

VBOX-3620-M12X

In-Vehicle Computing

User's Manual

Version 1.1

Document Name		VBOX-3620-M12X User Manual		Document No.	UM2017362010
Version		1.1		Date	Feb 20, 2019
Reversion History :					
Reversion		Date	Notes		Author(s)
From	To	Jan 31, 2018	Initial document issued		Stanley Chou
1.0	1.1	Feb 20, 2019	Change Engineering Specification		Stanley Chou

SINTRONES® Technology Corp.

User Manual

Copyright

©2009 by SINTRONES® Technology Corp. All Rights Reserved.

No part of this publication may be reproduced, transcribed, stored in a retrieval system, translated into any language, or transmitted in any form or by any means such as electronic, mechanical, magnetic, optical, chemical, photocopy, manual, or otherwise, without prior written permission from SINTRONES® Technology Corp.

Other brands and product names used herein are for identification purposes only and may be trademarks of their respective owners.

Disclaimer

SINTRONES® Technology Corp. shall not be liable for any incidental or consequential damages resulting from the performance or use of this product.

SINTRONES® Technology Corp. makes no representation or warranty regarding the content of this manual. Information in this manual had been carefully checked for accuracy; however, no guarantee is given as to the correctness of the contents. For continuing product improvement, SINTRONES® Technology Corp. reserves the right to revise the manual or make changes to the specifications of this product at any time without notice and obligation to any person or entity regarding such change. The information contained in this manual is provided for general use by customers.

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

1. This device may not cause harmful interference.
2. This device must withstand any background interference including those that may cause undesired operation.

Safety Information

Read the following precautions before setting up a SINTRONES Product.

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

CAUTION

Incorrectly replacing the battery may damage this computer. Replace only with the same or its equivalent as recommended by SINTRONES® Technology Corp. Dispose used battery according to the manufacturer's instructions.

Technical Support

Please do not hesitate to call or e-mail our customer service when you still cannot fix the problems.

Tel : +886-2-82280101

Fax : +886-2-82280100

E-mail : sales@sintrones.com

Website : www.sintrones.com

TABLE OF CONTENTS

	<u>Page #</u>
1.0 <i>Introduction</i>.....	1-1
1.1 Model Specification	1-1
1.2 VBOX-3620-M12X Illustration (MB, System)	1-3
1.3 Architecture.....	1-5
1.4 Principal component Specification.....	1-6
2.0 <i>Internal Connector Specification</i>.....	2-1
2.1 LAN1 Connector	2-1
2.2 LAN2 Connector	2-2
2.3 LAN3 Connector	2-3
2.4 MINI PCI-E Connector (MINICARD1)	2-4
2.5 MINI PCI-E Connector (MINICARD2)	2-6
2.6 MINI PCI-E Connector (MINICARD3)	2-8
2.7 NGFF Connector (M_2).....	2-10
2.8 DIO1 JST Connector (GPIO1)	2-12
2.9 COM JST Connector (COM3)	2-13
2.10 COM JST Connector (COM4)	2-14
2.11 USB JST Connector (USB3)	2-15
2.12 SATA Connector (SATA3)	2-16
2.13 JSIM JST Connector (JSIM).....	2-17
2.14 IGN JST Connector (IGN1)	2-18
2.15 PWR1 JST Connector (PWR1).....	2-19
2.16 UPS JST Connector (UPS1)	2-20
2.17 SATA Power Connector (SPWR1).....	2-21
3.0 <i>External Connector Specification</i>	3-1
3.1 DP Connector (DP1)	3-1
3.2 DP Connector (DP2)	3-2
3.3 VGA Connector (VGA1)	3-3
3.4 COM Connector (COM1).....	3-4
3.5 COM Connector (COM2).....	3-5

3.6	USB 2.0 Connector	3-6
3.7	USB 3.0 Connector	3-7
3.8	Remote Connector	3-8
4.0	<i>System Installation.....</i>	4-1
4.1	System Introduction	4-1
4.2	Opening Chassis.....	4-2
4.3	Installing Memory	4-4
4.4	Installing MINI PCIe Expansion Card (PCIe 1, 3G Module only)	4-6
4.5	Installing MINI PCIe Expansion Card (PCIe 2).....	4-8
4.6	Installing MINI PCIe Expansion Card (PCIe 3).....	4-10
4.7	Installing SATADOM Module	4-12
4.8	Installing Internal Antenna Cable	4-14
4.9	Installing SIM Card	4-18
4.10	Installing HDD.....	4-20
4.11	Installing Battery Module	4-23
4.12	Installing SIM-6A Module.....	4-25
5.0	<i>BIOS.....</i>	5-1
5.1	Enter The BIOS.....	5-1
5.2	Main	5-3
5.3	Advanced	5-4
5.4	Chipset.....	5-10
5.5	Boot.....	5-13
5.6	Security.....	5-15
5.7	Exit	5-16
6.0	<i>Packing List.....</i>	6-1
6.1	Packing List	6-1

1.0 INTRODUCTION

1.0 INTRODUCTION

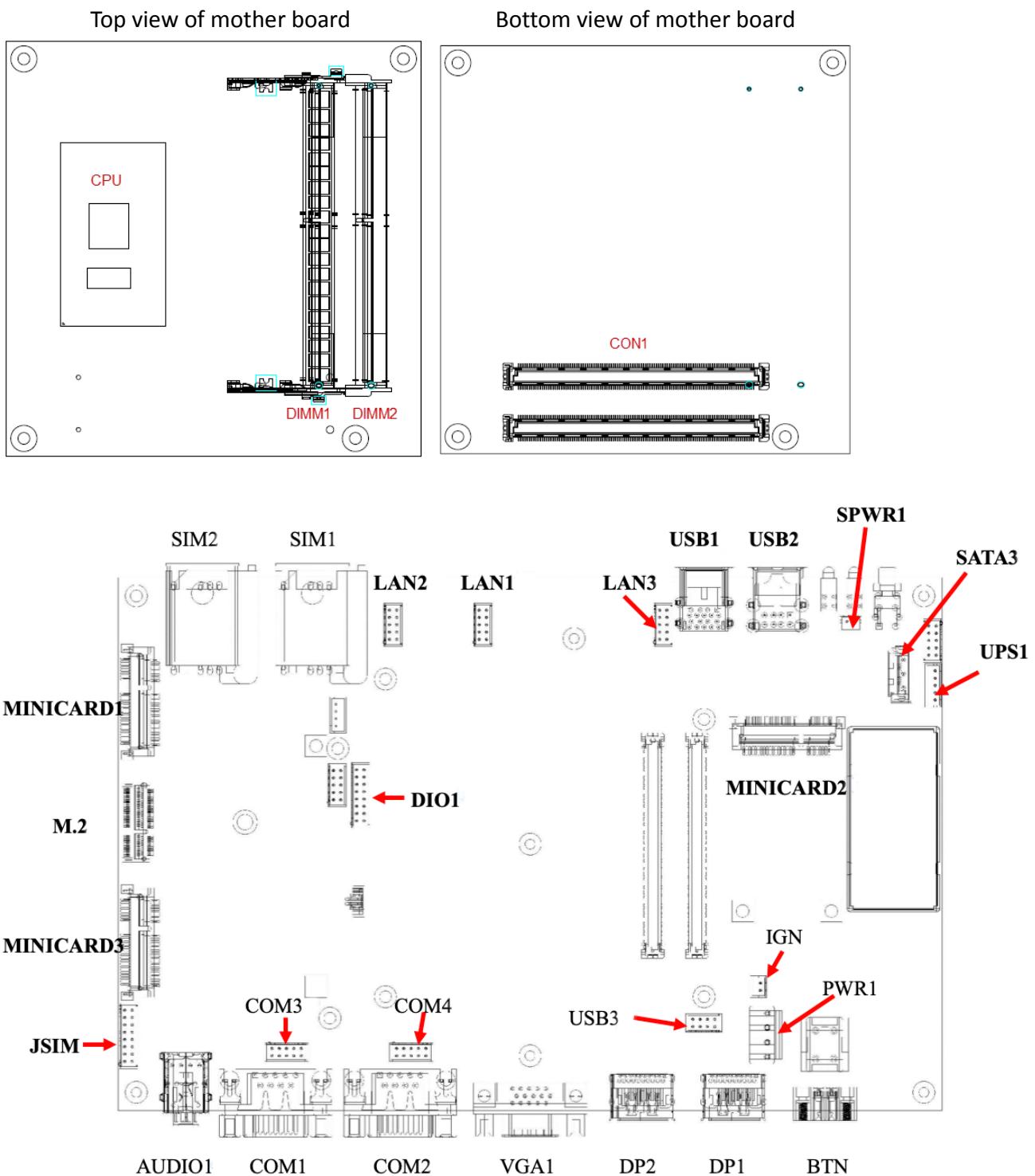
1.1 Model Specification



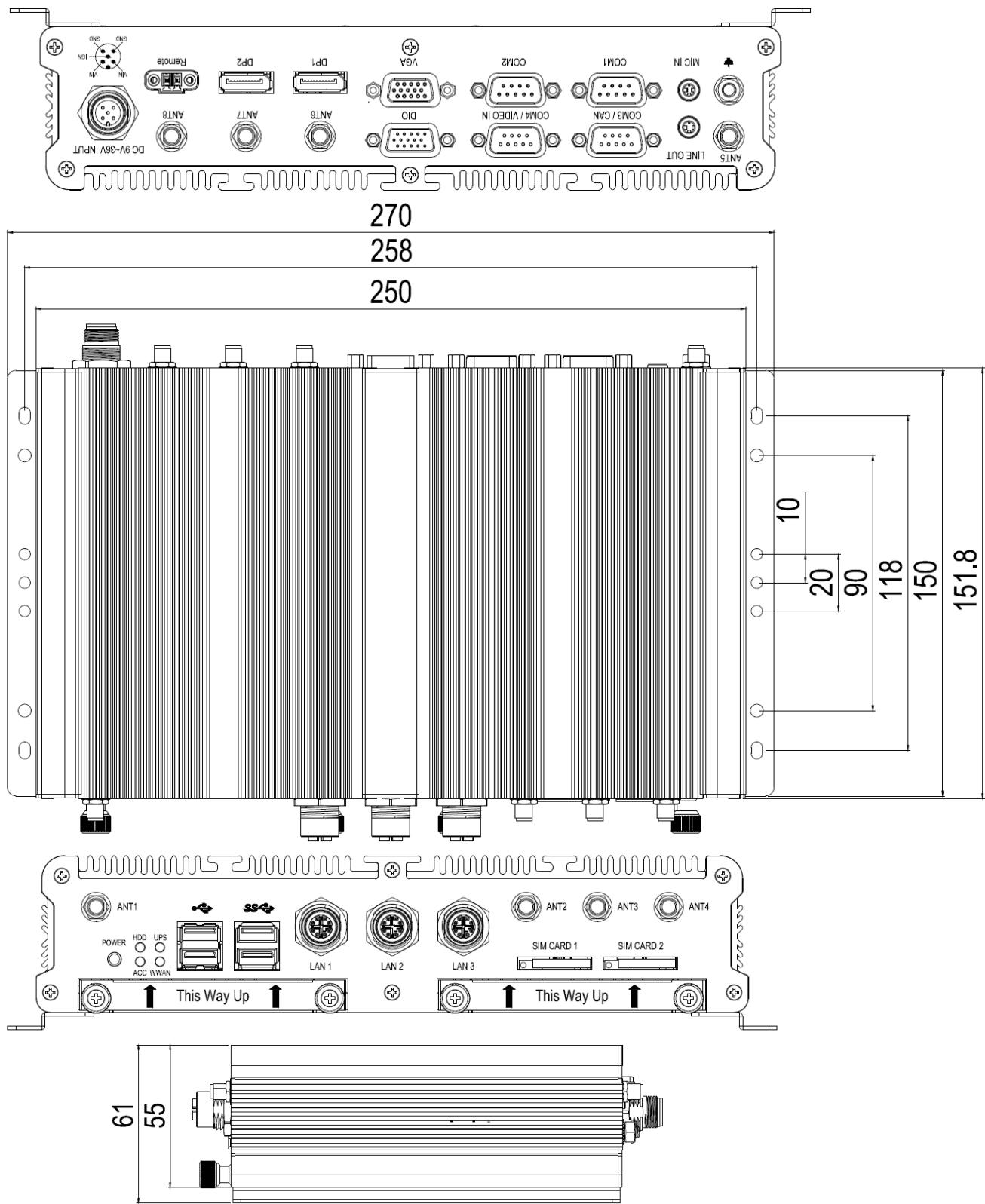
System	
CPU	Intel Gen 6 Core i7-6600U 2.6GHz up to 3.4GHz Intel Gen 6 Core i5-6300U 2.4GHz up to 3.0GHz Intel Gen 6 Core i3-6100U 2.3GHz Intel Gen 6 Dual Core 3955U 2.0GHz
Memory	2 x SO-DIMM DDR4 up to 32GB
LAN Chipset	2 x Intel I210-AT and 1 x Intel i219LM
Audio	Realtek ALC662 HD Codec onboard
Watchdog	Watchdog Timer Support, Offer 1 – 255 Step
Power Requirement	
Power Input	9V-36V DC Power Input
Power Protection	Automatic Recovery Short Circuit Protection
Power Management	Vehicle Power Ignition for Variety Vehicle
Power Off Control	Power off Delay Time Setting by BIOS and Software
Battery	Internal Battery Kit for 10 Mins Operating (Optional) *cannot use with optional SIM-6A (6 x SIM card module) in the same time.
Storage	
Type	2 x 2.5" Drive Bay for SATA Type HDD / SSD, Support RAID 0, 1 1 x SATA DOM

Graphics	
Graphics	Intel® HD Graphics 520 DirectX Video Acceleration (DXVA) for Accelerating Video Processing - Full AVC/VC1/MPEG2 HW Decode Supports DirectX 11/10.1/10/9 and OpenGL 4.0
Resolution	Up to 4096 x 2304@60Hz
I/O	
Serial Port	4 x RS-232/422/485 with isolation (Auto Direction Control))
USB Port	2 x USB 3.0 Ports, 2 x USB 2.0 Ports
LAN	3 x 10/100/1000 Mb/s w/ M12 x-code (1 port with iAMT)
Video Port	2 x DP Port, 1 x VGA (Support Triple Independent Display)
DIO Port	8 x GPI and 4 x GPO with isolation
Audio	1 x Line-out and 1 x Mic-in (Line-in Optional)
SIM Card Socket	2 x SIM Card Sockets, supported onboard with eject 6 x SIM Card Sockets (Optional) *cannot use with optional Battery backup module in the same time.
Expansion Bus	3 x Mini-card slots 2 x M.2 slot
Environment	
Operating Temp.	-40°C ~ 70°C
Storage Temp.	-40°C ~ 80°C
Relative Humidity	0% RH– 95% RH
Vibration (random)	IEC60068-2-64, random, 2.5G@5~500Hz, 1hr/axis with SSD
Vibration Operating	MIL-STD-810G, Method 514.6, Procedure I, Category 4
Shock	Operating: MIL-STD-810G, Method 516.6, Procedure I, Trucks and semi-trailers=15G (11ms) with SSD
Certifications	CE, FCC Class A, EN50155, EN50121
Mechanical	
Construction	Aluminum alloy
Mounting	Supports both of wall-mount/VESA-mount
Weight	1.9 kg (bare-bone)
Dimensions	250 x 150 x 55 mm

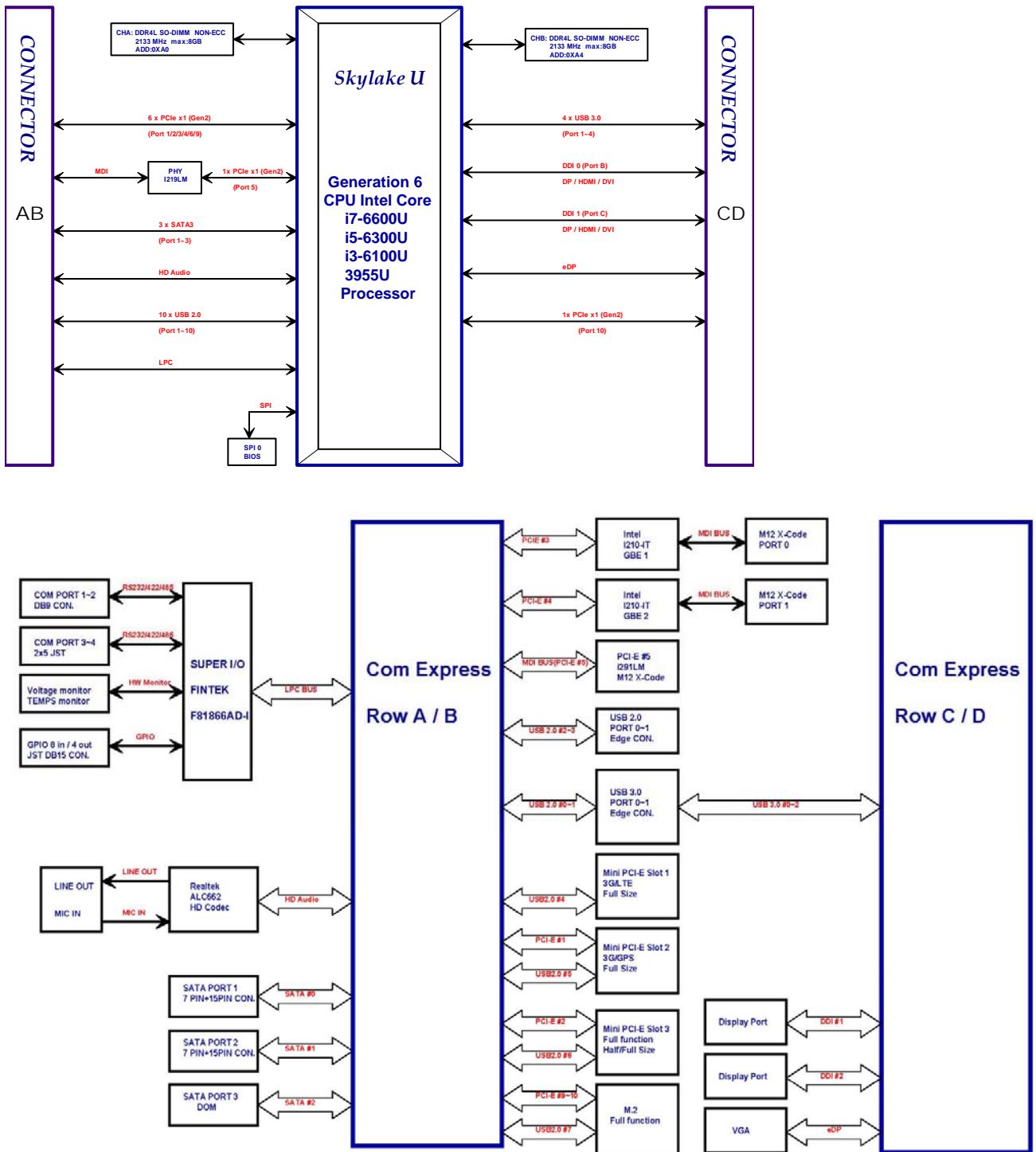
1.2 VBOX-3620-M12X Illustration (MB, System)



