Lanner

Industrial Communications

Hardware Platforms for Industrial Computing

LEC-2430
V1.1

User's Manual

Release Date: 2018-03-09

Overview

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

NOTE: This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

WARNING: This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

The listed websites are links to the on-line product information and technical support.

Resource	Website
Lanner	http://www.lannerinc.com
Product Resources	http://www.lannerinc.com/support/download-center
RMA	http://eRMA.lannerinc.com

Copyright and Trademarks

Acknowledgement

Compliances and Certification

CE Certification

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A Certification

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 when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

EMC Notice

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Safety Guidelines

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free before, during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses/goggles if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

LITHIUM BATTERY CAUTION:

Risk of explosion could occur if battery is replaced by an incorrect type. Please dispose of used batteries according to the recycling instructions of your country.

- Installation only by a trained electrician or only by an electrically trained person who knows all the applied or related installation and device specifications..
- Do not carry the handle of power supplies when moving to other place.
- The machine can only be used in a fixed location such as labs or computer facilities.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.

- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

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Chapter 1: Introduction Brief

Thank you for choosing LEC-2430. LEC-2430 is a compact and value embedded system which adopts Intel Bay-Trail CPU to provide a high performance with lower power consumption, ideal for various applications. LEC-2430 supports many integrated multimedia and I/O features such as video, audio, network, serial, and USB ports suitable for many mainstream applications. In addition, LEC-2430 is designed for easy installation and replacement for most environments.

Here is the summary of the key features of LEC-2430:

- **Intel® Bay Trail Celeron® Processor J1900**
- **Robust Fan-less enclosure and compact size**
- **DDR3L memory support up to 8GB**
- **Dual display support VGA and HDMI**
- **Dual 10/100/1000Mbps Ethernet ports**
- **USB ports: 1x USB3.0 and 4x USB2.0**
- **2x serial ports supporting RS232/422/485**
- **Support audio Line-out and MIC**
- **Storage: 1x SATA port, and 1x mSATA socket**
- **1x Mini-PCIe with SIM-card reader**
- **1x PCI expansion slot**
- **Wide Range Power Input +9~+30 VDC (2 pin phoenix connector)**

System Specifications

Processor Options		Intel® Bay Trail Celeron® J1900
Chipset		N/A
BIOS		AMI SPI Flash ROM
System Memory	Sockets	1x 204 pin SO-DIMM
	Technology	DDR3L 1333 SDRAM
	Max. Capacity	8 GB
USB		1x USB 3.0 Type-A in blue 4x USB 2.0 Type-A
Expansion Bus		1x Mini-PCIexpress expansion socket (USB2.0 + PCIe) for 3G mini-card 1x PCI expansion slot for PCI added-on card (for PCIe x1 expansion riser card)
OS Support		Windows 7/7 Embedded 32/64bit, Windows 8 32/64bit , Linux
Storage	CompactFlash	N/A
	HDD/SSD Support	1 x SATA 2.5" HDD/SSD/SATA DOM 1 x mSATA storage
Networking	LAN	2x RJ45 connectors 10/100/1000Mbps
	Controller	Intel® i210 10/100/1000 BASE-T
Serial Interface	Serial Standard	2x DB9 male connectors for RS232/422/485; double-stacked
Display	Graphics Controller	Intel Integrated Graphics supports
	Resolutions	HDMI: up to 1920x1080 VGA: up to 1600x1200 @60 24bpp
LEDs		1x double-stack LEDs; Yellow for storage-access status, green for 3G status if 3G mini-card exists
Antenna		1x SMA Antenna slot for wireless connectivity
Audio		1x stack audio 3.5mm connector with Realtek ALC886 *green phone-jack connector for audio Line-out *pink phone-jack connector for audio Mic-in
Super I/O		1x LPC Super I/O Fintek F81866A, support Serial ports, GPIO, Keyboard/ Mouse, Watchdog timer and Hardware monitor; Provide 6 UARTS
Control Buttons		1 x Reset 1 x Power switch with LED (RED for standby mode and Green for power-on mode)
Physical Characteristics	Housing	Steel Aluminium
	Weight	TBD
	Dimensions(HxWxD)	268mm(W) x 195mm(D) x 65.5mm(H)
	Mounting Options	Wall mount
Environment	Operating Temperature	-20°C to +55°C with industrial grade storage and memory
	Storage Temperature	-20°C~+70°C
	Ambient Relative Humidity	5 to 95% (non-condensing)
Power	Input Voltage	+9~+30Vdc power input
	Power Consumption	TBD
	Connector	2 pin phoenix 5.0mm connector
Standard and Regulation	EMC	CE, FCC
	Green product	RoHS
Reliability and Utility		Lanner DIO utility Watchdog Timer

Package Contents

Your package contains the following items:

