C&T SOLUTION INC.

USER'S MANUAL

CT-DAL11 Series

3.5” Industrial Single Board Computer with Intel ADL-N Processors

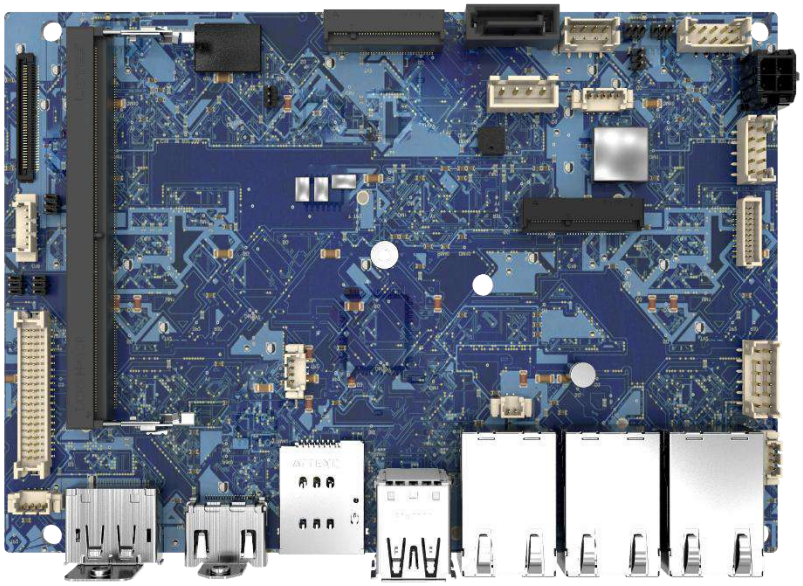

Table of Contents

Prefaces

Revision

Revision	Description	Date
1.0	Manual Released	2024/11/7

Disclaimer

All specifications and information in this User's Manual are believed to be accurate and up to date. C&T Solution Inc. does not guarantee that the contents herein are complete, true, accurate or non-misleading. The information in this document is subject to change without notice and does not represent a commitment on the part of C&T Solution Inc.
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Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. Please recycle to minimize pollution and ensure environment protection.

Regulatory Notices

FCC-A Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and radiates radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

NOTE

- The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- Shield interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

FCC Conditions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

CE Conformity

Hereby, C&T Solution Inc. declares that this device is in compliance with the essential safety requirements and other relevant provisions set out in the European Directive.

WEEE Statement

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2012/19/EU, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life.

Battery Information

Please take special precautions if this product comes with a battery.

- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- Avoid disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, which can result in an explosion.
- Avoid leaving a battery in an extremely high temperature or extremely low air pressure environment that can result in an explosion or the leakage of flammable liquid or gas.
- Do not ingest battery. If the coin/button cell battery is swallowed, it can cause severe internal burns and can lead to death. Keep new and used batteries away from children.

European Union:

Batteries, battery packs, and accumulators should not be disposed of as unsorted household waste. Please use the public collection system to return, recycle, or treat them in compliance with the local regulations.

BSMI:

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

California, USA:

The button cell battery may contain perchlorate material and requires special handling when recycled or disposed of in California.
For further information please visit:
http://www.dtsc.ca.gov/hazardouswaste/perchlorate/

Chemical Substances Information

In compliance with chemical substances regulations, such as the EU REACH Regulation (Regulation EC No. 1907/2006 of the European Parliament and the Council), C&T provides the information of chemical substances in products at:
https://www.candtsolution.com

Environmental Policy

- The product has been designed to enable proper reuse of parts and recycling and should not be thrown away at its end of life.
- Users should contact the local authorized point of collection for recycling and disposing of their end-of-life products.
- Visit the C&T website and locate a nearby distributor for further recycling information.
- Users may also reach us at C&T for information regarding proper Disposal, Take-back, Recycling, and Disassembly of C&T products.

Green Product Features

- Reduced energy consumption during use and stand-by
- Limited use of substances harmful to the environment and health
- Easily dismantled and recycled
- Reduced use of natural resources by encouraging recycling
- Extended product lifetime through easy upgrades
- Reduced solid waste production through take-back policy

Copyright and Trademarks Notice

Technical Support

If a problem arises with your product and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please visit https://www.candtsolution.com

Safety Information

Before installing and using the equipment, please read the following precautions:

- The components included in this package are prone to damage from electrostatic discharge (ESD). Please adhere to the following instructions to ensure successful computer assembly.
- Ensure that all components are securely connected. Loose connections may cause the computer to not recognize a component or fail to start.
- Hold the motherboard by the edges to avoid touching sensitive components.
- It is recommended to wear an electrostatic discharge (ESD) wrist strap when handling the motherboard to prevent electrostatic damage. If an ESD wrist strap is not available, discharge yourself of static electricity by touching another metal object before handling the motherboard.
- Store the motherboard in an electrostatic shielding container or on an anti-static pad whenever the motherboard is not installed.
- Before turning on the computer, ensure that there are no loose screws or metal components on the motherboard or anywhere within the computer case.
- Do not boot the computer before installation is completed. This could cause permanent damage to the components as well as injury to the user.
- If you need help during any installation step, please consult a certified computer technician.
- Always turn off the power supply and unplug the power cord from the power outlet before installing or removing any computer component.
- Keep this user guide for future reference.
- Keep this motherboard away from humidity.
- Make sure that your electrical outlet provides the same voltage as is indicated on the PSU, before connecting the PSU to the electrical outlet.
- Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
- All cautions and warnings on the motherboard should be noted.
- If any of the following situations arises, get the motherboard checked by service personnel:
    - Liquid has penetrated into the computer.
    - The motherboard has been exposed to moisture.
    - The motherboard does not work well or you can not get it work according to user guide.
    - The motherboard has been dropped and damaged.
    - The motherboard has obvious sign of breakage.
- Do not leave this motherboard in an environment above 60°C (140°F), it may damage the motherboard

Technical Support and Assistance

1. Visit the C&T Solution Inc website at https://www.candtsolution.com where you can find the latest information about the product.
2. Contact your distributor, our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:
   - Model name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Conventions Used in this Manual

WARNING This indication alerts operators to an operation that, if not strictly observed, may result in severe injury.

CAUTION This indication alerts operators to an operation that, if not strictly observed, may result in safety hazards to personnel or damage to equipment.

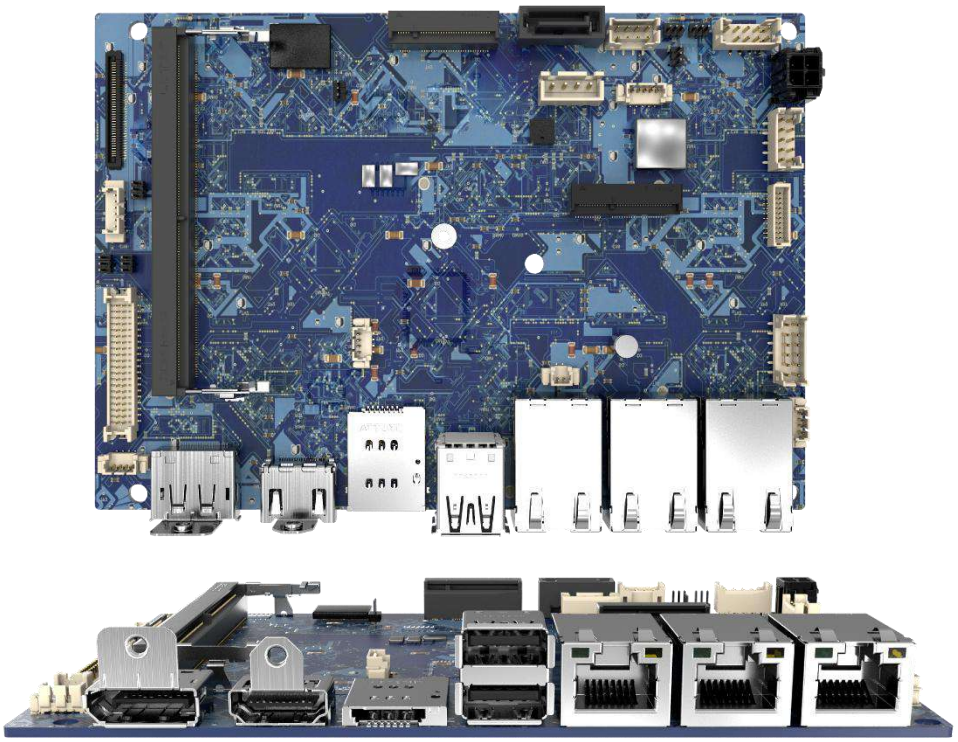
NOTE This indication provides additional information to complete a task easily.

Chapter 1

Product Introductions

1.1 Overview

3.5" SBC with Intel® Alder Lake-N for Fanless, Ultra Low-Power, Wide Voltage Range & High-Performance Solution



Key Features

- Supports Intel® N97/ Atom® x7835RE Processors
- 1x 262-pin DDR5 4800 SO-DIMM. Max. up to 16GB (Non-ECC)
- 3x Intel® i226V 2.5 GbE
- Triple independent displays supported: DP, HDMI, LVDS or eDP
- 1x Front Panel with Audio support by internal header
- 1x M.2 B Key 2242/3042 support for NVMe/SATA SSD/4G/5G, 1x Dual Nano SIM slot
- 2x USB 3.2 Gen 2 (10Gbps), 2x USB 2.0 (internal)
- 1x RS-232/422/485 & 1x RS-232 (internal), 1x 8-bit GPIO
- 1x SATA 3.0 6Gb/s (Support AHCI)
- 1x Amp internal header
- Watchdog timer 1~255 sec. System reset
- TPM 2.0 Supported
- Wide Voltage DC-IN 12~36V

1.2 Hardware Specification

System	
Processor	• 12th Gen Intel® Alder Lake-N Processor N97, 6M Cache, up to 3.60 GHz, 4 core 12W • Intel® Atom® x7835RE Processor 6M Cache, up to 3.60 GHz, 8 core 12W
Chipset	SoC
Memory	1x 262-Pin DDR5 4800MHz SO-DIMM. Max. up to 16GB (Non-ECC)
LAN Chipset	GbE1~GbE3: Intel i226V 2.5GbE LAN PXE Support
BIOS	AMI uEFI 256MB SPI flash
Audio Codec	REALTEK ALC897 High Definition Audio CODEC
Watchdog	Software Programmable Supports 1~255sec. System Reset
TPM	TPM 2.0

