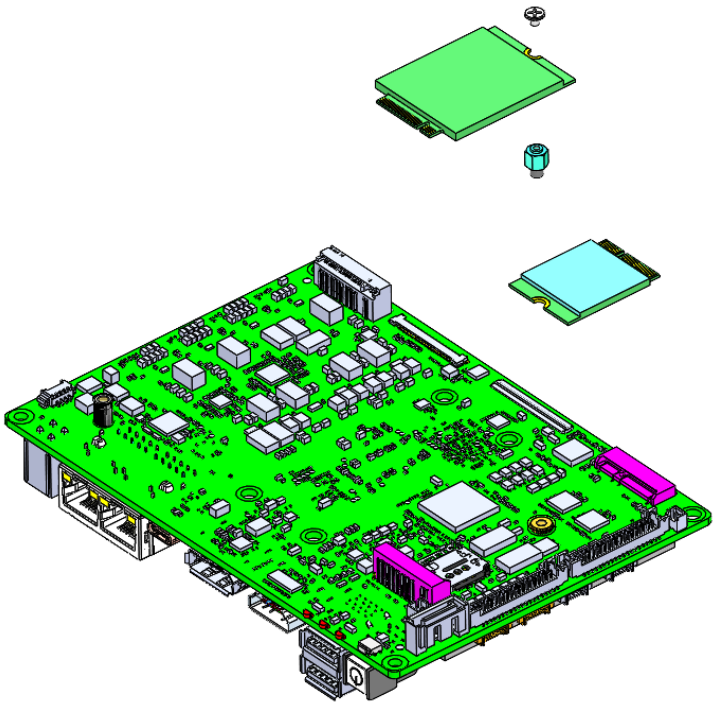
2. Assemble and secure the CPU cooler using the screws provided, as illustrated below.



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2.3 Installing M.2 Expansion Modules

M.2 B-key and M.2 E-key share the same mounting hole, please install as illustrated below.



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3 Specifications

3.1 Core System

- **CPU:**
  - Intel® Core™ i7/i5/i3 or Celeron processor
- **Memory:** Dual-channel DDR5 SO-DIMMs 4800MHz, up to 64GB

3.2 I/O Interface

- **USB:**
  - 2x USB 3.2 Gen2x1 ports (10Gbps) (rear)
  - 3x USB 2.0 via headers (max. 5V, 0.5A per port)
- **USB Type-C:** 1x USB Type-C (USB 3.2, DP, Power delivery 5V, 3A)
- **COM:**
  - 2x RS-232/422/485 pin headers
  - 2x RS-232 pin headers
- **Serial ATA:** 1x SATA 6Gb/s ports w/ 5V SATA power
- **DI/DO:** 8DI, 8DO
- **TPM:** TPM 2.0 (option)
- **M.2 connectors:**
  - 1x M.2 (Key E, 2230) with PCIe x1, USB 2.0
  - 1x M.2 (Key B, 3042) with USB 3.0/2.0
  - 1x M.2 (Key M, 2280) with PCIe x4
- **SBC-FM Board Expansion:** 1x PCIe x1, 1x PCIe x4**,** 1x USB 3.0/2.0**,** LPC

3.3 Video

- **Interfaces:** 1x Type-C, 1x eDP (co-lay LVDS by option), 1x HDMI, 1x DisplayPort

3.4 Audio

- **Audio Codec:** Realtek® ALC888S
- **Interfaces**: 1x Mic-in, 1x Line-in, and 1x Line-out

3.5 LAN

- **LAN1:** Intel® I219-V via RJ45 connector, with 10/100/1000 Mbps
- **LAN2:** Intel® I225-V via RJ45 connector, with 10/100/1000/2500 Mbps

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3.6 Dimension

- **ATX**: 5.75” x 4” (146mm x 102mm)

3.7 Power Supply

- 12V-24V, Reserved DC Jack connector (option)

3.8 Temperatures

- **Operating Temperature:** 0°C to 60°C
- **Storage Temperature:** -40°C to 85°C

