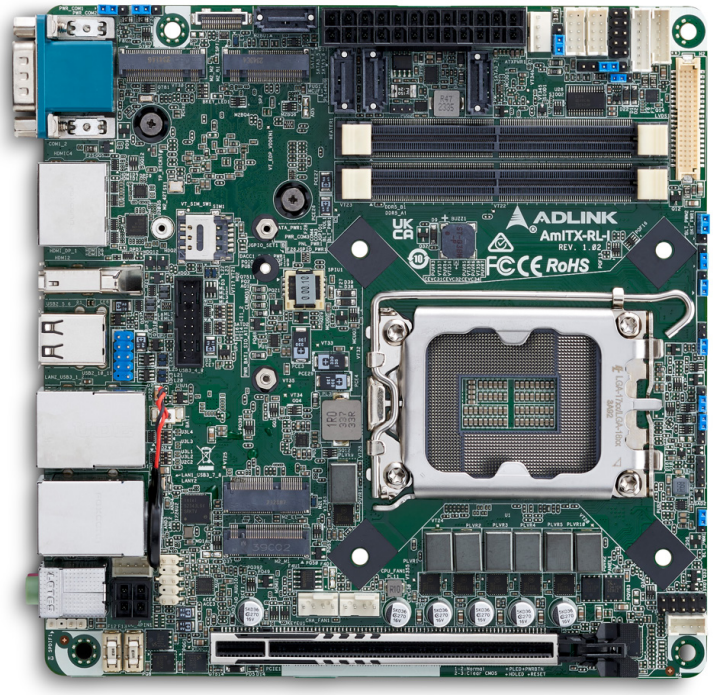
AmITX-RL-I

User's Manual

Mini-ITX Embedded Motherboard with
12th/13th/14th Gen Intel® Core™ i9/i7/i5/i3 Processors
and Intel® Q670 Chipset



Manual Rev.:	Rev. 1.6
Revision Date:	October 13, 2026
Part Number:	50M-16008-1060

LEADING EDGE AI COMPUTING

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Preface

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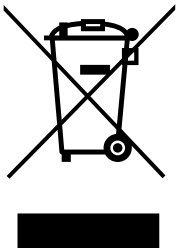
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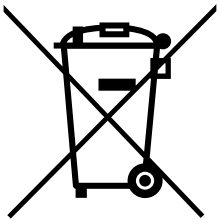
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Revision History

Revision	Description	Date	By
1.0	Initial release	2024-07-12	AL
1.1	USB 3.2 Gen1 header updated	2024-08-16	AL
1.2	Connectors and jumpers updated	2025-01-14	AL
1.3	Mechanical layout and connectors and jumpers updated	2025-02-18	AL
1.4	Specifications and BIOS settings updated	2025-06-27	AL
1.5	Mechanical layout updated	2026-08-14	AL
1.6	Connectors and jumpers updated	2026-10-13	AL

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1 Introduction

The AmITX-RL-I is a Mini-ITX motherboard supporting the Desktop 12th/13th/14th Generation Intel® Core™ i9/i7/i5/i3 and Pentium®/Celeron® Processor with Intel® Q670 Chipset. The AmITX-RL-I is specifically designed for customers who need high-level processing and graphics performance with a long product life solution.

The AmITX-RL-I features one DisplayPort, two HDMI®, one LVDS or eDP, 2.5 and 1 Gigabit Ethernet ports, USB 3.2 Gen 2 and Gen 1 ports, USB 2.0 ports, and SATA 6 Gb/s ports. Expansion is provided by one PCIe Gen 5 x16 slot. The onboard feature connector provides GPIO, SMBus support. The board is equipped with SPI AMI EFI BIOS, supporting embedded features such as hardware monitor and watchdog timer

Model Number	Chipset
AmITX-RL-I	Q670

Latest revisions of the datasheet, user's manual, BIOS, drivers, and board support packages, can be downloaded from the product webpage on the ADLINK web site: www.adlinktech.com

1.1 Packing List

- AmITX-RL-I Mini-ITX motherboard
- Rear I/O shield
- M.2 screws kit

1.2 Optional Accessories

- CPU cooler for 65W CPU (P/N: 32-20976-0000-A0)
- USB 2.0 Cable (P/N: 30-21625-0000-B0)
- USB 3.0 Cable (P/N: 30-21597-1000-A0)
- SATA Cable (P/N: 30-10057-7000)
- SATA Power Cable (P/N: 30-22156-0000-A0)
- COM Port Cable (P/N: 30-22155-0000-A0)

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2 Specifications

2.1 Core System

CPU	Desktop 12th/13th/14th Generation Intel® Core™ i9/i7/i5/i3 and Pentium®/Celeron® Processor, LGA1700 socket					
	Family	**Number**	**CPU Core**	**Frequency (GHz)**	**Cache (MB)**	**Power**
	Alder Lake-S	i9-12900TE	16	1.1GHz	30MB	65W
	Alder Lake-S	i9-12900E	16	2.3GHz	30MB	65W
	Alder Lake-S	i7-12700TE	12	1.4GHz	25MB	35W
	Alder Lake-S	i7-12700E	12	2.1GHz	25MB	65W
	Alder Lake-S	i5-12500TE	6	1.9GHz	18MB	35W
	Alder Lake-S	i5-12500E	6	2.9GHz	18MB	65W
	Alder Lake-S	i3-12100TE	4	2.1GHz	12MB	35W
	Alder Lake-S	i3-12100E	4	3.2GHz	12MB	60W
	Alder Lake-S	G7400TE	2	3.0GHz	6MB	35W
	Alder Lake-S	G7400E	2	3.6GHz	6MB	46W
	Alder Lake-S	G6900TE	2	2.4GHz	4MB	35W
	Alder Lake-S	G6900E	2	3.0GHz	4MB	46W
	Raptor Lake-S	i9-13900TE	24	1.0GHz	36MB	35W
	Raptor Lake-S	i9-13900E	24	1.8GHz	36MB	65W
	Raptor Lake-S	i7-13700TE	16	1.1GHz	30MB	35W
	Raptor Lake-S	i7-13700E	16	1.9GHz	30MB	65W
	Raptor Lake-S	i5-13500TE	14	1.3GHz	24MB	35W
	Raptor Lake-S	i5-13500E	14	2.4GHz	24MB	65W
	Raptor Lake-S	i5-13400E	10	2.4GHz	20MB	65W
	Raptor Lake-S	i3-13100TE	4	2.4GHz	12MB	35W
	Raptor Lake-S	i3-13100E	4	3.3GHz	12MB	65W
	Raptor Lake-S Refresh	i9-14900T	24	1.1GHz	36MB	35W
	Raptor Lake-S Refresh	i9-14900	24	2.0GHz	36MB	65W
	Raptor Lake-S Refresh	i7-14700T	20	1.3GHz	33MB	35W
	Raptor Lake-S Refresh	i7-14700	20	2.1GHz	33MB	65W
	Raptor Lake-S Refresh	i5-14500T	14	1.7GHz	24MB	35W

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	Raptor Lake-S Refresh	i5-14500	14	2.6GHz	24MB	65W
	Raptor Lake-S Refresh	i5-14400T	10	1.5GHz	20MB	35W
	Raptor Lake-S Refresh	i5-14400	10	2.5GHz	20MB	65W
	Raptor Lake-S Refresh	i3-14100T	4	2.7Ghz	12MB	35W
	Raptor Lake-S Refresh	i3-14100	4	3.5GHz	12MB	60W
	Raptor Lake-S Refresh	300T	2	3.4GHz	6MB	35W
	Raptor Lake-S Refresh	300	2	3.9GHz	6MB	46W
	Note: Availability of features may vary between processor SKUs and operating systems.					
Chipset	Intel® Q670 Chipset					
Memory	Two 262-pin DDR5 non-ECC SODIMM slots, DDR5 4800 MHz, up to 64 GB (CPU dependent)					
Embedded BIOS	AMI® UEFI BIOS, 256Mb SPI flash memory					

2.2 Rear I/O Connectors

Display	1x HDMI 2.0b, 1x HDMI 1.4b, 1x DP 1.4a
LAN	1x 1GbE RJ-45 1x 2.5GbE RJ-45
USB	4x USB3.2 Gen2 x1 2 x USB 2.0
Audio	1x Line-out, 1x Mic-in connector
Serial	2x RS-232/422/485