Display	
Display Port	1x DP 1.4a up to 4096x2304 @60Hz
eDP	1x eDP 1.4b up to 1920x1080 @60Hz
HDMI	1x HDMI™ 1.4b up to 3840x2160 @30Hz
LVDS	1x LVDS up to 1920x1200 @60Hz
Multiple Display	Triple Displays

Storage	
SATA	1x SATA 3.0 6Gb/s port (Support AHCI)

Expansion	
M.2	1 x M.2 B Key (PCIe x1/SATA/USB3.0), 2242/3042 for NVMe/4G/5G support 1 x M.2 E Key (PCIe x1, USB 2.0), 2230 for Wifi/Bluetooth

I/O	
Display Port	1x DisplayPort
HDMI	1x HDMI connector
LAN	3x RJ45
SIM	1x Dual Nano SIM Socket (Attached M.2 B Key)
USB	2x USB 3.2 Gen 2 (10Gbps)

Internal I/O	
Audio	1x Front panel header
COM	1x RS-232/422/485 & 1x RS-232 Internal 2.0PH headers
GPIO	1x GPIO header 8-pin header (4 In/4 Out, non isolation)
SATA	1x SATA, 4-pin SATA power connector
USB	2x USB 2.0 Internal 2.0 Headers
Others	• 1x 4-pin DC in 12~36V header • 1x SMBus header • 1x LVDS connector, 1x eDP connector • 1 LVDS inverter header • 1x System fan header

Operating System	
Windows	Windows 10 IoT Enterprise LTSC 2021 Windows 11 IoT Enterprise
Linux	Ubuntu 22.04 LTS

Power	
Power Mode	AT, ATX
Power Supply Voltage	DC IN 12~36V
Power Connector	Micro fit pitch 3.0 2x2 pin
Power Protection	OVP (Over Voltage Protection) OCP (Over Current Protection) Reverse Protection

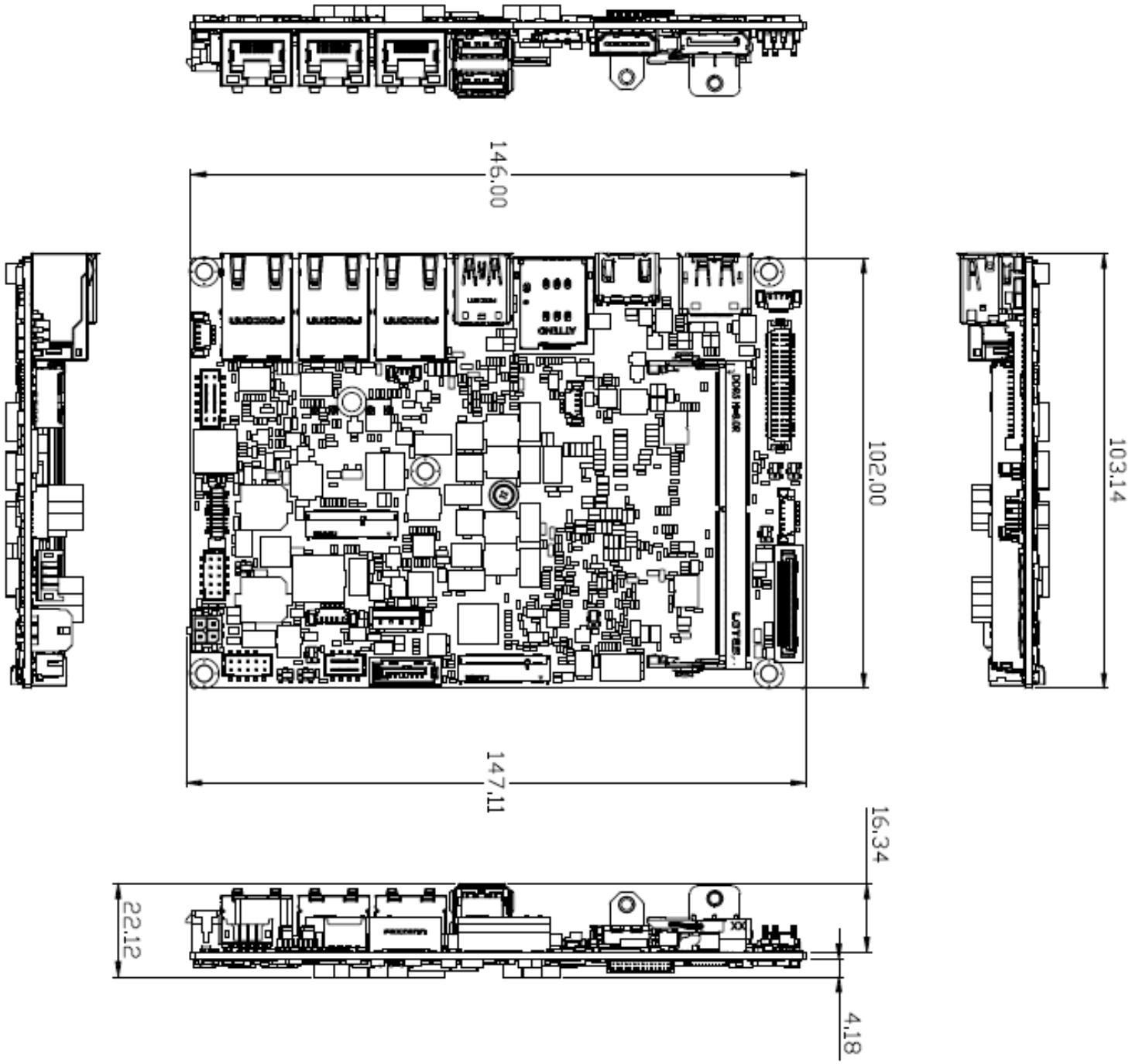
Mechanical Environment	
Form Factor	3.5" Embedded SBC
Operating Temperature	-10°C ~ 60°C, 10-90% (non-condensing)
Storage Temperature	-20°C ~ 80°C, 10-95% (non-condensing)
Certification	CE, FCC Class A