3.9 ESD

- Contact +/- 8kV, Air +/- 12kV

3.10 Certificate (EMC)

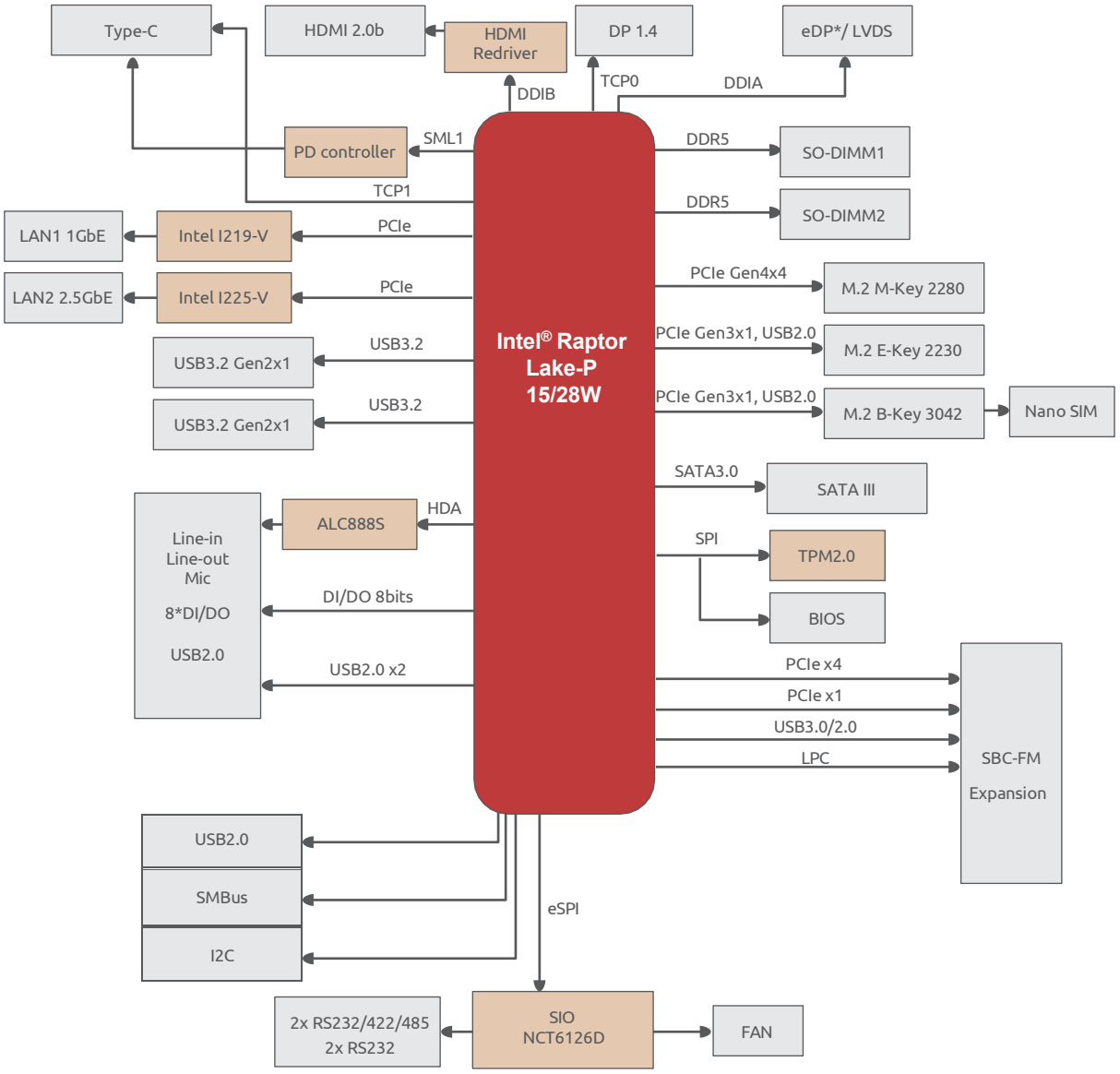
- CE/FCC Class B

3.11 Operating Systems

- Microsoft® Windows 10 IoT Enterprise LTSC 21H2 (64-bit)
- Microsoft® Windows 11
- Ubuntu® Desktop 22.04 LTS (by project basis)

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3.12 Functional Block Diagram



* Default by BOM change, contact with your local sales to support option.

Figure 1: Functional Block Diagram

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4 Mechanical Layout

4.1 Connector Locations

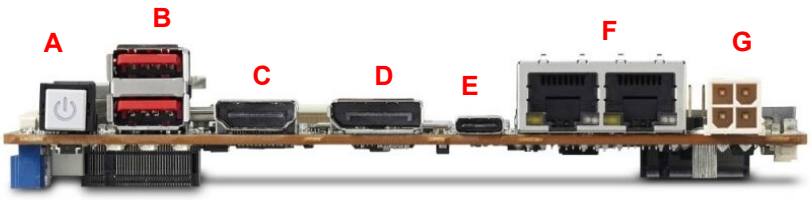


Figure 2: IO Panel Connector Locations

Table 1: IO Panel Connector Definitions

IO Panel Connectors	
Item	**Description**
A	Power button
B	2x USB 3.0 connectors
C	HDMI connector
D	DisplayPort connector
E	USB Type-C connector
F	2x RJ45 LAN ports (I219-V, I225-V)
G	DC In connector

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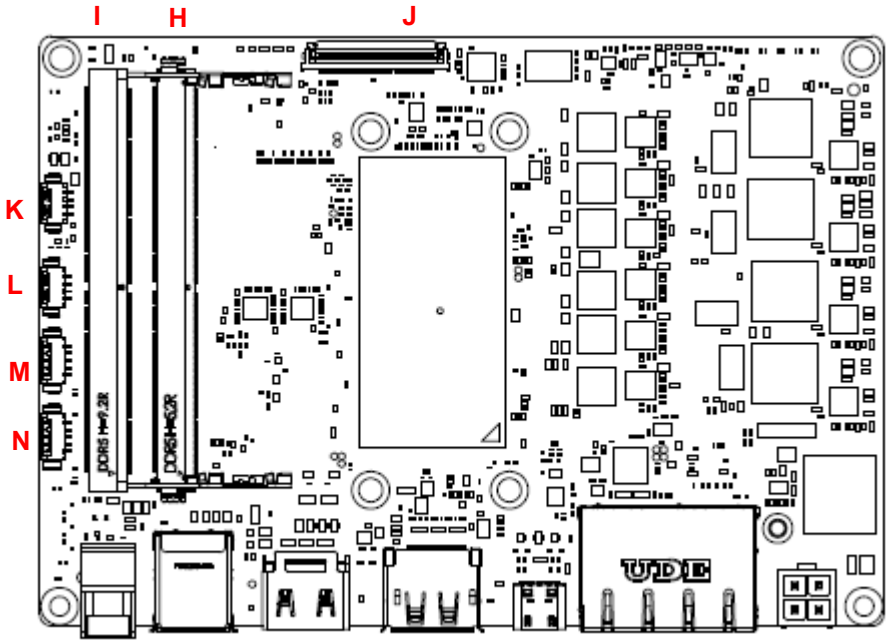


Figure 3: Onboard Connector Locations (Top)

Table 2: Onboard Connector Definitions (Top)

Onboard Connectors	
Item	Description
H	SO-DIMM1 DDR5_5.2mm
I	SO-DIMM2 DDR5_9.2mm
J	DB40 connector
K	System Fan connector
L	USB 2.0 connector
M	I^2C connector
N	SMB connector

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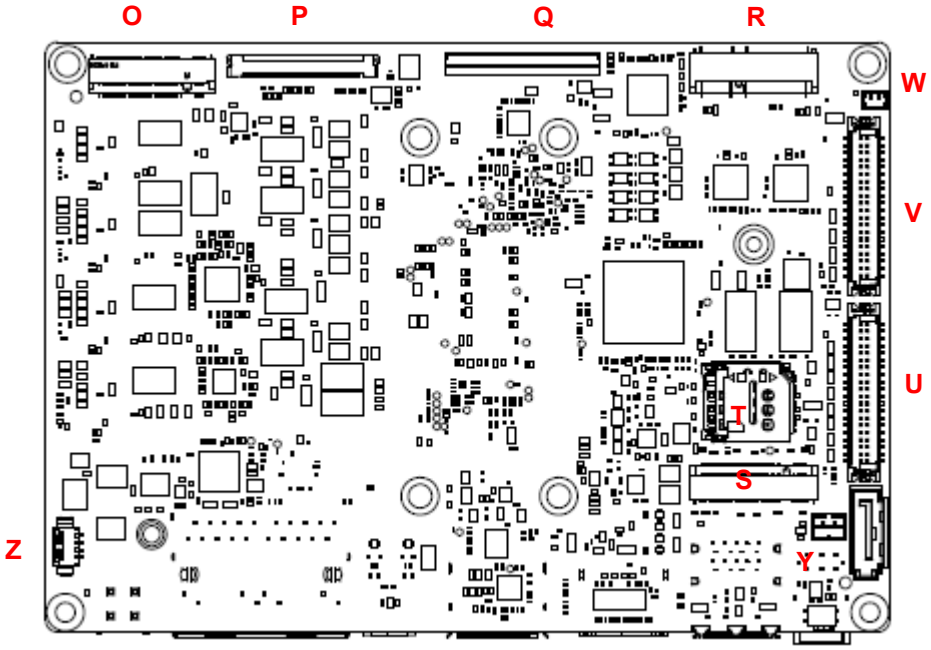


Figure 4: Onboard Connector Locations (Bottom)

Table 3: Onboard Connector Definitions (Bottom)

Onboard Connectors	
Item	Description
O	NGF M.Key (only supports NVM SSD)
P	eDP/LVDS connector (eDP by default, please contact ADLINK representative for LVDS support)
Q	FPC connector (supports SBC-FM board)
R	NGF E.Key (1x PCIe 3.0, 1x USB 2.0)
S	NGF B.Key (1x PCIe 3.0, 1x USB 3.0, 1x USB 2.0)
T	Nano SIM connector
U	Wafer for COM 1,2,3,4
V	Wafer for DI, DO + MIC + Line-in + Line-out + 2x USB 2.0
W	RTC Battery connector
X	SATA connector
Y	SATA Power connector
Z	External Power connector for SBC-FM board