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2.3 Internal Headers and Connectors

PCI Express Slots	1x PCIe Gen5 x16
USB	2x USB3.2 Gen1 x1 (via header) 2x USB2.0 (via header)
SATA	4x SATA 6.0 Gb/s connectors. Software RAID support 0/1/5/10
Expansion Slots	1x M.2 B-key 3042/3052 (PCIe x1, USB3.2 Gen1, USB 2.0) for 4G/5G module 1x M.2 E-key 2230 (PCIe x1, USB 2.0, CNVi) for Wireless 1x M.2 M-Key 2242 (PCIe Gen3 x4) for SSD 1x M.2 M-Key 2242/2280 (PCIe Gen4 x4) for SSD 1x SIM socket connected to M.2 B Key
Serial	4x RS-232 headers
LVDS	1x LVDS pin header, supports single/dual channel 24-bit up to 1920x1200@60Hz (Connector shared with eDP)
DIO	1x 8-bit GPIO pin header
Other	ESPI Header CPU Fan Connector Chassis Fan Connector System Panel Header Front Panel Audio Header Chassis Intrusion Header SPDIF Header Speaker Header SATA PWR Output ATX Power Connector, 12V DC-In co-design (4-pin) ATX Power Connector (24-pin)

2.4 Form Factor

Mini-ITX: 170mm x 170mm

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2.5 Video

Controller	Intel® UHD Graphics
Display Interface Support	• 1x HDMI 2.0b, max resolution up to 4096x2160@60Hz • 1x HDMI 1.4b, max resolution up to 4096x2160@30Hz • 1x DP 1.4a, DP++, max resolution up to 4096x2160@60Hz • 1x LVDS, supports dual channel 24-bit, max resolution up to 1920x1200@60Hz (Connector shared with eDP)

2.6 Audio

Audio Codec	Realtek ALC897
Interfaces	1x Line-out, 1x Mic-in connector

2.7 LAN

Controller	1x Intel® i226-V with 10/100/1000/2500 Mbps 1x Intel® i219-LM with 10/100/1000 Mbps, supports vPro
Interface	RJ45 connectors

2.8 Trusted Platform Module (TPM)

TPM 2.0	Infineon SLB9670XQ2.0

2.9 Power Specification

Input PWR	ATX PWR (24+4-pin) and +12V DC-In co-design
Power On	AT/ATX Supported - AT: Directly PWR on as power input ready - ATX: Press button to PWR on after power input ready

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2.10 Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255 Sec

2.11 Temperatures

Standard Operating Temperature	-20°C to 70°C
Storage Temperature	-40°C to 85°C

2.12 Environmental

Humidity	60°C @ 95% RH non-condensing
Vibration	1Grms, 5-500Hz, non-operation

2.13 Operating Systems

Standard Support	Microsoft® Windows® 10/11 64-bit, Ubuntu 22.04.4 LTS 64-bit

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2.14 Functional Block Diagram

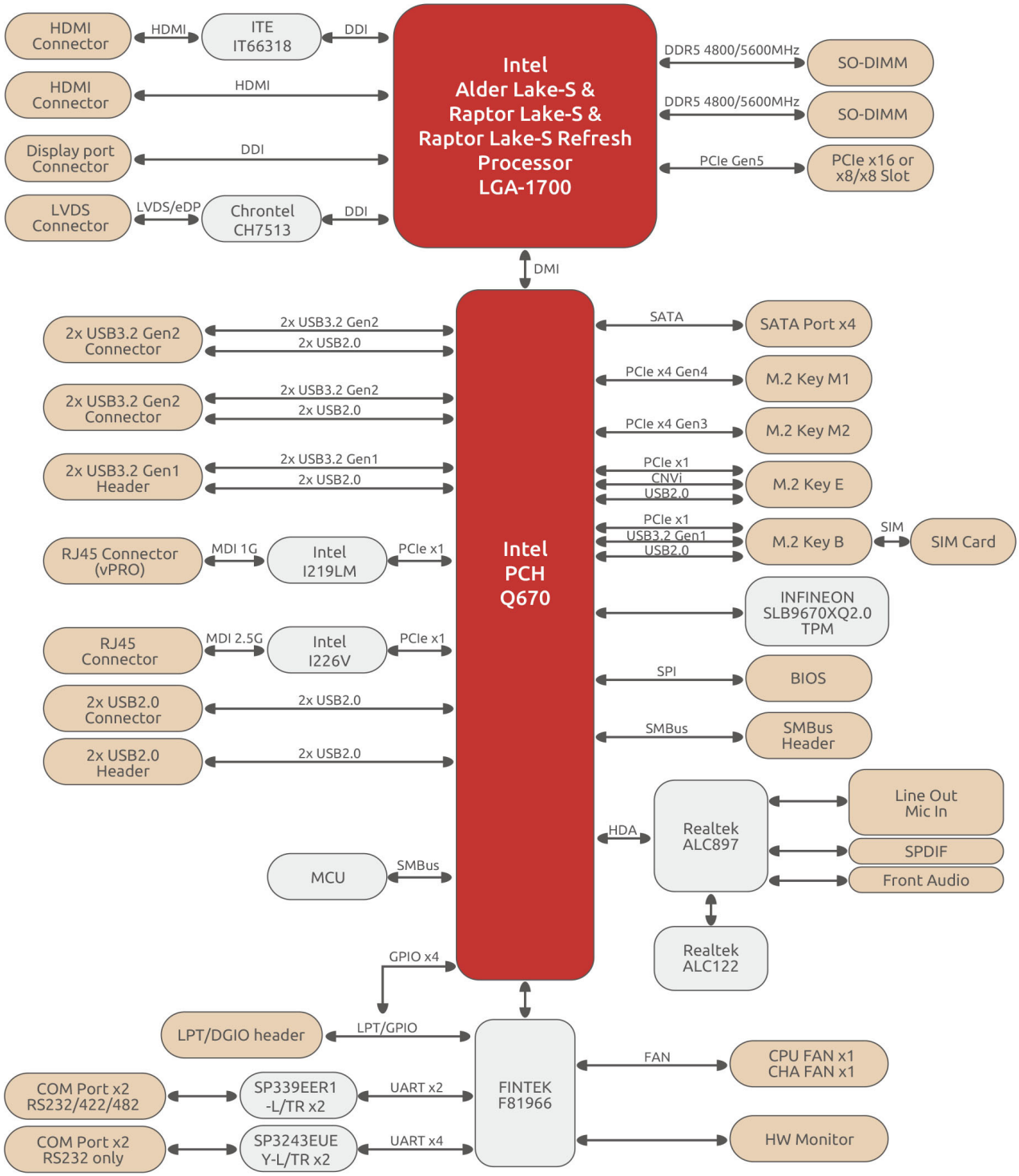


Figure 1: AmITX-RL-I functional block diagram

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3 Mechanical Layout

3.1 Connector Locations

3.1.1 Rear I/O Connectors

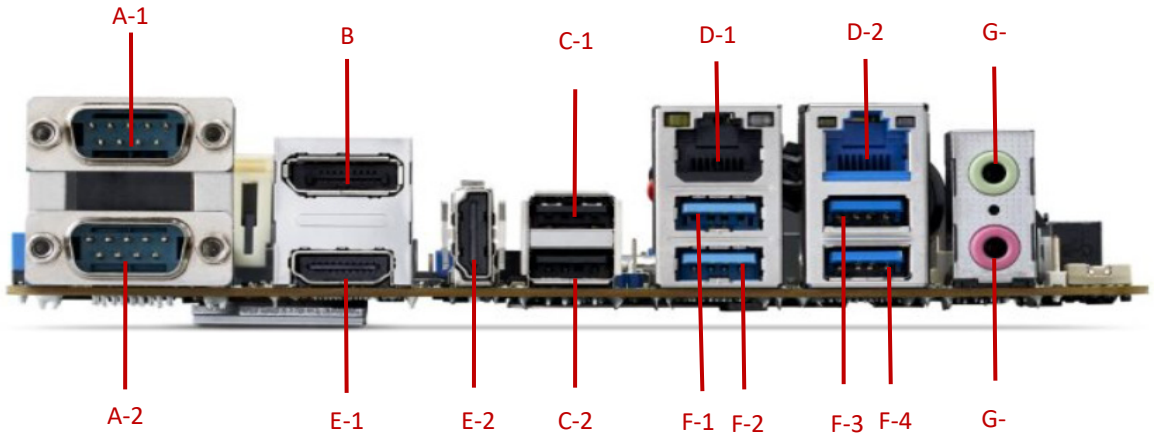


Figure 2: AmITX-RL-I rear I/O

Item	Description (Location)
A-1	COM Port (COM1) (RS232/422/485)
A-2	COM Port (COM2) (RS232/422/485)
B	DisplayPort (DP1)
C-1	USB 2.0 Port (USB3_5)
C-2	USB 2.0 Port (USB3_6)
D-1	RJ45 2.5GbE LAN Port (LAN2)
D-2	RJ45 GbE LAN Port (LAN1)
E-1	HDMI Port (HDMI1)
E-2	HDMI Port (HDMI2)
F-1	USB 3.2 Gen2 Port (USB3_2)
F-2	USB 3.2 Gen2 Port (USB3_1)
F-3	USB 3.2 Gen2 Port (USB3_8)
F-4	USB 3.2 Gen2 Port (USB3_7)
G-1	Audio Output: Green - Line Out
G-2	Audio Output: Pink - Mic In