Physical	
Dimensions	146 x 102mm
Weights	0.58kg

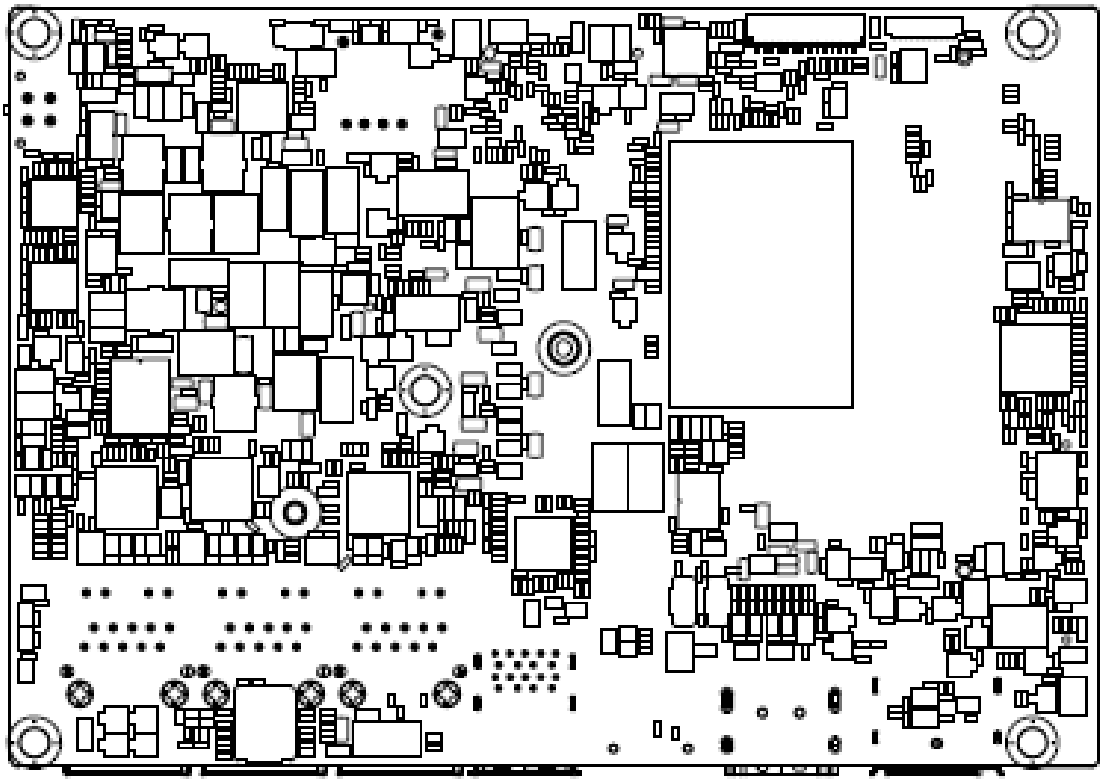
1.3 ME Overview

Board Dimension

Unit of measurement: mm



Bottom View

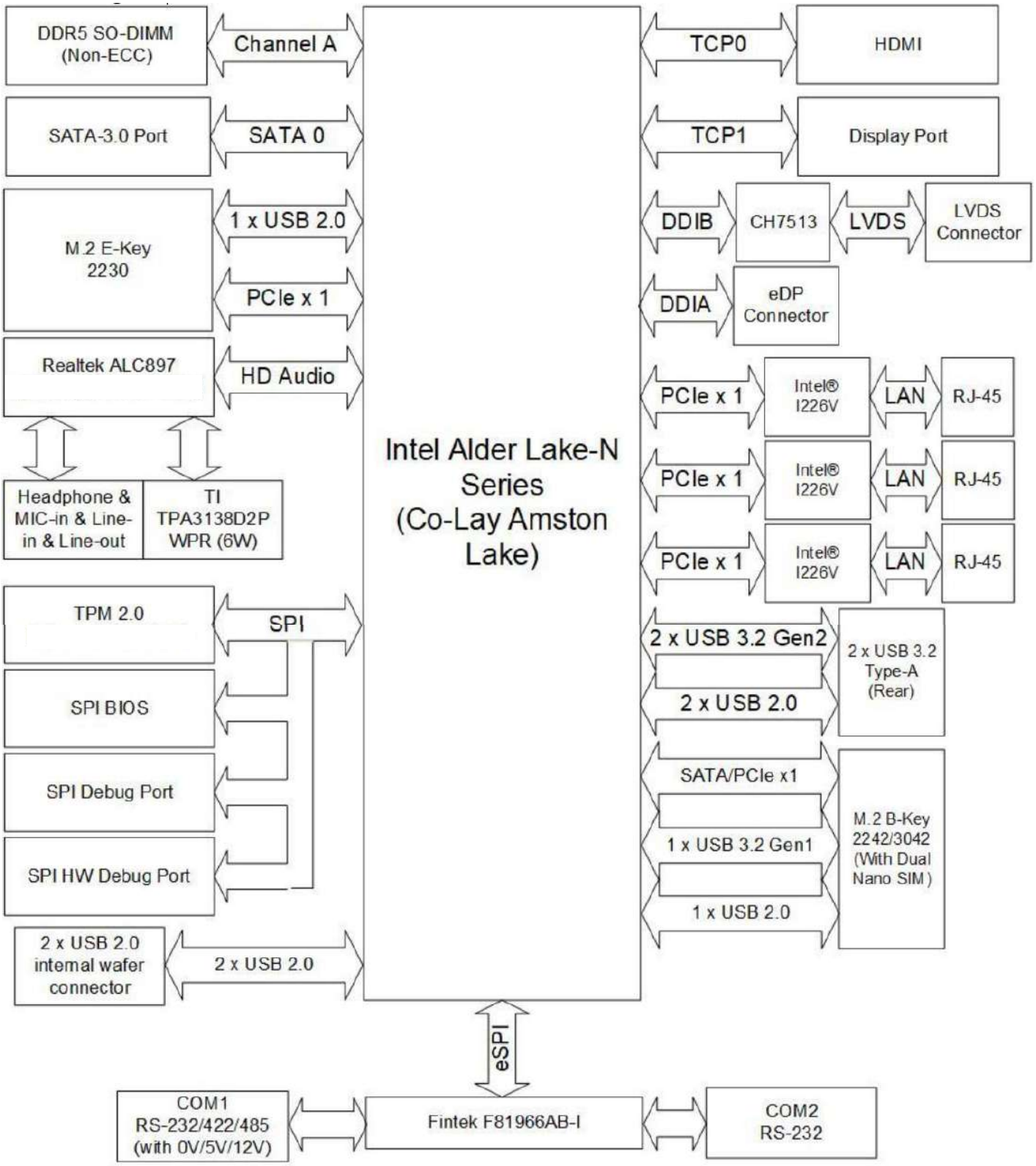


Chapter 2

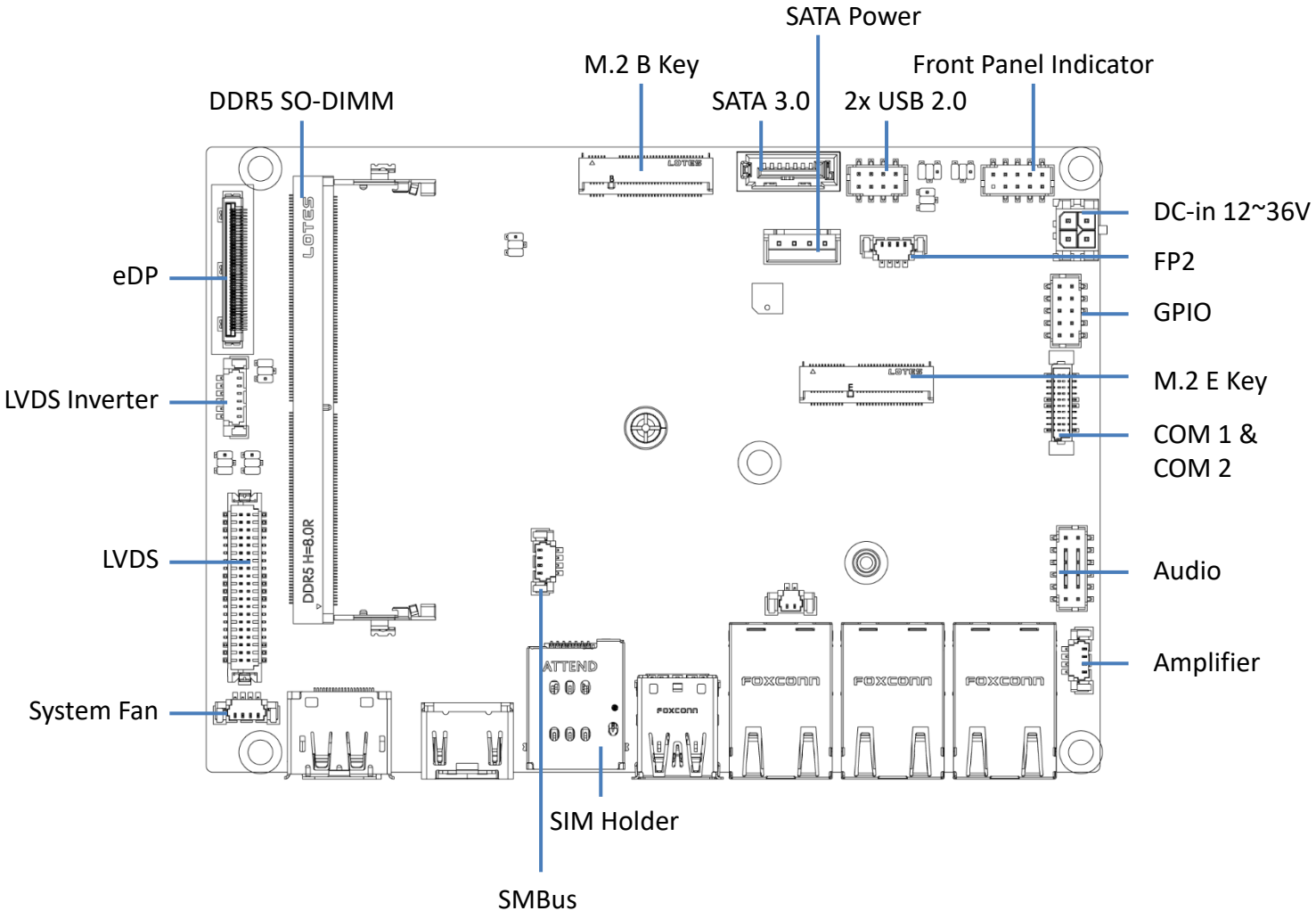
Switches and Connectors

2.1 Motherboard Overview

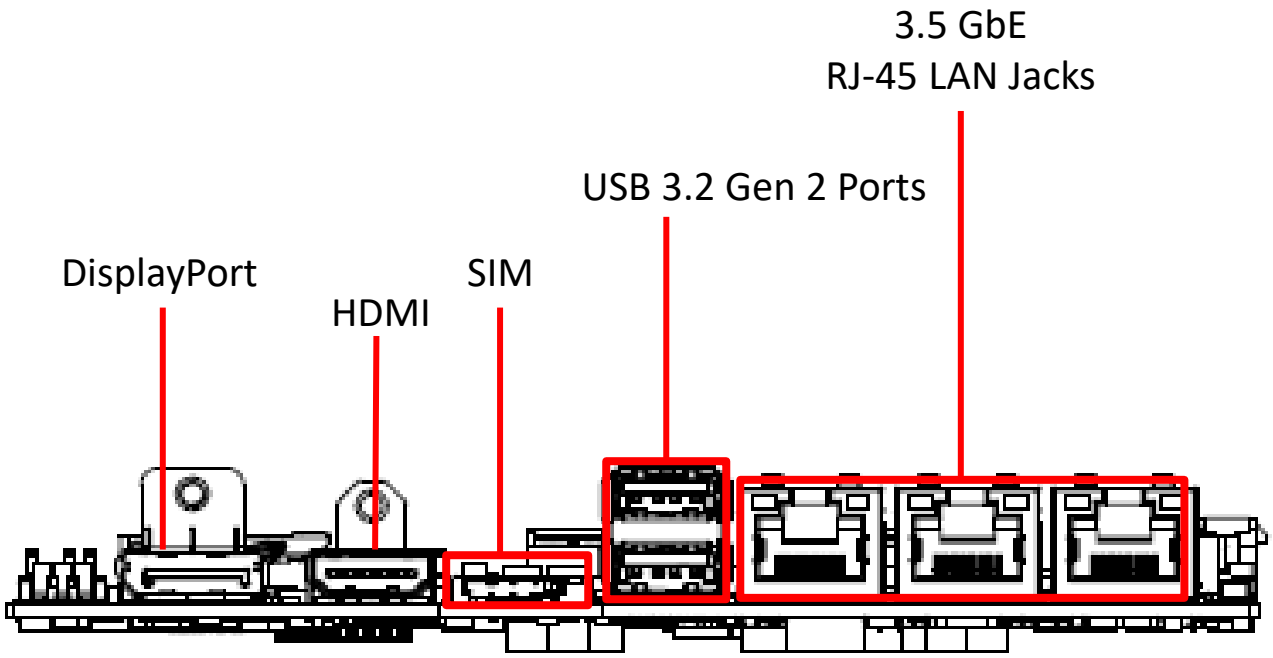
2.1.1 Block Diagram



2.1.2 Top View


SATA Power
M.2 B Key
Front Panel Indicator
DDR5 SO-DIMM
SATA 3.0
2x USB 2.0
DC-in 12~36V
eDP
FP2
GPIO
LVDS Inverter
M.2 E Key
COM 1 &
COM 2
LVDS
Audio
Amplifier
System Fan
SIM Holder
SMBus

2.1.3 Rear I/O Panel



DisplayPor

DisplayPort is a digital display interface standard. This connector is used to connect a monitor with DisplayPort inputs.

USB 3.2 Gen 2 Port

USB 3.2 Gen 2, the SuperSpeed USB 10Gbps, delivers high-speed data transfer for various devices, such as storage devices, hard drives, video cameras, etc.