- LEC-2430 fanless box PC
- Drivers and User's Manual CD

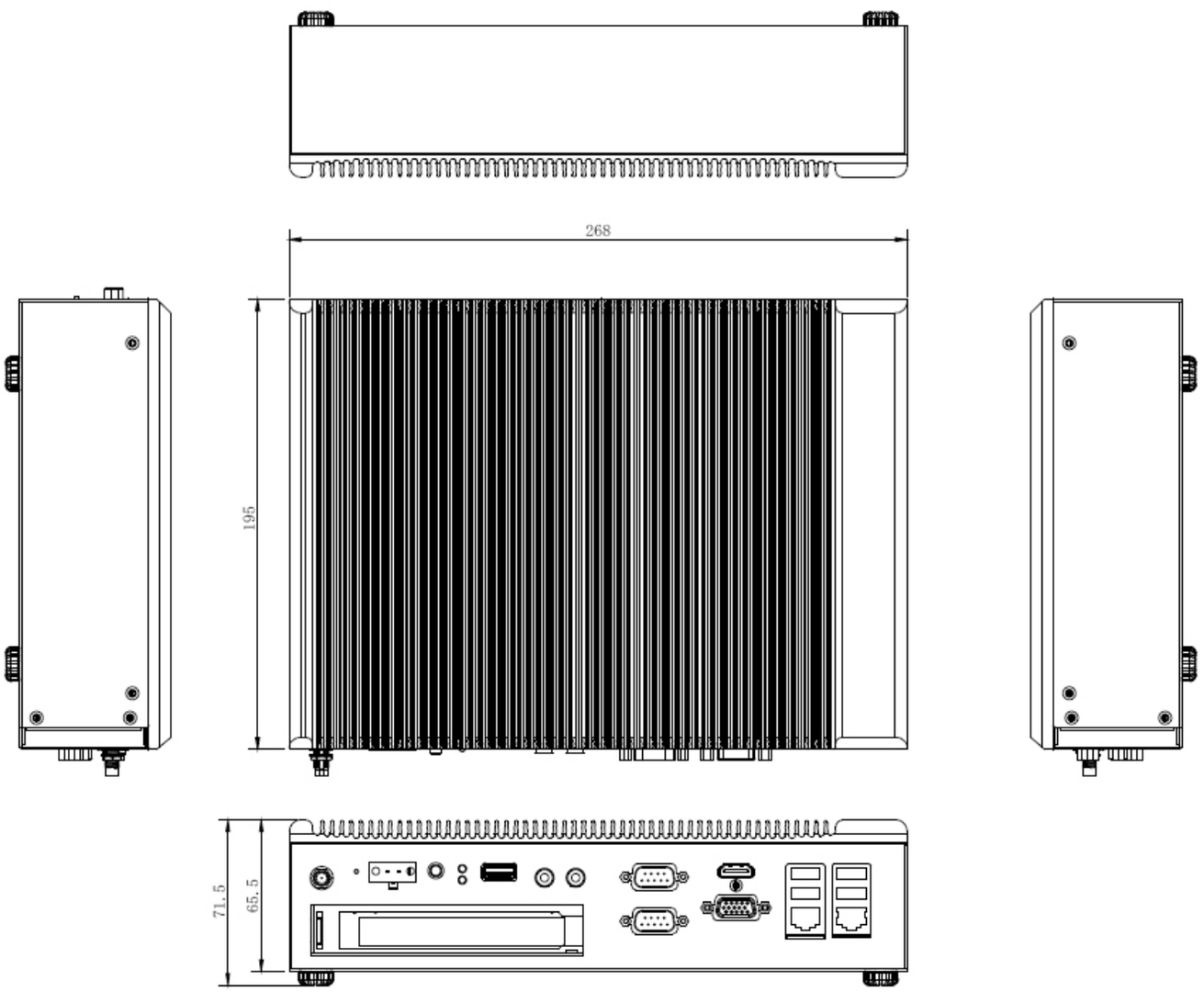
Notes: if there is any missing item, please contact your dealer immediately for assistance.

Ordering Information

LEC-2430-J11A	Fanless Industrial PC with Intel® Celeron® Processor J1900 4C @ 2GHz CPU, 2x RS232/422/485, 1x USB3.0, 4x USB2.0, 2x Giga LAN, one PCI expansion, +9~30vdc power input