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3.1.2 Connectors and Jumpers

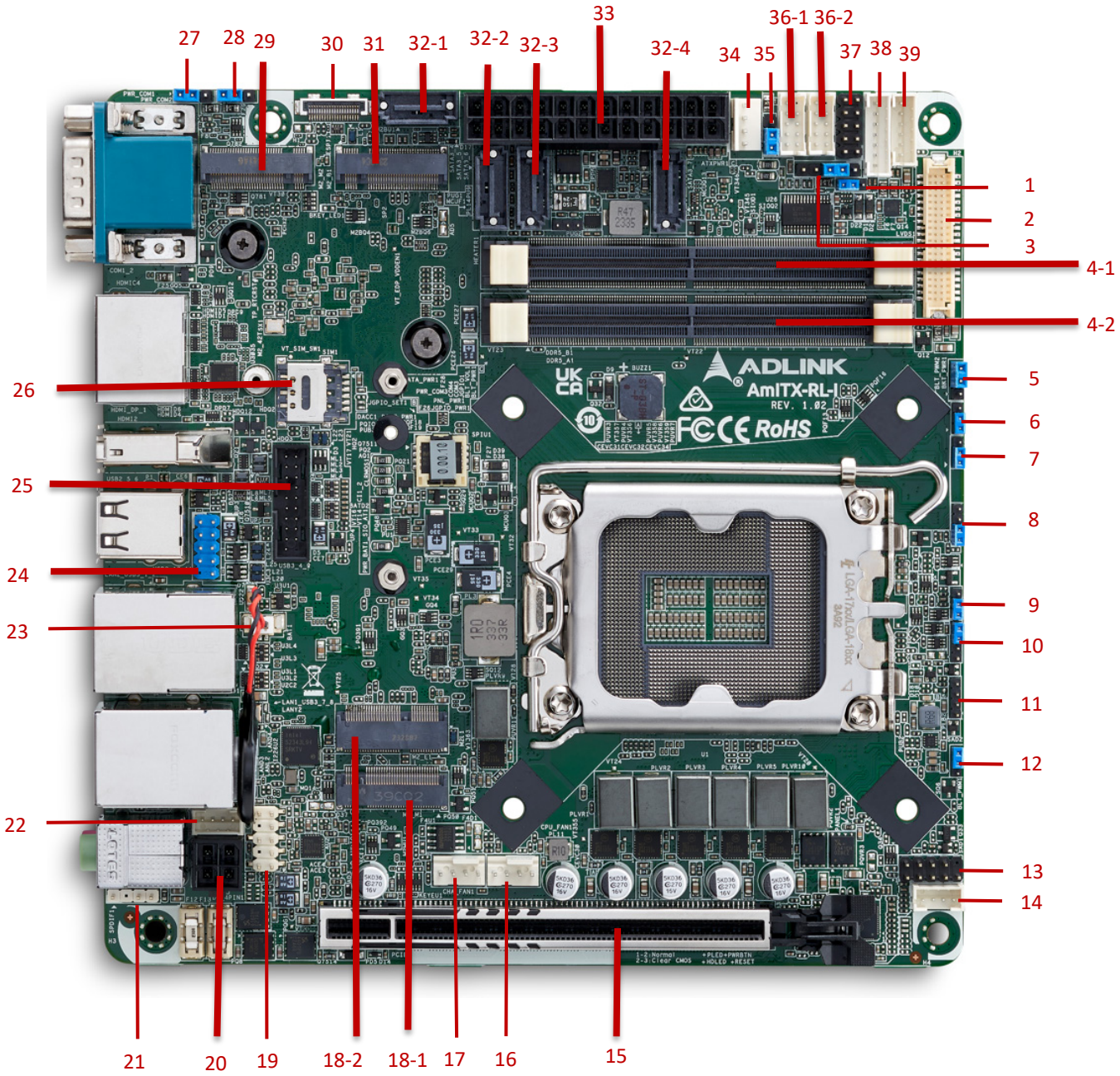


Figure 3: AmITX-RL-I component-side connectors

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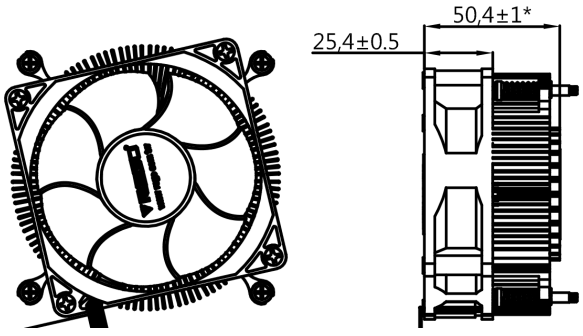
Item	Description (Location)	Item	Description (Location)
1	Digital Input / Output Power Select (JGPIO_PWR1)	22	3W Audio AMP Output Wafer (SPEAKER1)
2	LVDS Panel Connector (LVDS1)	23	Battery Connector (BAT1)
3	Panel Power Select (LCD_VCC) (PNL_PWR1)	24	USB 2.0 Header (USB2_10_11)
4-1	DDR5_B1	25	USB 3.2 Gen1 Header (USB3_4_9)
4-2	DDR5_A1	26	SIM socket (SIM1)
5	Backlight Power Select (LCD_BLT_VCC) (BKT_PWR1)	27	COM Port PWR Setting Jumper (PWR_COM1 (For COM Port1))
6	CON_LBKLT_CTL Voltage Level (BLT_PWM2)	28	COM Port PWR Setting Jumper (PWR_COM2 (For COM Port2))
7	Digital Input / Output Default Value Setting (JGPIO_SET1)	29	M.2 M-Key 2242 slot (M2_M2)
8	DACC1_PCIE_PWR1	30	ESPI Header (ESPI1)
9	Clear CMOS Header (CLRMOS1)	31	M.2 B-Key 3042/3052 slot (M2_B1)
10	Chassis Intrusion Header (CI1_2)	32-1	SATA3 Connectors (SATA3_4)
11	PWR_BAT1_SIO_AT1	32-2	SATA3 Connectors (SATA3_5)
12	Brightness Control Mode (BLT_PWM1)	32-3	SATA3 Connectors (SATA3_6)
13	System Panel Header (PANEL1)	32-4	SATA3 Connectors (SATA3_7)
14	SMBUS_TEST1	33	24-pin ATX Power Input Connector (ATXPWR1)
15	PCIe Gen5 x16 slot (PCIE1)	34	SATA Power Output Connector (SATA_PWR1)
16	CPU FAN Connector (+12V) (CPU_FAN1)	35	COM Port PWR Setting Jumper (PWR_COM3 (For COM Port3))
17	Chassis FAN Connector (+12V) (CHA_FAN1)	36-1	COM Port Headers (COM 4) (RS232)
18-1	M.2 M-Key 2242/2280 slot (M2_M1)	36-2	COM Port Headers (COM 3) (RS232)
18-2	M.2 E-Key 2230 slot (M2_E1)	37	Digital Input/Output Pin Header (JGPIO1)
19	Front Panel Audio Header (HD_AUDIO1)	38	Backlight Volume Control (BLT_VOL1)
20	4-pin ATX PWR Connector (DC_4PIN1)	39	Inverter Power Control Wafer (BLT_PWR1)
21	SPDIF Header (SPDIF1)		

3.2 Thermal Solutions

LGA1700 CPU Cooler, H=50.4mm, 65W

Standard Temp.: 0°C to 60°C

P/N: 32-20976-0000-A0



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4 Connectors and Jumpers

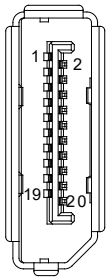
See 3.1 Connector Locations on page 9.