LAN port

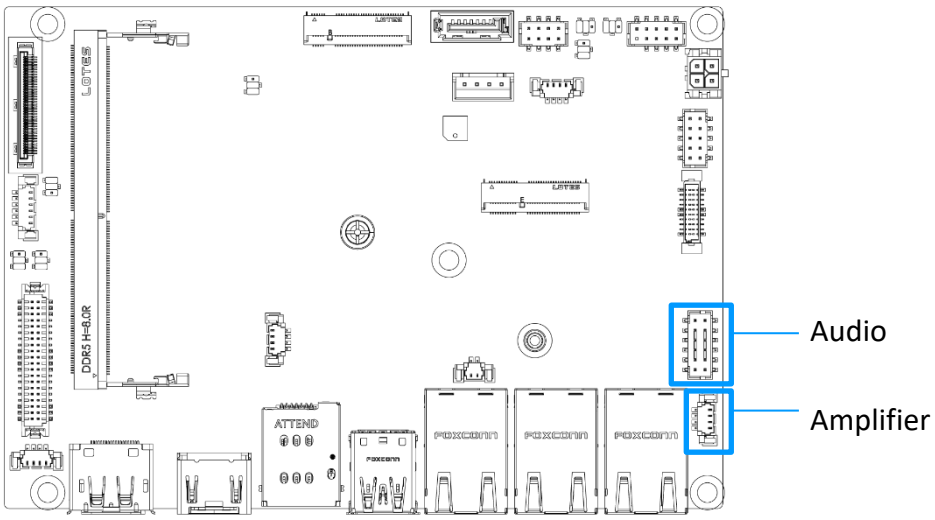
Used to connect the system to a local area network

SIM

Used to insert SIM card

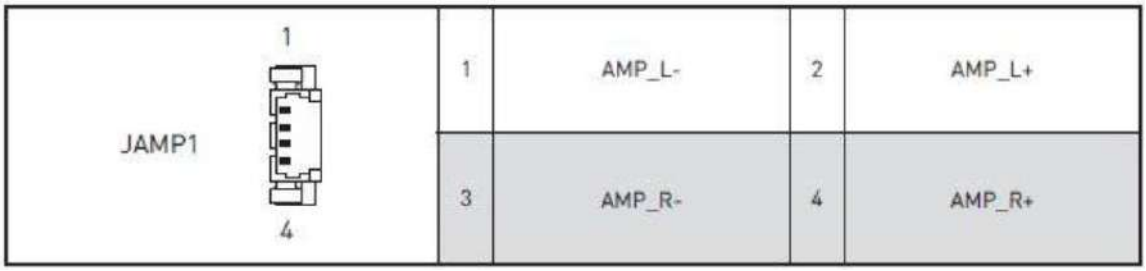
2.2 Pin Define

2.2.1 Amplifier



JAMP1: Audio Amplifier Header

The connector is used to connect audio amplifiers to enhance audio performance.



1	AMP_L-	2	AMP_L+
3	AMP_R-	4	AMP_R+

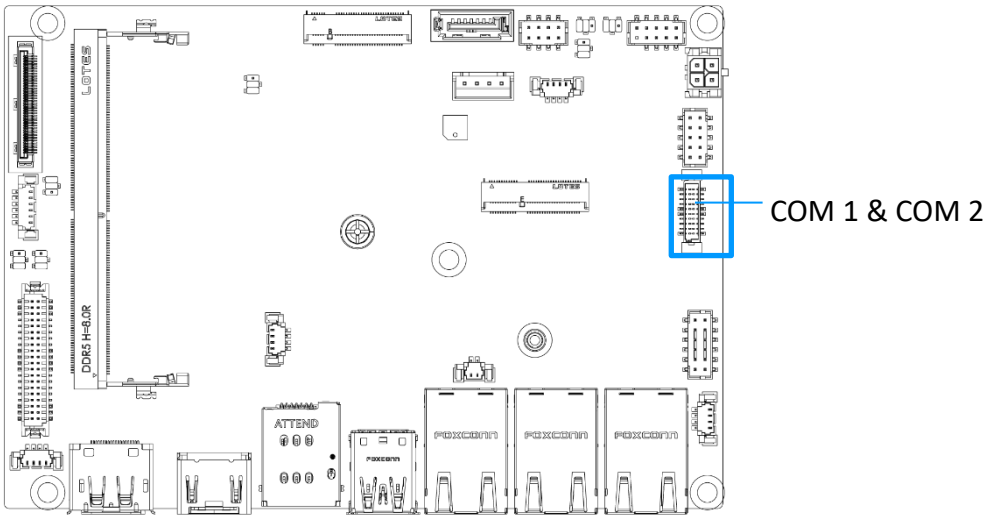
2.2.2 Front Audio

JAUD1: Front Audio Header

This connector allows you to connect front panel audio.

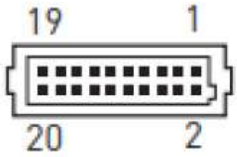
1	LINE_IN_RA	2	MIC1_RA
3	LINE_IN_LA	4	MIC1_LA
5	LOUT_RA	6	MIC1_JD
7	LOUT_LA	8	LINE_IN_JD
9	FRONT_JD	10	GND
11	GND	12	GND

2.2.3 COM Ports (COM 1~2)



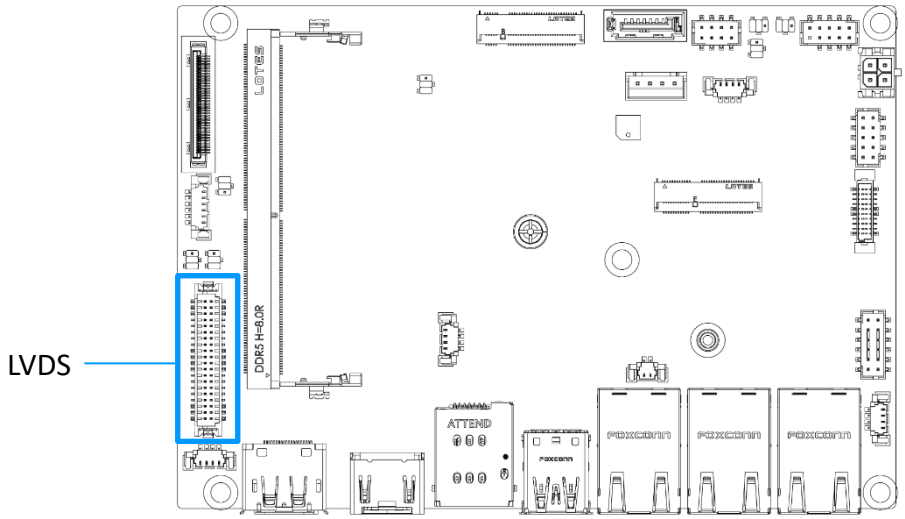
COM 1 and COM 2

JCOM1_2



RS232			RS422			RS485		
1	2	DCD	1	2	TXD-	1	2	TXD-
3	4	RXD	3	4	TXD+	3	4	TXD+
5	6	TXD	5	6	RXD+	5	6	NC
7	8	DTR	7	8	RXD-	7	8	NC
9	10	GND	9	10	GND	9	10	GND
11	12	DSR	11	12	NC	11	12	NC
13	14	RTS	13	14	NC	13	14	NC
15	16	CTS	15	16	NC	15	16	NC
17	18	POWER	17	18	NC	17	18	NC
19	20	NC	19	20	NC	19	20	NC

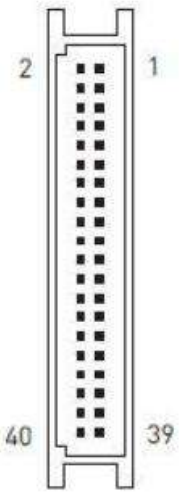
2.2.4 LVDS



JLVDS1: LVDS Wafer Connector

This connector is designed for use with LVDS interface flat panels. When connecting your flat panel to this connector, be sure to check the panel datasheet to ensure that you set the **LVDS power select jumper (JVDD1)** to the appropriate power voltage.

JLVDS1

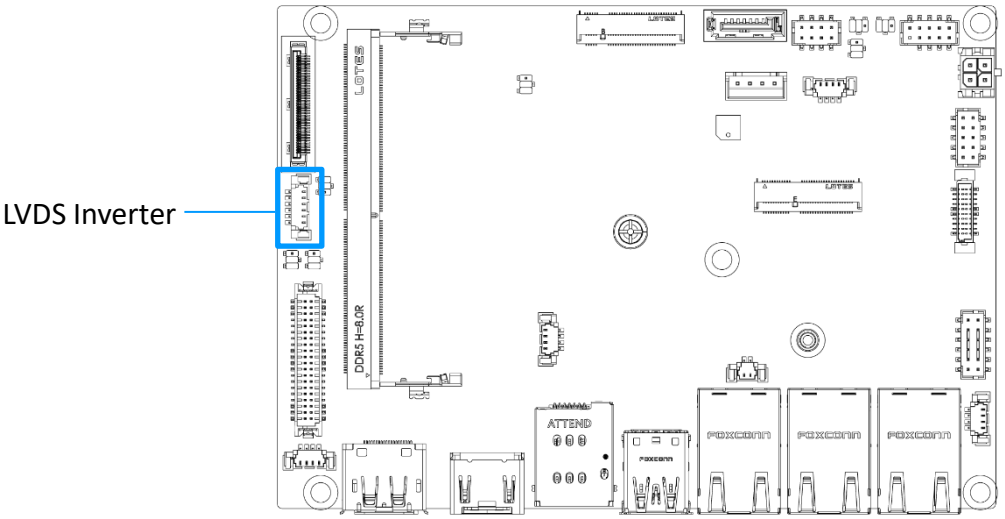


1	12V	2	12V
3	LCD_VDD	4	12V
5	LCD_VDD	6	LCD_VDD
7	DDC_CLK	8	DDC_DATA
9	L_BKLT_CTRL#	10	LCDEN
11	INV_ON	12	LVDS_DETECT#_C
13	LVDSA_DATA1	14	LVDSA_DATA0
15	LVDSA_DATA#1	16	LVDSA_DATA#0
17	GND	18	GND
19	LVDSA_DATA3	20	LVDSA_DATA2
21	LVDSA_DATA#3	22	LVDSA_DATA#2
23	GND	24	GND
25	LVDSB_DATA1	26	LVDSB_DATA0
27	LVDSB_DATA#1	28	LVDSB_DATA#0
29	GND	30	GND
31	LVDSB_DATA3	32	LVDSB_DATA2
33	LVDSB_DATA#3	34	LVDSB_DATA#2
35	GND	36	GND
37	LVDSB_CLK	38	LVDSA_CLK
39	LVDSB_CLK#	40	LVDSA_CLK#

Important

Pin 12 is a detect pin. When using a customized LVDS cable, pin 12 should be a signal ground with a low impedance. Otherwise, LVDS will not function.