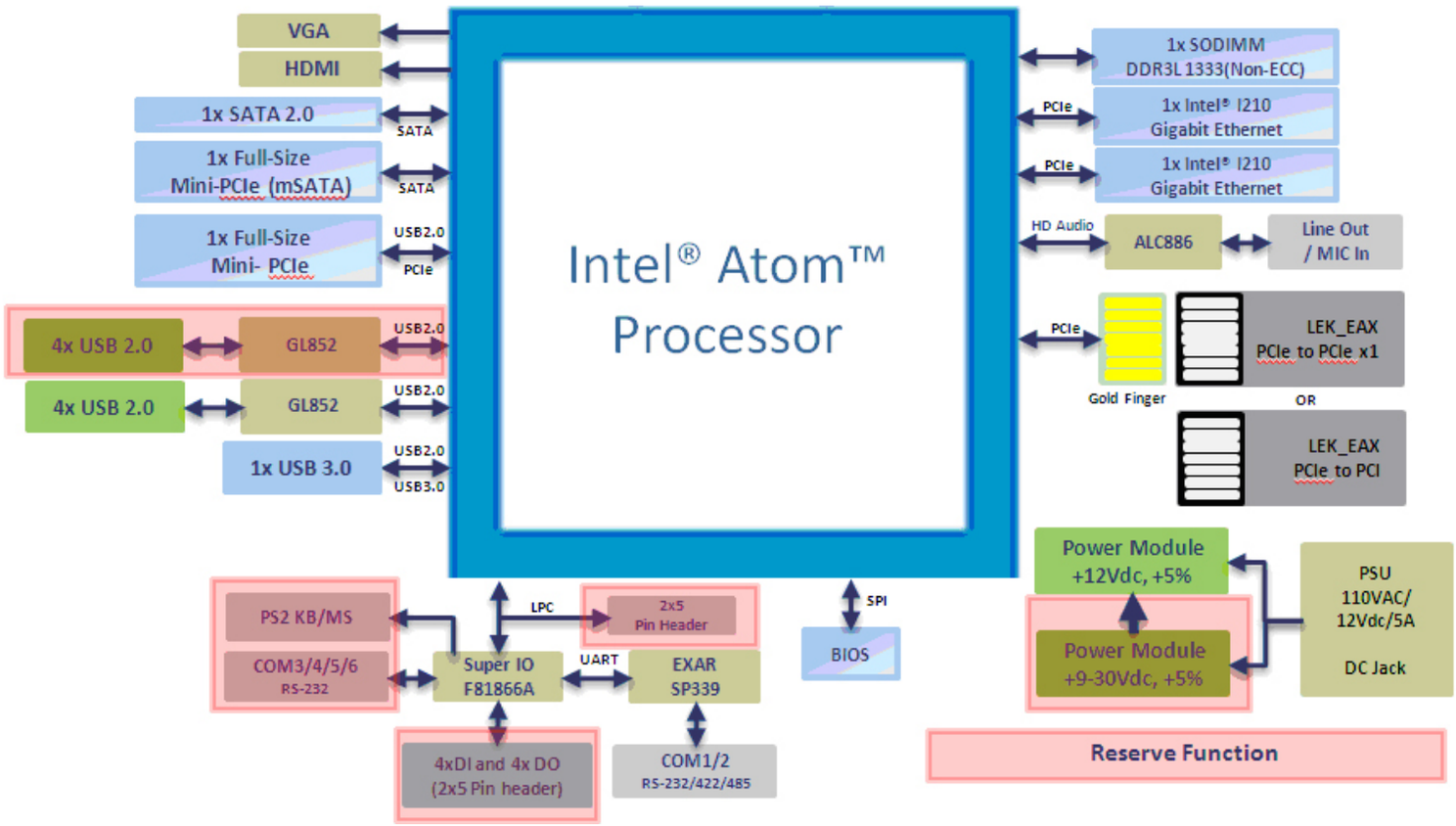
Chapter 2:
System Components

Mechanical Drawing

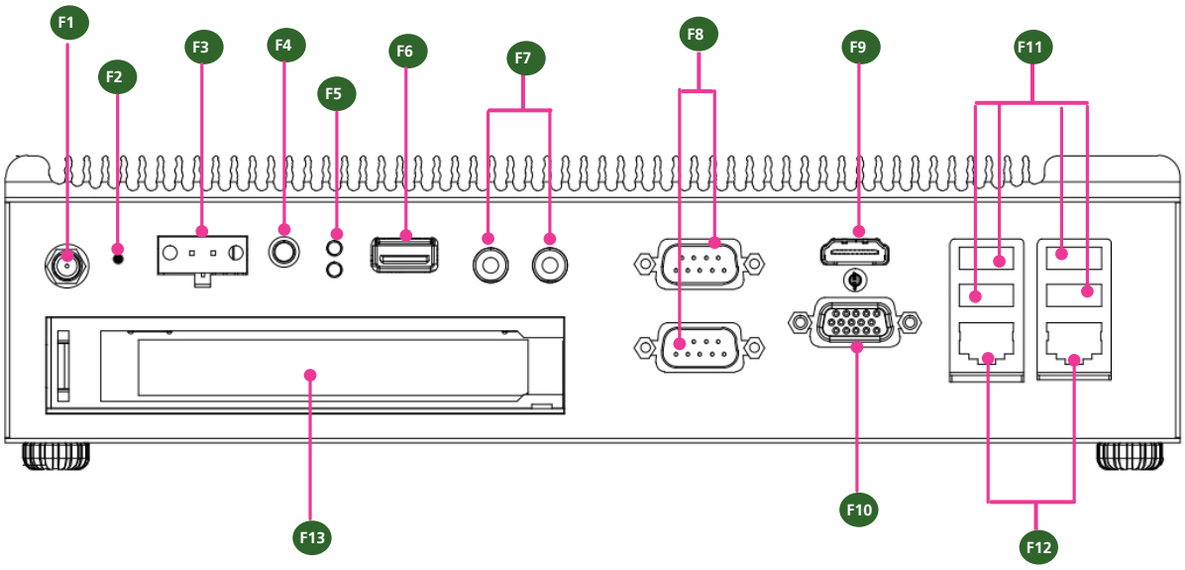


Unit: mm

Block Diagram

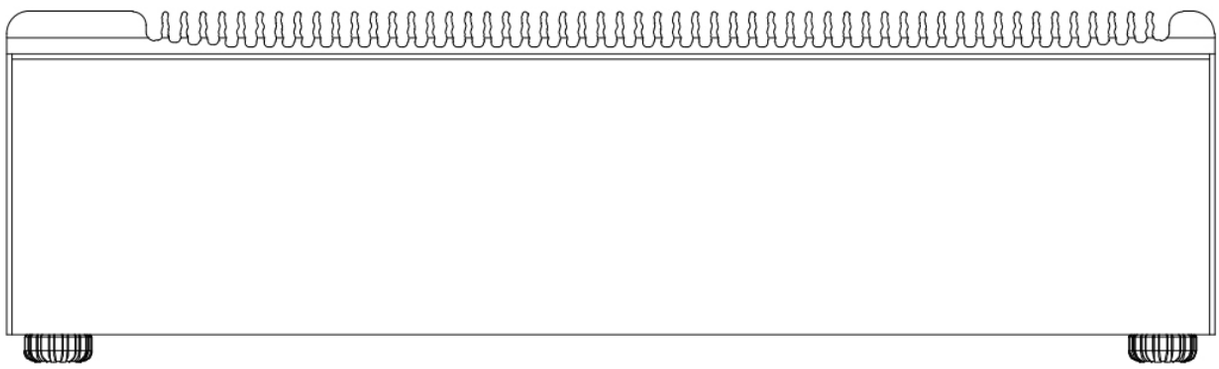


Front Components



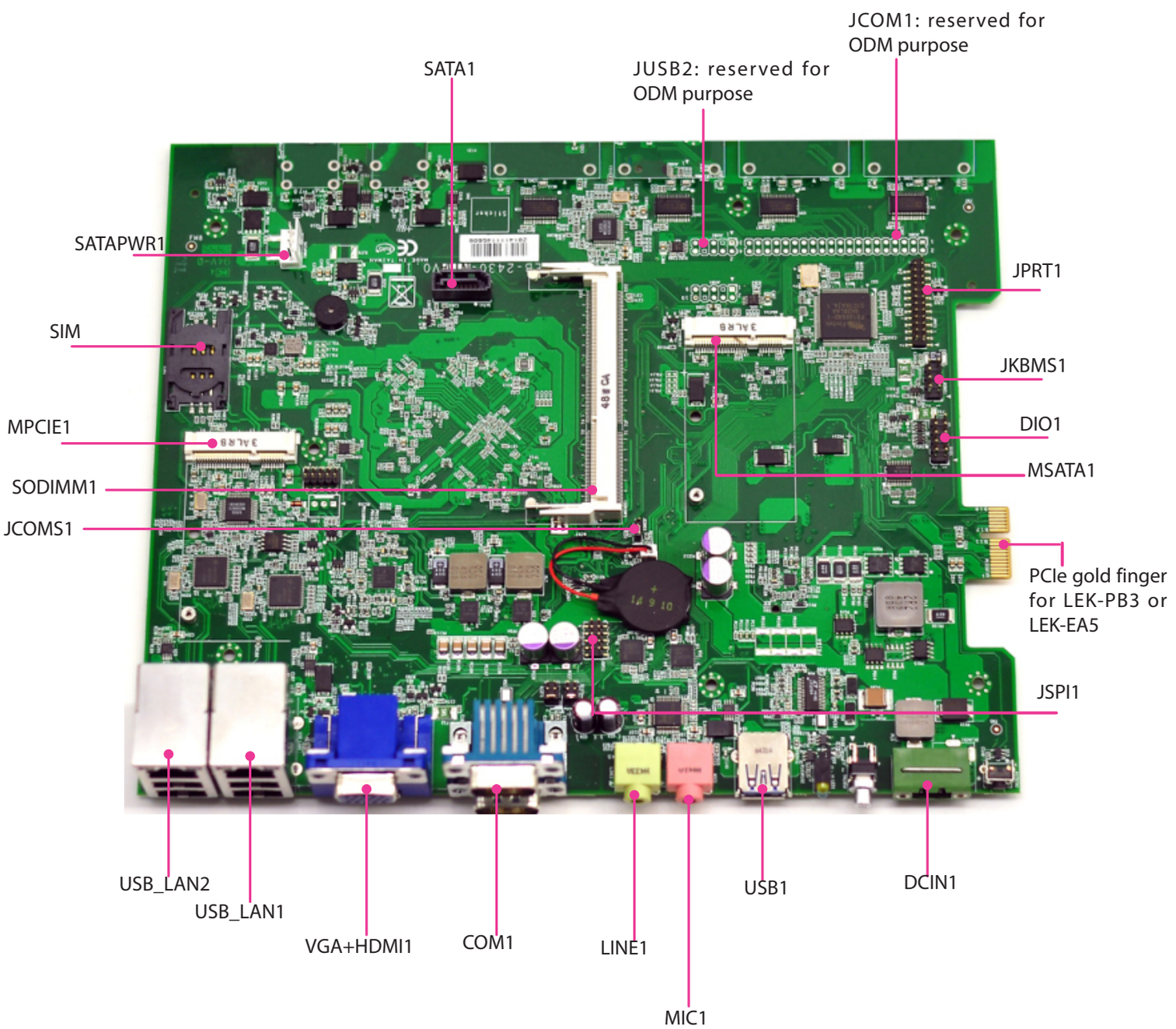
Component	Description	Remarks
F1 Antenna Hole	1 x SMA Antenna hole for wireless connectivity	
F2 Reset	1 x Reset switch	
F3 Power Input	+9~+30 VDC 2-pin Phoenix Contact connector	
F4 Power Switch	1 x Power on/off button	
F5 LEDs	Double-stacked LEDs; yellow for storage access status, while green for 3G status (if 3G mini card installed)	
F6 USB3.0	1 x USB 3.0 port (Type-A)	