System



1.3 Architecture



1.4 Principal component Specification

CPU

Chip	Description					
Intel	1. Power consumption:					
	CPU	Core Frequency	TDP	Unit	T _j	Cache
	i7-6600U	2.6 GHz	15 W	W	100°C	4MB
	i5-6300U	2.4 GHz	15 W	W	100°C	3MB
	i3-6100U	2.3 GHz	15 W	W	100°C	3MB
	Celeron 3955U	2.0 GHz	15 W	W	100°C	2MB

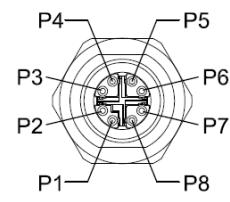
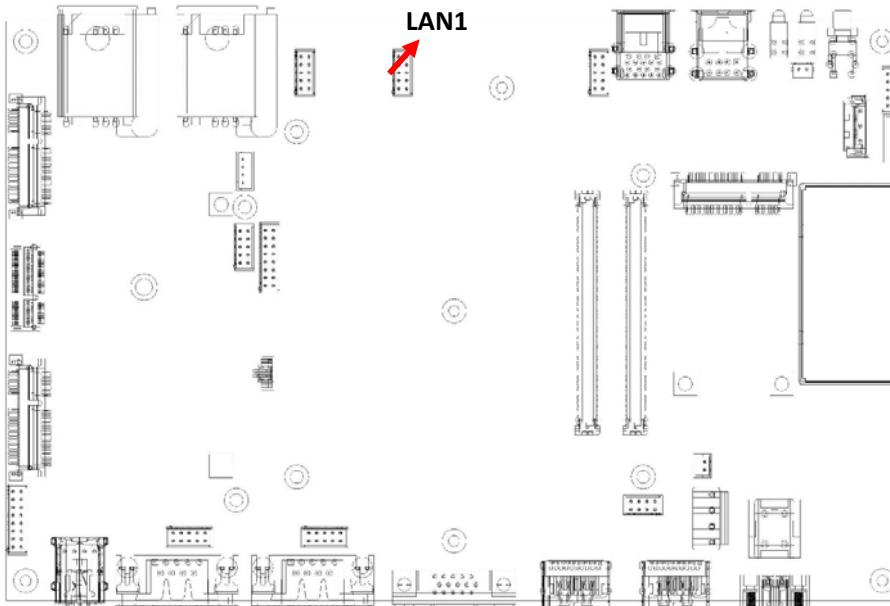
2.0

INTERNAL CONNECTOR

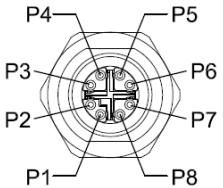
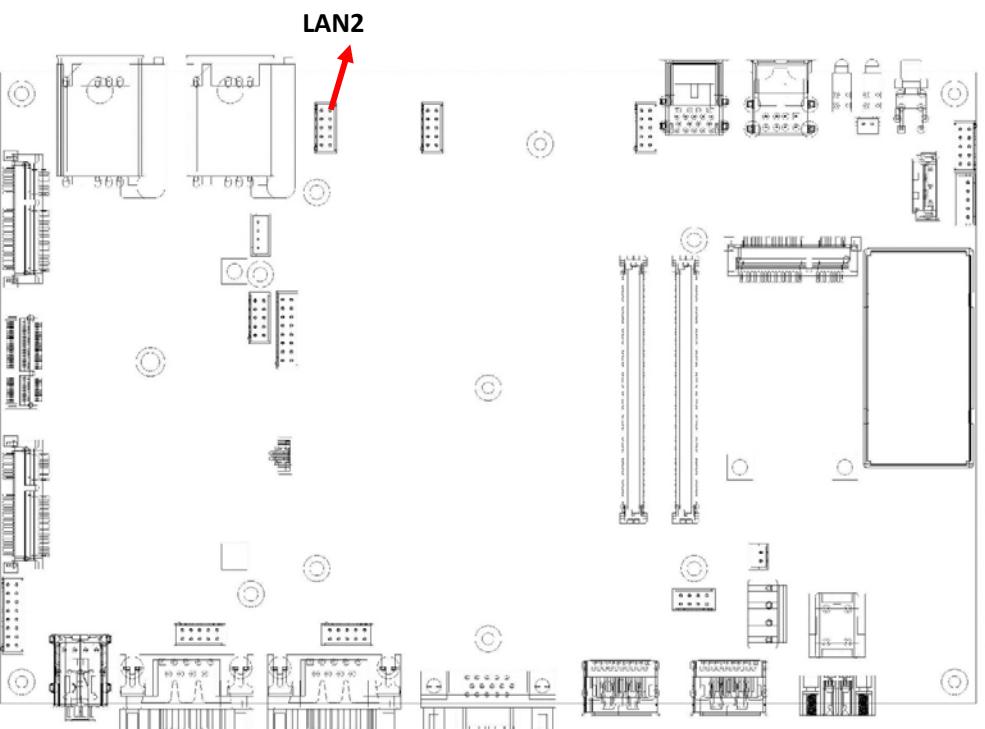
SPECIFICATION

2.0 INTERNAL CONNECTOR SPECIFICATION

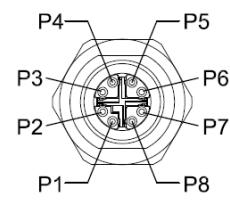
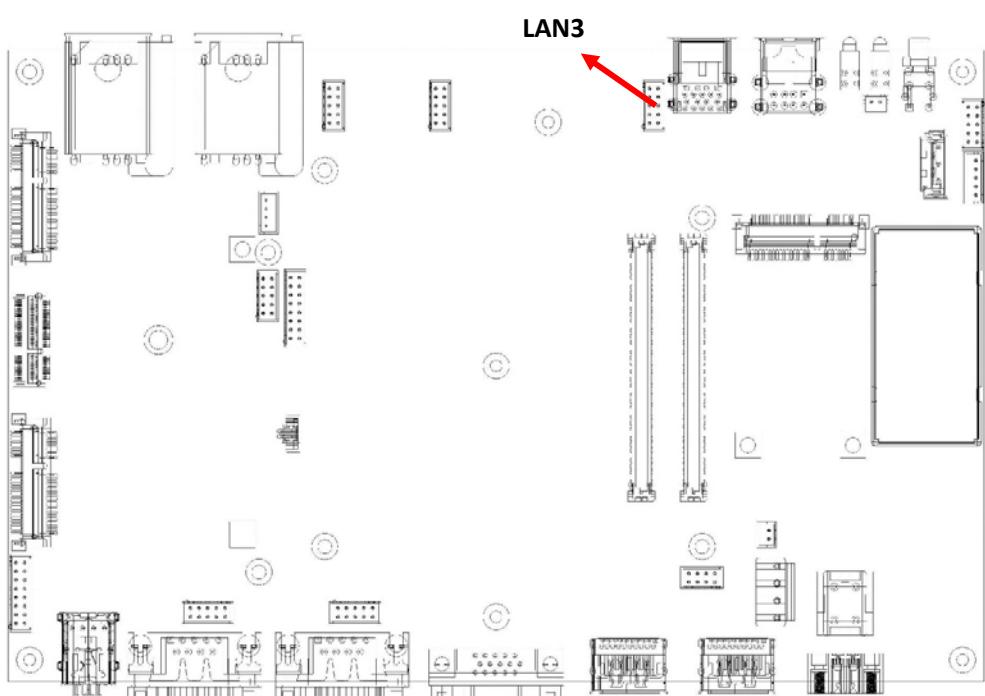
2.1 LAN1 Connector

Connector size	10 Pin																										
Connector type	JST-2.0mm-M-180																										
Connector location	LAN1																										
M12 pin definition	 <table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>LAN1_MDI2N</td> <td>2</td> <td>LAN1_MDI2P</td> </tr> <tr> <td>3</td> <td>LAN1_MDI3N</td> <td>4</td> <td>LAN1_MDI3P</td> </tr> <tr> <td>5</td> <td>LAN1_MDI1N</td> <td>6</td> <td>LAN1_MDI1P</td> </tr> <tr> <td>7</td> <td>LAN1_MDI0P</td> <td>8</td> <td>LAN1_MDI0N</td> </tr> </tbody> </table>			Pin	Signal	Pin	Signal	1	LAN1_MDI2N	2	LAN1_MDI2P	3	LAN1_MDI3N	4	LAN1_MDI3P	5	LAN1_MDI1N	6	LAN1_MDI1P	7	LAN1_MDI0P	8	LAN1_MDI0N				
Pin	Signal	Pin	Signal																								
1	LAN1_MDI2N	2	LAN1_MDI2P																								
3	LAN1_MDI3N	4	LAN1_MDI3P																								
5	LAN1_MDI1N	6	LAN1_MDI1P																								
7	LAN1_MDI0P	8	LAN1_MDI0N																								
Connector pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>LAN1_MDI0P</td> <td>2</td> <td>LAN1_MDI1P</td> </tr> <tr> <td>3</td> <td>LAN1_MDI0N</td> <td>4</td> <td>LAN1_MDI1N</td> </tr> <tr> <td>5</td> <td>LGND_CASE</td> <td>6</td> <td>LGND_CASE</td> </tr> <tr> <td>7</td> <td>LAN1_MDI2P</td> <td>8</td> <td>LAN1_MDI3P</td> </tr> <tr> <td>9</td> <td>LAN1_MDI2N</td> <td>10</td> <td>LAN1_MDI3N</td> </tr> </tbody> </table>			Pin	Signal	Pin	Signal	1	LAN1_MDI0P	2	LAN1_MDI1P	3	LAN1_MDI0N	4	LAN1_MDI1N	5	LGND_CASE	6	LGND_CASE	7	LAN1_MDI2P	8	LAN1_MDI3P	9	LAN1_MDI2N	10	LAN1_MDI3N
Pin	Signal	Pin	Signal																								
1	LAN1_MDI0P	2	LAN1_MDI1P																								
3	LAN1_MDI0N	4	LAN1_MDI1N																								
5	LGND_CASE	6	LGND_CASE																								
7	LAN1_MDI2P	8	LAN1_MDI3P																								
9	LAN1_MDI2N	10	LAN1_MDI3N																								
Connector map																											

2.2 LAN2 Connector

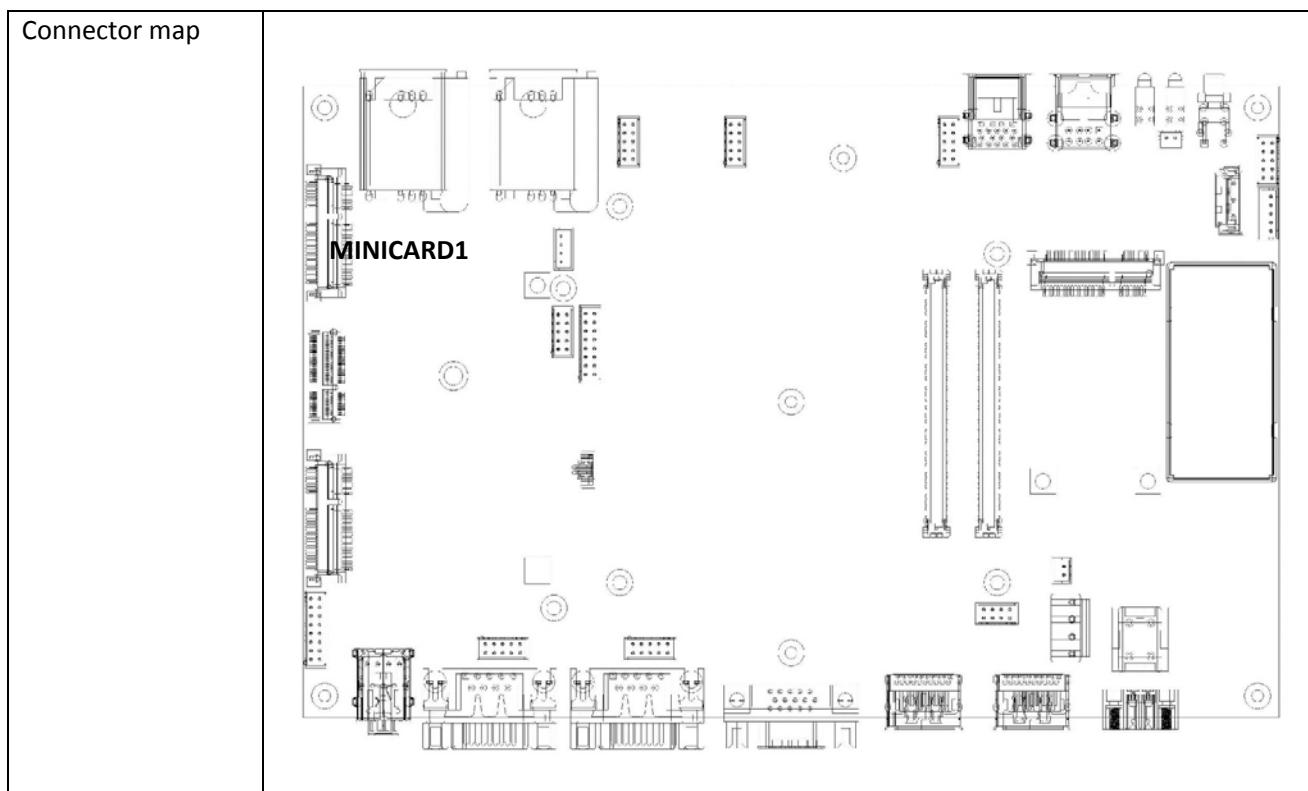
Connector size	10 Pin																											
Connector type	JST-2.0mm-M-180																											
Connector location	LAN2																											
M12 pin definition	 <table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>LAN2_MDI2N</td> <td>2</td> <td>LAN2_MDI2P</td> </tr> <tr> <td>3</td> <td>LAN2_MDI3N</td> <td>4</td> <td>LAN2_MDI3P</td> </tr> <tr> <td>5</td> <td>LAN2_MDI1N</td> <td>6</td> <td>LAN2_MDI1P</td> </tr> <tr> <td>7</td> <td>LAN2_MDI0P</td> <td>8</td> <td>LAN2_MDI0N</td> </tr> </tbody> </table>				Pin	Signal	Pin	Signal	1	LAN2_MDI2N	2	LAN2_MDI2P	3	LAN2_MDI3N	4	LAN2_MDI3P	5	LAN2_MDI1N	6	LAN2_MDI1P	7	LAN2_MDI0P	8	LAN2_MDI0N				
Pin	Signal	Pin	Signal																									
1	LAN2_MDI2N	2	LAN2_MDI2P																									
3	LAN2_MDI3N	4	LAN2_MDI3P																									
5	LAN2_MDI1N	6	LAN2_MDI1P																									
7	LAN2_MDI0P	8	LAN2_MDI0N																									
Connector pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>LAN2_MDI0P</td> <td>2</td> <td>LAN2_MDI1P</td> </tr> <tr> <td>3</td> <td>LAN2_MDI0N</td> <td>4</td> <td>LAN2_MDI1N</td> </tr> <tr> <td>5</td> <td>LGND_CASE</td> <td>6</td> <td>LGND_CASE</td> </tr> <tr> <td>7</td> <td>LAN2_MDI2P</td> <td>8</td> <td>LAN2_MDI3P</td> </tr> <tr> <td>9</td> <td>LAN2_MDI2N</td> <td>10</td> <td>LAN2_MDI3N</td> </tr> </tbody> </table>				Pin	Signal	Pin	Signal	1	LAN2_MDI0P	2	LAN2_MDI1P	3	LAN2_MDI0N	4	LAN2_MDI1N	5	LGND_CASE	6	LGND_CASE	7	LAN2_MDI2P	8	LAN2_MDI3P	9	LAN2_MDI2N	10	LAN2_MDI3N
Pin	Signal	Pin	Signal																									
1	LAN2_MDI0P	2	LAN2_MDI1P																									
3	LAN2_MDI0N	4	LAN2_MDI1N																									
5	LGND_CASE	6	LGND_CASE																									
7	LAN2_MDI2P	8	LAN2_MDI3P																									
9	LAN2_MDI2N	10	LAN2_MDI3N																									
Connector map																												