2.2.5 LVDS Inverter

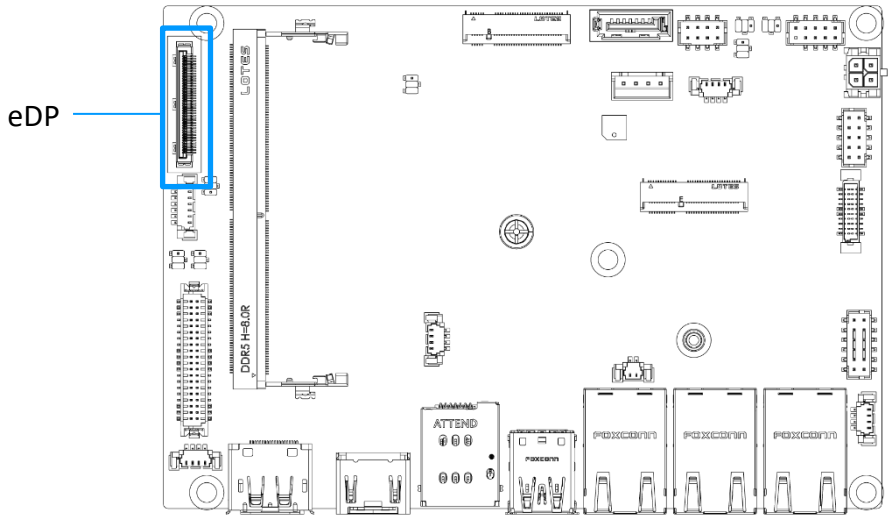


JINVDD1: LVDS Inverter Box Header

The connector is provided for LCD backlight options, be sure to check the panel datasheet to ensure that you set the **LVDS Inverter Power Select Jumper (JINV1)** to the appropriate power voltage (5V/12V).

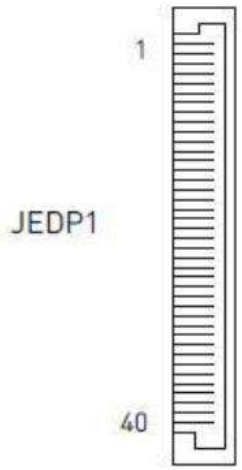
1	5V/12V	2	5V/12V
3	BKLT_EN	4	BKLT_CTRL
5	GND	6	GND

2.2.6 eDP



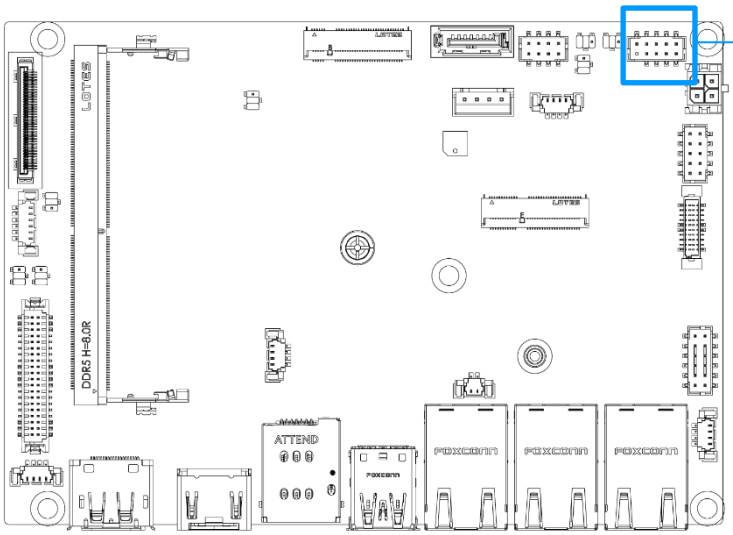
JEDP1: eDP Connector

This connector is designed for use with eDP interface flat panels. When connecting your flat panel to this connector, be sure to check the panel datasheet to ensure that you set the **eDP power select jumper (JEDP_VDD1)** to the appropriate power voltage.



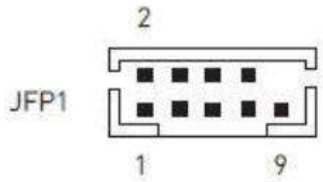
1	LCD_VDD1	2	LCD_VDD1
3	LCD_VDD1	4	LCD_VDD1
5	LCD_VDD1	6	VCC3
7	SMB_CLK	8	SMB_DATA
9	GND	10	HPD
11	N/C	12	N/C
13	GND	14	DPC_LINE3_DN
15	DPC_LINE3_DP	16	GND
17	DPC_LINE2_DN	18	DPC_LINE2_DP
19	GND	20	DPC_LINE1_DN
21	DPC_LINE1_DP	22	GND
23	DPC_LINE0_DN	24	DPC_LINE0_DP
25	GND	26	DSP_DDPC_AUXP
27	DSP_DDPC_AUXN	28	GND
29	VCC3	30	GND
31	+12V	32	GND
33	GND	34	VCC5
35	GND	36	BKLTCTL
37	BKLT_EN	38	+12V
39	VCC3	40	GND

2.2.7 Front Panel



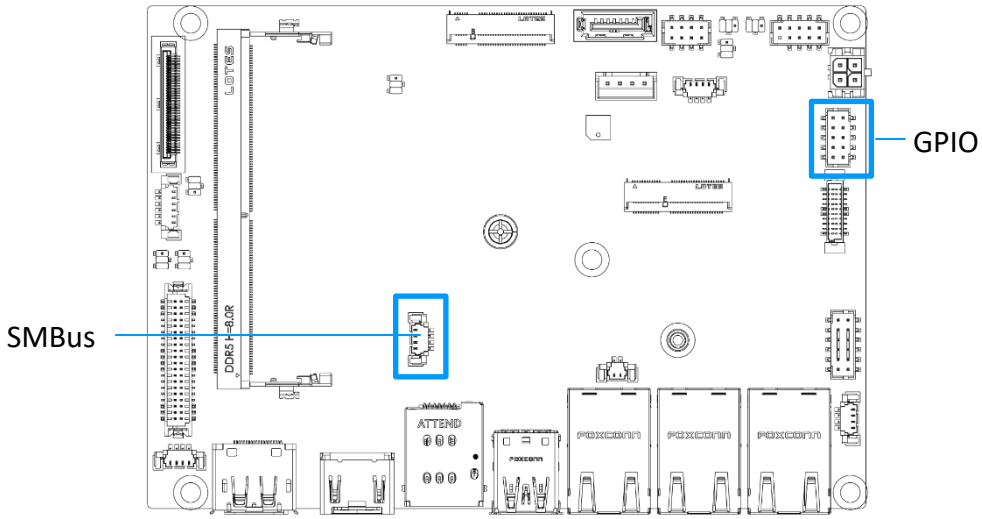
JFP1: Front Panel Connector

This front-panel connector is provided for electrical connection to the front panel switches & LEDs and is compliant with Intel Front Panel I/O Connectivity Design Guide.



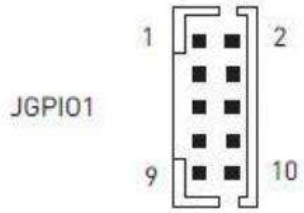
	1	HDD LED+	2	POWER LED
	3	HDD LED-	4	SUS LED
	5	GND	6	POWER SWITCH+
	7	RESET SWITCH+	8	POWER SWITCH-
	9	NC	10	No pin

2.2.8 GPIO



JGPIO1: GPIO (DIO) Box Header

This connector is provided for the General-Purpose Input/Output (GPIO) peripheral module.

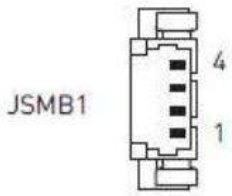


1	GND	2	VCC5
3	GPO0	4	GPI0
5	GPO1	6	GPI1
7	GPO2	8	GPI2
9	GPO3	10	GPI3

2.2.9 SMBus

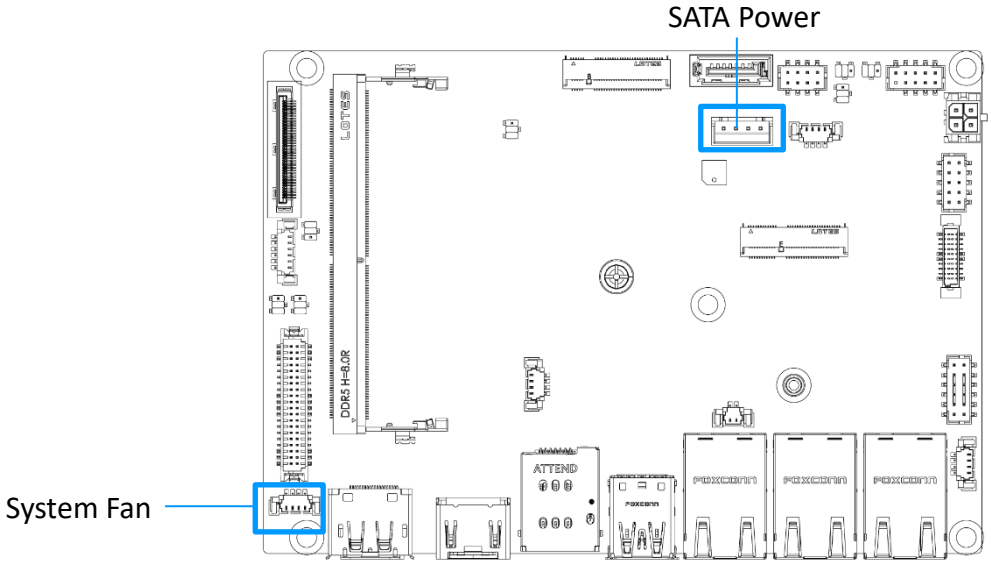
JSMB1: SMBus Box Header

This connector, known as I2C, is for users to connect System Management Bus (SMBus) interface.



1	5VSB	2	SMBCLK
3	SMBDATA	4	GND

2.2.10 System Fan



SYSFAN1: PWM System Fan Box Header

The fan power connector supports system cooling fans with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND.