4.1 Rear IO Connectors

4.1.1 DisplayPort

One DisplayPort 1.4a specification port up to 4096x2160@60Hz

Pin	Signal Name	Pin	Signal Name
1	DP1_CON_DP0	2	GND
3	DP1_CON_DN0	4	DP1_CON_DP1
5	GND	6	DP1_CON_DN1
7	DP1_CON_DP2	8	GND
9	DP1_CON_DN2	10	DP1_CON_DP3
11	GND	12	DP1_CON_DN3
13	DP1_HDMI_DNG_DET	14	DP_CFG2
15	DP1_CON_AUXP	16	GND
17	DP1_CON_AUXN	18	DP1_CON_HPD
19	GND	20	+3.3V

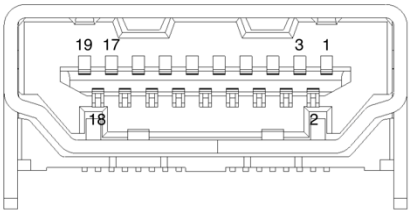


4.1.2 HDMI

One HDMI 2.0b specification port up to 4096 x 2160 @ 60 Hz

One HDMI 1.4b specification port up to 4096 x 2160 @ 30 Hz

Pin	Signal Name	Pin	Signal Name
1	HDMI1_CON_DP2	2	GND
3	HDMI1_CON_DN2	4	HDMI1_CON_DP1
5	GND	6	HDMI1_CON_DN1
7	HDMI1_CON_DP0	8	GND
9	HDMI1_CON_DN0	10	HDMI1_CON_CKP
11	GND	12	HDMI1_CON_CKN
13	N/C	14	N/C
15	HDMI1_DDC_CLK	16	HDMI1_DDC_DATA
17	GND	18	+5V
19	HDMI1_CON_HPD		



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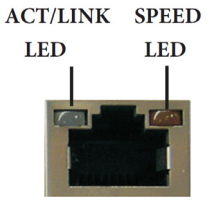
4.1.3 Ethernet Connectors (LAN1, LAN2)

LAN1: 10/100/1000/2500 Mbps LAN Ethernet controllers based on i226-LM.

LAN2: 10/100/1000 Mbps LAN Ethernet controllers based on i219-V, support vPro.

Both supporting PXE and WOL.

Pin	10BASE-T/ 100BASE-TX	1000BASE-T
1	TX+	LAN_MDI0+
2	TX-	LAN_MDI0-
3	RX+	LAN_MDI1+
4	--	LAN_MDI2+
5	--	LAN_MDI2-
6	RX-	LAN_MDI1-
7	--	LAN_MDI3+
8	--	LAN_MDI3-



LED Behavior

LAN2 LED Indications				
Activity Link LED			SPEED LED	
Status	Description		Status	Description
Off	No Link		Off	10Mbps
On	Link		Orange	100Mbps
Blinking	Data Activity		Green	1Gbps connection

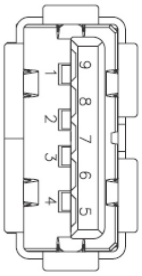
LAN1 LED Indications				
Activity Link LED			SPEED LED	
Status	Description		Status	Description
Off	No Link		Off	10Mbps/100Mbps
On	Link		Orange	1Gbps connection
Blinking	Data Activity		Green	2.5Gbps connection

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4.1.4 USB Connectors

4x USB3.2 Gen2 x1, 2x USB2.0

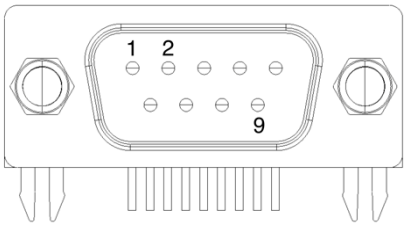
Pin	Signal Name
1	+5VDC
2	USB_N
3	USB_P
4	GND
5	USB3_RX_N
6	USB3_RX_P
7	GND
8	USB3_TX_N
9	USB3_TX_P



4.1.5 Serial COM Port Connector (COM1,2)

COM Port Pin Definition
COM1,2 supports RS-232/422/485, selected in BIOS.

Pin	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	TX+	RTX+
3	TXD	RX+	N/A
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	PWR	PWR	PWR



4.1.6 Audio Connectors

- One Line-out, and one Mic-in on rear I/O
- Realtek ALC897 codec

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4.2 Internal Connectors

4.2.1 ATX Power Connector (ATXPWR1)

AmITX-RL-I supports a standard 24-pin ATX Power Connector (ATXPWR1)

Pin	Signal Name	Pin	Signal Name
1	+3V	13	+3V
2	+3V	14	-12V
3	GND	15	GND
4	+5V	16	PSON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWROK_PS	20	NA
9	ATX+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3V	24	GND

This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along with Pin 1 and Pin 13.

4.2.2 ATX 12V Power Connector (DC_4PIN1)

Pin	Signal Name
1	GND
2	GND
3	DC Input
4	DC Input

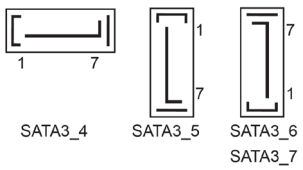


4.2.3 SATA Connectors (SATA3_4~7)

Four SATA 6 Gbps ports are available on AmITX-RL-I.

The Serial ATA3 (SATA3) connector supports SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

Pin	Signal Name
1	GND
2	SATA-A+
3	SATA-A-
4	GND
5	SATA-B-



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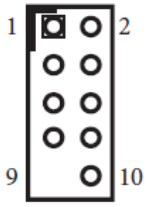
Pin	Signal Name
6	SATA-B+
7	GND

4.2.4 USB 2.0 Header (USB2_10_11)

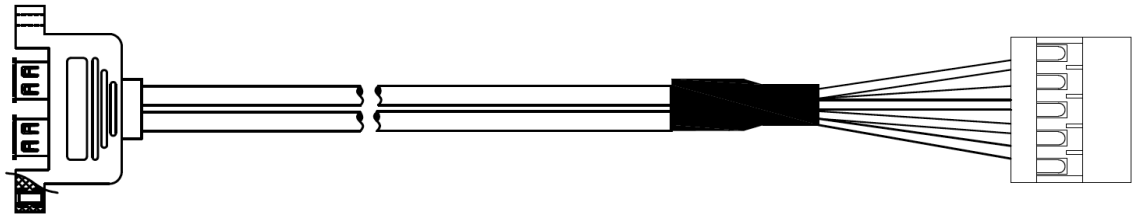
2x USB 2.0.

The board provides one internal USB 2.0 header and the connector can support two USB 2.0. The maximum current per port is 0.5A.

Pin	Signal Name	Pin	Signal Name
1	USB_PWR	2	USB_PWR
3	P-	4	P-
5	P+	6	P+
7	GND	8	GND
9		10	DUMMY



USB Cable (optional):
USB 2.0 Header to 2x Female Type-A Cable (length 150mm), P/N: 30-21625-0000-B0



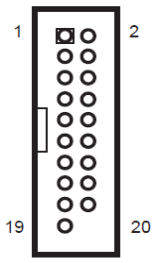
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4.2.5 USB 3.2 Gen1 Header (USB3_4_9)

2x USB 3.2 Gen1

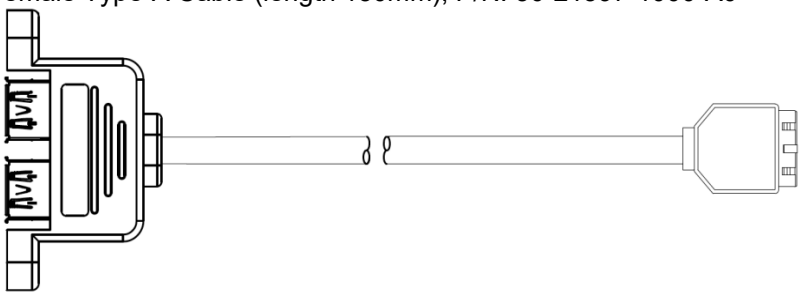
There is only a single USB 3.2 Gen1 connector on this motherboard. This header can support two USB 3.2 Gen1 ports with a maximum power current of 0.9A per port.