2.3 LAN3 Connector

Connector size	10 Pin																											
Connector type	JST-2.0mm-M-180																											
Connector location	LAN3																											
M12 pin definition	 <table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>LAN3_MDI2N</td> <td>2</td> <td>LAN3_MDI2P</td> </tr> <tr> <td>3</td> <td>LAN3_MDI3N</td> <td>4</td> <td>LAN3_MDI3P</td> </tr> <tr> <td>5</td> <td>LAN3_MDI1N</td> <td>6</td> <td>LAN3_MDI1P</td> </tr> <tr> <td>7</td> <td>LAN3_MDI0P</td> <td>8</td> <td>LAN3_MDI0N</td> </tr> </tbody> </table>				Pin	Signal	Pin	Signal	1	LAN3_MDI2N	2	LAN3_MDI2P	3	LAN3_MDI3N	4	LAN3_MDI3P	5	LAN3_MDI1N	6	LAN3_MDI1P	7	LAN3_MDI0P	8	LAN3_MDI0N				
Pin	Signal	Pin	Signal																									
1	LAN3_MDI2N	2	LAN3_MDI2P																									
3	LAN3_MDI3N	4	LAN3_MDI3P																									
5	LAN3_MDI1N	6	LAN3_MDI1P																									
7	LAN3_MDI0P	8	LAN3_MDI0N																									
Connector pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>LAN3_MDI0P</td> <td>2</td> <td>LAN3_MDI1P</td> </tr> <tr> <td>3</td> <td>LAN3_MDI0N</td> <td>4</td> <td>LAN3_MDI1N</td> </tr> <tr> <td>5</td> <td>LGND_CASE</td> <td>6</td> <td>LGND_CASE</td> </tr> <tr> <td>7</td> <td>LAN3_MDI2P</td> <td>8</td> <td>LAN3_MDI3P</td> </tr> <tr> <td>9</td> <td>LAN3_MDI2N</td> <td>10</td> <td>LAN3_MDI3N</td> </tr> </tbody> </table>				Pin	Signal	Pin	Signal	1	LAN3_MDI0P	2	LAN3_MDI1P	3	LAN3_MDI0N	4	LAN3_MDI1N	5	LGND_CASE	6	LGND_CASE	7	LAN3_MDI2P	8	LAN3_MDI3P	9	LAN3_MDI2N	10	LAN3_MDI3N
Pin	Signal	Pin	Signal																									
1	LAN3_MDI0P	2	LAN3_MDI1P																									
3	LAN3_MDI0N	4	LAN3_MDI1N																									
5	LGND_CASE	6	LGND_CASE																									
7	LAN3_MDI2P	8	LAN3_MDI3P																									
9	LAN3_MDI2N	10	LAN3_MDI3N																									
Connector map																												

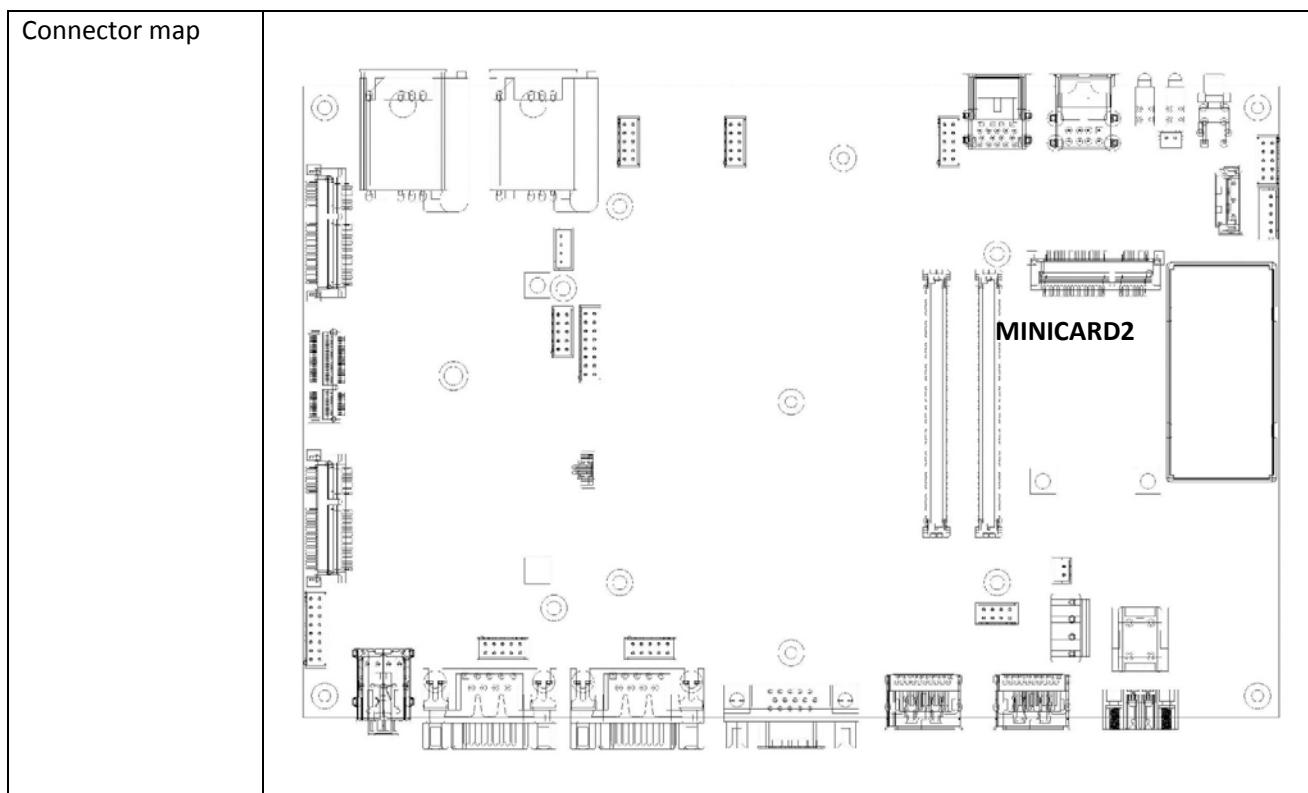
2.4 MINI PCI-E Connector (MINICARD1)

Connector size	2 X 26 = 52 Pin			
Connector type	MINI PCI-E CON 9.2mmH			
Connector location	MINICARD1			
Connector pin definition	Pin	Signal	Pin	Signal
	1	PCIE_WAKE#	2	3VSB
	3	NC	4	GND
	5	NC	6	NC
	7	NC	8	UIM_PWR_A
	9	GND	10	UIM_DAT_A
	11	NC	12	UIM_CLK_A
	13	NC	14	UIM_RST_A
	15	GND	16	NC
	17	NC	18	GND
	19	NC	20	MINICARD0_DIS#
	21	GND	22	PCIE_RST#
	23	NC	24	3VSB
	25	NC	26	GND
	27	GND	28	NC
	29	GND	30	NC
	31	NC	32	NC
	33	NC	34	GND
	35	GND	36	USB_4N
	37	GND	38	USB_4P
	39	3VSB	40	GND
	41	3VSB	42	LED_WWAN_A#
	43	GND	44	NC
	45	NC	46	NC
	47	NC	48	NC
	49	NC	50	GND
	51	NC	52	3VSB



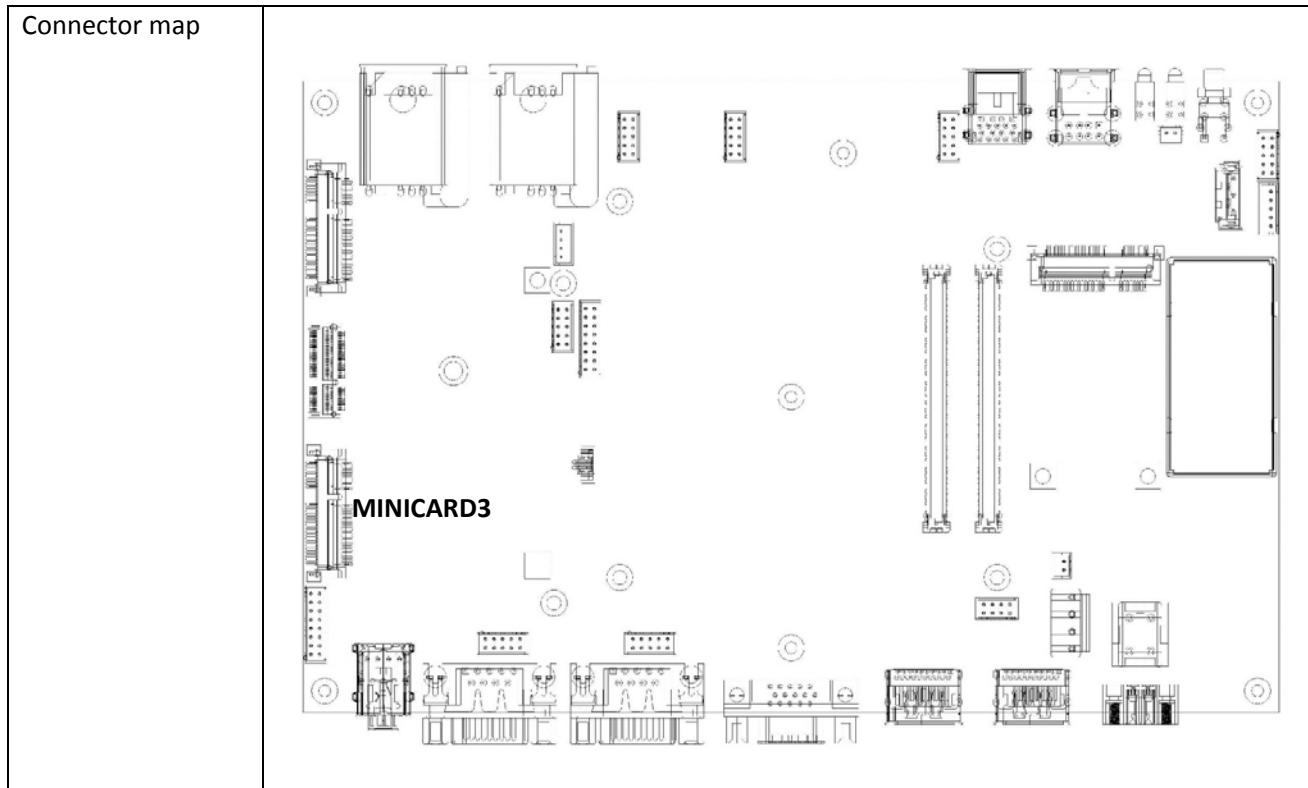
2.5 MINI PCI-E Connector (MINICARD2)

Connector size	2 X 26 = 52 Pin			
Connector type	MINI PCI-E CON 9.2mmH			
Connector location	MINICARD2			
Connector pin definition	Pin	Signal	Pin	Signal
	1	PCIE_WAKE#	2	3VSB
	3	NC	4	GND
	5	NC	6	+1.5V
	7	MINICARD2_CLKREQ#	8	NC
	9	GND	10	NC
	11	PCIE1_MCARD2_CLK_DN	12	NC
	13	PCIE1_MCARD2_CLK_DP	14	NC
	15	GND	16	NC
	17	NC	18	GND
	19	NC	20	MINICARD2_DIS#
	21	GND	22	PCIE_RST#
	23	PCIE1_MCARD2_RX_N	24	3VSB
	25	PCIE1_MCARD2_RX_P	26	GND
	27	GND	28	+1.5V
	29	GND	30	SMB_CLK
	31	PCIE1_MCARD2_TX_N	32	SMB_DATA
	33	PCIE1_MCARD2_TX_P	34	GND
	35	GND	36	USB_5N
	37	GND	38	USB_5P
	39	3VSB	40	GND
	41	3VSB	42	NC
	43	GND	44	NC
	45	NC	46	NC
	47	NC	48	+1.5V
	49	NC	50	GND
	51	NC	52	3VSB



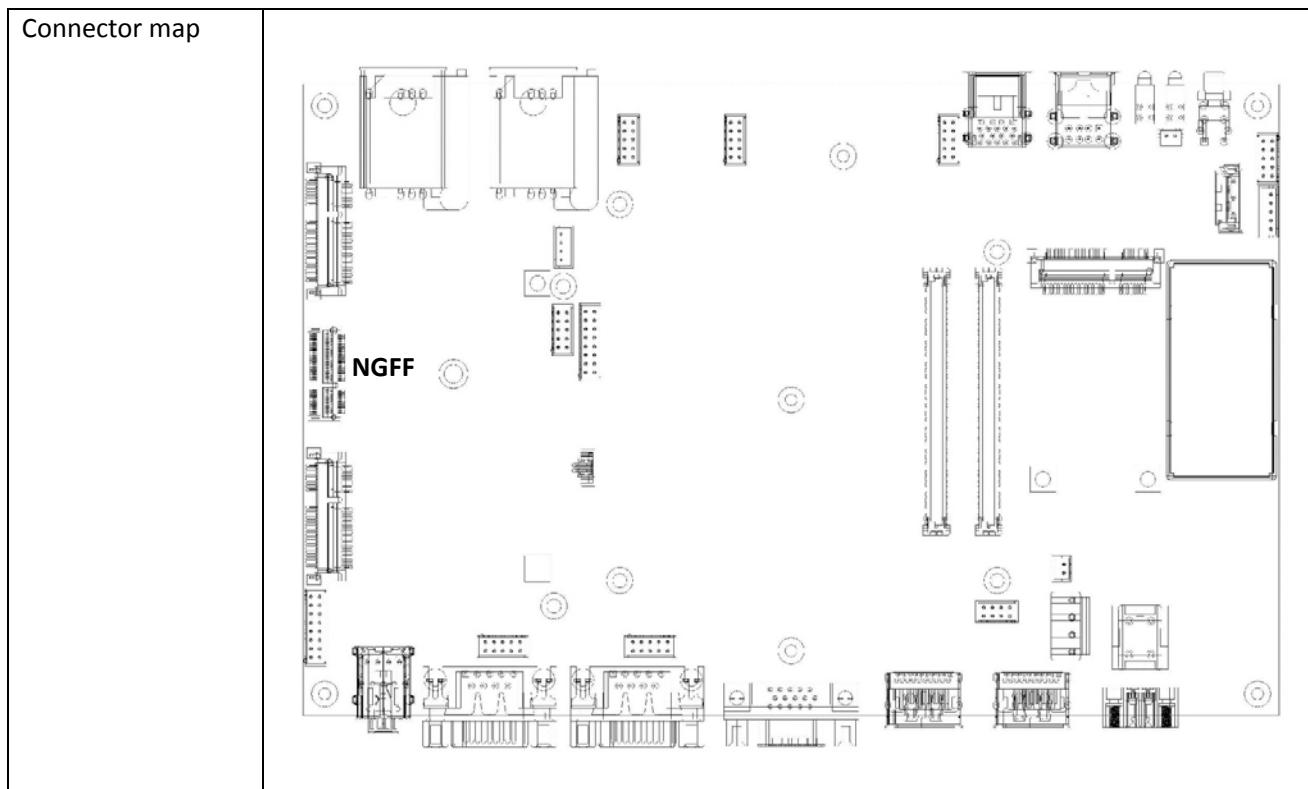
2.6 MINI PCI-E Connector (MINICARD3)

Connector size	2 X 26 = 52 Pin			
Connector type	MINI PCI-E CON 9.2mmH			
Connector location	MINICARD3			
Connector pin definition	Pin	Signal	Pin	Signal
	1	PCIE_WAKE#	2	3VSB
	3	NC	4	GND
	5	NC	6	+1.5V
	7	MINICARD3_CLKREQ#	8	UIM_PWR_C
	9	GND	10	UIM_DAT_C
	11	PCIE2_MCARD3_CLK_DN	12	UIM_CLK_C
	13	PCIE2_MCARD3_CLK_DP	14	UIM_RST_C
	15	GND	16	NC
	17	NC	18	GND
	19	NC	20	MINICARD3_DIS#
	21	GND	22	PCIE_RST#
	23	PCIE2_MCARD3_RX_N	24	3VSB
	25	PCIE2_MCARD3_RX_P	26	GND
	27	GND	28	+1.5V
	29	GND	30	SMB_CLK
	31	PCIE2_MCARD3_TX_N	32	SMB_DATA
	33	PCIE2_MCARD3_TX_P	34	GND
	35	GND	36	USB_6N
	37	GND	38	USB_6P
	39	3VSB	40	GND
	41	3VSB	42	LED_WWAN_C#
	43	GND	44	NC
	45	NC	46	NC
	47	NC	48	+1.5V
	49	NC	50	GND
	51	NC	52	3VSB



2.7 NGFF Connector (M_2)

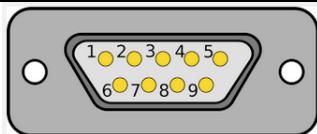
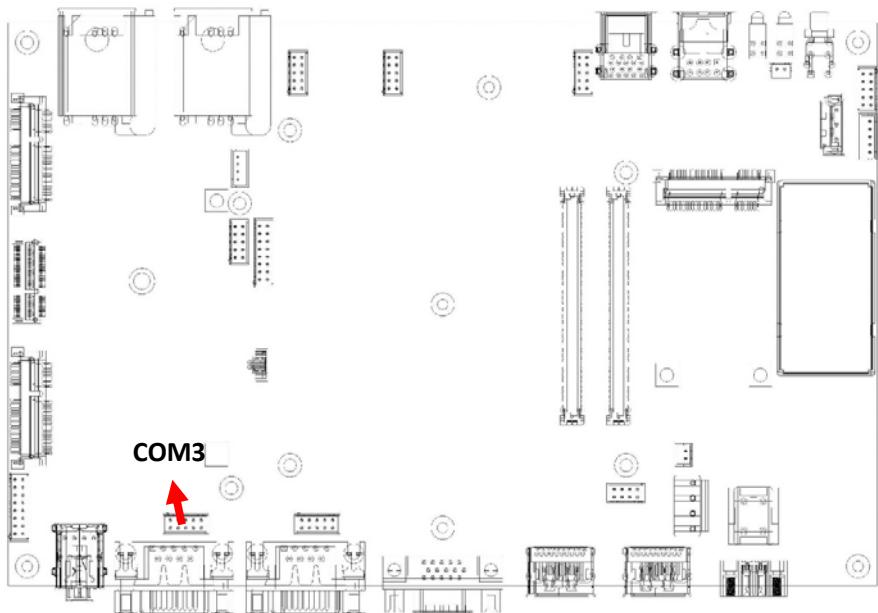
Connector size	2 X 26 = 52 Pin			
Connector type	NGFF _AE KEY_H:8.5mm			
Connector location	M_2			
Connector pin definition	Pin	Signal	Pin	Signal
	1	GND	2	3VSB
	3	USB_7P_L	4	3VSB
	5	USB_7N_L	6	LED1_C_M.2#
	7	NC	8	NC
	9	NC	10	NC
	11	NC	12	NC
	13	NC	14	NC
	15	NC	16	LED2_C_M.2#
	17	NC	18	NC
	19	NC	20	NC
	21	NC	22	NC
	23	NC	24	NC
	25	NC	26	NC
	27	NC	28	NC
	29	NC	30	NC
	31	NC	32	NC
	33	GND	34	NC
	35	PCIE9_M.2_TX_OP_C	36	NC
	37	PCIE9_M.2_TX_ON_C	38	NC
	39	GND	40	NC
	41	PCIE9_M.2_RX_OP_C	42	NC
	43	PCIE9_M.2_RX_ON_C	44	NC
	45	GND	46	NC
	47	PCIE9_M.2_CLK_OP	48	NC
	49	PCIE9_M.2_CLK_ON	50	NC
	51	GND	52	M.2_RST
	53	M.2_CLKREQ0#	54	M.2_DIS2#
	55	PCIE_WAKE0#	56	M.2_DIS1#
	57	GND	58	NC
	59	PCIE10_M.2_TX_1P_C	60	NC
	61	PCIE10_M.2_TX_1N_C	62	NC
	63	GND	64	NC
	65	PCIE10_M.2_RX_1P_C	66	NC
	67	PCIE10_M.2_RX_1N_C	68	M.2_CLKREQ1#
	69	GND	70	PCIE_WAKE0#
	71	PCIE10_M.2_CLK_1P	72	NC
	73	PCIE10_M.2_CLK_1N	74	NC
	75	GND	76	NC