SYSFAN1 (4 1)	1	GND	2	FAN POWER
	3	FAN SENSE	4	FAN_PWM

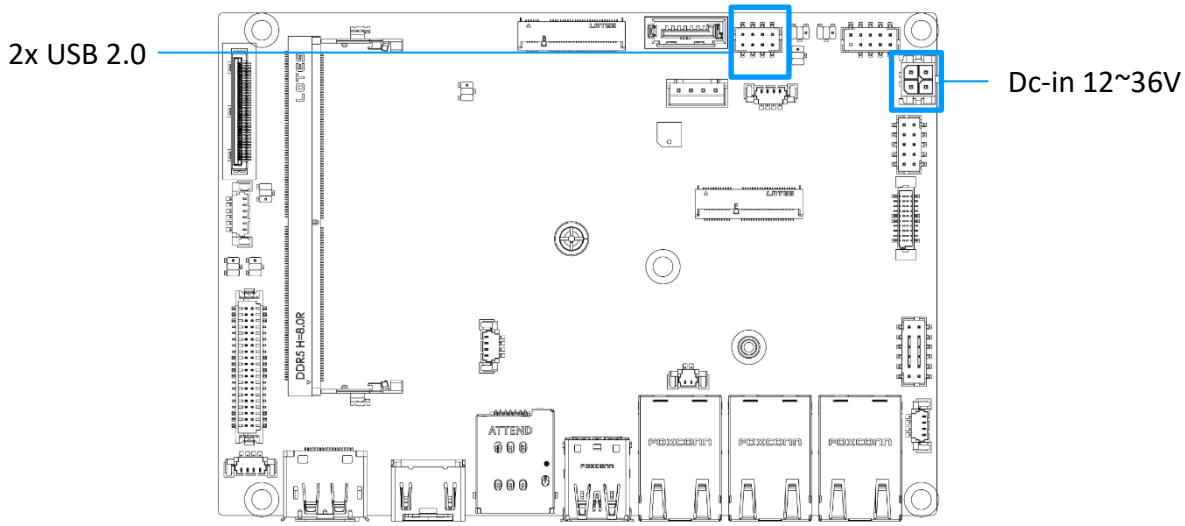
2.2.11 SATA Power

JPW1: 4-Pin SATA Power Connector

This connector is used to provide power to SATA devices.

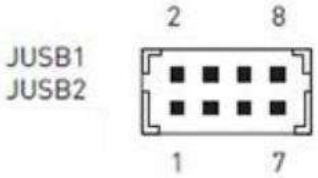
JPW1 (4 1)	1	5V	2	GND
	3	GND	4	12V

2.2.12 USB 2.0



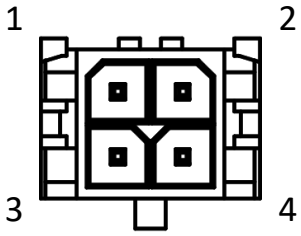
USB 2.0 Box Headers

These connectors are ideal for connecting USB devices such as keyboard, mouse, or other USB-compatible devices.



1	5V	2	GND
3	USB_0-	4	USB_1+
5	USB_0+	6	USB_1-
7	GND	8	5V

2.2.13 DC in 12~36V



Pin	Signal
1	GND
2	GND
3	DC_IN
4	DC_IN

Chapter 3

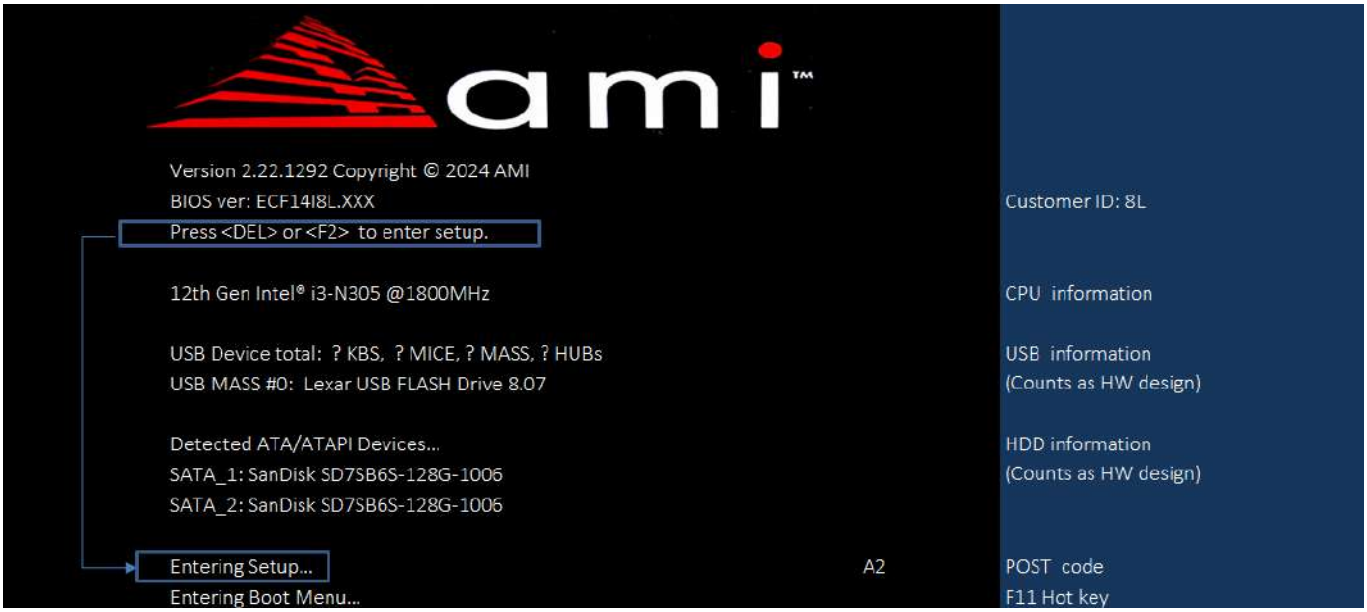
BIOS Setup

3.1 BIOS Setup

Versions

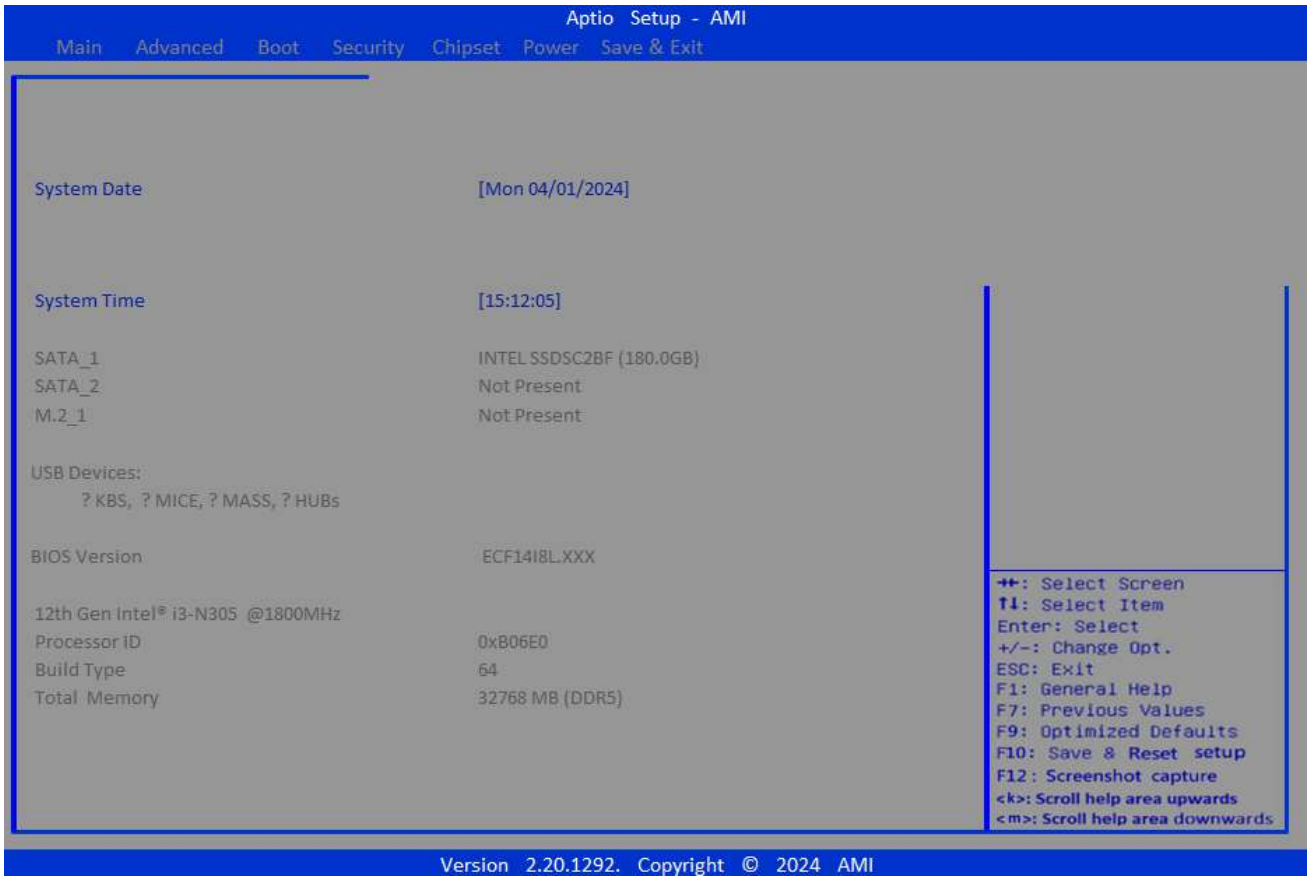
Date	Ver.	Note	Phase
2024/5/10	0.1	Initial release	MVT
2024/5/15	0.2	1. Modify some typo words for all sheet 2. Modify ASPM M2_M1 to M2_B1 3. add Data bit and Stop bit option	MVT
2024/5/27	0.3	1. Modify AC power loss default from power off to Last State. 2. Remove LVDS(via cable auto detect)	MVT
2024/6/4	0.4	1. Add item "M.2 B key Peripheral" for B key de specific B key device with USB. 2. Clean DMI DATA type 1/2 Manufacturer	MVT
2024/7/4	0.5	1. Remove item "M.2 B key Peripheral" for B key de specific B key device with USB. (default: enabled) 2. Add Backlight ctrl item in chipset page	MVT
2024/8/28	0.6	1. Add Key B USB3 interface 2. Add Intel VT-d in setup if CPU /PCH/platform support 3. Gray out panel related function when no panel detected. 4. Gray out Restore AC power loss when in AT mode. 5. Add Buzzer Beeps rule when ME disabled in BIOS Design rule sheet	MVT

POST



POST Hotkey	
Special Feature	Hot Key
Into BSU	"DEL", "F2"
boot oder menu	F11
PXE boot	F12