F7 Audio	1 x Green phone jack for audio Line-out 1 x Pink phone jack for Mic-in	
F8 Serial COM	2 x Serial COM ports in DB9 connectors, supporting RS-232/422/485 signals	
F9 HDMI	1 x HDMI output port	
F10 VGA	1 x VGA display port	
F11 USB2.0	4 x USB 2.0 ports (Type-A)	
F12 LAN	2 x Ethernet LAN ports (RJ-45 with LED) for 10/100/1000 Mbps	
F13 PCIe	1 x PCIe expansion slot (for PCI add-on card)	

Rear Components

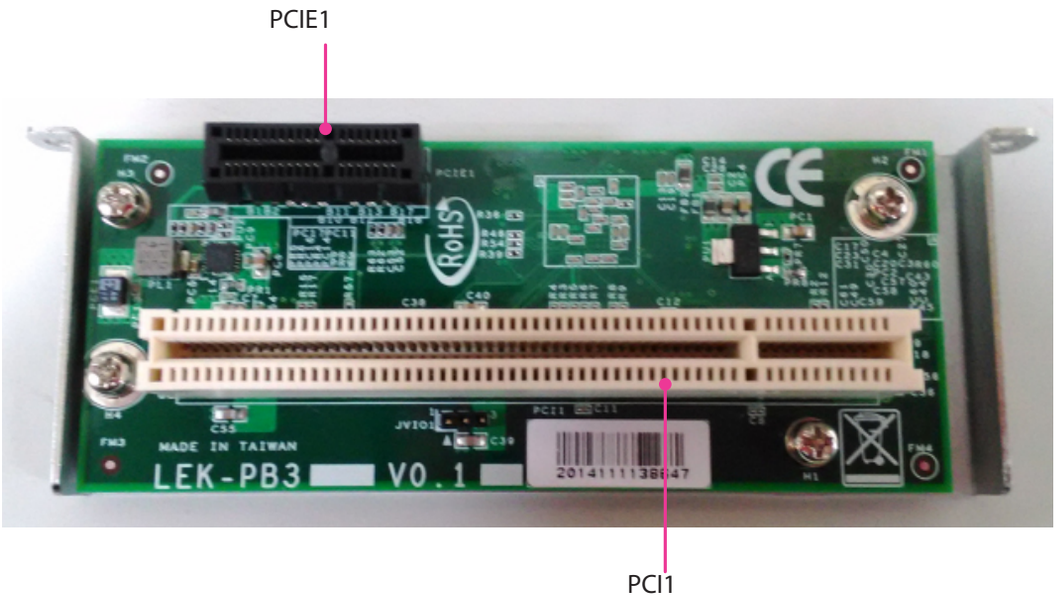


Chapter 3:
Motherboard Information

Inside LEC-2430



LEK-PB3 Add-on Card



LEK-EA5 Add-on Card

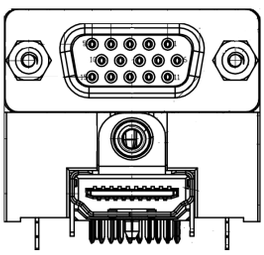
Notes: Add-on card(s) are provided depending on the package you order.