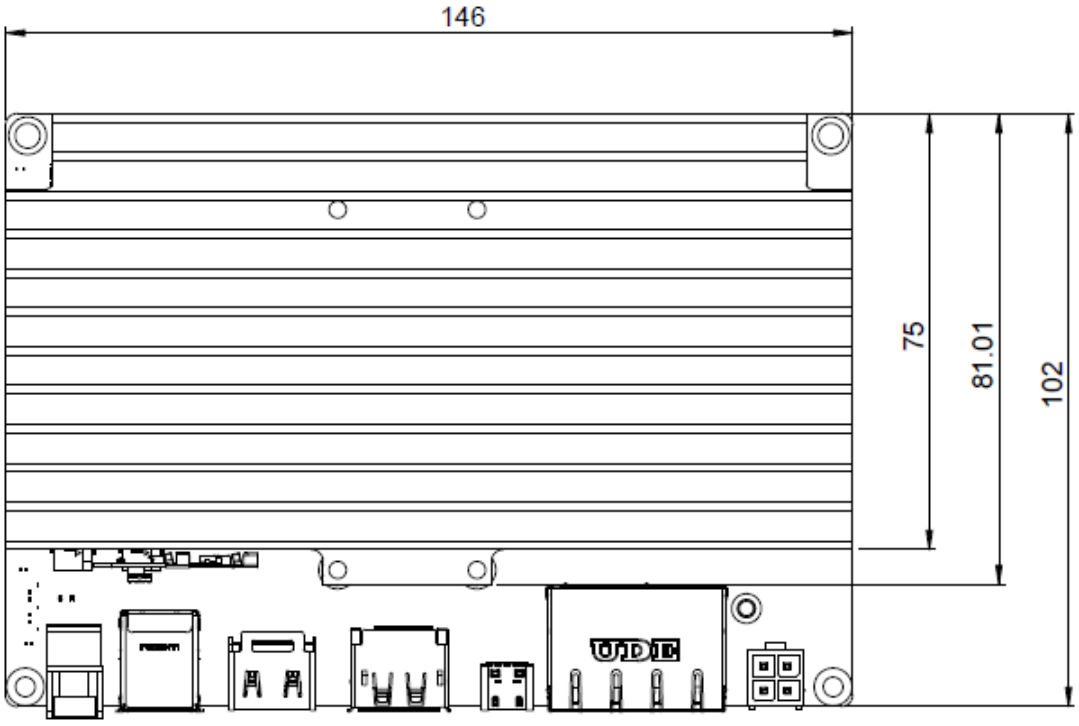
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4.2 Mechanical Dimensions

4.2.1 With Passive Heatsink for 15W SKU

(ADLINK Part Number: 32-21015-0000-A0)

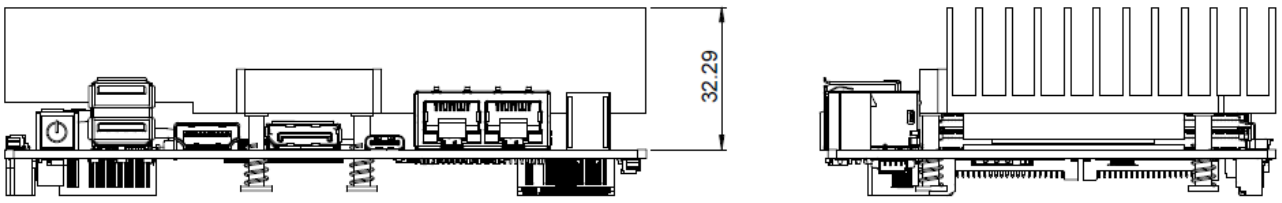
Top View



Dimensions: mm

Figure 5: Mechanical Dimensions

Side View



Dimensions: mm

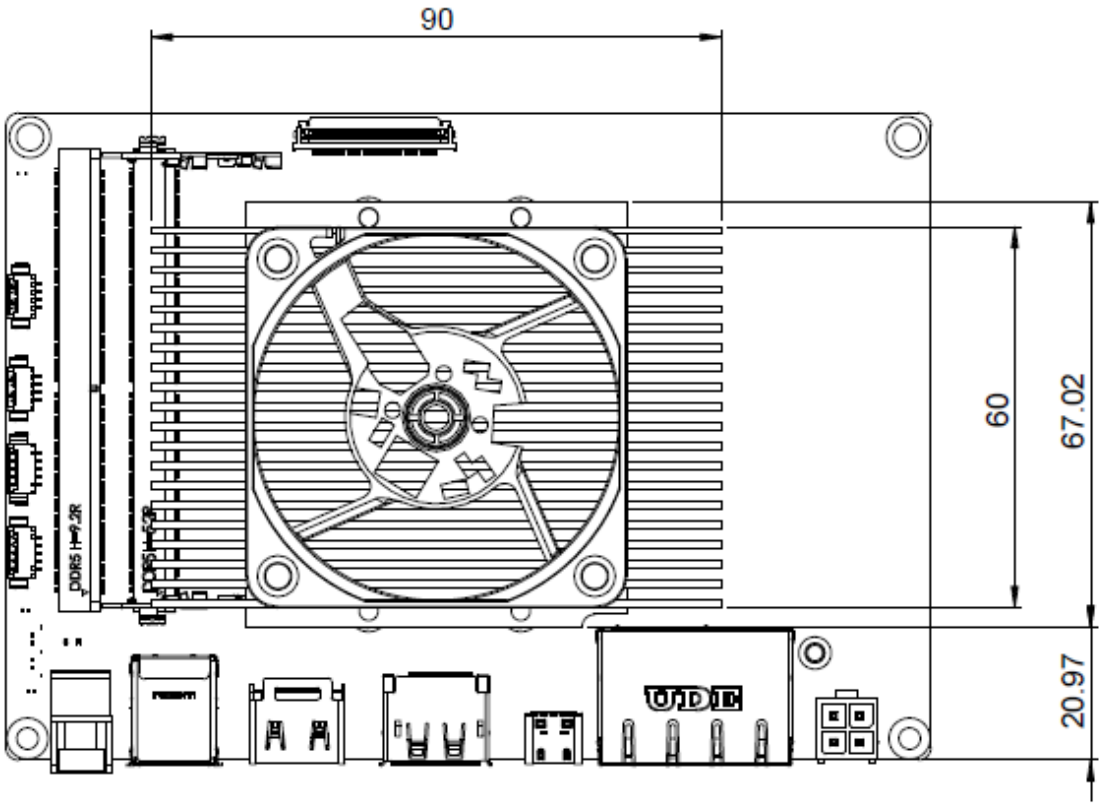
Figure 6: Mechanical Dimensions - IO Panel

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4.2.2 With Cooler Solution for 28W SKU

(ADLINK Part Number: 32-21014-0000-A0)