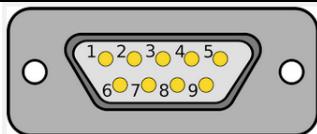
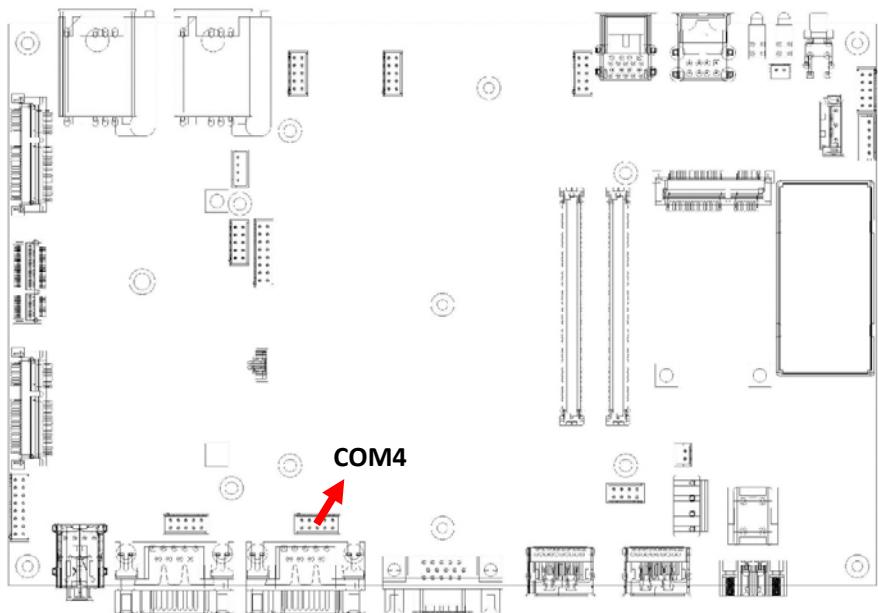
2.8 DIO1 JST Connector (GPIO1)

Connector size	2 X 8 = 16 Pin			
Connector type	JST-2.0mm-M-180			
Connector location	GPIO1			
Connector pin definition	Pin	Signal	Pin	Signal
	1	DO_1(5V@100mA)	2	DO_2(5V@100mA)
	3	DO_3(5V@100mA)	4	DO_1(5V@100mA)
	5	GND_DIO	6	GND_DIO
	7	DI_1 (9V~36V)	8	DI_2 (9V~36V)
	9	DI_3 (9V~36V)	10	DI_4 (9V~36V)
	11	DI_5 (9V~36V)	12	DI_6 (9V~36V)
	13	DI_7 (9V~36V)	14	DI_8 (9V~36V)
DB9 pin definition	Pin	Signal	Pin	Signal
	1	DO_1	2	DO_2
	3	DO_3	4	DO_4
	5	GND	6	GND
	7	DI_1	8	DI_2
	9	DI_3	10	DI_4
	11	DI_5	12	DI_6
	13	DI_7	14	DI_8
Connector map				

2.9 COM JST Connector (COM3)

Connector size	2 X 5 = 10 Pin			
Connector type	JST-2.0mm-M-180			
Connector location	COM3			
Connector pin definition	Pin	Signal	Pin	Signal
	1	SP3_DCD	2	SP3_RXD
	3	SP3_TXD	4	SP3_DTR
	5	GND	6	SP3_DSR
	7	SP3_RTS	8	SP3_CTS
DB9 pin definition	9	SP3_RI	10	COM_GND
				
	Pin	Signal		
		RS232	RS422	RS485
	1	COM3_DCD	TXD-	TXD-/RXD-
	2	COM3_RXD	TXD+	TXD+/RXD+
	3	COM3_TXD	RXD+	NC
	4	COM3_DTR	RXD-	NC
	5	GND	GND	GND
	6	COM3_DSR	NC	NC
Connector map				

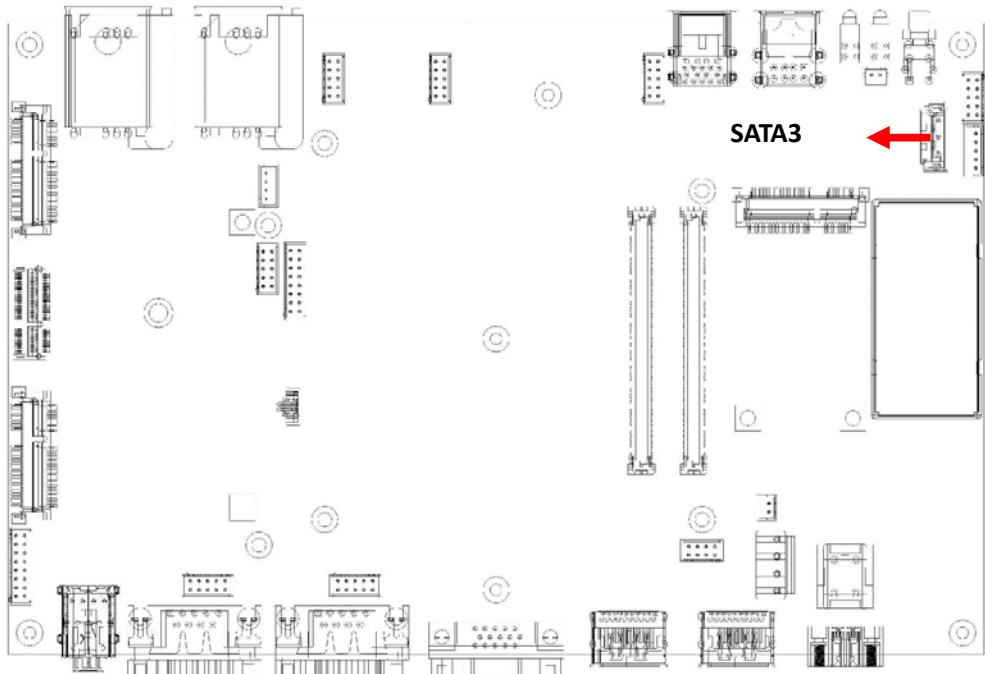
2.10 COM JST Connector (COM4)

Connector size	2 X 5 = 10 Pin			
Connector type	JST-2.0mm-M-180			
Connector location	COM4			
Connector pin definition	Pin	Signal	Pin	Signal
	1	SP4_DCD	2	SP4_RXD
	3	SP4_TXD	4	SP4_DTR
	5	GND	6	SP4_DSR
	7	SP4_RTS	8	SP4_CTS
DB9 pin definition	9	SP4_RI	10	COM_GND
				
	Pin	Signal		
		RS232	RS422	RS485
	1	COM4_DCD	TXD-	TXD-/RXD-
	2	COM4_RXD	TXD+	TXD+/RXD+
	3	COM4_TXD	RXD+	NC
	4	COM4_DTR	RXD-	NC
	5	GND	GND	GND
	6	COM4_DSR	NC	NC
Connector map				

2.11 USB JST Connector (USB3)

Connector size	2 X 4 = 8 Pin			
Connector type	JST-2.0mm-M-180			
Connector location	USB3			
Connector pin definition	Pin	Signal	Pin	Signal
	1	5VSB	2	5VSB
	3	USB_9N_C	4	NC
	5	USB_9P_C	6	NC
Connector map	7	GND	8	GND

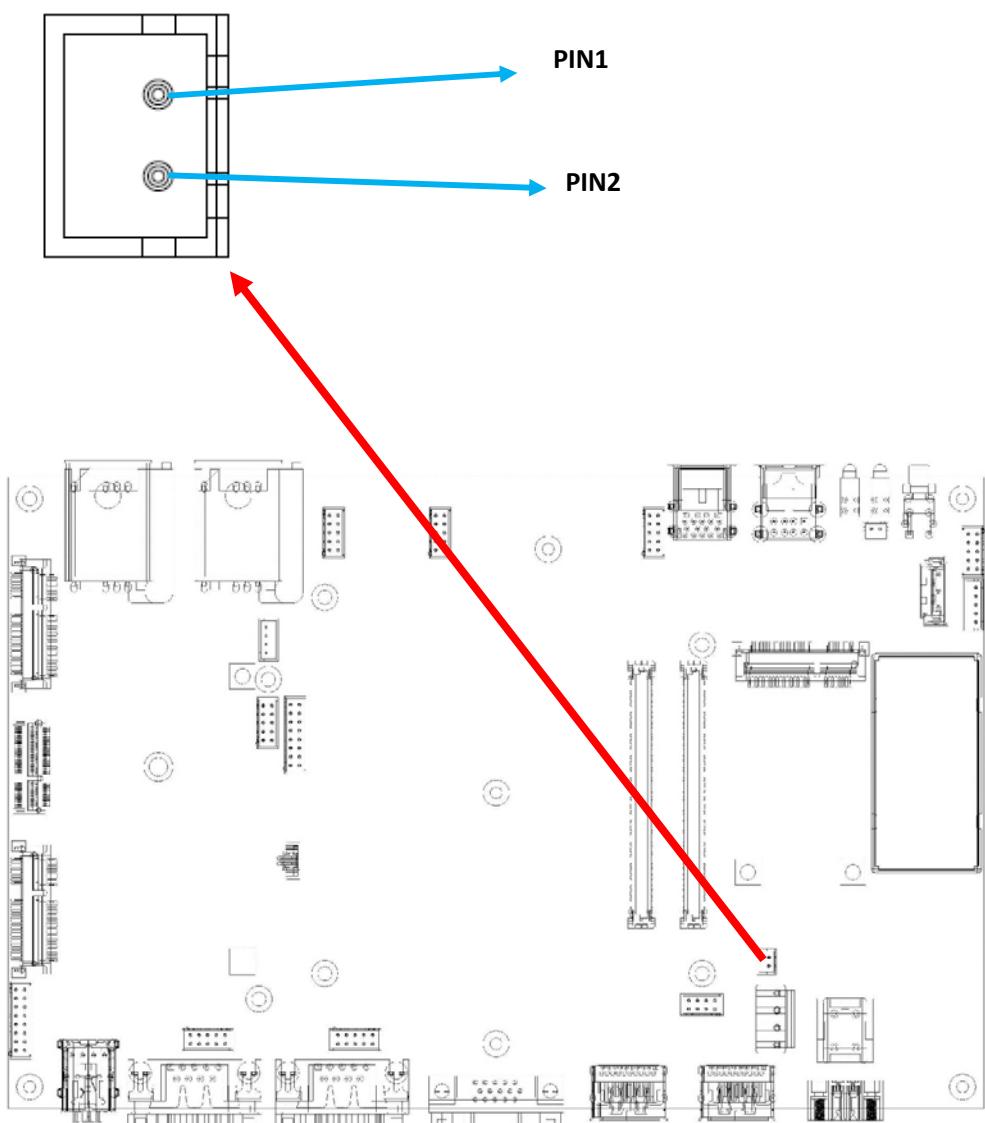
2.12 SATA Connector (SATA3)

Connector size	1 X 7 = 7 Pin																
Connector type	SATA 1.27mm-M-180D																
Connector location	SATA3																
Connector pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GND</td> </tr> <tr> <td>2</td> <td>SATA_TXP2_C</td> </tr> <tr> <td>3</td> <td>SATA_TXN2_C</td> </tr> <tr> <td>4</td> <td>GND</td> </tr> <tr> <td>5</td> <td>SATA_RXN2_C</td> </tr> <tr> <td>6</td> <td>SATA_RXP2_C</td> </tr> <tr> <td>7</td> <td>GND</td> </tr> </tbody> </table>	Pin	Signal	1	GND	2	SATA_TXP2_C	3	SATA_TXN2_C	4	GND	5	SATA_RXN2_C	6	SATA_RXP2_C	7	GND
Pin	Signal																
1	GND																
2	SATA_TXP2_C																
3	SATA_TXN2_C																
4	GND																
5	SATA_RXN2_C																
6	SATA_RXP2_C																
7	GND																
Connector map																	

2.13 JSIM JST Connector (JSIM)

Connector size	2 X 8 = 8 Pin			
Connector type	JST-2.0mm-M-180			
Connector location	JSIM			
Connector pin definition	Pin	Signal	Pin	Signal
	1	5VSB	2	5VSB
	3	5VSB	4	5VSB
	5	GND	6	GND
	7	GND	8	GND
	9	PCIE_WAKE0#	10	SIM_6A_GPIO
	11	Module_SIM_SEL1	12	3VSB_Module1_EN
	13	Module_SIM_SEL2	14	3VSB_Module2_EN
	15	Module_SIM_SEL3	16	3VSB_Module3_EN
Connector map				

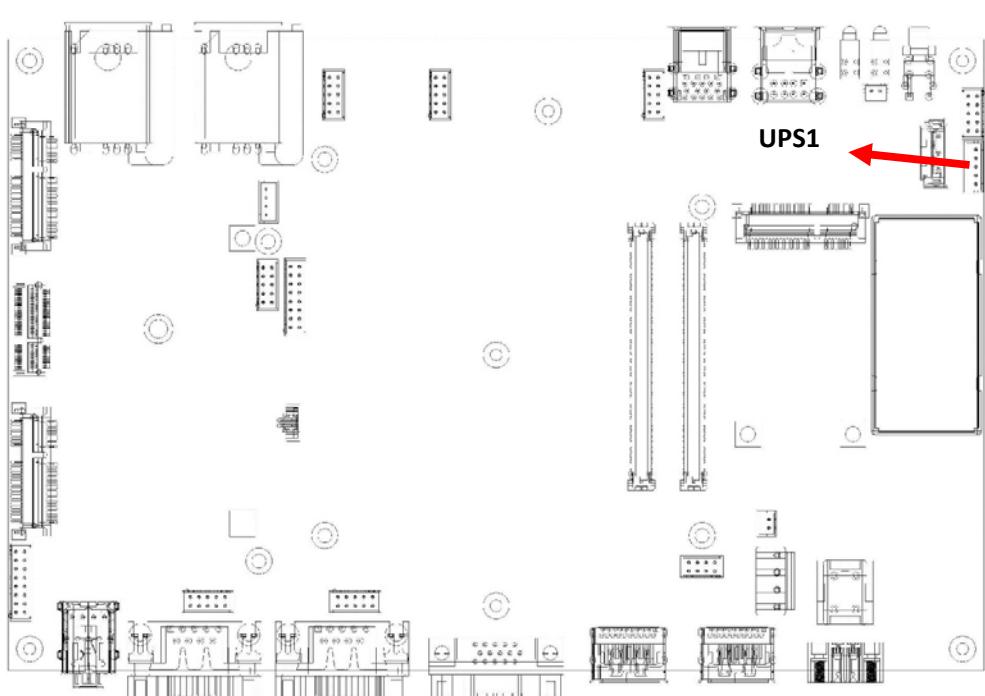
2.14 IGN JST Connector (IGN1)

Connector size	1 X 2 = 2 Pin			
Connector type	JST-2.0mm-M-180			
Connector location	IGN1			
Connector pin definition	Pin	Signal	Pin	Signal
	1	GND_IGN	2	IGNITION
Connector map				