Connectors and Jumpers List

Connectors/Jumpers	
Labels	Function
VGA+HDMI1	VGA and HDMI output ports
LINE1	3.5mm green phone jack
MIC1	3.5mm pink phone jack
USB_LAN1/2	USB and LAN stacked ports
COM1	2 x COM ports (double stacked)
USB1	USB2.0/3.0 connector
DCIN1	DC power input in 2-pin connector
JSPI1	SPI pin header for debug purpose
MSATA1	mSATA storage socket
DIO1	Digital input/output pin header
JKBMS1	PS/2 keyboard and mouse pin header
JPRT1	Parallel connector
JCOM1	40-pin Serial connector reserved for ODM purpose
JUSB2	10-pin USB pin header reserved for ODM purpose
SATA1	SATA signal connector (7-pin)
SATAPWR1	SATA power connector (4-pin)
SIM	SIM card reader
MPCIE1	Mini PCIe socket
SODIMM1	DDR3L SO-DIMM socket
JCOMS1	CMOS jumper
PCIE1/2	PCIe x 1 lane socket
PCI1	Conventional PCI bus

Jumper Settings & Connector Pinouts

VGA + HDMI1: VGA and HDMI display ports



HDMI

Pin No.	Description	Pin No.	Description
1	DATA2+	2	GND
3	DATA2-	4	DATA1+
5	GND	6	DATA1-
7	DATA0+	8	GND
9	DATA0-	10	CLK+
11	GND	12	CLK-
13	N.C	14	N.C
15	DDC CLK	16	DDC DAT
17	GND	18	DDC DAT
19	HPD		

VGA

Pin No.	Description	Pin No.	Description
1	CRT-R	2	CRT-G
3	CRT-B	4	N.C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N.C	12	V_SDAT
13	HSYNC	14	VSYNC
15	V_SCLK		

Audio

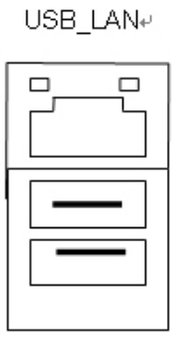
LINE1: 3.5mm phone jack (green)

Pin No.	Description
1	GND
2	LINE_OUT_L
3	GND
4	GND
5	LINE_OUT_R

MIC1: 3.5mm phone jack (pink)

Pin No.	Description
1	GND
2	MIC_L
3	GND
4	GND
5	MIC_R

USB_LAN1/2: LAN Connector(RJ-45 connector with LED)+USB Dual Connectors



Pin No.	Description	
1	TXD+	MD0+
2	TXD-	MD0-
3	RXD+	MD1+
4	T45	MD2+
5	T45	MD2-
6	RXD-	MD1-
7	T78	MD3+
8	T78	MD3-
9	10-/100-/1000+	
10	10+/100+/1000-	
11	NC	
12	NC	
13	Active LED- (yellow)	
14	Active LED+	

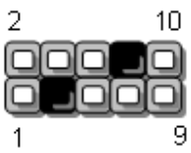
USB Dual Connector port#0/1/2/3 under LAN ports

Pin No.	Description
1	5V_USB1
2	-USB0
3	+USB0
4	GND
5	5V_USB1
6	-USB1
7	+USB1
8	GND

USB1: USB2.0/3.0 Connector

Pin No.	Description
1	USB_VCC1
2	USB1 D-
3	USB1 D+
4	GND
5	USB RX-
6	USB RX+
7	GND
8	USB1 TX-
9	USB1 TX+

JUSB2: Internal USB Pin header (for ODM purpose)

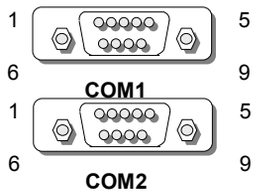


Pin No.	Description	Pin No.	Description
1	USB VCC	2	GND
3	KEY	4	+USB
5	-USB	6	-USB
7	+USB	8	KEY
9	GND	10	USB VCC

JKBMS1: PS/2 Keyboard & Mouse Connector(2x4 2.54mm Pin Header)

Pin No.	Description	Pin No.	Description
1	KBCLK	2	GND
3	KEY	4	KBDATA
5	KEY	6	MSDATA
7	MSCLK	8	KBVCC

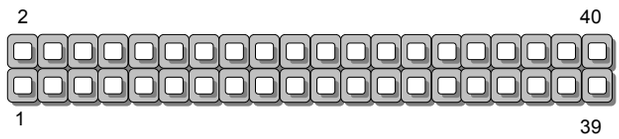
COM1: dual COM (D-SUB9) Connectors



Pin No.	Description
1	Data Carrier Detect (DCDA#)
2	Receive Data (RXDA)
3	Transmit Data (TXDA)
4	Data Terminal Ready (DTRA#)
5	Ground (GND)
6	Data Set Ready (DSRA#)
7	Request To Send (RTSA#(
8	Clear To Send (CTSA#)
9	Ring Indicator (RIA#)

Pin No.	RS-232	RS-422	RS-485
1	DCD	TX-	RTX-
2	RXD	TX+	RTX+
3	TXD	RX+	
4	DTR	RX-	
5	GND		
6	DSR		
7	RTS		
8	CTS		
9	RI		

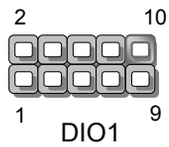
JCOM1: Serial Port3~6 (2x20 2.0mm Pin Header for ODM purposes)



JCOM1

Pin No.	Description	Pin No.	Description
1	DCD#3	2	DSR#3
3	RX3	4	RTS#3
5	TX3	6	CTS#3
7	DTR#3	8	RI3
9	GND	10	N.C
11	DCD#4	12	DSR#4
13	RX4	14	RTS#4
15	TX4	16	CTS#4
17	DTR#4	18	RI4
19	GND	20	N.C
21	DCD#5	22	DSR#5
23	RX5	24	RTS#5
25	TX5	26	CTS#5
27	DTR#5	28	RI5
29	GND	30	N.C
31	DCD#6	32	DSR#6
33	RX6	34	RTS#6
35	TX6	36	CTS#6
37	DTR#6	38	RI6
39	GND	40	N.C

DIO1: Digital Input/output

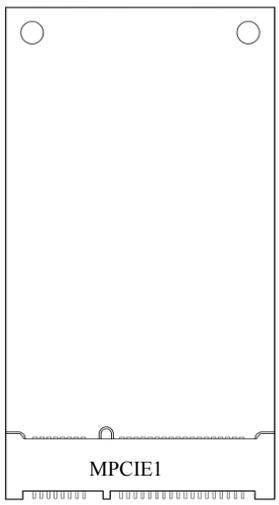


Pin No.	Description
1	DI 0
2	DO 0
3	DI 1
4	DO 1
5	DI 2
6	DO 2
7	DI 3
8	DO 3
9	GND
10	DIO 5V

JPRT1:Parallel Connector(2x26 2.0mm Pin Header)