Pin	Signal Name	Pin	Signal Name
1	DUMMY	2	IntA_PA_D+
3	IntA_PB_D+	4	IntA_PA_D-
5	IntA_PB_D-	6	GND
7	GND	8	IntA_PA_SSTX+
9	IntA_PB_SSTX+	10	IntA_PA_SSTX-
11	IntA_PB_SSTX-	12	GND
13	GND	14	IntA_PA_SSRX+
15	IntA_PB_SSRX+	16	IntA_PA_SSRX-
17	IntA_PB_SSRX-	18	Vbus
19	Vbus	20	



USB Cable (optional):

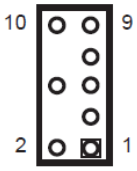
USB 3.0 Header to 2x Female Type-A Cable (length 150mm), P/N: 30-21597-1000-A0



4.2.6 Front Panel Audio Header (HD_AUDIO1)

This is a line out/microphone interface for the front panel audio cable that allows jack detection, and provides a convenient connection and control of audio devices.

Pin	Signal Name	Pin	Signal Name
1	MIC2_L	2	GND
3	MIC2_R	4	
5	OUT2_R	6	MIC_RET
7	J_SENSE	8	
9	OUT2_L	10	OUT_RET



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4.2.7 CPU Fan and Chassis Fan Connectors (+12V) (CPU_FAN1, CHA_FAN1)

The board offers three 4-pin CPU fan (Smart Fan) connectors that are compatible with 3-pin CPU fan. If you connect a 3-pin CPU fan to the CPU fan connector on this motherboard, please connect it to pin 1-3. The maximum current is 1A.

Pin	Signal Name
1	GND
2	+12V
3	FAN_SPEED
4	FAN_SPEED_CONTROL



4.2.8 Serial COM Port Connector (COM3,4)

Two internal serial ports (COM3,4). Serial ports are over-current protected.

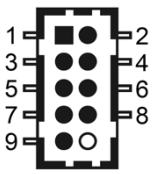
Serial Port	Functions
COM3	Supports RS-232
COM4	Supports RS-232

RS-232

There are two 2.54mm-pitch COM port headers (COM3~COM4) that only support RS-232. The maximum current is 1A per port. The power supply of pin 9 is either 5V or 12V; Use the COM port pin 9 PWR Setting Jumper to control it.

(COM3)

Pin	Signal Name	Pin	Signal Name
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	PWR	10	

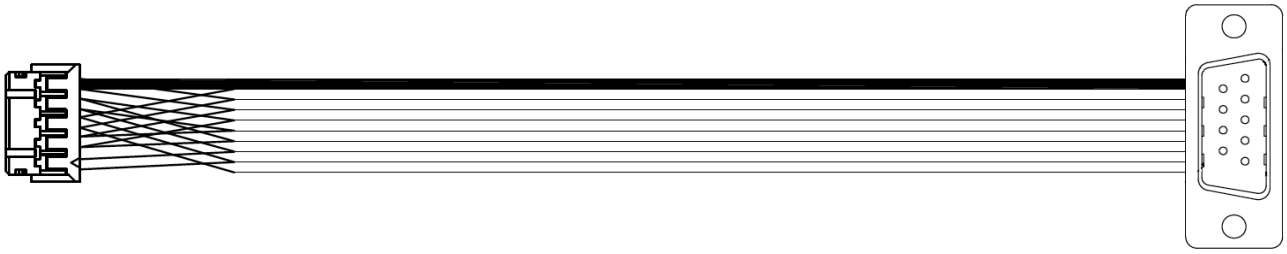


(COM4)

Pin	Signal Name	Pin	Signal Name
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	N/A	10	

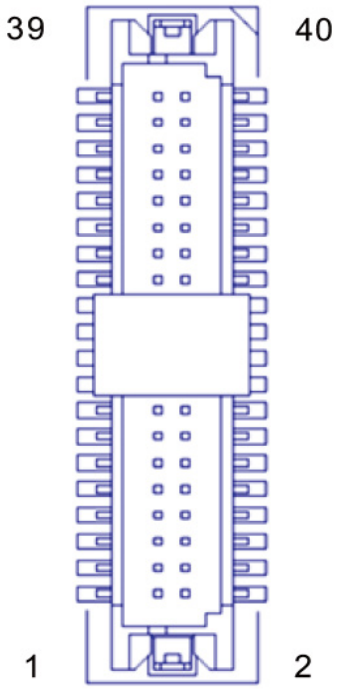
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COM Cable (optional):
COM Port Cable (length 350mm), P/N: 30-22155-0000-A0



4.2.9 LVDS Panel Connector (LVDS1)

Pin	Signal Name	Pin	Signal Name
1	LCD_VCC	2	LCD_VCC
3	+3.3V	4	NA
5	NA	6	LVDS_A_DATA0#
7	LVDS_A_DATA0	8	GND
9	LVDS_A_DATA1#	10	LVDS_A_DATA1
11	GND	12	LVDS_A_DATA2#
13	LVDS_A_DATA2	14	GND
15	LVDS_A_DATA3#	16	LVDS_A_DATA3
17	GND	18	LVDS_A_CLK#
19	LVDS_A_CLK	20	GND
21	LVDS_B_DATA0#	22	LVDS_B_DATA0
23	GND	24	LVDS_B_DATA1#
25	LVDS_B_DATA1	26	GND
27	LVDS_B_DATA2#	28	LVDS_B_DATA2
29	DPLVDD_EN	30	LVDS_B_DATA3#
31	LVDS_B_DATA3	32	GND
33	LVDS_B_CLK#	34	LVDS_B_CLK
35	GND	36	CON_LBKLT_EN
37	CON_LBKLT_CTL	38	LCD_BLT_VCC
39	LCD_BLT_VCC	40	LCD_BLT_VCC



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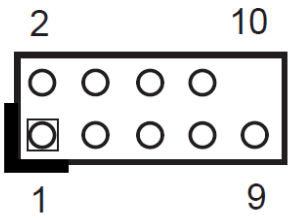
*eDP by pass mode pin definition (switch by BIOS)

Pin	Signal Name	Pin	Signal Name
1	LCD_VCC	2	LCD_VCC
3	N/A	4	N/A
5	N/A	6	N/A
7	N/A	8	GND
9	EDP_TX1#	10	EDP_TX1
11	GND	12	EDP_TX0#
13	EDP_TX0	14	GND
15	N/A	16	N/A
17	GND	18	EDP_AUXN
19	EDP_AUXP	20	GND
21	N/A	22	N/A
23	GND	24	N/A
25	N/A	26	GND
27	N/A	28	N/A
29	DPLVDD_EN	30	N/A
31	N/A	32	GND
33	N/A	34	N/A
35	GND	36	CON_LBKLT_EN
37	CON_LBKLT_CTL	38	LCD_BLT_VCC
39	LCD_BLT_VCC	40	LCD_BLT_VCC

4.2.10 System Panel Header (PANEL1)

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.

Pin	Signal Name	Pin	Signal Name
1	HDLED+	2	PLED+
3	HDLED-	4	PLED-
5	GND	6	PWRBTN#
7	RESET#	8	GND
9	GND	10	



PWRBTN (Power Switch):

Connect to the power switch on the chassis front panel. You may configure how 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.

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PLED (System Power LED):

Connect to the power status indicator on the chassis front panel. The LED is turned on when the system is operating. The LED blinks when the system is in the S1 sleep state. The LED is off when the system is in the S3/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 turned 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, etc. When connecting your chassis front panel module to this header, make sure the wire and the pin assignments are matched correctly.

4.2.11 Chassis Intrusion Header (CI1_2)

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.

PIN 1-2 Open	Normal
PIN 1-2 Short	Active Case Open
PIN 3-4 Open	Active Case Open (Default)
PIN 3-4 Short	Normal



4.2.12 ESPI Header (ESPI1)

The header is reserved for Port 80 code. display and debugging purposes.