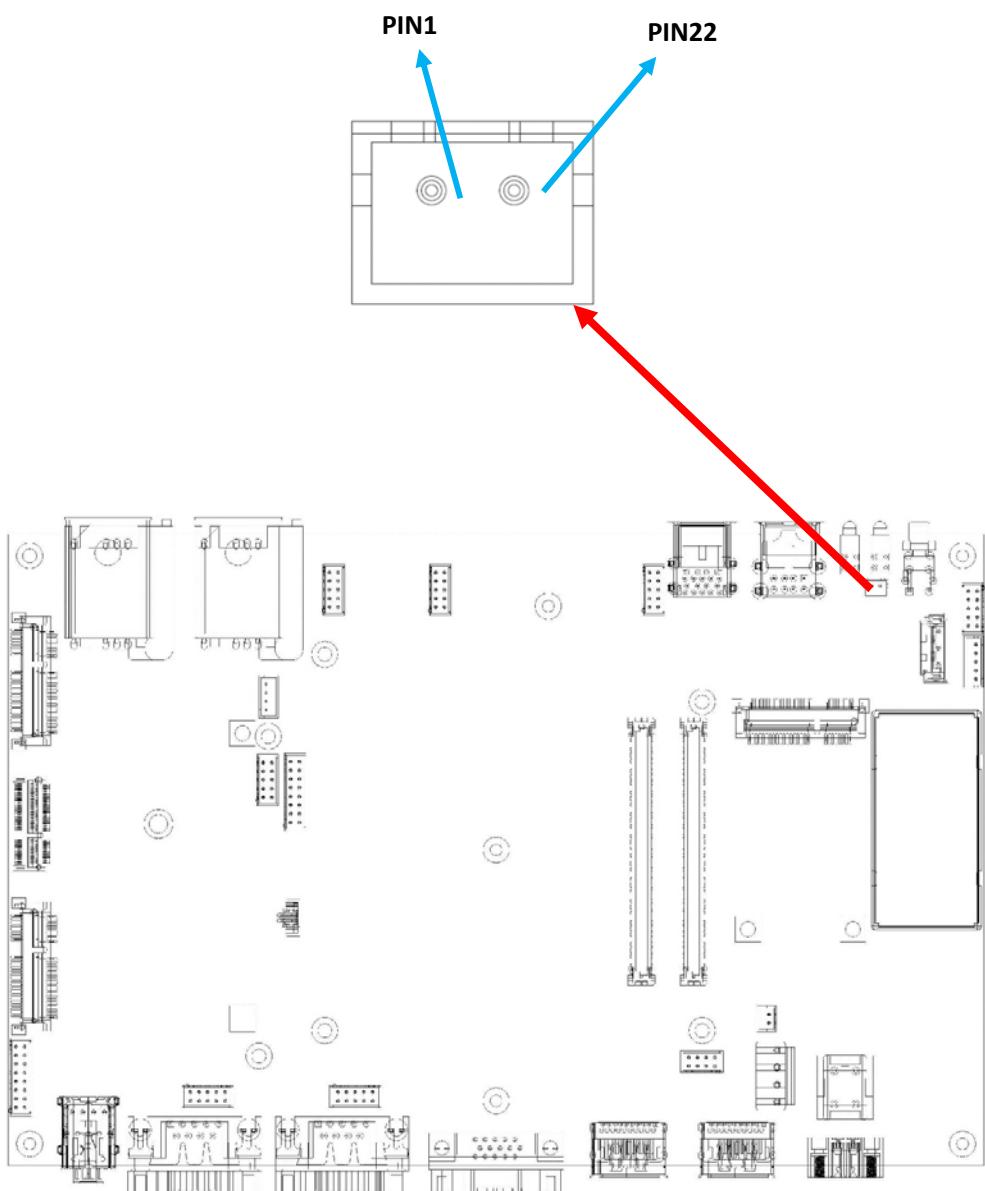
2.15 PWR1 JST Connector (PWR1)

Connector size	1 X 3 = 3 Pin			
Connector type	POWER-3.96mm-M-180			
Connector location	PWR1			
Connector pin definition	Pin	Signal	Pin	Signal
	1	GND	2	GND
	3	VIN	4	VIN
Connector map				

2.16 UPS JST Connector (UPS1)

Connector size	1 X 5 = 5 Pin	
Connector type	WAFER 2.54mm-M-180	
Connector location	UPS1	
Connector pin definition	Pin	Signal
	1	+12V
	2	+12V
	3	NC
	4	GND
	5	GND
Connector map		

2.17 SATA Power Connector (SPWR1)

Connector size	1 X 2 = 2 Pin	
Connector type	JST-2.0mm-M-180	
Connector location	SPWR1	
Connector pin definition	Pin	Signal
	1	GND
	2	+5V
Connector map		

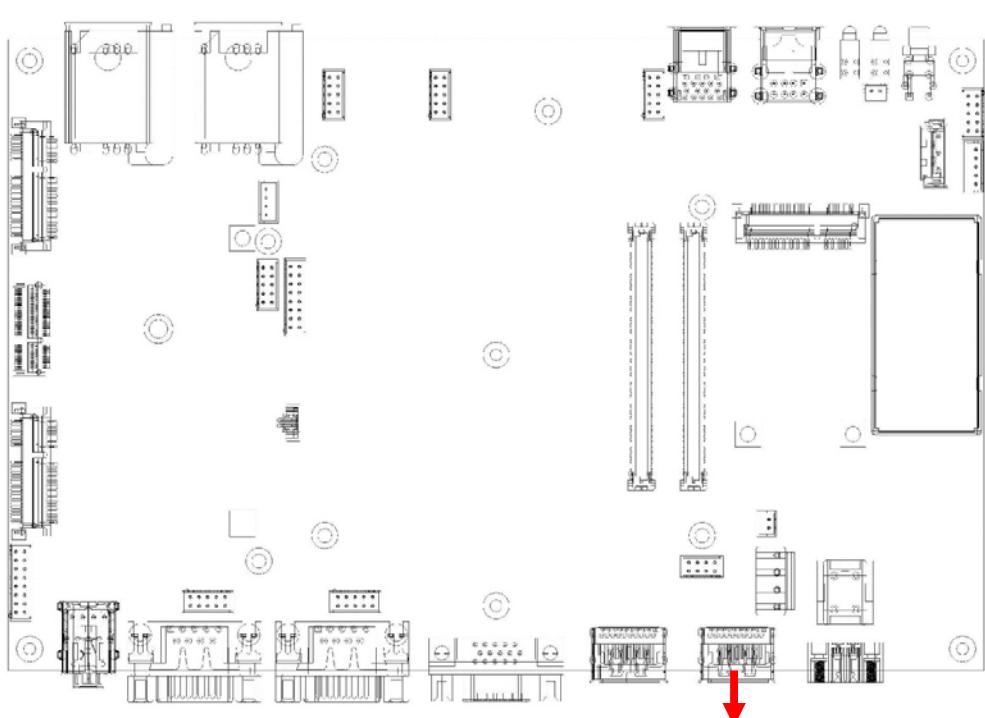
3.0

EXTERNAL CONNECTOR

SPECIFICATION

3.0 EXTERNAL CONNECTOR SPECIFICATION

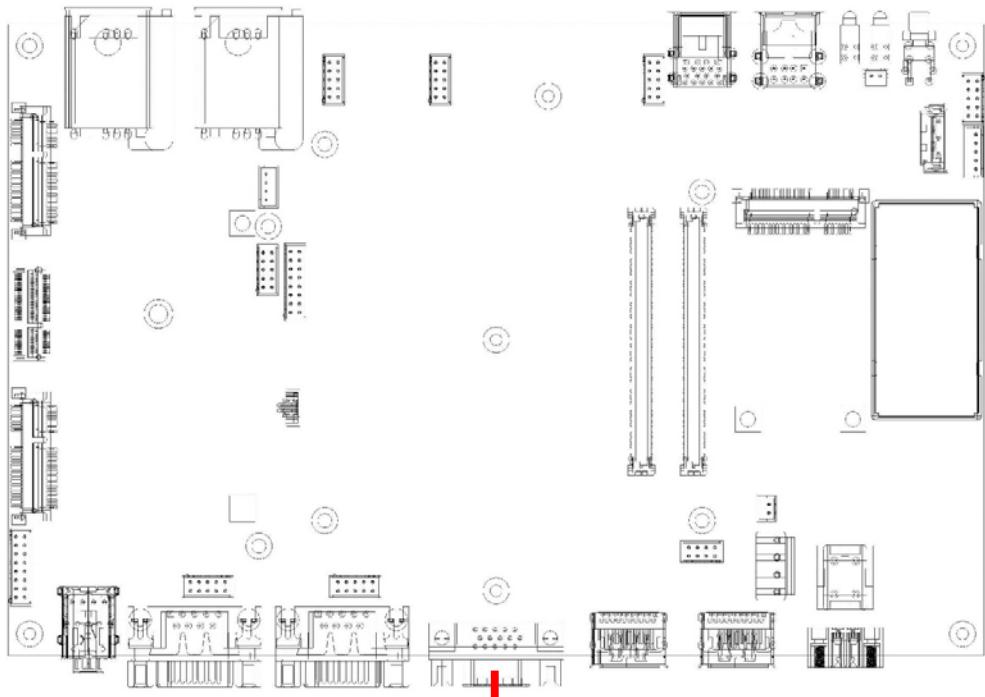
3.1 DP Connector (DP1)

Connector size	20 Pin			
Connector type	DP			
Connector location	DP1			
Connector pin definition	Pin	Signal	Pin	Signal
	1	DP1_LANE_0P	2	GND
	3	DP1_LANE_0N	4	DP1_LANE_1P
	5	GND	6	DP1_LANE_1N
	7	DP1_LANE_2P	8	GND
	9	DP1_LANE_2N	10	DP1_LANE_3P
	11	GND	12	DP1_LANE_3N
	13	DP1_AUX_EN#	14	GND
	15	DDI1_DP_AUXP_CLK	16	GND
	17	DDI1_DP_AUXN_DATA	18	DP1_HPD
Connector map	 DP1			

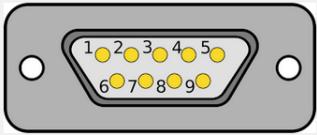
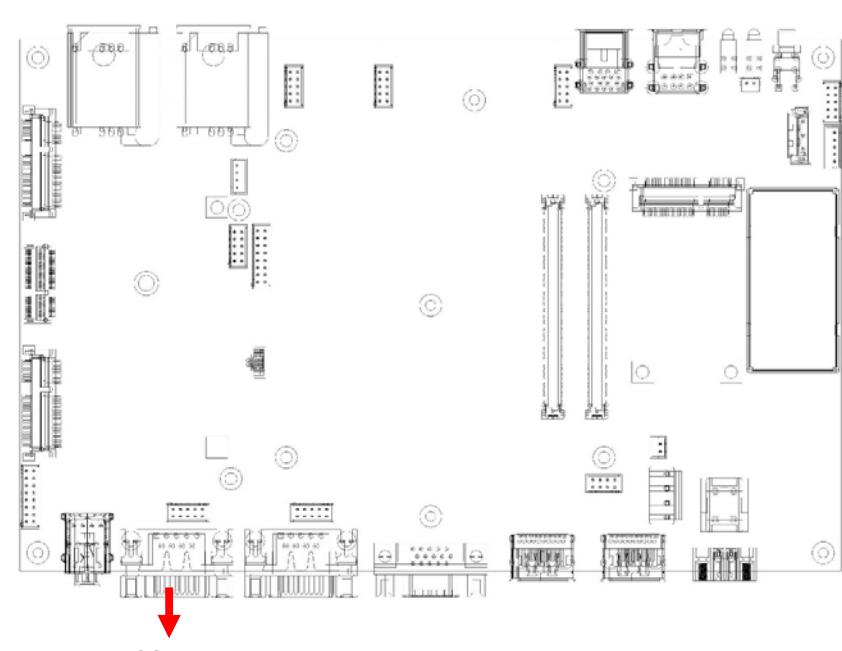
3.2 DP Connector (DP2)

Connector size	20 Pin			
Connector type	DP			
Connector location	DP2			
Connector pin definition	Pin	Signal	Pin	Signal
	1	DP2_LANE_0P	2	GND
	3	DP2_LANE_0N	4	DP2_LANE_1P
	5	GND	6	DP2_LANE_1N
	7	DP2_LANE_2P	8	GND
	9	DP2_LANE_2N	10	DP2_LANE_3P
	11	GND	12	DP2_LANE_3N
	13	DP2_AUX_EN#	14	GND
	15	DDI2_DP_AUXP_CLK	16	GND
	17	DDI2_DP_AUXN_DATA	18	DP2_HPD
Connector map				
	DP2			

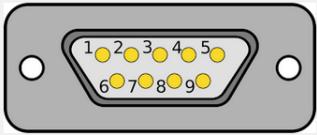
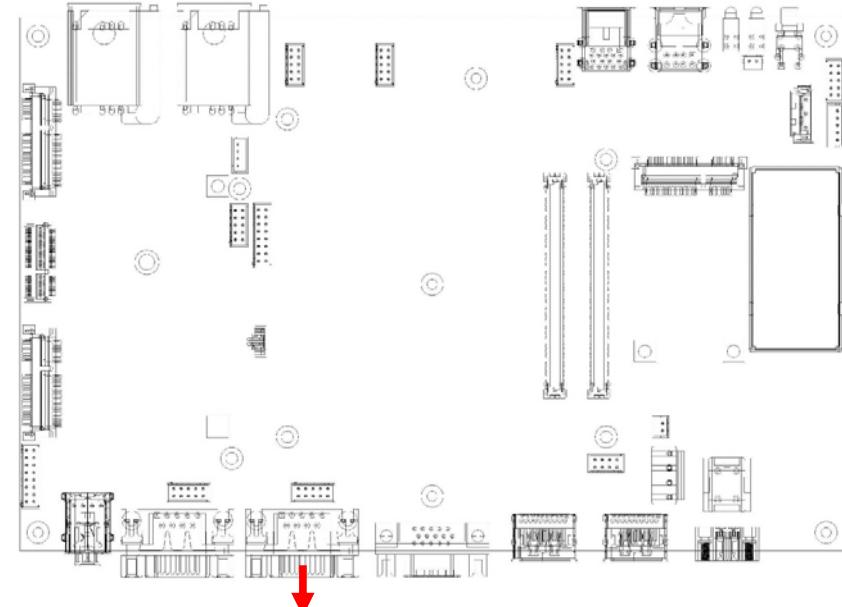
3.3 VGA Connector (VGA1)

Connector size	2 X 8 = 16 Pin			
Connector type	VGA-F-90D_W/O SCREW			
Connector location	VGA1			
Connector pin definition	Pin	Signal	Pin	Signal
	1	CRT_RED	2	CRT_GREEN
	3	CRT_BLUE	4	NC
	5	CRT_DET_C	6	GND
	7	GND	8	GND
	9	VCC5	10	GND
	11	NC	12	CRT_DAC_SDA
	13	CRT_HSYNC	14	NC
Connector map				

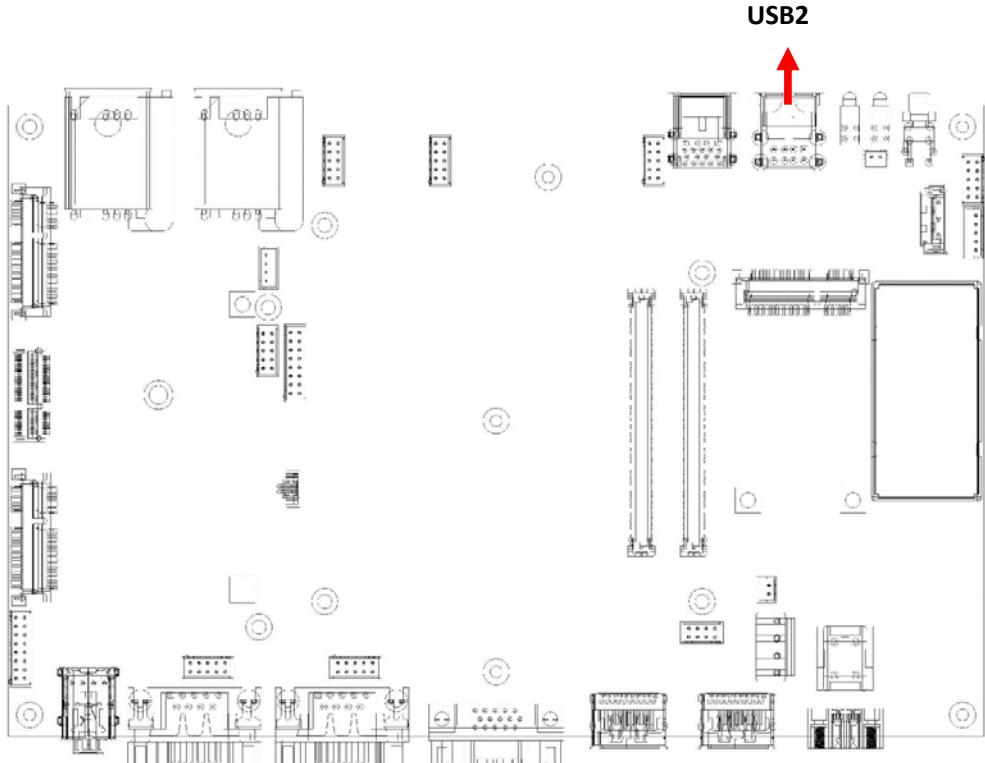
3.4 COM Connector (COM1)

Connector size	9 Pin			
Connector type	DSUB			
Connector location	COM1			
Connector pin definition	Pin	Signal	Pin	Signal
	1	COM1_DCD	2	COM1_RXD
	3	COM1_TXD	4	COM1_DTR
	5	GND	6	COM1_DSR
	7	COM1_RTS	8	COM1_CTS
DB9 pin definition	9	COM1_RI#		
				
	Pin	Signal		
		RS232	RS422	RS485
	1	COM1_DCD	TXD-	TXD-/RXD-
	2	COM1_RXD	TXD+	TXD+/RXD+
	3	COM1_TXD	RXD+	NC
	4	COM1_DTR	RXD-	NC
	5	GND	GND	GND
	6	COM1_DSR	NC	NC
Connector map				

3.5 COM Connector (COM2)

Connector size	9 Pin			
Connector type	DSUB			
Connector location	COM2			
Connector pin definition	Pin	Signal	Pin	Signal
	1	COM2_DCD	2	COM2_RXD
	3	COM2_TXD	4	COM2_DTR
	5	GND	6	COM2_DSR
	7	COM2_RTS	8	COM2_CTS
DB9 pin definition	9	COM2_RI#		
				
	Pin	Signal		
		RS232	RS422	RS485
	1	COM2_DCD	TXD-	TXD-/RXD-
	2	COM2_RXD	TXD+	TXD+/RXD+
	3	COM2_TXD	RXD+	NC
	4	COM2_DTR	RXD-	NC
	5	GND	GND	GND
	6	COM2_DSR	NC	NC
Connector map				
	<p style="text-align: center;">COM2</p>			