3.2 System Status

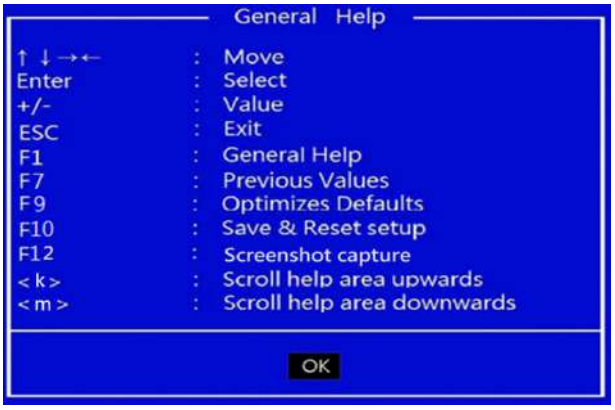


Fn Hotkey			
Special Feature	Location		Note
General Help	Hot Key"F1"		
Load Previous Values	Hot Key"F7"		
Load Optimizes Defaults	Hot Key"F9"		
Save & Reset setup	Hot Key"F10"		
Screenshot	Hot Key"F12"		

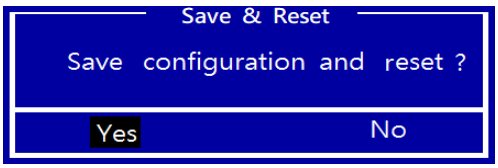
- Set the Date. Use Tab to switch beteeen Date elements
- Default Ranges:
- Year:2000-2099
- Month: 1-12
- Days: Dependent on month Range of Years may vary.

- SATA_2 for M.2 SATA
- M2_1 for PCIE x1

F1 screen



F10 screen



3.3 Advanced

Item String	Optimized Default	Option Name
Full Screen Logo Display	[Disabled]	Disabled/Enabled
Bootup NumLock State	[On]	On/Off
Key B USB3 interface	[Disabled]	Disabled/Enabled
>CPU Configuration		sub-menu
>Super IO Configuration		sub-menu
>H/W Monitor		sub-menu
>Smart Fan Configuration		sub-menu
>PCI/PCIE Device Configuration		sub-menu
>Network Stack Configuration		sub-menu
>GPIO Group Configuration		sub-menu
>PCIE ASPM Settings		sub-menu
>Engineer Mode		sub-menu

- Please be informed rule as below:
- 1. DO NOT adjust any items from this entry on executing formal test
- 2. Item should be hidden after MP candidate BIOS.

CPU Configuration

Item String	Optimized Default	Option Name
CPU Configuration		
12th Gen Intel ® i3-N305		
Porcessor ID	0xB06E0h	
Porcessor Speed	1800MHz	
E-Core Information		
L1 Data Cache	32 KB X 8	
L1 Instruction Cache	64 KB X 8	
L2 Cache	2048 KB X 2	
L3 Cache	6 MB	
VT-d	[Enabled]	Disabled/Enabled
Intel Virtualization Technology	[Enabled]	Disabled/Enabled
Active Efficient-cores	[All]	All/1/2/3 (Base on counts of E-core)
Intel ® SpeedStep(tm)	[Enabled]	Disabled/Enabled
Intel ® Speed Shift Technology	[Enabled]	Disabled/Enabled
C states	[Enabled]	

Displayed base on supported CPU
There is mechanism to display item for support CPU

Super IO Configuration

Item String	Optimized Default	Option Name
Super IO Configuration		
Serial Port 1	[Enabled]	Disabled/Enabled
Device Settings	IO=3F8h; IRQ=4;	
		Auto
		IO=3F8h; IRQ=4;
Change Settings	[Auto]	IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;
		IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;
		IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;
		IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;
		RS232
		RS422
Mode Select	[RS232]	RS485
		RS422 with TR
		RS485 with TR
Serial Port 2	[Enabled]	Disabled/Enabled
Device Settings	IO=2F8h; IRQ=3;	
		Auto
		IO=2F8h; IRQ=3;
Change Settings	[Auto]	IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;
		IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;
		IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;
		IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;

Device Settings	
Serial Port 1	Display STD IO port (3F8h,2F8h,3E8h,2E8h)
Serial Port 2	Display STD IO port (3F8h,2F8h,3E8h,2E8h)

Item String	Optimized Default	Option Name
		RS232
		RS422
Mode Select	[RS232]	RS485
		RS422 with TR
		RS485 with TR
FIFO Mode	[128-byte]	16/32/64/128
Watch Dog Timer	[Disabled]	Disabled/Enabled
Set Watch Dog Timer (Sec)	30	1-255(sec)

Mode Select	Item for MVT only. Hidden and default RS232 before MP candidate BIOS
Watch Dog Timer	Displayed when Watch Dog Timer enable

H/W Monitor

Item String	Optimized Default	Option Name
PC Health Status		
Thermal Shutdown	[Disabled]	Disabled/Enabled
CPU Temperature	: +36°C	
System Temperature	: +24°C	
SYSFAN	: N/A	
VCC_CORE	: +0.736 V	
VCC3	: +3.279 V	
VCC5	: +5.003 V	
+12V	: +12.144 V	
VSB3V	: +3.280 V	
VSB5V	: +4.992 V	
VBAT	: +3.040 V	

As Project type after MP candidate BIOS release

Motherboard (MS-98XX, MS-CFXX): Hidden
System (MS-C9XX): Display

Smart Fan Configuration

Item String	Optimized Default	Option Name
Configuration Smart Fan		
SYSFAN	[Disabled]	Disabled/40-70℃ (per class 5 ℃)
Min. Speed (%)	[50.0%]	0~87.5% (per class 12.5%)

PCI/PCIE Device Configuration

Item String	Optimized Default	Option Name
Audio Controller	[Enabled]	Disabled/Enabled

Nerwork Stack Configuration

Item String	Optimized Default	Option Name
Network Stack	[Disabled]	Disabled/Enabled
Ipv4 PXE Support	[Disabled]	Disabled/Enabled
Ipv4 HTTP Support	[Disabled]	Disabled/Enabled
Ipv6 PXE Support	[Disabled]	Disabled/Enabled
Ipv6 HTTP Support	[Disabled]	Disabled/Enabled
PXE boot wait time	0	
Media detect count	1	

GPIO Group Configuration

Item String	Optimized Default	Option Name
GPIO Group Configuration		
GPO0	[Low]	Low/High
GPO1	[Low]	Low/High
GPO2	[Low]	Low/High
GPO3	[Low]	Low/High
GPO Status		
GPO0	: 1	
GPO1	: 1	
GPO2	: 1	
GPO3	: 1	
GPI Status		
GPI0	: 1	
GPI1	: 1	
GPI2	: 1	
GPI3	: 1	

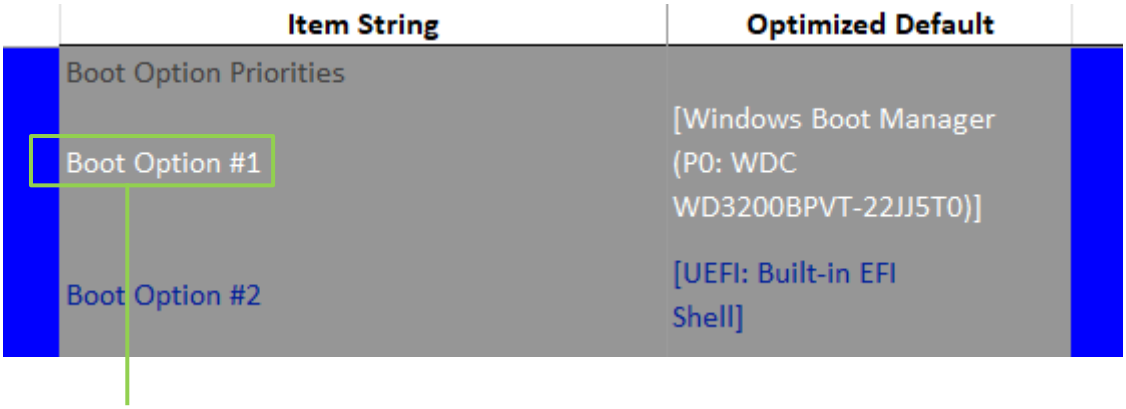
1. Status as setting
2. item must be hidden after MP candidate BIOS.

PCIE ASPM settings

Item String	Optimized Default	Option Name
M2_B1	[Disabled]	Option Defined:
M2_E1	[Disabled]	PCH : Disabled/ L1/ Auto

Displayed as HW design when config as PCIE

3.4 Boot



SUT will return BIOS Setup when no disabled all boot option

3.5 Security

Item String	Optimized Default	Option Name
Administrator Password		
User Password		
Disabled Block Sid	[Disabled]	Disabled/Enabled
>PCH-FW Configuration		sub-menu
>Trusted Computing		sub-menu
>Serial Port Console Redirection		sub-menu
>Secure boot		sub-menu

Item only support for NVMe Device (TCG support)

PCH-FW Configuration

Item String	Optimized Default	Option Name
ME Firmware Version	16.X.XX.XXXX	
ME Firmware Mode	Normal Mode	
ME Firmware SKU	Consumer SKU	
ME State	[Enabled]	Disabled/Enabled
Comms Hub Support	[Disabled]	Disabled/Enabled
JHI Support	[Disabled]	Disabled/Enabled
Core BIOS Done Message	[Enabled]	Disabled/Enabled
>Firmware Update Configuration		sub-menu
>PTT Configuration		sub-menu
>ME Debug Configuration		sub-menu
>Anti-Rollback SVN Configuration		sub-menu

Displayed when ME state enabled

Trust Computing

Item String	Optimized Default	Option Name
TPM2.0 Device Found		
Firmware Version:	7.85	
Vendor	IFX	
Security Device Support	[Enabled]	Disabled/Enabled
Active PCR Banks	SHA256	
Available PCR Banks	SHA256,SHA384,SM3	
SHA256 PCR Bank	[Enabled]	Disabled/Enabled
SHA384 PCR Bank	[Disabled]	Disabled/Enabled
Pending opertaion	[None]	None/TPM Clear
Platform Hierarchy	[Enabled]	Disabled/Enabled
Storage Hierarchy	[Enabled]	Disabled/Enabled
Endorsement Hierarchy	[Enabled]	Disabled/Enabled
Physical Presence Spec Version	[1.3]	1.2/1.3
TPM 2.0 Interfacetype	[TIS]	
PH Randomization	[Enabled]	Disabled/Enabled
		TPM 1.2/
Device Select	[TPM 2.0]	TPM 2.0/
		Auto