Pin	Signal Name
1	GND
2	C_ESPI_CLK
3	GND
4	C_ESPI_CS#
5	DEBUG_RESET
6	GND
7	+3V
8	GND
9	SMB_CLK_MAIN
10	SMB_DATA_MAIN
11	C_ESPI_IO0
12	C_ESPI_IO1
13	C_ESPI_IO2
14	C_ESPI_IO3
15	GND
16	+3VSB
17	N/A
18	N/A

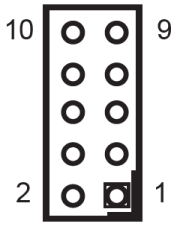


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Pin	Signal Name
19	C_ESPI_ALERT#
20	GND

4.2.13 8-bit GPIO (JGPIO1)

Pin	Signal Name	Pin	Signal Name
1	SIO_GP71	2	GPP_H23
3	SIO_GP72	4	GPP_I10
5	SIO_GP73	6	GPP_E5
7	SIO_GP74	8	GPP_E6
9	JGPIOPWR_R	10	GND



Output (Pin 1, 3, 5, 7)

Parameter	Range
GPIO output low voltage	Max: 0.4V
GPIO output high voltage	Low: 2.4V
Note: Max. load per GPO pin: 12 mA Current max. 1A per power pin	

Input (Pin 2, 4, 6, 8)

Parameter	Range
GPIO input low voltage	Max: 1V
GPIO input high voltage	Low: 2.3V
Note: Max. load per GPI pin: 5μA Current max. 1A per power pin	

4.2.14 M.2 M-Key Socket (M2_M2)

Pin	Signal Name	Pin	Signal Name
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PERn3	6	NA
7	PERp3	8	NA
9	GND	10	LED
11	PETn3	12	+3.3V
13	PETp3	14	+3.3V
15	GND	16	+3.3V
17	PERn2	18	+3.3V
19	PERp2	20	NA
21	GND	22	NA

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Pin	Signal Name	Pin	Signal Name
23	PETn2	24	NA
25	PETp2	26	NA
27	GND	28	NA
29	PERn1	30	NA
31	PERp1	32	NA
33	GND	34	NA
35	PETn1	36	NA
37	PETp1	38	DEVSLP
39	GND	40	SMB_CLK
41	PERn0	42	SMB_DATA
43	PERp0	44	NA
45	GND	46	NA
47	PETn0	48	NA
49	PETp0	50	PERST#
51	GND	52	CLKREQ#
53	PEFCLKn	54	NA
55	PEFCLKp	56	NA
57	GND	58	NA
67	NA	68	NA
69	PEDET	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

4.2.15 M.2 M-Key Socket (M2_M2)

Pin	Signal Name	Pin	Signal Name
1	NA	2	+3.3V
3	GND	4	+3.3V
5	GND	6	FuLL Card_Power_
			off
7	USB_D+	8	W_DISABLE
9	USB_D-	10	WWAN_LED#
11	GND		
21	GND	20	NA
23	NA	22	NA

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Pin	Signal Name	Pin	Signal Name
25	NA	24	NA
27	GND	26	NA
29	USB3_RX-	28	NA
31	USB3_RX+	30	UIM_RESET
33	GND	32	UIM_CLK
35	USB3_TX-	34	UIM_DATA
37	USB3_TX+	36	UIM_PWR
39	GND	38	NA
41	PERn0	40	NA
43	PERP0	42	NA
45	GND	44	NA
47	PETn0	46	NA
49	PETP0	48	NA
51	GND	50	PERST#
53	PEFCLKn	52	CLKREQ#
55	PEFCLKp	54	NA
57	GND	56	NA
59	NA	58	NA
61	NA	60	NA
63	NA	62	NA
65	NA	64	NA
67	NA	66	NA
69	NA	68	NA
71	GND	70	+3.3V
73	GND	72	+3.3V
75	NA	74	+3.3V

4.2.16 M.2 Mkey Socket (M2_M1)

Pin	Signal Name	Pin	Signal Name
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PERn3	6	NA
7	PERp3	8	NA
9	GND	10	SATA_LED
11	PETn3	12	+3.3V
13	PETp3	14	+3.3V
15	GND	16	+3.3V

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Pin	Signal Name	Pin	Signal Name
17	PERn2	18	+3.3V
19	PERp2	20	NA
21	GND	22	NA
23	PETn2	24	NA
25	PETp2	26	NA
27	GND	28	NA
29	PERn1	30	NA
31	PERp1	32	NA
33	GND	34	NA
35	PETn1	36	NA
37	PETp1	38	NA
39	GND	40	SMB_CLK
41	PERn0	42	SMB_DATA
43	PERp0	44	NA
45	GND	46	NA
47	PETn0	48	NA
49	PETp0	50	PERST#
51	GND	52	CLKREQ#
53	PEFCLKn	54	NA
55	PEFCLKp	56	NA
57	GND	58	NA
67	NA	68	NA
69	PEDET	70	+3.3V
71	GND	72	+3.3V
73	GND	0	+3.3V
75	GND		

4.2.17 M.2 E-Key Socket (M2_E1)

Pin	Signal Name	Pin	Signal Name
1	GND	2	+3.3V
3	USB_D+	4	+3.3V
5	USB_D-	6	NA
7	GND	8	NA
9	CNV_WGR_D1-	10	CNV_RF_RESET
11	CNV_WGR_D1+	12	NA
13	GND	14	MODEM_CLKREQ

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Pin	Signal Name	Pin	Signal Name
15	CNV_WGR_D0-	16	NA
17	CNV_WGR_D0+	18	GND
19	GND	20	NA
21	CNV_WGR_CLK-	22	CNV_BRI_RSP
23	CNV_WGR_CLK+		
33	GND	32	CNV_BGI_DT
35	PETp	34	CNV_RGI_RSP
37	PETn	36	CNV_BRI_DT
39	GND	38	NA
41	PERp	40	NA
43	PERn	42	NA
45	GND	44	NA
47	PEFCLKp	46	NA
49	PEFCLKn	48	NA
51	GND	50	SUSCLK
53	CLKREQ#	52	PERST0#
55	NA	54	W_DISABLE1#
57	GND	56	W_DISABLE2#
59	CNV_WT_D1-	58	SMB_DATA
61	CNV_WT_D1+	60	SMB_CLK
63	GND	62	NA
65	CNV_WT_D0-	64	NA
67	CNV_WT_D0+	66	NA
69	GND	68	NA
71	CNV_WT_CLK-	70	NA
73	CNV_WT_CLK+	72	+3.3V
75	GND	74	+3.3V

4.3 Jumper and Switch Settings

4.3.1 PWR_BAT1_SIO_AT1

Only supported by chargeable battery.

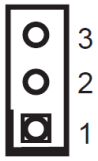
PIN 1-2 Open	Normal
PIN 1-2 Short	Charge Battery
PIN 3-4 Open	ATX Mode
PIN 3-4 Short	AT Mode



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4.3.2 Clear CMOS Header (CLRMOS1)

1-2	Normal (Default)
2-3	Clear CMOS

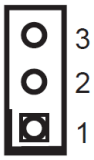


4.3.3 Brightness Control Mode (BLT_PWM1)

Please set to 1-2 when adjusting brightness by Brightness Control bar under OS.

Please set to 2-3 when adjusting brightness by BLT_VOL1.

1-2	From eDP PWM to CON_LBKLT_CTL
2-3	From LVDS PWM to CON_LBKLT_CTL (Default)



4.3.4 COM Port PWR Setting Jumpers

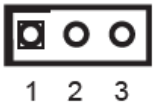
PWR_COM1 (For COM Port1)

PWR_COM2 (For COM Port2)

PWR_COM3 (For COM Port3)

The maximum current per port is 1A and the power supply is either 5V or 12V. Use the jumpers to set the power for COM port pin 9.

1-2	Normal (Default)
2-3	Clear CMOS



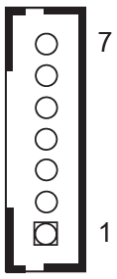
4.3.5 SATA Power Output Connector (SATA_PWR1)

Pin	Signal Name
1	+5V
2	GND
3	GND
4	+12V



4.3.6 Backlight Volume Control (BLT_VOL1)

Pin	Signal Name
1	GPIO_VOL_UP
2	GPIO_VOL_DW
3	PWRDN
4	BLT_UP
5	BLT_DW
6	GND
7	GND



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4.3.7 Inverter Power Control Wafer (BLT_PWR1)

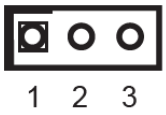
Pin	Signal Name
1	GND
2	GND
3	CON_LBKLT_CTL
4	CON_LBKLT_EN
5	LCD_BLT_VCC
6	LCD_BLT_VCC



4.3.8 Digital Input / Output Power Select (JGPIO_PWR1)

The maximum current JGPIO_PWR1 provides is 1A.