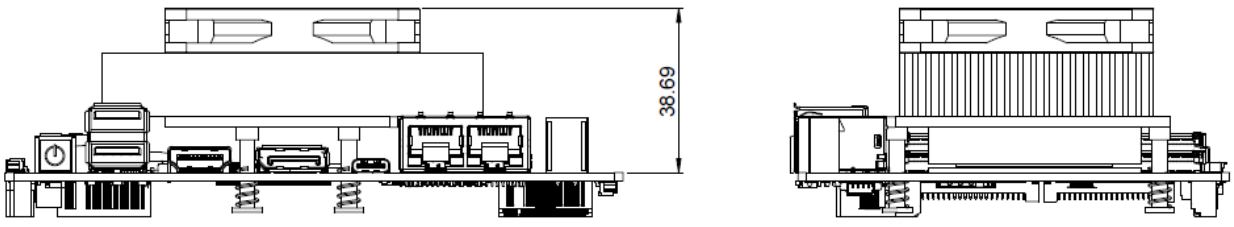
Top View



Dimensions: mm

Figure 7: Mechanical Dimensions

Side View



Dimensions: mm

Figure 8: Mechanical Dimensions - IO Panel

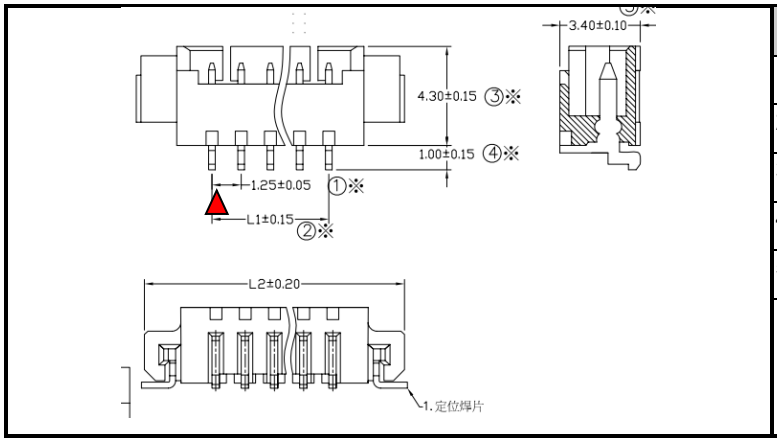
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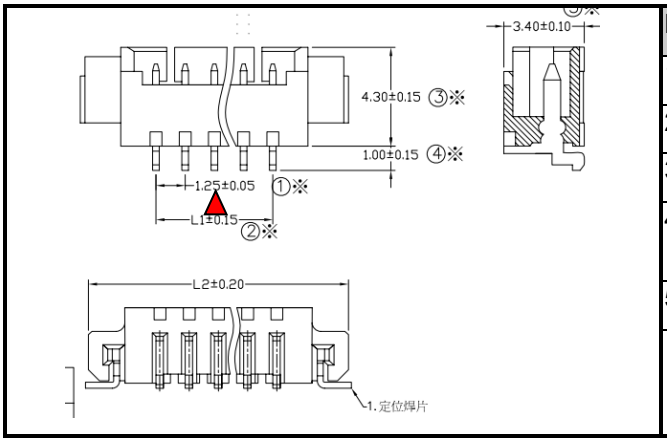
5 Connector Pinouts

5.1 I2C Connector



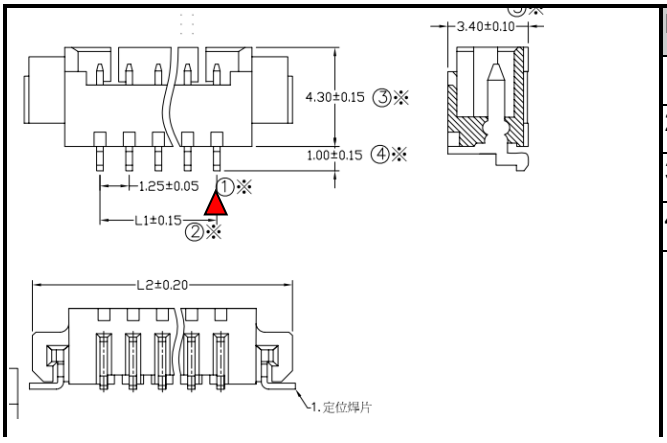
Pin	Signal
1	P_+3V3_A
2	PCH_I2C0_CLK
3	PCH_I2C0_DAT
4	I2C1_GPIO-L
5	GND

5.2 SMBus Connector



Pin	Signal
1	P_+3V3_A
2	SMB_CLK_S
3	SMB_DAT_S
4	PCH_SMB_ALERT-L
5	GND

5.3 USB2 Connector



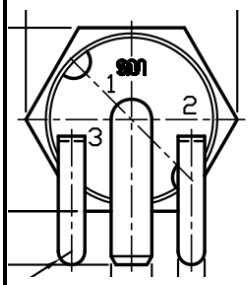
Pin	Signal
1	P_+5V_DDR5
2	U2_USB1_N
3	U2_USB1_P
4	GND

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5.4 Power Input & DC-In Connector

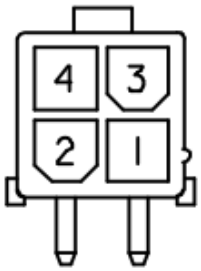
- Input power voltage range: DC 12V-24V
- Input current: 8A -12A
- Suggest Adapter: 100-144W (CPU 15W or 28W type)

DC Power Jack RT Φ2.6 24V/12A



Pin	Signal
1	Power
2	GND1
3	GND2

Power Header ML 2x2P ST D4.2 (default)



Pin	Signal	Pin	Signal
1	GND	3	Power
2	GND	4	Power

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5.5 RS-232/422/485

There are four COM ports on the board. Port 1 and 2 can be set to RS232, 422, or 485 within BIOS while Port 3 and 4 are RS232 only. All COM port signals are separated within one wafer connector.

Pin	Name	Pin	Name
1	GND	2	GND -
3	CON1_COM_CTS-L	4	CON1_COM_RI
5	CON1_COM_DSR-L	6	CON1_COM_RTS-L
7	CON1_COM_TXD	8	CON1_COM_DTR-L
9	CON1_COM_DCD-L	10	CON1_COM_RXD
11	CON2_COM_RXD	12	CON2_COM_DCD-L
13	CON2_COM_TXD	14	CON2_COM_DTR-L
15	CON2_COM_DSR-L	16	CON2_COM_RTS-L
17	CON2_COM_CTS-L	18	CON2_COM_RI
19	COM3_RS232_CTS-L	20	COM3_RS232_RXD
21	COM3_RS232_DTR-L	22	COM3_RS232_RI
23	COM3_RS232_RTS-L	24	COM3_RS232_TXD
25	COM3_RS232_DCD-L	26	COM3_RS232_DSR-L
27	COM4_RS232_DSR-L	28	COM4_RS232_DCD-L
29	COM4_RS232_TXD	30	COM4_RS232_RTS-L
31	COM4_RS232_RXD	32	COM4_RS232_DTR-L
33	COM4_RS232_RI	34	COM4_RS232_CTS-L
35	GND	36	GND
37	NC	38	NC
39	NC	40	NC

5.5.1 RS-232 to 422/485 Pin Comparison in DB9 Connector

Pin	RS232	RS422	RS485
1	DCD#	TXD-	DATA-
2	RX	TXD+	DATA+
3	TX	RXD+	
4	DTR#	RXD-	
5	GND	GND	
6	DSR#		
7	RTS#		
8	CTS#		
9	RI#		

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5.6 DI/DO/USB2/Audio Combo Header

DO signal has PH *P_+5V_S0" on MB side, output current is 5mA. DI signal only has one pull down 100k on MB side. 2x USB2 signals are for internal use.