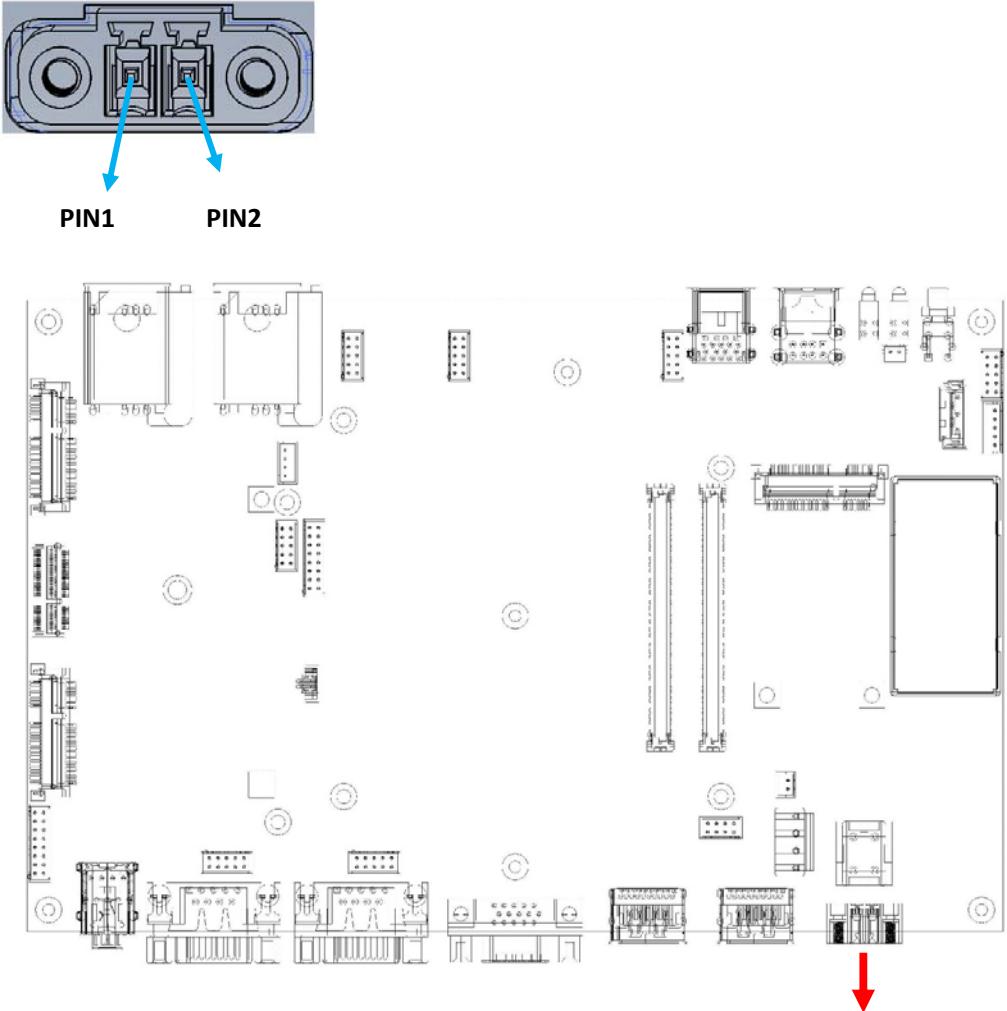
3.6 USB 2.0 Connector

Connector size	4 Pin			
Connector type	USB2.0 Type A			
Connector location	USB2			
Connector pin definition	Pin	Signal	Pin	Signal
	1	5VSB	2	USB_2N
	3	USB_2P	4	GND
	5	5VSB	6	USB_3N
	7	USB_3P	8	GND
Connector map				

3.7 USB 3.0 Connector

Connector size	18 Pin			
Connector type	USB3.0 Type A			
Connector location	USB1			
Connector pin definition	Pin	Signal	Pin	Signal
	1	5VSB	2	USB_ON
	3	USB_OP	4	GND
	5	USB3_SSRX_ON	6	USB3_SSRX_OP
	7	GND	8	USB3_SSTX_ON
	9	USB3_SSTX_OP	10	5VSB
	11	USB_1N	12	USB_1P
	13	GND	14	USB3_SSRX_1N
	15	USB3_SSRX_1P	16	GND
	17	USB3_SSTX_1N	18	USB3_SSTX_1P
Connector map				

3.8 Remote Connector

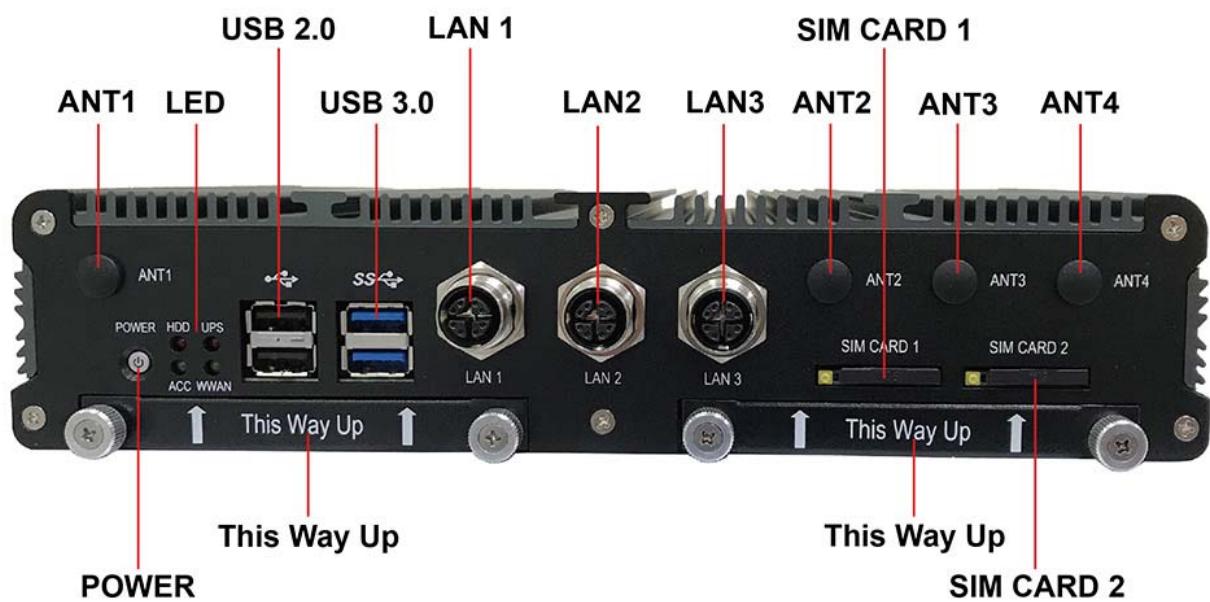
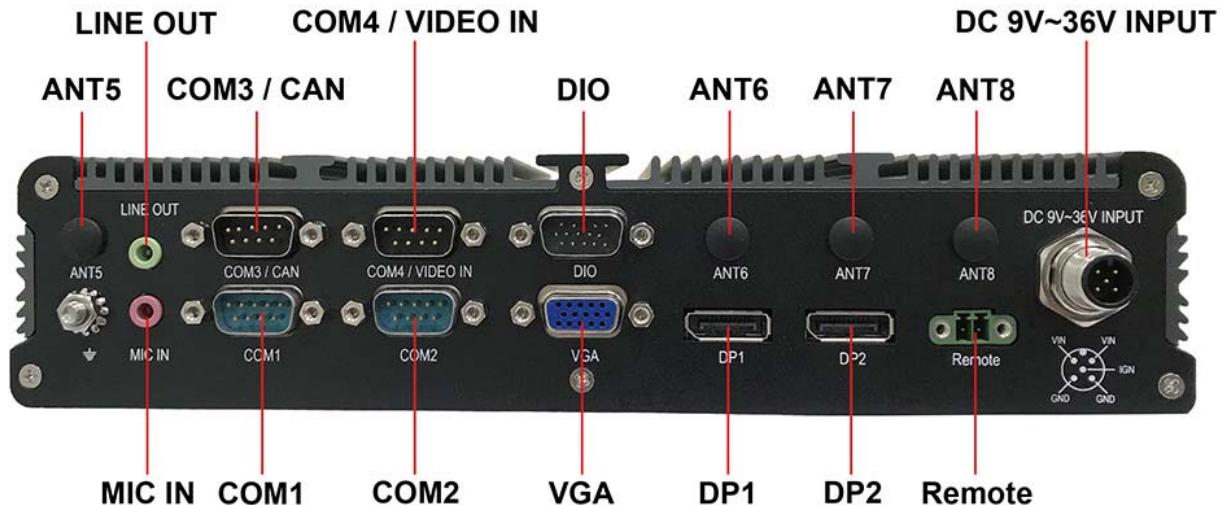
Connector size	1 X 2 = 2 Pin	
Connector type	Terminal block 2PIN pitch :3.5mm	
Connector location	Remote (BTN1)	
Connector pin definition	Pin	Signal
	1	BTN1_1
	2	GND
Connector map		

4.0

SYSTEM INSTALLATION

4.0 SYSTEM INSTALLATION

4.1 System Introduction



4.2 Opening Chassis

Step1. Unscrew the six screws of the Back Cover as shown in the picture.



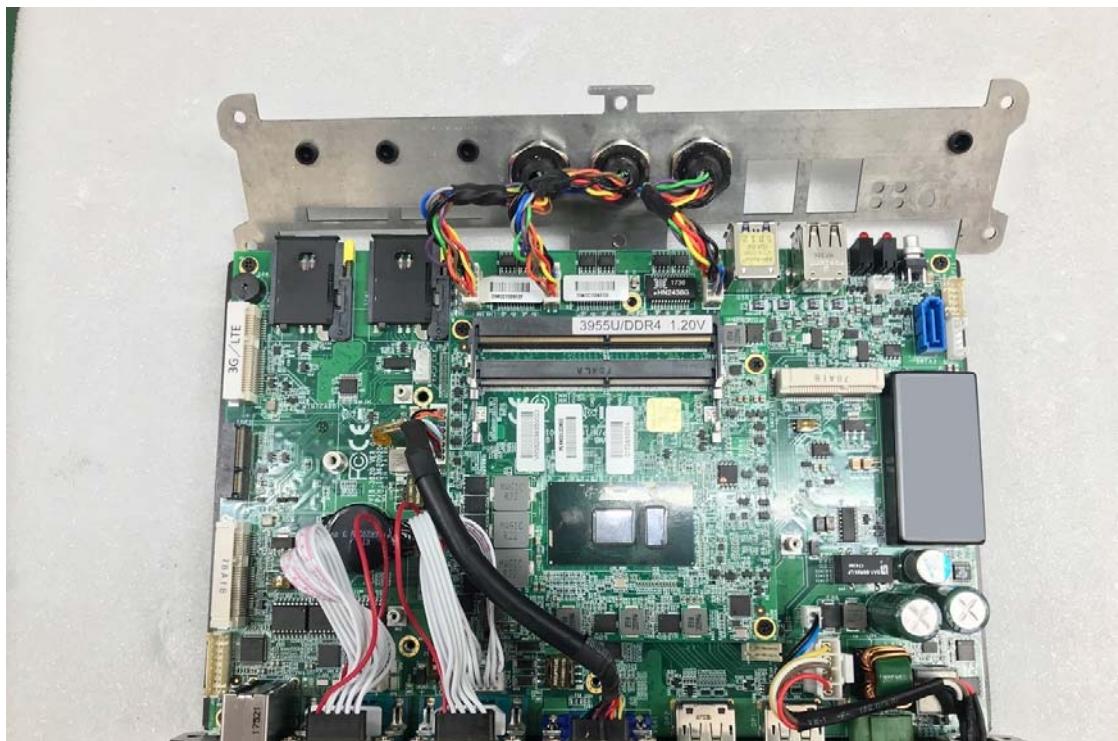
Step2. Unscrew the six screws of the Front Panel as shown in the picture.



Step3. Unscrew the six screws of the Rear Panel as shown in the picture.



Step4. Open Top Cover as shown in the picture.



4.3 Installing Memory

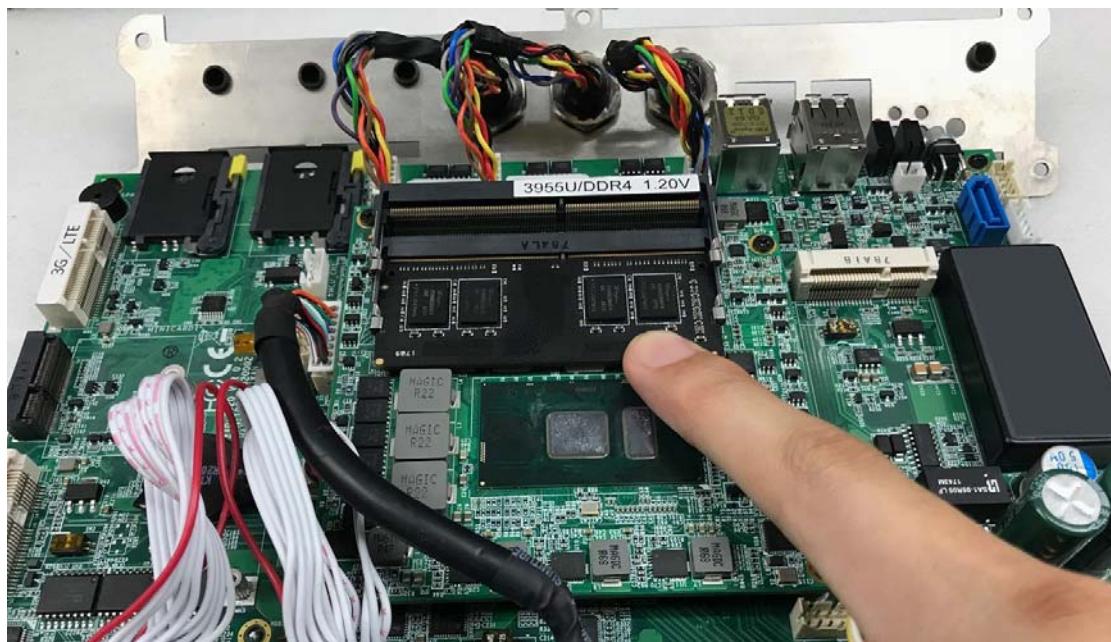
Step1. Put Memory on this place as shown in the picture.



Step2. Hold the Memory with its notch aligned with the Memory socket of the board and insert it at a 30-degree angle into the socket as shown in the picture.

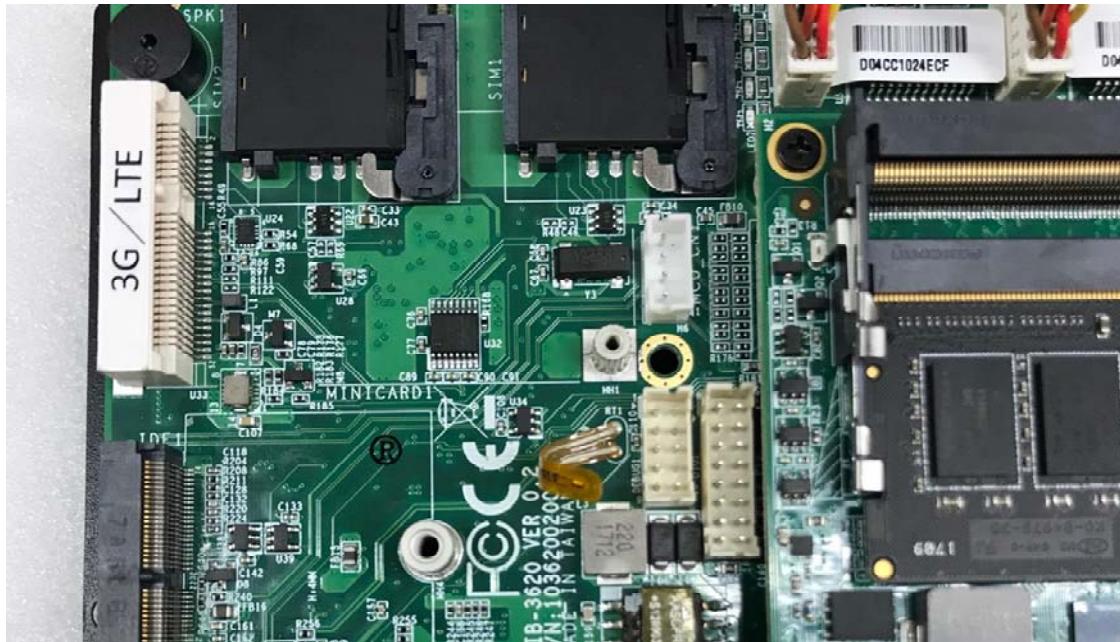


Step3. Press down on the Memory so that the tabs of the socket lock on both sides of the module as shown in the picture.



4.4 Installing MINI PCIe Expansion Card (PCIe 1, 3G Module only)

Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.



Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.



Step 3. Screw one screw to the holder as shown in the picture.

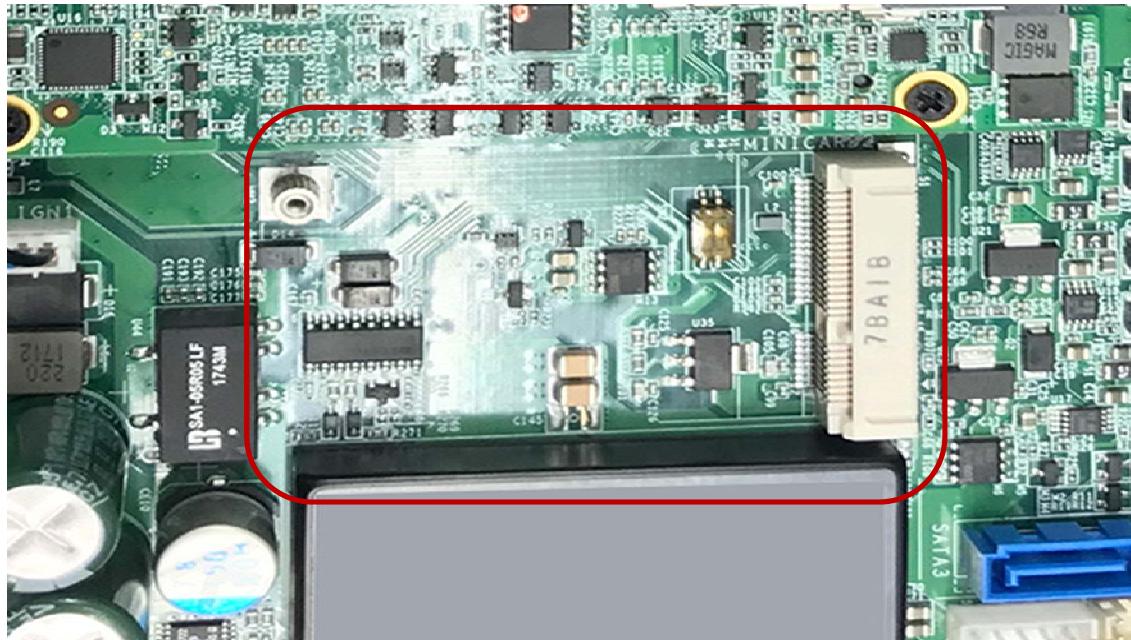


Step 4. Done as shown in the picture.