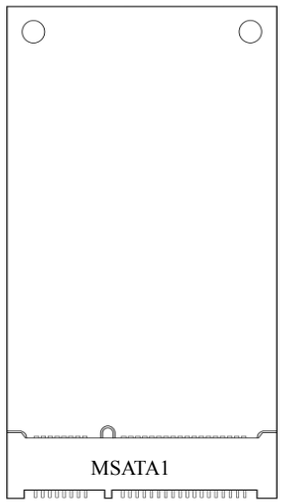
Pin No.	Description	Pin No.	Description
1	STROBE	2	AFD#
3	PD0	4	ERR#
5	PD1	6	INIT#
7	PD2	8	SLIN#
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	

MPCIE1:mini PCIe Slot /w SIM (Full Size)



Pin No.	Description	Pin No.	Description
1	WAKE#	2	+3.3V
3	RSVD	4	GND
5	RSVD	6	+1.5V
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_RESET
15	GND	16	UIM_VPP
KEY			
17	RSVD	18	GND
19	RSVD	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0	24	+3.3V
25	PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	USB_D+
37	GND	38	USB_D-
39	+3.3V	40	GND
41	+3.3V	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	RSVD	46	LED_WPAN#
47	RSVD	48	1.5V
49	RSVD	50	GND
51	RSVD	52	+3.3V

MSATA1: mSATA Slot(Full Size)

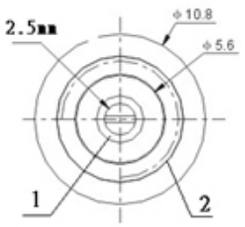


PIN	Description	PIN	Description
1	N.C	2	+3.3V
3	N.C	4	GND
5	N.C	6	N.C
7	N.C	8	N.C
9	GND	10	N.C
11	N.C	12	N.C
13	N.C	14	N.C
15	GND	16	N.C
KEY			
17	N.C	18	GND
19	N.C	20	N.C
21	GND	22	N.C
23	SATA_RXp	24	+3.3V
25	SATA_RXn	26	GND
27	GND	28	N.C
29	GND	30	N.C
31	SATA_TXn	32	N.C
33	SATA_TXp	34	GND
35	GND	36	N.C
37	GND	38	N.C
39	+3.3V	40	GND
41	+3.3V	42	N.C
43	GND	44	N.C
45	N.C	46	N.C
47	N.C	48	N.C
49	N.C	50	GND
51	N.C	52	+3.3V

DCIN1: 5.0mm 2-pin Phoenix connector

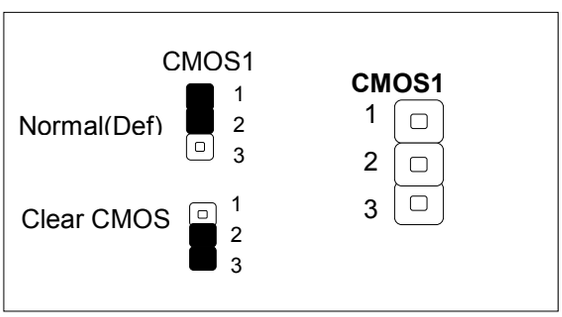
Pin No.	Description
1	DC IN (9~30V)
2	DC IN (-)

DCJACK1: DC Power JACK(Optional)



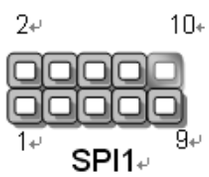
Pin No.	Description
1	DC IN (+12V)
2	DC IN (-)

JCOMS1: Clear CMOS



Description	CMOS1 pins
Normal (default)	Short 1-2
Clear CMOS	Short 2-3

JSPI1: SPI Interface(debug only)



Pin No.	Description	Pin No.	Description
1	SPI HOLD	2	N.C
3	SPI CS#	4	SPI VCC
5	SPI MO	6	N.C
7	N.C	8	SPI CLK
9	GND	10	SPI MI

Chapter 4:
Hardware Setup

Preparing the Hardware Installation

WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, please make sure the device is totally powered off and without any power source connected.

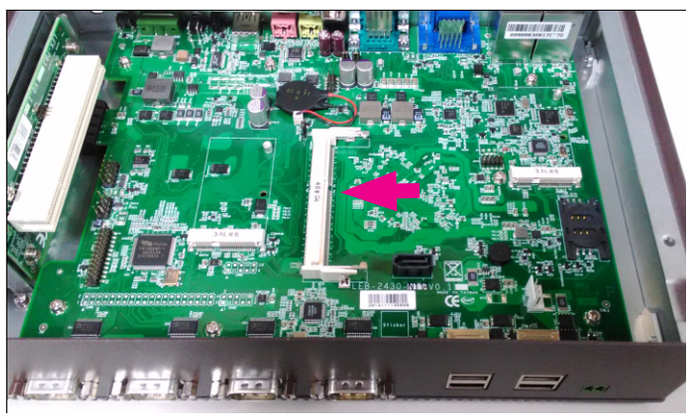
1. Turn the system upside down and remove the 4 rubber feet on the bottom compartment, as circled in the image below.

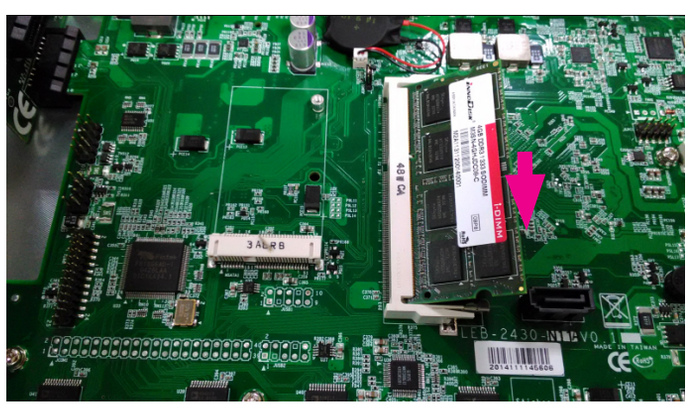
2. Lift the compartment up to access the motherboard.