Audio: 1x line-in, 1x line-out, MIC-in

Pin	Name	Pin	Name
1	CN_DO0	2	CN_DO4
3	CN_DO1	4	CN_DO5
5	CN_DO2	6	CN_DO6
7	CN_DO3	8	CN_DO7
9	CN_DI0	10	CN_DI4
11	CN_DI1	12	CN_DI5
13	CN_DI2	14	CN_DI6
15	CN_DI3	16	CN_DI7
17	GND	18	GND
19	P_+5V_DDR5	20	U2_USB4_N_C
21	P_+5V_DDR5	22	U2_USB4_P_C
23	GND	24	GND
25	GND_AUD	26	U2_USB3_N_C
27	LINE1_JD	28	U2_USB3_P_C
29	LINL	30	GND
31	LINR	32	GND_AUD
33	MIC1_JD	34	FRONT_JD
35	MIC1L	36	LOUTL
37	MIC1R	38	LOUTR
39	GND_AUD	40	GND_AUD

5.7 M.2 Key-B

M.2 Key-B connector supports 3042-size card, and supports 1 Nano SIM.

This connector only supports Key-B card, and not B+M card.

Pin	Name	Pin	Name
1	M2B_CONFIG_3	2	P_+3V3_NGFF_B
3	GND	4	P_+3V3_NGFF_B
5	GND	6	PU 100K to P_+3V3_NGFF_B
7	U2_USB10_P	8	NC
9	U2_USB10_N	10	NC
11	GND		

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21	M2B_CONFIG_0	20	NC
23	NC	22	NC
25	NC	24	NC
27	GND	26	W_DISABLE2#
29	U3_P2_RX_N	28	NC
31	U3_P2_RX_P	30	UIM_RST
33	GND	32	UIM_CLK
35	U3_P2_TX_N	34	UIM_DATA
37	U3_P2_TX_P	36	P_UIM_PWR
39	GND	38	NC
41	X_PCIEX1_P1_RX_N	40	NC
43	X_PCIEX1_P1_RX_P	42	NC
45	GND	44	NC
47	X_PCIEX1_P1_TX_N	46	NC
49	X_PCIEX1_P1_TX_P	48	NC
51	GND	50	PCH_PLTRST-L_BUF
53	C_REFCLK_P5_100M_N	52	PCH_CLK_REQ_P5_N
55	C_REFCLK_P5_100M_P	54	NC
57	GND	56	NC
59	NC	58	NC
61	NC	60	NC
63	NC	62	NC
65	NC	64	NC
67	NC	66	UIM_DET
69	M2B_CONFIG_1	68	NC
71	GND	70	P_+3V3_NGFF_B
73	GND	72	P_+3V3_NGFF_B
75	M2B_CONFIG_2	74	P_+3V3_NGFF_B

5.8 Nano SIM

Pin	Name
C1	P_UIM_PWR
C2	UIM_RST
C3	UIM_CLK
C5	GND
C6	NC
C7	UIM_DATA

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5.9 M.2 Key-M

M.2 Key-M 2280 connector supports PCIe Gen4 x4

Pin	Name	Pin	Name
1	GND	2	P_+3V3_M.2_M
3	GND	4	P_+3V3_M.2_M
5	PCIE4_B_P3_RX_N	6	NC
7	PCIE4_B_P3_RX_P	8	NC
9	GND	10	M2M_LED
11	PCIE4_B_P3_TX_N	12	P_+3V3_M.2_M
13	PCIE4_B_P3_TX_P	14	P_+3V3_M.2_M
15	GND	16	P_+3V3_M.2_M
17	PCIE4_B_P2_RX_N	18	P_+3V3_M.2_M
19	PCIE4_B_P2_RX_P	20	NC
21	GND	22	NC
23	PCIE4_B_P2_TX_N	24	NC
25	PCIE4_B_P2_TX_P	26	NC
27	GND	28	NC
29	PCIE4_B_P1_RX_N	30	NC
31	PCIE4_B_P1_RX_P	32	NC
33	GND	34	NC
35	PCIE4_B_P1_TX_N	36	NC
37	PCIE4_B_P1_TX_P	38	NC
39	GND	40	NC
41	PCIE4_B_P0_RX_N	42	NC
43	PCIE4_B_P0_RX_P	44	NC
45	GND	46	NC
47	PCIE4_B_P0_TX_N	48	NC
49	PCIE4_B_P0_TX_P	50	PCH_PLTRST-L_BUF
51	GND	52	PCH_CLK_REQ_P3_N
53	C_REFCLK_P3_100M_N	54	NC
55	C_REFCLK_P3_100M_P	56	NC
57	GND	58	NC
67	NC	68	NC
69	M2M_CONFIG_1	70	P_+3V3_M.2_M
71	GND	72	P_+3V3_M.2_M
73	GND	74	P_+3V3_M.2_M
75	GND		

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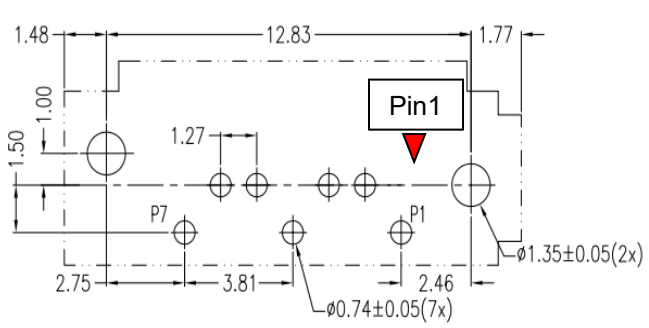
5.10 M.2 Key-E

M.2 Key-E connector supports 2230-size card.