1-2	+12V
2-3	+5V (Default)



4.3.9 Panel Power Select (LCD_VCC)

(PNL_PWR1)

Use this to set up the VDD power of the LVDS connector.

1-2	LCD_VCC: +3V (Default)
2-3	LCD_VCC: +5V
4-5	LCD_VCC: +12V



4.3.10 Backlight Power Select (LCD_BLT_VCC)

(BKT_PWR1)

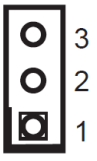
Use this header to set up the backlight power of the LVDS connector and the panel backlight power of BLT_PWM1.

1-2	LCD_BLT_VCC: +5V (Default)
2-3	LCD_BLT_VCC: +12V



4.3.11 CON_LBKLT_CTL Voltage Level (BLT_PWM2)

1-2	3V Level (Default)
2-3	5V Level

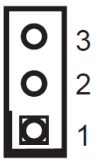


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4.3.12 Digital Input / Output Default Value Setting (JGPIO_SET1)

The header is used for GPIO default value setting for either pull high or pull low. Pulling the header to a high/low value means the voltage is anchored to VCC/GND, in a stable, non-floating state.

1-2	Pull-High (Default)
2-3	Pull-Low



4.3.13 DACC1_PCIE_PWR1

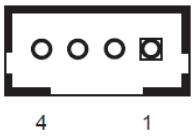
Auto clear CMOS when system boot improperly.

PIN1-2 Open	No ACC (Default)
PIN1-2 Short	ACC
PIN3	PSON#
PIN4	GND



4.3.14 SMBUS_TEST1

Pin	Signal Name
1	GPP_E7
2	SMB_CLK_MAIIN
3	SMB_DATA_MAIN
4	GND



4.3.15 SPDIF Header (SPDIF1)

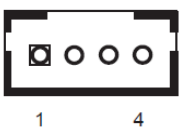
SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/projector/LCD devices. Please connect the SPDIF connector of HDMI VGA card to this header.

Pin	Signal Name
1	+5V
2	
3	SPDIF OUT
4	GND



4.3.16 3W Audio AMP Output Wafer (SPEAKER1)

Pin	Signal Name
1	OUTLN
2	OUTLP
3	OUTRP
4	OUTRN



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4.3.17 Battery Connector (BAT1)

Pin	Signal Name
1	+BAT
2	GND



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5 Driver Installation

Drivers can be downloaded through the following link.

https://www.adlinktech.com/Products/Industrial_Motherboards_SBCs/Mini-ITXEmbeddedBoards/AmITX-RL-I

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6 BIOS Settings

6.1 Menu Structure

This section presents the six primary menus of the UEFI (BIOS) Setup Utility. Use the following table as a quick reference for the contents of the BIOS Setup Utility. The subsections in this section describe the submenus and setting options for each menu item. The function of each setting is described in the right-hand column of the respective table.

There are two options to enter UEFI Setup Utility:

- Press [F2] or [Del] during POST (Power-On-Self-Test)
- Press [Ctl] + [Alt] + [Del] after POST

Main	**Advanced**	**H/W Monitor**
Sets up the system time/date and displays the system information: - System Date - System Time - BIOS Information - Memory Information	Contains advanced system configurations, including: ▶ CPU Configuration ▶ Chipset Configuration ▶ Storage Configuration ▶ Super IO Configuration ▶ AMT Configuration ▶ ACPI Configuration ▶ USB Configuration ▶ Trusted Computing ▶ Instant Flash	Displays Hardware Status info, including: - Hardware Health Event Monitoring - CPU_FAN1 Setting - CHA_FAN1 Setting - Case Open Feature
Security	**Boot**	**Exit**
Changes or clears the supervisor/user password for the system - Supervisor Password - User Password - Secure Boot	Configures the boot settings and boot priority for available devices - Boot Option #1 - Boot From Onboard LAN - Setup Prompt Timeout - Bootup Num-Lock - Full Screen Logo	Exits the UEFI Setup Utility while saving or discard the changes made - Save Changes and Exit - Discard Changes and Exit - Discard Changes - Load UEFI Defaults - Launch EFI Shell from filesystem device

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6.2

6.2 Main

Upon entering the UEFI 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 screenshots and tables below for details of the submenus and settings.

Feature	Options
System Date	xxx mm/dd/yyyy
System Time	hh:mm:ss
BIOS Information	
UEFI Version	AmITX-RL-I x.xx.xx
Processor Type	Info only
Processor Speed	Info only
Cache Size	Info only
Memory Information	
Total Memory	Info only
DDR5_A1	Info only
DDR5_B1	Info only
LVDS Rom Version	Info only

6.3 Advanced

Contains the configurations for the following: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, AMT Configuration, ACPI Configuration, USB Configuration, and Trusted Computing.

Feature
▶ CPU Configuration
▶ Chipset Configuration
▶ Storage Configuration
▶ Super IO Configuration
▶ AMT Configuration
▶ ACPI Configuration
▶ USB Configuration
▶ Trusted Computing

Feature	Description
▶ 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, and then you can update your UEFI in only a few clicks without preparing an additional floppy diskette or other com- plicated 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.

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6.3.1 CPU Configuration

Feature	Description
Intel Hyper Threading Technology	Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved. Configuration options: [Enabled] [Disabled]
Active Processor P-Cores	This allows you to select the number of cores to enable in each processor package.
Active Processor E-Cores	This allows you to select the number of E-Cores to enable in each processor package. NOTE: Number of P-Cores and E-Cores are looked at together. When both are {0,0}, Pcode will enable all cores.
CPU C States Support	This allows you to enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving. Configuration options: [Enabled] [Disabled]
Enhanced Halt State (C1E)	The option allows you to enable Enhanced Halt State (C1E) for lower power consumption. Configuration options: [Enabled] [Disabled]
Package C States Support	The option allows you to enable CPU, PCIe, Memory, Graphics C State Support for power saving.
CFG Lock	The option allows you to enable or disable the CFG Lock. Configuration options: [Enabled] [Disabled]
Intel Virtualization Technology	Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems. Configuration options: [Enabled] [Disabled]
Intel SpeedStep Technology	Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation. CPU turbo ratio can be fixed when Intel SpeedStep Technology is set to [Disabled] and Intel Turbo Boost Technology is set to [Enabled]. Configuration options: [Enabled] [Disabled]. If you install Windows® 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	Intel Turbo Boost Technology enables the processor to run above its base operating fre- quency when the operating system requests the highest performance state. The default value is [Enabled]. Configuration options: [Enabled] [Disabled]
CPU Thermal Throttling	CPU Thermal Throttling allows you to enable CPU internal thermal control mechanisms to keep the CPU from overheating. Configuration options: [Enabled] [Disabled]

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6.3.2 Chipset Configuration

Feature	Description
Primary Graphics Adapter	The option allows you to select a primary VGA. Configuration options: [Onboard] [PCI Express] (Options vary when you have installed a graphics card on your motherboard.)
Above 4G Decoding	The option allows you to enable or disable above 4G Memory Mapped IO decoding. This is disabled automatically when Aperture Size is set to 2048MB. Configuration options: [Enabled] [Disabled]
VT-d	Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance. Configuration options: [Enabled] [Disabled]
Re-Size BAR Support	If system has Resizable BAR capable PCIe Devices, this option enables or disables Resizable BAR Support.
PCIE1 Bandwidth Mode	Select PCIE1 Bandwidth. Select [x8 / x8 Mode] when using a Riser card in the PCIE1 slot.
PCIE1 Link Speed	The option allows you to configure PCIE1 Slot Link Speed. Auto mode is optimizing for overclocking. Configuration options: [Auto] [Gen1] [Gen2] [Gen3] [Gen4] [Gen5] (Options vary depending on your motherboard.)
Share Memory	Share memory allows you to configure the size of memory that is allocated to the integrated graphics processor when the system boots up. Configuration options: [Auto][32M][64M][128M][256M][512M] (Options vary depending on the memory you Use on your motherboard.)
IGPU Multi-Monitor	Select [Disabled] to disable the integrated graphics when an external graphics card is in- stalled. Select [Enabled] to keep the integrated graphics enabled at all times. Configuration options: [Enabled] [Disabled]
Render Standby	Power down the render unit when the GPU is idle for lower power consumption.
Active LVDS	Use this option to enable or disable the LVDS. The default value is [Disabled]. Set the item to [Enabled]. Then press <F10> to save the setting and restart the system. Now the default value of Active LVDS is changed to ENABLED (F9 load default is also set to ENABLED). Change the setting from [Enabled] to [Disabled], and then press <F10> to save the setting and restart the system. Likewise, the default value of Active LVDS is changed to DIS- ABLED (F9 load default is also set to DISABLED).
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.