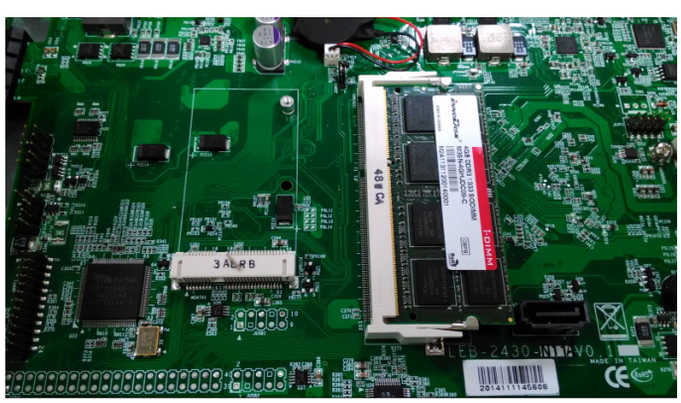
Installing the System Memory

The motherboard comes with one DDR3L SO-DIMM socket. Please follow the steps below for installation.

1. Align the memory module's key with the SO-DIMM socket's key.
2. Install the SO-DIMM until firmly seated.







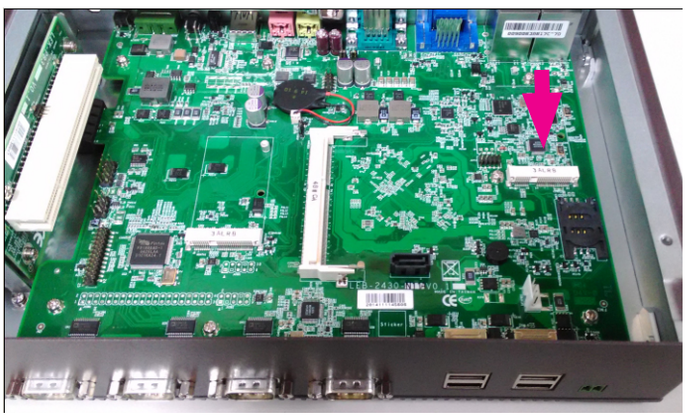
Note:

1. The SO-DIMM to be installed should meet the required frequency which is 1333 MHz for this system. Do not install SO-DIMM supporting different frequencies.
2. The motherboards can support up to 8 GB memory capacity in maximum.

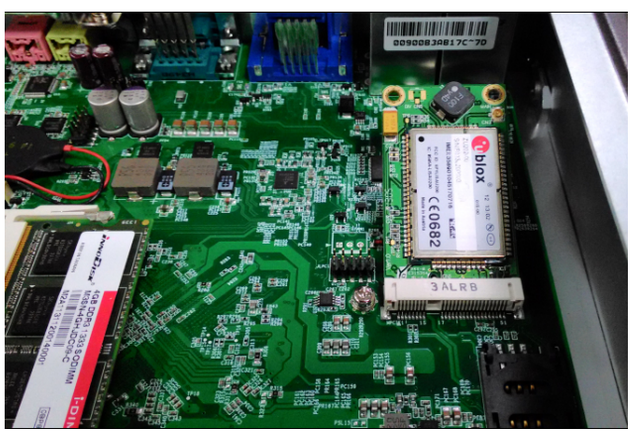
Installing a Mini PCIe Module

The system comes with a mini PCIe socket. Please follow the steps below for installing a mini PCIe module.

1. Locate the mini-PCIe socket on the board.



2. Align the notches and insert the module.

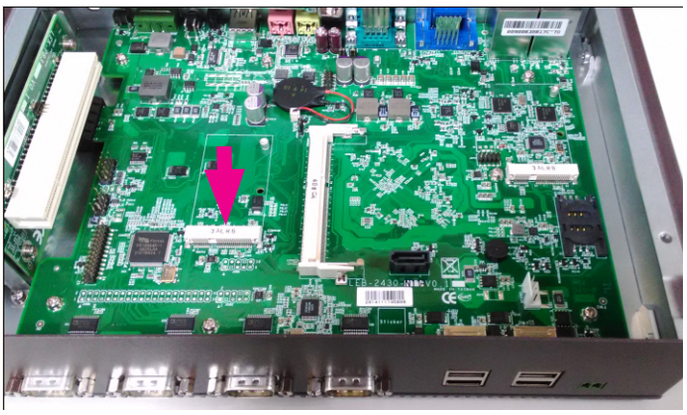


3. Press module down and apply a screw to secure it.

Installing a mSATA Storage Module

The system comes with a mSATA socket. Please follow the steps below for installing a mSATA storage module.

1. Locate the mSATA socket on the board.

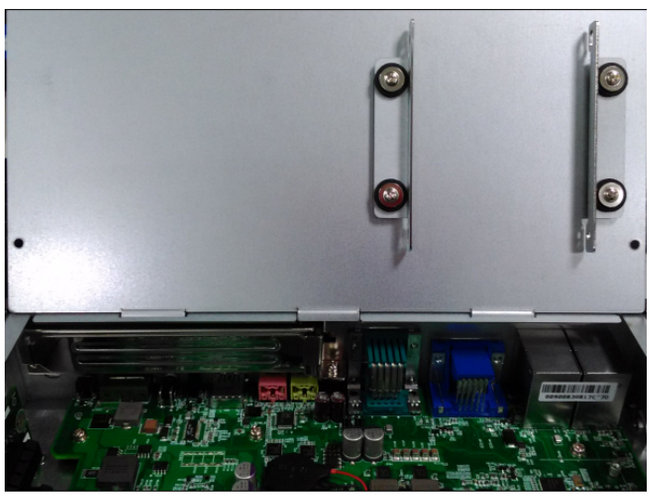


2. Please follow the way mini PCIe module is installed to secure the mSATA module. (The installation method of mSATA and mini PCIe modules is the same.)

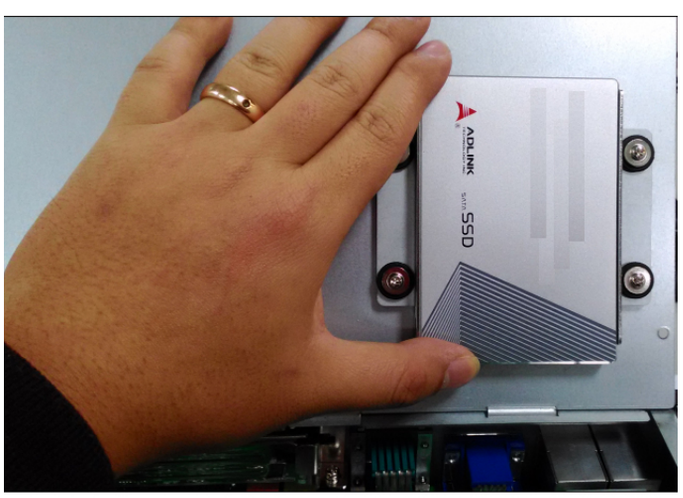
Installing A Disk Drive

The system comes with a disk drive tray supporting SATA 2.5" HDD/SSD. Please follow the steps below for installation.