Pin	Name	Pin	Name
1	GND	2	P_+3V3_M.2_E
3	U2_USB9_P	4	P_+3V3_M.2_E
5	U2_USB9_N	6	NC
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	NC		
33	GND	32	NC
35	X_PCIEX1_P0_TX_P	34	NC
37	X_PCIEX1_P0_TX_N	36	NC
39	GND	38	NC
41	X_PCIEX1_P0_RX_P	40	NC
43	X_PCIEX1_P0_RX_N	42	NC
45	GND	44	NC
47	C_REFCLK_P4_100M_P	46	NC
49	C_REFCLK_P4_100M_N	48	NC
51	GND	50	NC
53	PCH_CLK_REQ_P4_N	52	PCH_PLTRST-L_BUF
55	NC	54	BT_DISABLE#
57	GND	56	WIFI_DISABLE#
59	NC	58	NC
61	NC	60	NC
63	GND	62	NC
65	NC	64	NC
67	NC	66	NC
69	GND	68	NC
71	NC	70	NC
73	NC	72	P_+3V3_M.2_E
75	GND	74	P_+3V3_M.2_E

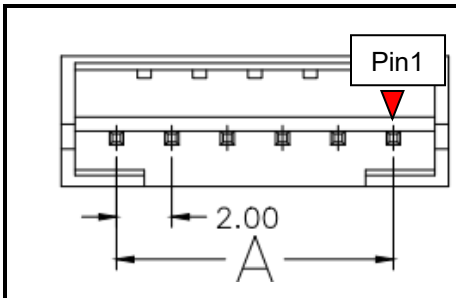
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5.11 SATA connector



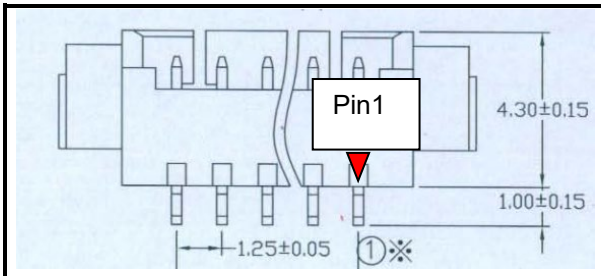
Pin	Signal Name	Pin	Signal Name
P1	GND	P5	SATA3_P1_RX_N
P2	SATA3_P1_TX_P	P6	SATA3_P1_RX_P
P3	SATA3_P1_TX_N	P7	GND
P4	GND		

5.11.1 SATA Power Connector



Pin	Signal Name
P1	P_+5V_S0
P2	GND

5.12 Fan Connector



Pin	Signal Name
P1	GND
P2	5V IN PWR
P3	FAN TACH
P4	FAN PWM

5.13 USB Connector

There are two USB3.2 Gen2 Ports on front panel, 3x USB 2.0 via headers.

USB3.2 Gen 2 ports provide over current protect design, 1A current.

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5.14 SBC-FM Connector

SBC-FM connector is reserved for I/O expansion flexibility through FPC.

Manufacturer: HIROSE

MFG P/N: FH34SRJ-50S-0.5SH

ADLINK P/N: 61-02010-0500

Location: FPC

SBC-NetworkFM Connector Pin Define					
	Signal Name	Pin#	Pin#	Signal Name	
PCIE4	PCIE4_A_P3_TX_P	1	26	PCH_CLK_REQ_P6_N	PCIE3 CLK Request
	PCIE4_A_P3_TX_P	2	27	U3_P3_TX_P	USB3.0
	PCIE4_A_P2_TX_P	3	28	U3_P3_TX_N	
	PCIE4_A_P2_TX_N	4	29	U3_P3_RX_P	
	PCIE4_A_P1_TX_P	5	30	U3_P3_RX_N	
	PCIE4_A_P1_TX_N	6	31	U2_USB0_P_C	USB2.0
	PCIE4_A_P0_TX_P	7	32	U2_USB0_N_C	
	PCIE4_A_P0_TX_N	8	33	LPC_CLK	LPC
	PCIE4_A_P3_RX_P	9	34	LPC_AD3	
	PCIE4_A_P3_RX_N	10	35	LPC_AD2	
	PCIE4_A_P2_RX_P	11	36	LPC_AD1	
	PCIE4_A_P2_RX_N	12	37	LPC_AD0	
	PCIE4_A_P1_RX_P	13	38	LPC_LFRAME#	
	PCIE4_A_P1_RX_N	14	39	LPC_SERIRQ	
	PCIE4_A_P0_RX_P	15	40	LPC_LRESET#	
	PCIE4_A_P0_RX_N	16	41	PCIE_WAKE-L	PCIE Wake
PCIE4 CLK Request	PCH_CLK_REQ_P0_N	17	42	PCH_SLP_S3_N	PCH_SLP3
PCIE4 CLK	C_PCIECLK_P0_100M_P	18	43	PCH_PLTRST-L_BUF	PCH_PLTRST
	C_PCIECLK_P0_100M_N	19	44	SMB_CLK_S	SMB
PCIE3	X_PCIEX10_FM_TX_P	20	45	SMB_DAT_S	
	X_PCIEX10_FM_TX_N	21	46	PCH_SMB_ALERT-L	
	X_PCIEX10_FM_RX_P	22	47	GND	GND
	X_PCIEX10_FM_RX_N	23	48	P_+3V3_A	3.3V PWR
PCIE3 CLK	C_REFCLK_P6_100M_P	24	49	P_+3V3_A	(Standby)
	C_REFCLK_P6_100M_N	25	50	GND	GND
			51	GND	GND

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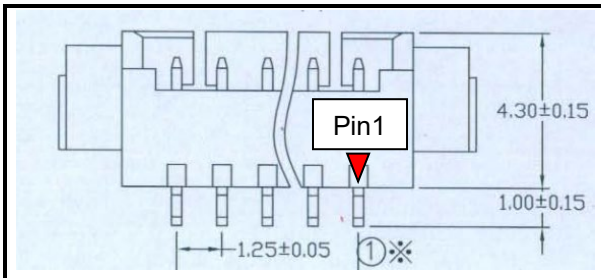
5.14.1 SBC-FM Power Connector

Manufacturer: JVE

MFG P/N: 24W1125A-04M00-01T-1-CF01

ADLINK P/N: 61-6AJ0X-1040

Location: FM_PWR



Pin	Signal Name
P1	P_+VIN_S (Standby)
P2	
P3	GND
P4	GND

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6 BIOS Setup

6.1 Menu Structure

This section presents the primary menus of the AMIBIOS® EFI BIOS setup utility. Use the following table as a quick reference for the contents of the BIOS Setup Utility. The subsections describe the submenus and options for each menu item.

To enter the BIOS Setup Utility:

- Press [Delete] or [Del] during POST (Power-On-Self-Test)

Main	**Advanced**	**Chipset**
Sets up the system time/date and displays the system information: - System Date - System Time	Contains advanced system configurations, including: - CPU Configuration - Power Management - Serial Console Redirection - USB Configuration - TPM 2.0 Configuration - Onboard Devices Configuration - Hardware Monitor - BIOS Watchdog Timer - Network Stake Configuration - Intel® Ethernet Controller (3) I225-V	Displays chipset configuration, including: - System Agent (SA) Configuration - PCH-I/O Configuration
Security	**Boot**	**Save & Exit**
Changes or clears the administrator/user password for the system - Administrator Password - User Password - Secure Boot menu - Security Configuration	Configures the boot settings and boot priority for available devices - Boot Option #1,2,3,4,5,6,7,8,9,10,11 - Setup Prompt Timeout - Bootup Num-Lock - Quiet Boot - Fast Boot	Exits the BIOS Setup Utility while saving or discard the changes made - Save Changes and Exit - Discard Changes and Exit - Save Changes and Reset - Discard Changes and Reset - Save Changes - Discard Changes - Restore Defaults - Save as User Defaults - Restore User Defaults - Launch EFI Shell from filesystem device
MEBx		
- Intel(R) ME Password	-	-

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6.2 Main Menu

Upon entering the BIOS Setup Utility, the Main Menu is displayed, providing read-only information about your system and also allows you to set the System Date and Time. Refer to the tables below for details of the submenus and settings.