Information as your choseen TPM displayed(dTPM/fTPM)

Serial Port Console Redirection

Item String	Optimized Default	Option Name
COM1		
Console Redirection	[Disabled]	Disabled/Enabled
>Console Redirection Settings		sub-menu

Unlock when Console Redirection enabled

Secure boot

Item String	Optimized Default	Option Name
System Mode	Setup	
Secure boot	[Disabled]	Disabled/Enabled
	Not Active	
Secure boot Mode	[Custom]	Custom/Standard
>Restore Factory Keys		
>Reset To setup Mode		
>Key Management		

All secure boot function is by AMI Default, but keep customer request.
No OEM Key roll in default.(reserve once customizing chance)
Default Key need to roll in via clicking "Restore Factory keys"
Default
Secure boot: Disabled
Secure boot Mode: Custom

Firmware Update Configuration

Item String	Optimized Default	Option Name
Me FW Image Re-Flash	[Disabled]	Disabled/Enabled
Local FW Update	[Enabled]	Disabled/Enabled

PTT Configuration

Item String	Optimized Default	Option Name
PTT Capability / State	1 / 0	
TPM Device Selection	[dTPM]	dTPM/PTT

ME Debug Configuration

Item String	Optimized Default	Option Name
HECI Timeouts	[Enabled]	Disabled/Enabled
Force ME DID Init Sratus	[Disabled]	Disabled 0 - Success 1 - No memery in Channels 2 - Memory Init Error
CPU Replaced Polling Disable	[Disabled]	Disabled/Enabled
HECI Message Check Disable	[Disabled]	Disabled/Enabled
MBP H0B Skip	[Disabled]	Disabled/Enabled
HECI2 Interface Communication	[Disabled]	Disabled/Enabled
KT Device	[Enabled]	Disabled/Enabled
End of Post Message	[Send in DXE]	Disabled/Send in DXE
D0I3 Settig for HECI Disable	[Disabled]	Disabled/Enabled
MCTP Broadcast Cycle	[Disabled]	Disabled/Enabled

Anti-Rollback SVN Configuration

Item String	Optimized Default	Option Name
Minimal Allowed Anti-Rollback SVN	0	
Executing Anti-Rollback SVN	1	
Automatic HW-Enforced Anti-Rollback SVN	[Disabled]	Disabled/Enabled
Set HW-Enforced Anti-Rollback for current SVN	[Disabled]	Disabled/Enabled

Displayed when Automatic HW-Enforced Anti-Rollback SVN Disabled

As CRB define and Mechanism

Console Redirection Settings (COM1)

Item String	Optimized Default	Option Name
COM1		
Console Redirection Settings		
Terminal Type	[ANSI]	VT100 VT100+ VT-UTF8 ANSI
Bits per second	[115200]	9600 19200 38400 57600 115200
Data Bits	[8]	7,8
Parity	[None]	None Even odd Mark Space
Stop Bits	[1]	1,2
Flow Control	[None]	None Hardware RTS/CTS
VT-UTF8 Combo Key Support	[Enabled]	Disabled/Enabled
Recorder Mode	[Disabled]	Disabled/Enabled
Resolution 100X31	[Disabled]	Disabled/Enabled
Putty KeyPad	[VT100]	VT100 Intel Linux XTERMR6 SCO ESCN VT400

3.6 Chipset

Item String	Optimized Default	Option Name
DVMT Total Gfx Mem	[256M]	128M/256M/MAX
DVMT Pre-allocated	[64M]	64M/128M/256M/512M/1024M
LVDS Panel Type	1024 X 768 & 24bit	640 x 480 & 18bit 640 x 480 & 24bit 800 x 480 & 18bit 800 x 480 & 24bit 800 x 600 & 18bit 800 x 600 & 24bit 1024 x 600 & 18bit 1024 x 600 & 24bit 1024 x 768 & 18bit 1024 x 768 & 24bit 1280 x 768 & 18bit 1280 x 768 & 24bit 1280 x 800 & 18bit 1280 x 800 & 24bit 1280 x 960 & 18bit 1280 x 960 & 24bit 1280 x 1024 & 18bit 1280 x 1024 & 24bit 1366 x 768 & 18bit 1366 x 768 & 24bit 1440 x 900 & 18bit 1440 x 900 & 24bit 1400 x 1050 & 18bit 1400 x 1050 & 24bit 1600 x 900 & 18bit 1600 x 900 & 24bit 1680 x 1050 & 24bit 1600 x 1200 & 24bit
Backlight Control	[Level 3]	Level 1-5

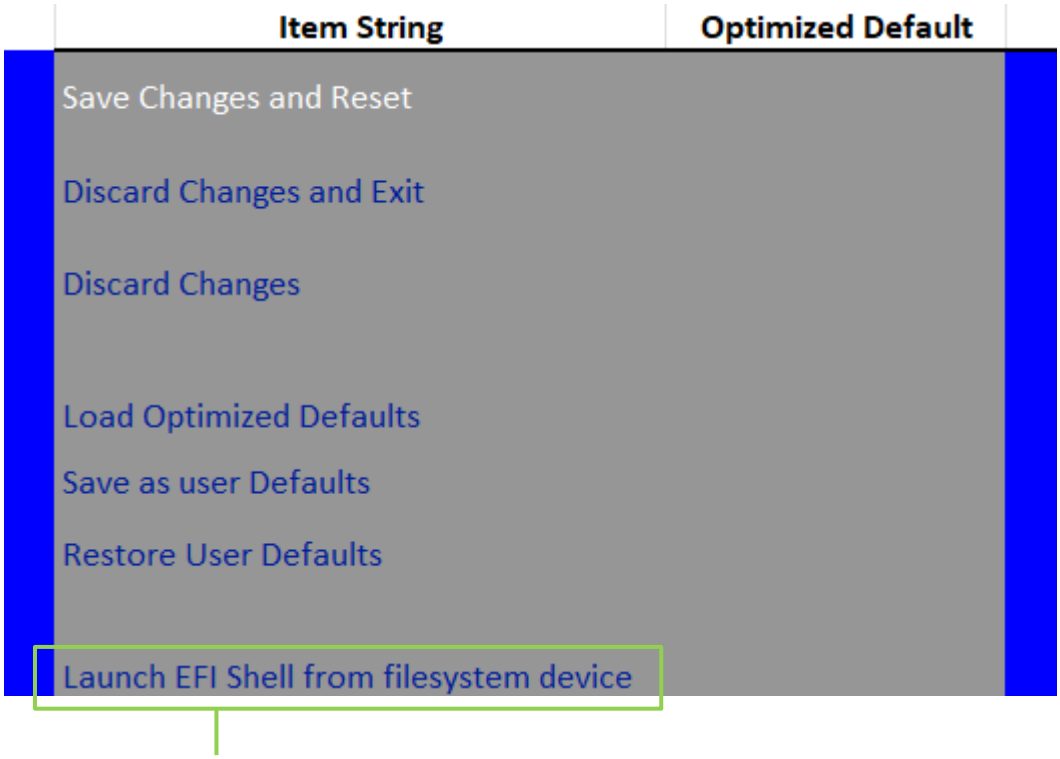
- DVMT Pre-allocated
  2048 as platform supporting

- LVDS Panel Type
  Gray out when no panel connected

3.7 Power

Item String	Optimized Default	Option Name	Remark
Restore AC power Loss	[Last State]	Power on Power off Last State	Function will work on ATX mode only Gray out in AT mode
Deep Sleep Mode	[S4+S5]	Disabled S4+S5	
Advanced Resume Events Control			
OnChip USB	[Enabled]	Disabled/Enabled	
LAN/PCIE PME	[Disabled]	Disabled/Enabled	
RTC	[Disabled]	Disabled Daily Dynamic Weekly	
wake up hour	0	0-23	When RTC set to Daily
wake up minute	0	0-59	
wake up second	0	0-59	
wake up minute icrease	1	1-- 5	When RTC set to Dynamic
Monday	[Disabled]	Disabled/Enabled	When RTC set to Weekly
Tuesday	[Disabled]	Disabled/Enabled	
Wednesday	[Disabled]	Disabled/Enabled	
Thursday	[Disabled]	Disabled/Enabled	
Friday	[Disabled]	Disabled/Enabled	
Saturday	[Disabled]	Disabled/Enabled	
Sunday	[Disabled]	Disabled/Enabled	
Wake up hour	0	0-23	EX: When weekly's sub items set to Enabled
Wake up minute	0	0-59	
Wake up second	0	0-59	

3.8 Save&Exit



Build-in SHELL is necessary

3.9 DMI Data

	Data	Related SW
BIOS Information (Type 0)		
BIOS Vendor	American Megatrends International Inc.	
BIOS Version	ECF14I8L.XXX	
Release Date	4/1/2024	
ROM Size	As plarform	
System Information (Type 1)		
Manufacturer		
Product Name	MS-CF14	SW Utility
Version	As M/B version	
Serial Number		
UUID	Generated at factory	
SKU Number		
Family		
Base Board Information (Type 2)		
Manufacturer		
Product Name	MS-CF14	SW Utility
Version	As M/B version	
Serial Number	Default String	
Asset Tag Number	Default String	

3.10 BIOS Design Rule

Admin/User PW

	OEM request		CRB Default			
	Admin	User	Admin	User		
Entry	Follow CRB default		BSU	POST	Into BSU/Before POST	
Length			20		<=20 characters	
A–Z			Yes		Case Sensitive or Not	
0–9			Yes		Yes or No	
PW state after clean CMOS	Follow CRB default		Clean		Keep or Clean	
Retry limited	Follow CRB default		3		Request by ODM	
	Restrict Page (Items)					
System Status	Follow CRB default		No restrict		Request by ODM and MSI estimate	
Advanced						
Boot						
Security						
Chipset						
Power						
Save&exit						

Buzzer

Event	Sounds
POST detect	1 short beep
No Con in/out Device detect	No beeps
Disabled ME	No beeps
Others	As AMI Default

ASPM

	Add-on	onBoard
Default Vaule	Disabled	Enabled
Items	Display	Hidden

DMI Data Preserve

	Preserve
FPT tool flash (F32M.NSH)	NO
AFU tool flash (FLASH.NSH)	Yes
Clear CMOS	Yes