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Onboard HD Audio	Onboard HD Audio allows you to enable or disable the onboard HD audio controller. Set this item to [Auto] to enable the onboard HD and automatically disable it when a sound card is installed. Configuration options: [Enabled] [Disabled]
Restore on AC/Power Loss	The option allows you to select the power state after a power failure. [Power Off] sets the power to remain off when the power recovers. [Power On] sets the system to start to boot up when the power recovers.

6.3.3 Storage Configuration

Feature	Description
VMD Configuration	This item allows you to enable or disable the Intel VMD support function.
SATA Controller(s)	The option allows you to enable or disable the SATA controllers. Configuration options: [Enabled] [Disabled]
SATA Mode Selection	AHCI supports new features that improve performance. Configuration option: [AHCI]
Hybrid Storage Detection and Configuration Mode	The option allows you to select Hybrid Storage Detection and Configuration Mode. Configuration options: [Dynamic Configuration for Hybrid Storage Enable] [Disabled]
SATA Aggressive Link Power Management	SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is supported only by AHCI mode. Configuration options: [Enabled] [Disabled]
Hard Disk S.M.A.R.T.	S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability. Configuration options: [Enabled] [Disabled]

6.3.4 Super IO Configuration

Feature	Description
COM1 Configuration	Use this to set parameters of COM1. Type Select Use this to select COM1 port type: [RS232], [RS422] or [RS485].
COM2 Configuration	Use this to set parameters of COM2. Type Select Use this to select COM2 port type: [RS232], [RS422] or [RS485].

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COM3 Configuration	Use this to set parameters of COM3.
COM4 Configuration	Use this to set parameters of COM4.
WDT Timeout Reset	Use this to set the Watch Dog Timer.

6.3.5 AMT Configuration

Feature	Description
USB Provisioning of AMT	Use this to enable or disable AMT USB Provisioning. The default is [Disabled].
MAC Pass Through	The option enables or disables MAC Pass Through function.
Activate Remote Assistance Process	Trigger CIRA boot. The default is [Disabled].
Un-Configure ME	Un-Configure ME without password. The default is [Disabled].
ASF Configuration	The option allows you to configure Alert Standard Format parameters.
Secure Erase Configuration	Secure Erase configuration menu.
One Click Recovery (OCR) Configuration	Configuration setting for One Click Recovery. This allows access for AMT to boot a recovery OS application
MEBx	This Formset contains forms for configuring MEBx.

6.3.6 ACPI Configuration

Feature	Description
Suspend to RAM	Suspend to RAM allows you to select [Disabled] for ACPI suspend type S1. It is recommended to select [Auto] for ACPI S3 power saving. Configuration options: [Auto] [Disabled]
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	RTC Alarm Power On allows the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system. Configuration options: [Enabled] [Disabled] [By OS]

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6.3.7 USB Configuration

Feature	Description
USB Power Control	Use this option to control USB power.
M.2 Key_B USB Function	The item enables or disables M.2 Key_B USB function.

6.3.8 Trusted Computing

Feature	Description
Security Device Support	Security Device Support allows you to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. Configuration options: [Enabled] [Disabled]
Active PCR banks	This item displays active PCR Banks.
Available PCR Banks	This item displays available PCR Banks.
SHA256 PCR Bank	SHA256 PCR Bank allows you to enable or disable SHA256 PCR Bank. Configuration options: [Enabled] [Disabled]
SHA384 PCR Bank	SHA384 PCR Bank allows you to enable or disable SHA384 PCR Bank. Configuration options: [Enabled] [Disabled]
Pending Operation	Pending Operation allows you to schedule an Operation for the Security Device. NOTE: Your computer will reboot during restart in order to change State of the Device. Configuration options: [None] [TPM Clear]
Platform Hierarchy	This item allows you to enable or disable Platform Hierarchy. Configuration options: [Enabled] [Disabled]
Storage Hierarchy	This item allows you to enable or disable Storage Hierarchy. Configuration options: [Enabled] [Disabled]
Endorsement Hierarchy	This item allows you to enable or disable Endorsement Hierarchy. Configuration options: [Enabled] [Disabled]
Physical Presence Spec Version	Select this item to tell OS to support PPI spec version 1.2 or 1.3. Please note that some HCK tests might not support version 1.3. Configuration options: [1.2] [1.3]

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TPM 2.0 InterfaceType	This item allows you to view the Communication Interface to TPM 2.0 Device: CRB or ITS.
Device Select	This item allows you to select the TPM device to be supported. [TPM 1.2] restricts support to TPM 1.2 devices. [TPM 2.0] restricts support to TPM 2.0 devices. [Auto] supports both TPM 1.2 and TPM 2.0 devices with the default set to TPM 2.0 de- vices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.
Onboard TPM	The option enables or disables Intel PTT in ME. Disable this option to Use discrete TPM Module.

6.4 HW Monitor

This screen allows you to monitor the status of your system and installed devices, such as CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.

Feature	Description
CPU_Fan 1 Setting	This item allows you to select a fan mode for CPU Fan 1. The default value is [Full On]. Configuration options: [Full On] [Automatic Mode]
CHA_Fan 1 Setting	This allows you to set chassis fan 1's speed. The default value is [Full On]. Configuration options: [Full On] [Automatic Mode]
Case Open Feature	This item 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.

6.5 Security

The Security Screen lets you change or clear the supervisor / user passwords for the system.

Feature	Description
Supervisor Password	Set or change the password for the administrator account. Only the administrator has the 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	Press [Enter] to configure the Secure Boot Settings. The feature protects the system from unauthorized access and malwares during POST.

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Secure Boot Mode	[Standard] Select this item and the system will automatically load the Secure Boot keys from the BIOS database. [Custom] Select this item and Secure Boot Policy variables can be configured by a physically present user without full authentication.
Install Default Secure Boot Keys	Please install default secure boot keys if it's the first time you use secure boot.
Clear Secure Boot Keys	This item appears only when you load the default Secure Boot keys. Use this item to clear all default Secure Boot keys.
Key Management	This item enables expert users to modify Secure Boot Policy variables without full authentication. This appears only when you set Secure Boot Mode to [Custom].

6.6 Boot

This section displays the available devices on your system for you to configure the boot priority and settings.

Feature	Description
Boot From Onboard LAN	The item allows the system to be waked up by the onboard LAN. Configuration options: [Enabled] [Disabled]
Setup Prompt Timeout	The item allows you to configures the number of seconds to wait for the UEFI setup utility. Configuration options: [1] - [65535]
Bootup Num-Lock	The item allows you to select whether Num Lock should be turned on or off when the system boots up. Configuration options: [On] [Off]
Full Screen Logo	[Enabled] Select this item to display the boot logo. [Disabled] Select this item to show normal POST messages.

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6.7 Exit

Feature	Description
Save Changes and Exit	When you select this option, the following message “Save configuration changes and exit setup?” will pop out. Select [Yes] to save the changes and exit the UEFI SETUP UTILITY.
Discard Changes and Exit	When you select this option, the following message “Discard changes and exit setup?” will pop out. Select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.
Discard Changes	When you select this option, the following message “Discard changes?” will pop out. Select [Yes] to discard all the changes.
Load UEFI Defaults	The item allows you to load UEFI default values for all options. The F9 key can be used for this operation.
Launch EFI Shell from filesystem device	The item allows you to copy shellx64.efi to the root directory to launch EFI Shell.

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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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