Feature	Option	Description
System Date	xxx mm/dd/yyyy	Sets the date. Use Tab to switch between date elements.
System Time	hh:mm:ss	Sets the time. Use Tab to switch between time elements.

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6.3 Advanced Menu

This menu contains the settings for most of the user interfaces in the system.

Feature	Option	Description
► CPU Configuration		CPU Configuration
► Power Management		System ACPI Parameters
► Serial Console Redirection		Serial Console Redirection
► USB Configuration		USB Configuration Parameters
► TPM 2.0 Configuration		TPM 2.0 Configuration
► Onboard Devices Configuration		Onboard Device Parameters
► Hardware Monitor		Monitor hardware status
► BIOS Watchdog Timer		BIOS Watch Dog Configuration
► Network Stack Configuration		Network Stack Settings
► Intel® Ethernet Controller I225-V		Configure Gigabit Ethernet device parameters

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6.3.1 Advanced > CPU Configuration

Feature	Option	Description
Hyper-threading	***Enabled*** Disabled	Enable or Disable Hyper-Threading Technology
Active Performance-cores	***All*** *7* *6* *5* *4* 3 2 1 0	Number of P-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.
Active Efficient-cores	***All*** *7* *6* *5* *4* 3 2 1 0	Number of E-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.
Intel (VMX) Virtualization Technology	***Enabled*** Disabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Intel(R) SpeedStep(TM)	***Enabled*** Disabled	Allow more than two frequency ranges to be supported.
Intel(R) Speed Shift Technology	***Enabled*** Disabled	Enable/Disable Intel(R) Speed Shift Technology Support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
C states	***Disabled*** Enabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

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6.3.2 Advanced > Power Management

Feature	Option	Description
Power Supply Unit	***ATX Mode*** Emulate AT Mode	Select Emulation AT or ATX function. If this option set to [Emulation AT], BIOS will report no suspend functions (S3 & S4) to ACPI OS. In windows XP, it will make OS show shutdown message during system shutdown. ATX: OS will turn off system power when shutdown.
State After G3	***S0 State*** S5 State	Specify what state to go to when power is re-applied after a power failure (G3 states).
RTC Wake system from S5	***Disabled*** Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime, system will wake on the current time + Increase minutes(S).
Wake up hour	***0***	Range: 0-23 hr For example enter 3 for 3am and 15 for 3pm
Wake up minute	***0***	Range: 0-59 min
Wake up second	***0***	Range: 0-59 sec
Wake up minute increase	***0***	Range: 1-5 min
PCIe Wake	***Enabled*** Disabled	Enable or disable PCI Express wake capability.

6.3.3 Advanced > Serial Console Redirection

Feature	Option	Description
Console Redirection	***Disabled*** Enabled	Console Redirection Enable or Disable
Terminal Type	***ANSI*** VT100 VT100Plus VT-UTF8	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100Plus: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bites per second	***115200*** 9600 19200 38400 57600	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	***8*** 7	Data Bites
Parity	***None*** Even Odd	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is

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	Mark Space	always 0. Mark and Space Parity do not allow for error detection.
Stop Bits	***1*** 2	Stop bits indicates the end of a serial data packet. (A stat bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may requires more than 1 stop bit.
Flow Control	***None*** Hardware RTS/CTS	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses tow wires to send start/stop signals.
VT-UTF8 Combo Key Support	***Enabled*** Disabled	Enabled VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
Recorder Mode	***Disabled*** Enabled	With the mode enabled only text will be sent. This is to capture Terminal data.
Resolution 100x31	***Disabled*** Enabled	Enables or disables extended terminal resolution.
Putty KeyPad	***VT100*** LINUX XTERMR6 SCO ESCN VT400	Select FunctionKey and KeyPad on Putty.

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6.3.4 Advanced > USB Configuration

Feature	Option	Description
USB Mass Storage Driver Support	***Enabled*** Disabled	Enable/Disable USB Mass Storage Driver Support
USB transfer time-out	***20 sec*** 1 sec 5 sec 10 sec	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	***20 sec*** 10 sec 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	***Auto*** Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

6.3.5 Advanced > TPM 2.0 Configuration

Make sure you have discrete TPM onboard before selecting dTPM item.

Feature	Option	Description
Security Device Support	***Enable*** Disable	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA256 PCR Bank	***Enabled*** Disabled	Enable or Disable SHA256 PCR Bank
SHA384 PCR Bank	***Disabled*** Enabled	Enable or Disable SHA384 PCR Bank
Pending operation	***None*** TPM Clear	Schedule an Operation for the Security Device. NOTE: Your computer will reboot during restart in order to change State of Security Device.
Platform Hierarchy	***Enabled*** Disabled	Enable or Disable Platform Hierarchy
Storage Hierarchy	***Enabled*** Disabled	Enable or Disable Storage Hierarchy
Endorsement Hierarchy	***Enabled*** Disabled	Enable or Disable Endorsement Hierarchy
Physical Presence Spec Version	***1.3*** 1.2	Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.
PH Randomization	***Enabled*** Disabled	Enables or Disables Platform Hierarchy randomization. DO NOT ENABLE THIS QUESTION IN

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6.3.6 Advanced > Onboard Devices Configuration

Feature	Option	Description
COM1 Mode Control	***RS232*** RS422 RS485	Select COM1 mode. RS232, RS422, RS485
COM2 Mode Control	***RS232*** RS422 RS485	Select COM1 mode. RS232, RS422, RS485
LAN #1	***Enabled*** Disabled	Enable/Disable
LAN #2	***Enabled*** Disabled	Enable/Disable

6.3.7 Advanced > NCT6126D Hardware Monitor

Feature	Option	Description
CPU Fan Control Mode(Fan 1)	***SMART FAN IV*** Manual mode	Configure Fan Control Mode. Select Manual Mode, user can configure a fix fan duty. Select SMART FAN IV, user can configure 4 temperatures and 4 fan duties. Select Auto Mode, FAN will run at automatic speed with thermal.
Manual PWM	***128***	
Temperature 1	***30***	The value of temperature1.
Percent of full FD/RPM 1	***30***	The value of Fan Duty/RPM when temperature is T1.
Temperature 2	***43***	The value of temperature2.
Percent of full FD/RPM 2	***50***	The value of Fan Duty/RPM when temperature is T2.
Temperature 3	***53***	The value of temperature3.
Percent of full FD/RPM 3	***80***	The value of Fan Duty/RPM when temperature is T3.
Temperature 4	***60***	The value of temperature4.
Percent of full FD/RPM 4	***100***	The value of Fan Duty/RPM when temperature is T4.
Critical Temperature	***61***	Fan temperature critical value.