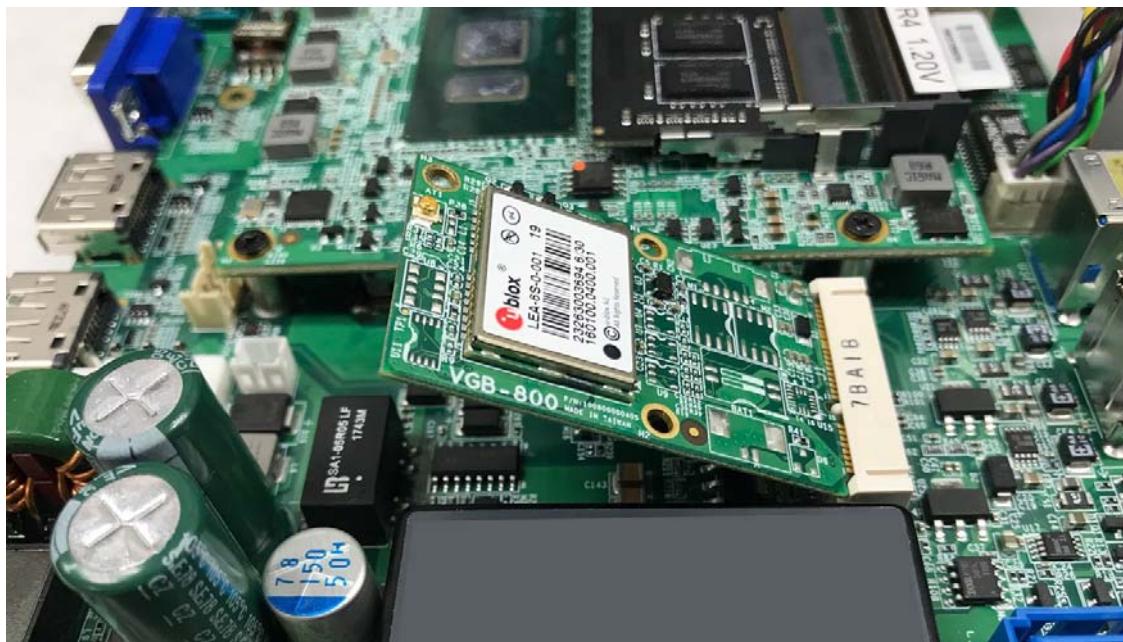


4.5 Installing MINI PCIe Expansion Card (PCIe 2)

Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.



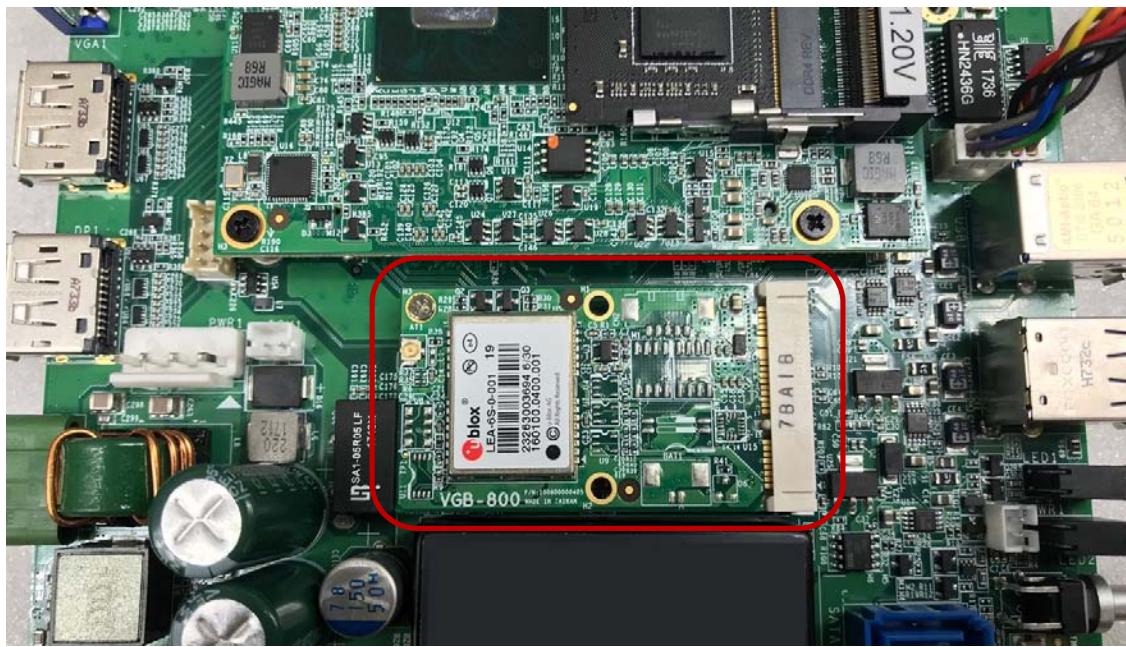
Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.



Step 3. Screw one screw to the holder as shown in the picture.



Step 4. Done as shown in the picture.



4.6 Installing MINI PCIe Expansion Card (PCIe 3)

Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.



Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.



Step 3. Screw one screw to the holder as shown in the picture.

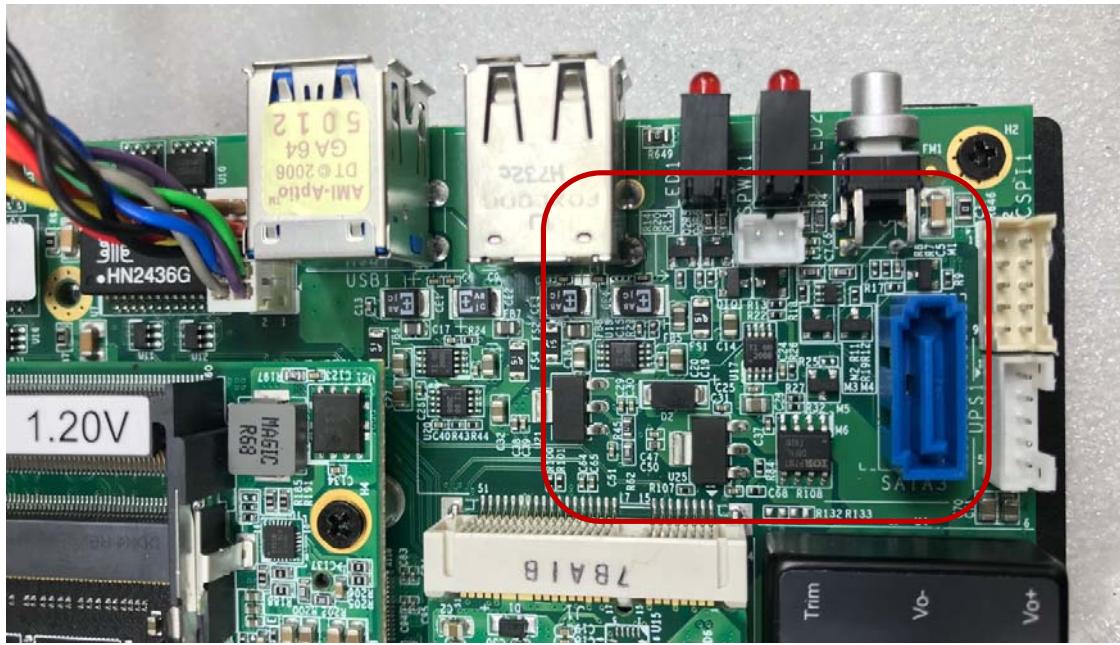


Step 4. Done as shown in the picture.



4.7 Installing SATADOM Module

Step 1. Put SATADOM Module on this place as shown in the picture.



Step 2. Insert the the cable into the socket as shown in the picture.



Step 3. Take the Module and insert it into the socket as shown in the picture.

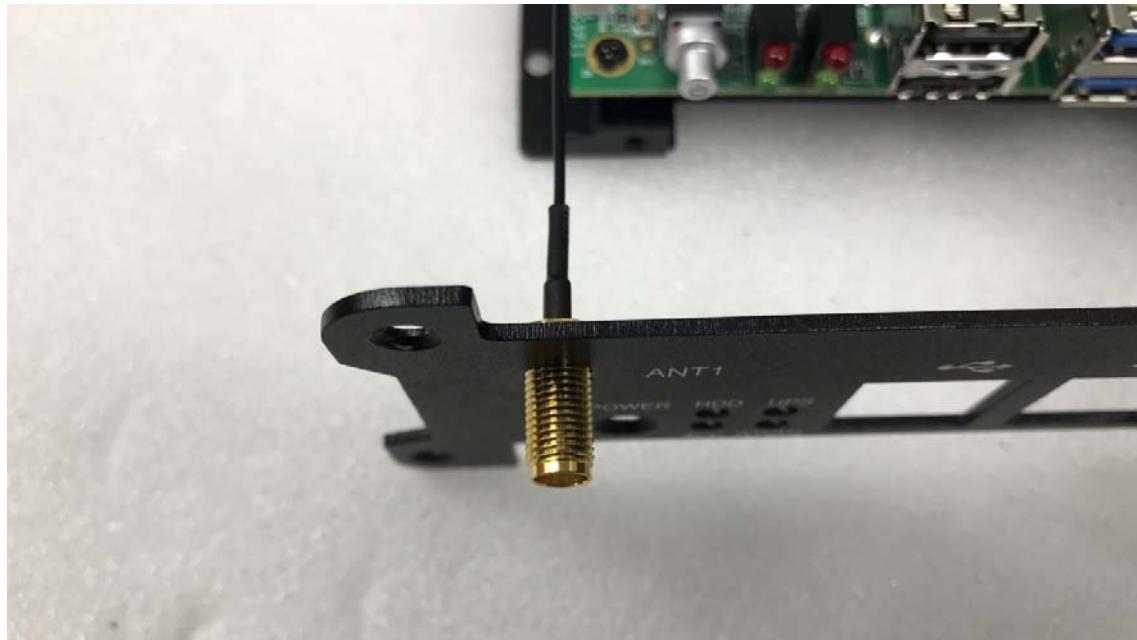


Step 4. Done as shown in the picture.



4.8 Installing Internal Antenna Cable

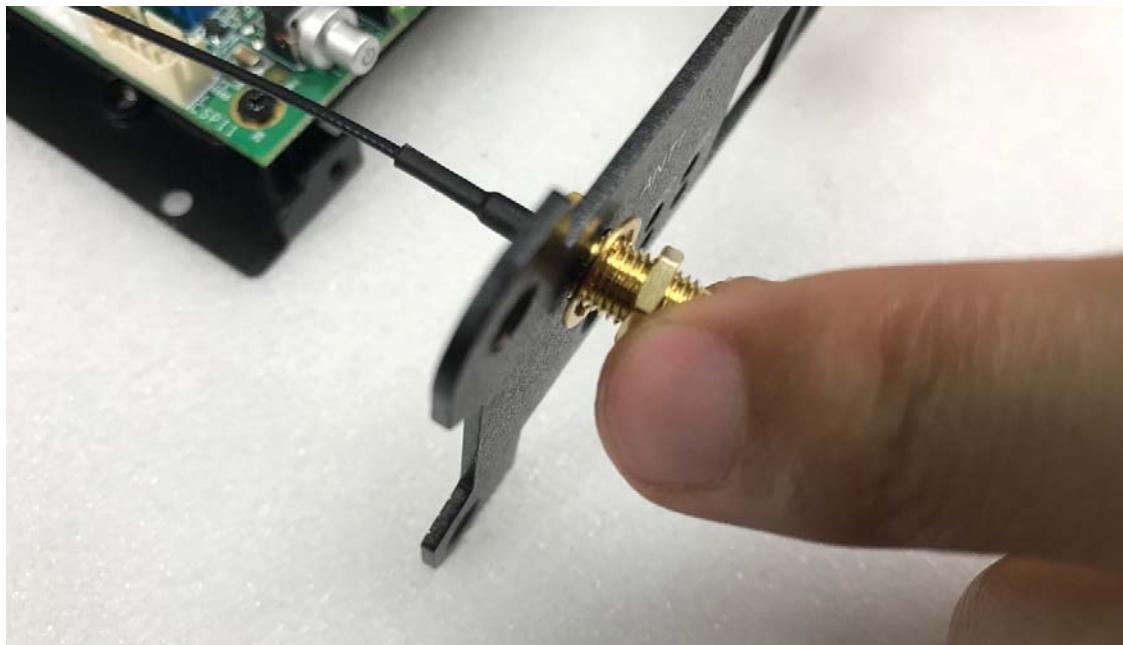
Step 1. Take the SMA Connector and Plug into IO Panel as shown in the picture.



Step 2. Put the Washer into the SMA Connector as shown in the picture.



Step 3. Put the O-ring to SMA Connector and tighten as shown in the picture.



Step 4. Done as shown in the picture.



Step 5. Take the IpeX Connector and press on the wifi module as shown in the picture.(Wifi)



Step 6. Take the IpeX Connector and press on the 3G module as shown in the picture. (3G)



Step 7. Take the IpeX Connector and press on the GPS module as shown in the picture.
(GPS, only support passive Antenna)



4.9 Installing SIM Card

Step 1. Use thin stick to push the button as shown in the picture.



Step 2. Take the holder away from front panel and put your SIM Card into the holder as shown in the picture.



Step 3. Take the SIM card holder and Insert it into the socket as shown in the picture.



Attention:

When insert a SIM card to the SIM card holder, please remove the main power at input to avoid undetectable SIM card.

4.10 Installing HDD

Step 1. Put the HDD into HDD Holder as shown in the picture.



Step 2. Screw two screws on both side as shown in the picture.



Step 3. Push the HDD Holder into the socket as shown in the picture.



Step 4. Fully insert the HDD Holder into the socket until a “click” is heard as shown in the picture.

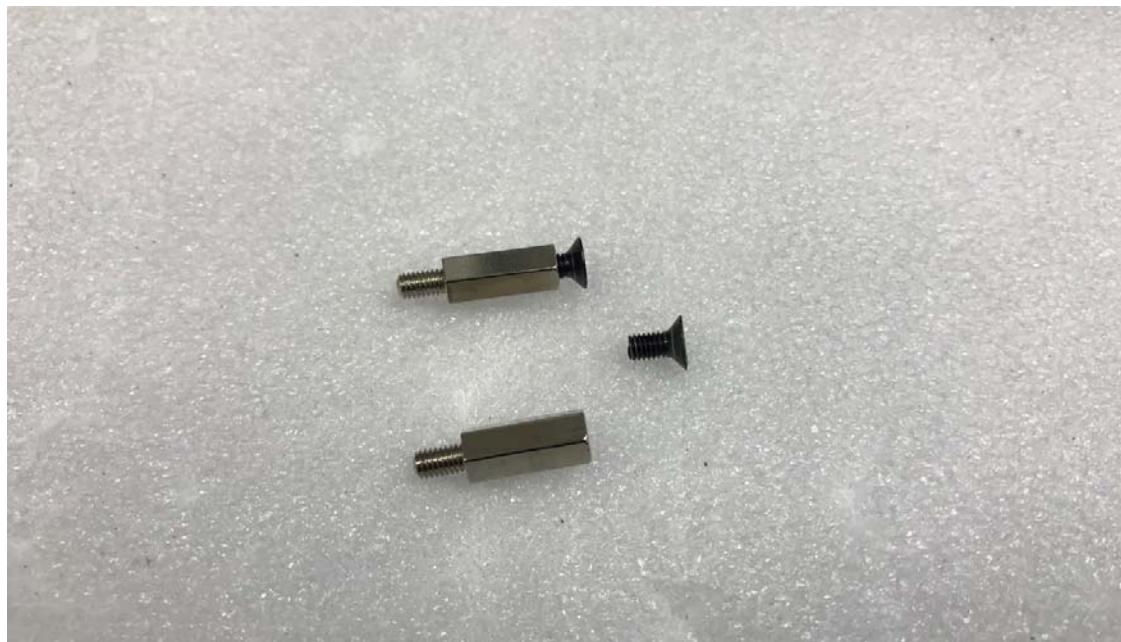


Step 5. Tighten to Storage Bracket screws as shown in the picture.