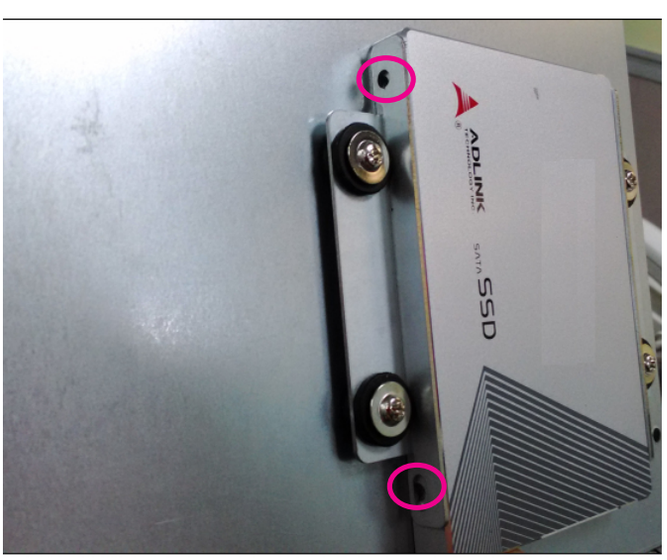
1. Once the bottom compartment is lifted, there is a SATA2.5 disk drive tray on the internal side of the compartment.



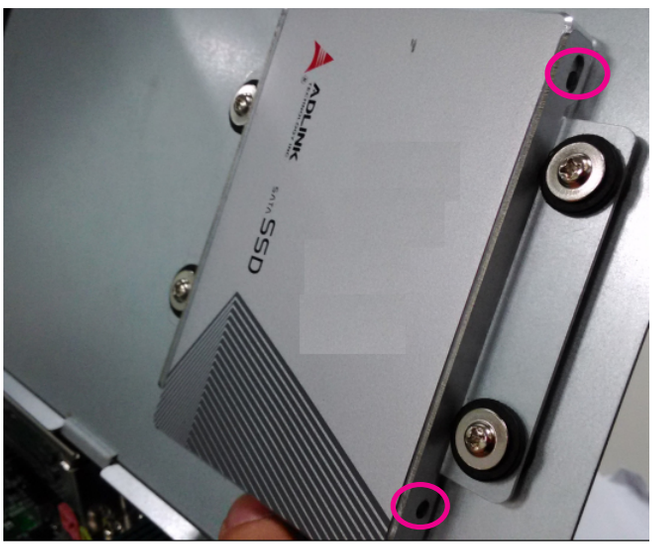
2. Place a SATA 2.5" HDD/SSD into the tray.



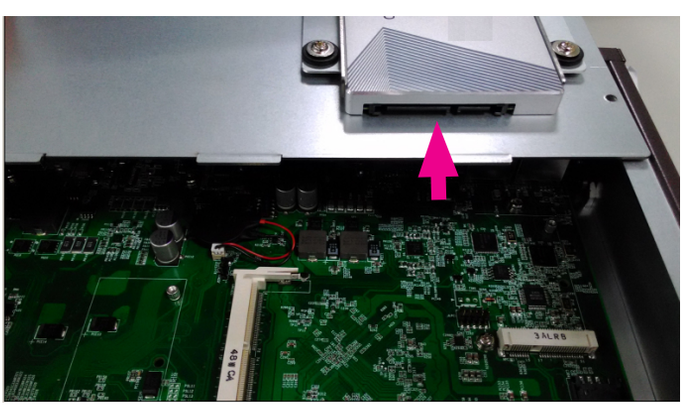
3. Lock the disk drive with 2 screws on each side.

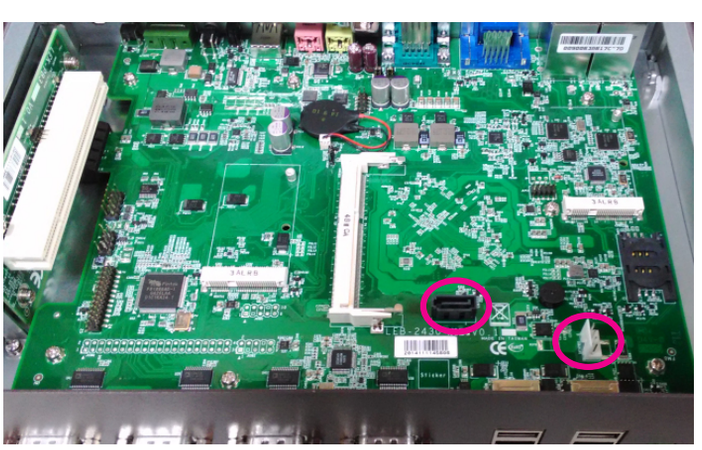


4. Repeat step 3 on the other side.



5. Connect SATA signal and power cables between the drive's SATA connector and the SATA signal and power connectors on the board.

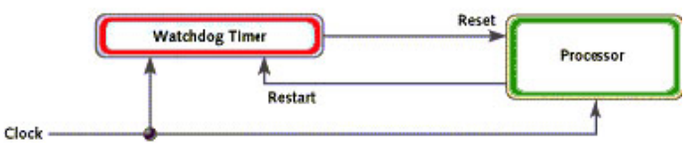




Appendix A: Programming Watchdog Timer

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in case there are any problems. Generally speaking, a watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is presumed to be malfunctioning and the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power.

For sample watchdog code, see *WD* folder under Driver and Utility on the *Driver and Manual CD*



Appendix B: Terms and Conditions

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:

Improper or inadequate maintenance by the customer Unauthorized modification, misuse, or reversed engineering of the product Operation outside of the environmental specifications for the product.

RMA Service

Requesting a RMA#

6. To obtain a RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
7. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
8. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
9. Mark the RMA# clearly on the box.

Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:	Reasons to Return: □ Repair(Please include failure details) □ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____ Shipping by: □ Air Freight □ Sea □ Express_____ □ Others:_____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

Request Party

_____

Authorized Signature / Date

Confirmed By Supplier

_____

Authorized Signature / Date