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6.3.8 Advanced > BIOS Watchdog Timer

Feature	Option	Description
BIOS POST Watchdog	***Disabled*** Second Mode Minute Mode	1. Disable: Disable WatchDog Timer; 2. Second Mode: Enable Watchdog Timer in second mode; 3. Minute Mode: Enable Watchdog Timer in minute mode.
BIOS Watchdog Timer	***1***	Set watchdog timer for BIOS POST process. Minute Mode
BIOS Watchdog Timer	***15***	Set watchdog timer for BIOS POST process. Second Mode

6.3.9 Advanced > Network Stack Configuration

Feature	Option	Description
Network Stack	***Disabled*** Enabled	Enable/Disable UEFI Network Stack
IPv4 PXE Support	***Disabled*** Enabled	Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.
IPv4 HTTP Support	***Disabled*** Enabled	Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.
IPv6 PXE Support	***Disabled*** Enabled	Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.
IPv6 HTTP Support	***Disabled*** Enabled	Enable/Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.
PXE boot wait time	***0***	Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.
Media detect count	***1***	Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

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6.4 Chipset

Feature	Option	Description
► System (SA) Configuration		System Agent (SA) Parameters
► PCH-IO Configuration		PCH Parameters
PCH digital I/O device	***Disabled*** Enable	Disable/Enable ACPI GPIO Device support for PCH digital I/O and user LED

6.4.1 Chipset > System Agent (SA) Configuration

Feature	Option	Description
► Memory Configuration		Memory Configuration Parameters
► Graphics Configuration		Graphics Configuration
VT-d	***Enabled*** Disabled	VT-d capability

6.4.2 Chipset > Graphics Configuration

Feature	Option	Description
Primary Display	***IGFX*** Auto PEG Slot PCH PCI	Select which of IGFX/PEG/PCI Graphics device should be Primary Display or select HG for Hybrid Gfx.
Internal Graphics	***Enabled*** Auto Disabled	Keep IGFX enabled based on the setup options.
GTT Size	***8MB*** 2MB 4MB	Select the GTT Size
Aperture Size	***256MB*** 128MB 512MB 1024MB 2048MB	Select the Aperture Size Note : Above 4GB MMIO BIOS assignment is automatically enabled when selecting > 2048MB aperture. To use this feature, please disable CSM Support.
DVMT Pre-Allocated	***32M*** 4M 8M 16M 64M	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device

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6.4.3 Chipset > PCH-IO Configuration

Feature	Option	Description
► SATA Configuration		SATA Device Options Settings
► NVMe Configuration		NVMe Device Options Settings

6.4.3.1. Chipset > PCH-IO Configuration > SATA Configuration

Feature	Option	Description
SATA Mode Selection	***AHCI***	Determines how SATA controller(s) operate.
SATA Controller Speed	***Gen3*** Default Gen1 Gen2	Indicates the maximum speed the SATA controller can support.
Serial ATA Port 1	***Enabled*** Disabled	Enable or Disable SATA Port

6.5 Security

Feature	Option	Description
Administrator Password		Set Administrator Password
User Password		Set User Password
► Secure Boot menu		Secure Boot configuration
► Security Configuration		Security Configuration settings

6.5.1 Security > Secure Boot Menu

Feature	Option	Description
Secure Boot Control	***Disabled*** Enabled	Secure Boot feature is Active if Secure Boot is Enabled, Platform key(PK) is enrolled and the system is in User mode. The mode change requires platform reset.
Secure Boot Mode	***Standard*** Custom	Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication

6.5.2 Security > Security Configuration

Feature	Option	Description
BIOS Lock	***Enabled*** Disabled	Enable/Disable the PCH BIOS Lock Enable feature. Required to be enabled to ensure SMM protect of flash.

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6.6 Boot

Feature	Option	Description
Setup Prompt Timeout	***1***	Number of seconds to wait for setup activation key. The maximum value is 8.
Bootup NumLock State	***Off*** On	Select the keyboard NumLock state
Quiet Boot	***Enabled*** Disabled	Enables or disables Quiet Boot option
Fast Boot	***Disable Link*** Enabled	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
Boot Option #1	***Hard Disk*** NVME UEFI AP CD/DVD SD USB Hard Disk USB CD/DVD USB Key USB Floppy USB Lan Network Disabled	Sets the system boot order
Boot Option #2	***NVME*** Hard Disk UEFI AP CD/DVD SD USB Hard Disk USB CD/DVD USB Key USB Floppy USB Lan Network Disabled	Sets the system boot order
Boot Option #3	***UEFI AP*** Hard Disk NVME CD/DVD SD USB Hard Disk	Sets the system boot order

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	USB CD/DVD USB Key USB Floppy USB Lan Network Disabled	
Boot Option #4	***CD/DVD*** Hard Disk NVME UEFI AP SD USB Hard Disk USB CD/DVD USB Key USB Floppy USB Lan Network Disabled	Sets the system boot order
Boot Option #5	***SD*** Hard Disk NVME UEFI AP CD/DVD USB Hard Disk USB CD/DVD USB Key USB Floppy USB Lan Network Disabled	Sets the system boot order
Boot Option #6	***USB Hard Disk*** Hard Disk NVME UEFI AP CD/DVD SD USB CD/DVD USB Key USB Floppy USB Lan	Sets the system boot order

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	Network Disabled	
Boot Option #7	***USB CD/DVD*** Hard Disk NVME UEFI AP CD/DVD SD USB Hard Disk USB Key USB Floppy USB Lan Network Disabled	Sets the system boot order
Boot Option #8	***USB Key*** Hard Disk NVME UEFI AP CD/DVD SD USB Hard Disk USB CD/DVD USB Floppy USB Lan Network Disabled	Sets the system boot order
Boot Option #9	***USB Floppy*** Hard Disk NVME UEFI AP CD/DVD SD USB Hard Disk USB CD/DVD USB Key USB Lan Network Disabled	Sets the system boot order
Boot Option #10	***USB Lan*** Hard Disk	Sets the system boot order

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	NVME UEFI AP CD/DVD SD USB Hard Disk USB CD/DVD USB Key USB Floppy Network Disabled	

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6.7 Save & Exit

Feature	Option	Description
Save Changes and Exit		Exit system setup after saving the changes.
Discard Changes and Exit		Exit system setup without saving any changes.
Save Changes and Reset		Reset the system after saving the changes.
Discard Changes and Reset		Reset the system without saving any changes.
Save Changes		Save Changes done so far to any of the setup options.
Discard Changes		Discard Changes done so far to any of the setup options.
Restore Defaults		Restore/Load Default values for all the setup options.
Save as User Defaults		Save the changes done so far as User Defaults.
Restore User Defaults		Restore the User Defaults to all the setup options
Launch EFI Shell from filesystem device		Attemps to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices

6.8 MEBx

Feature	Option	Description
Intel(R) ME Password		MEBx Login
Intel(R) AMT	Disabled Enable	

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Safety Instructions

Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use.

- Please read these safety instructions carefully.
- Please keep this User‘s Manual for later reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment, turn off the power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources.
  - Keep equipment away from high heat or high humidity.
  - Keep equipment properly ventilated (do not block or cover ventilation openings).
  - Make sure to use recommended voltage and power source settings.
  - Always install and operate equipment near an easily accessible electrical socket-outlet.
  - Secure the power cord (do not place any object on/over the power cord).
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings.
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.
- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

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Getting Service

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