4.11 Installing Battery Module

Step 1. Accessories list



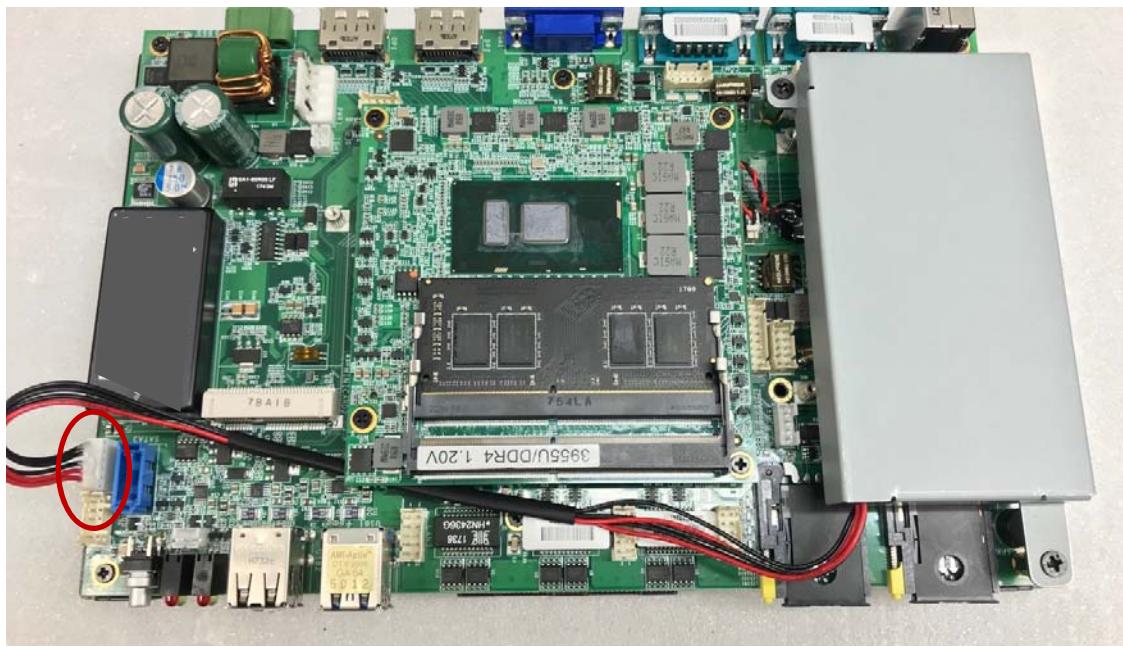
Step 2. Install the standoffs on the board



Step 3. Take the battery kit on the board and screw two screws as shown in the picture.

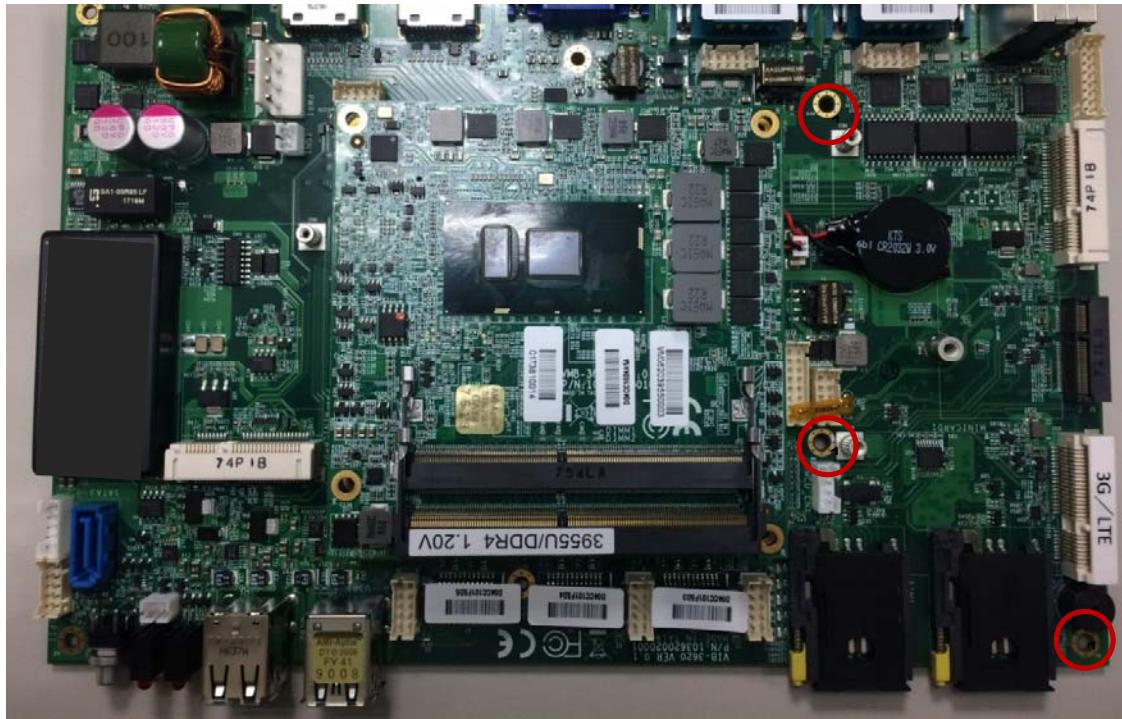


Step 4. Connect the battery with motherboard as shown in the picture.

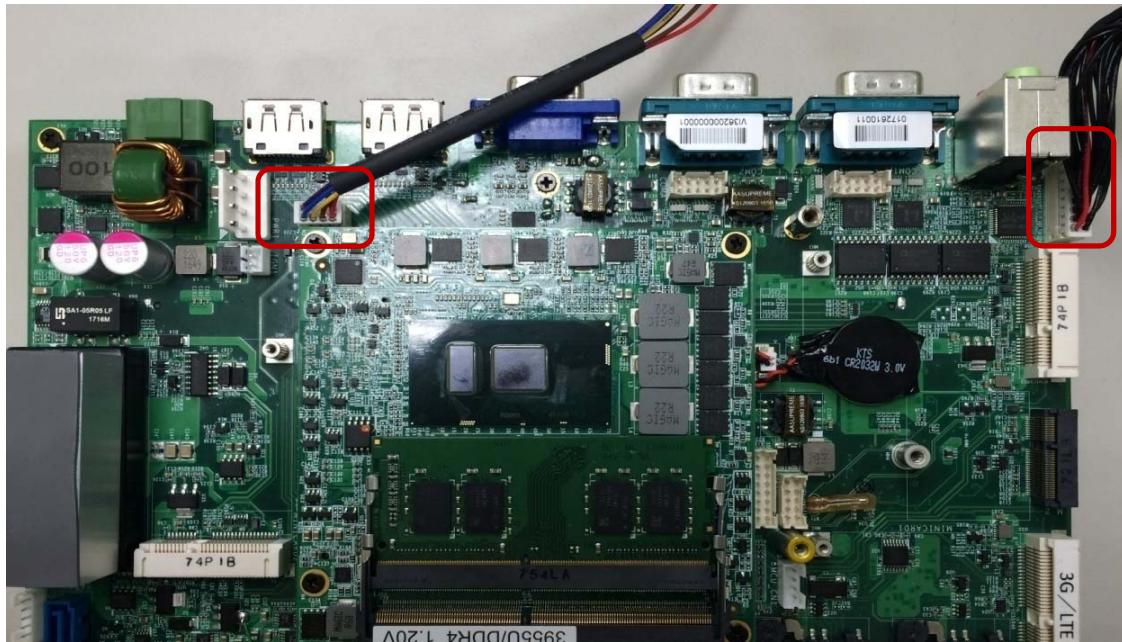


4.12 Installing SIM-6A Module

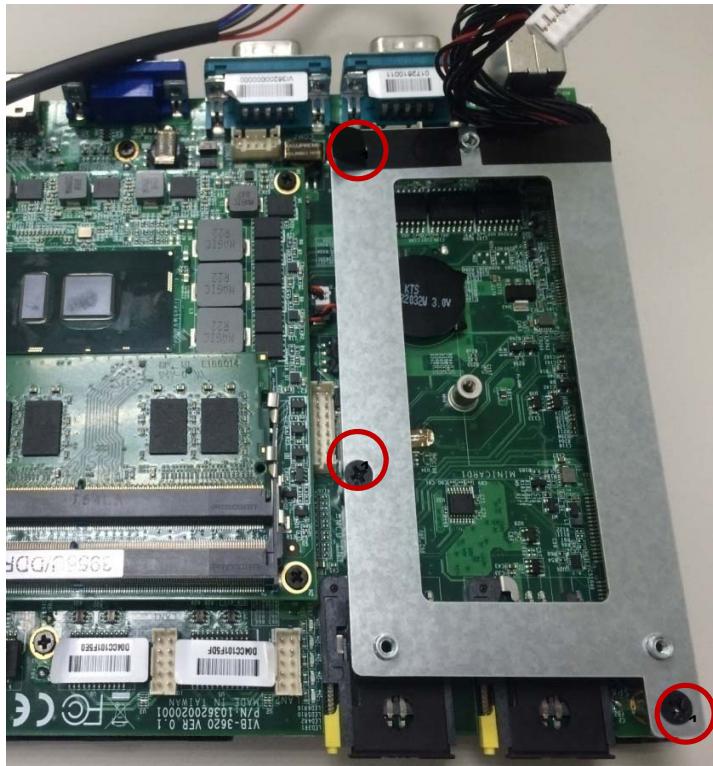
Step 1. Fix the Tube with the screws on the motherboard



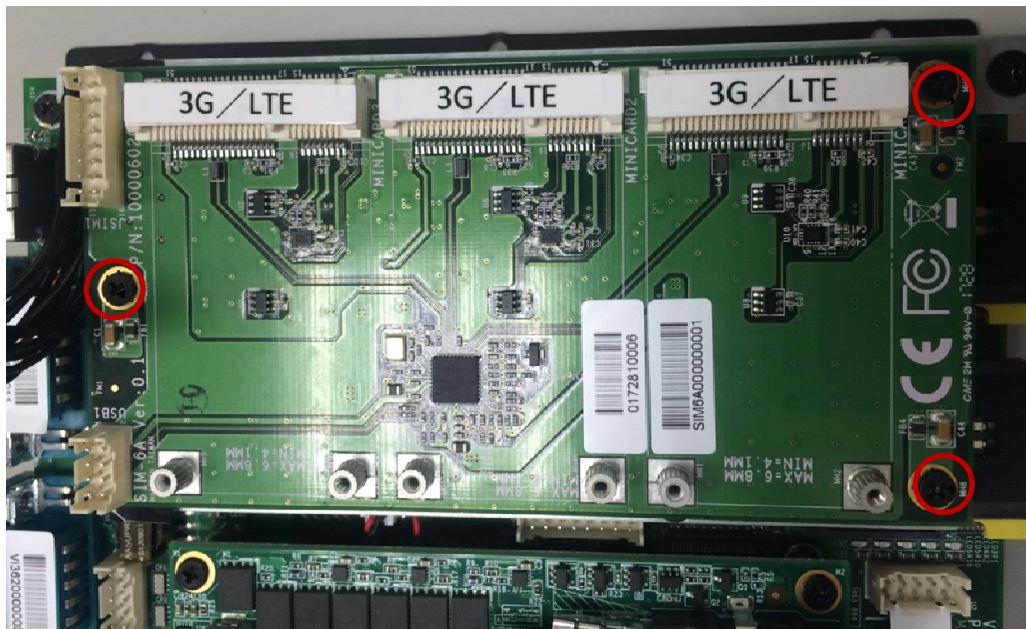
Step 2. Connect the SIM-6A cable with motherboard as shown in the picture.



Step 3. Take the bracket on the board and screw three screws on the motherboard



Step 4. Take SIM-6A Board on the board and screw three screws on the motherboard



Step 5. Connect the cable with SIM-6A Board on the motherboard



5.0 BIOS

5.0 BIOS

5.1 Enter The BIOS

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

- The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
- Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format.

VBOX-3620-M12X Mainboard V1.0 073109 where :

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX

2nd - 5th digit refers to the model number.

6th digit refers to the chipset as I = Intel, N = NVIDIA, A = AMD and V = VIA.

7th - 8th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS was released.

073109 refers to the date this BIOS was released.

Control Keys

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

<↑ >	Move to the previous item
<↓ >	Move to the next item
<↔>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General Help
<F3>	Load Optimized Defaults
<F4>	Save all the CMOS changes and exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys ($\uparrow \downarrow$) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

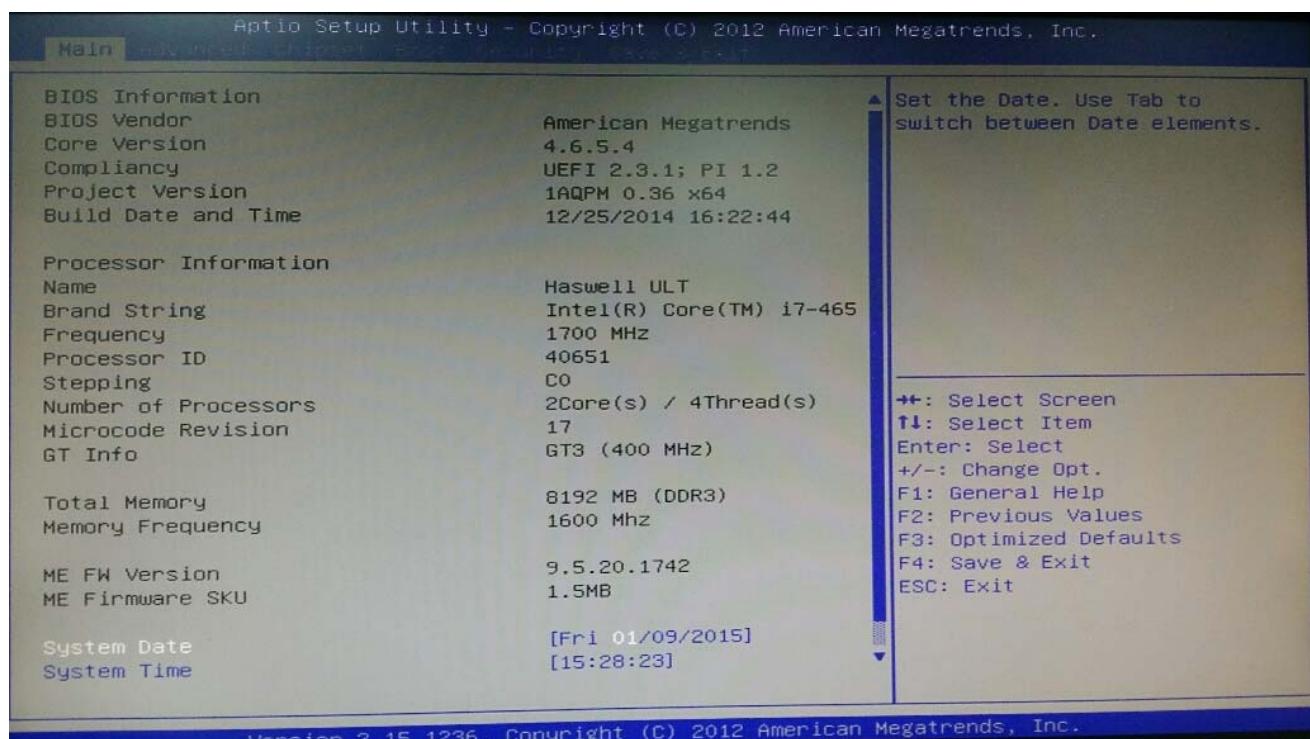
Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys ($\uparrow \downarrow$) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

5.2 Main



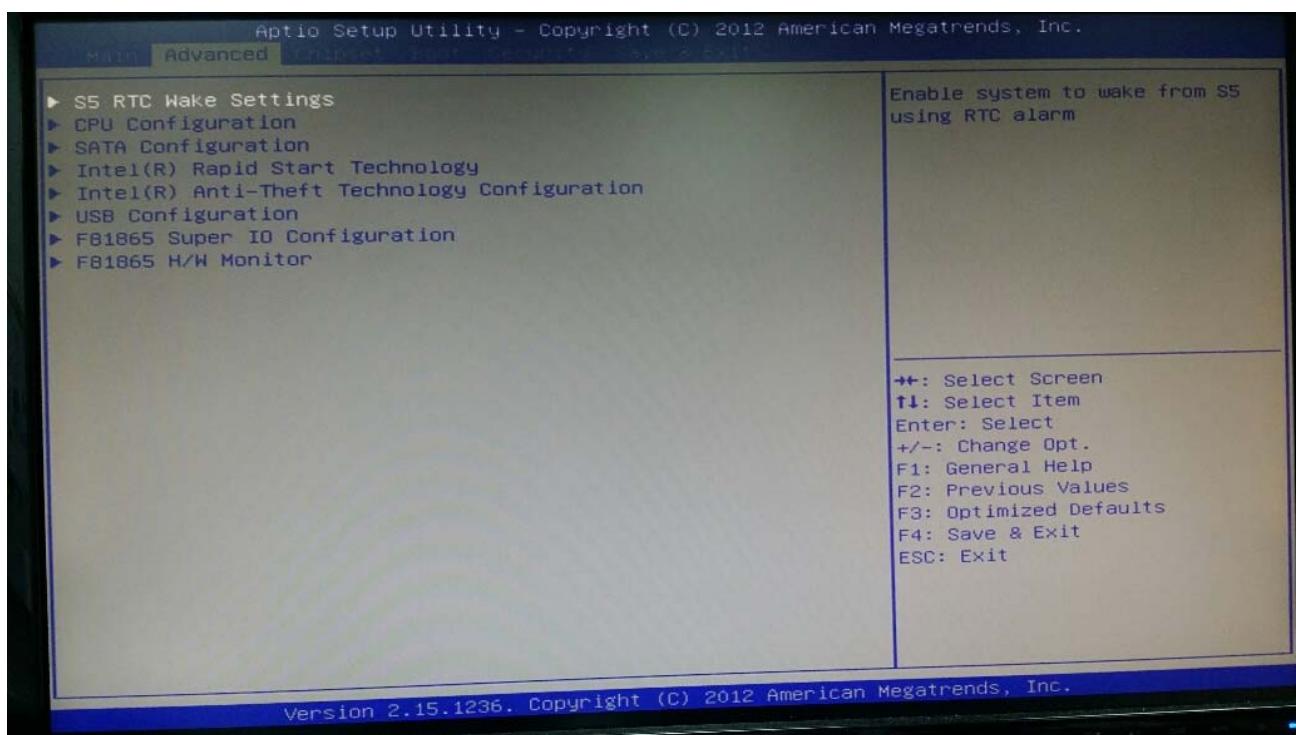
» System Date

This setting allows you to set the system Date. The time format is <Day> <Month> <Date> <Year>.

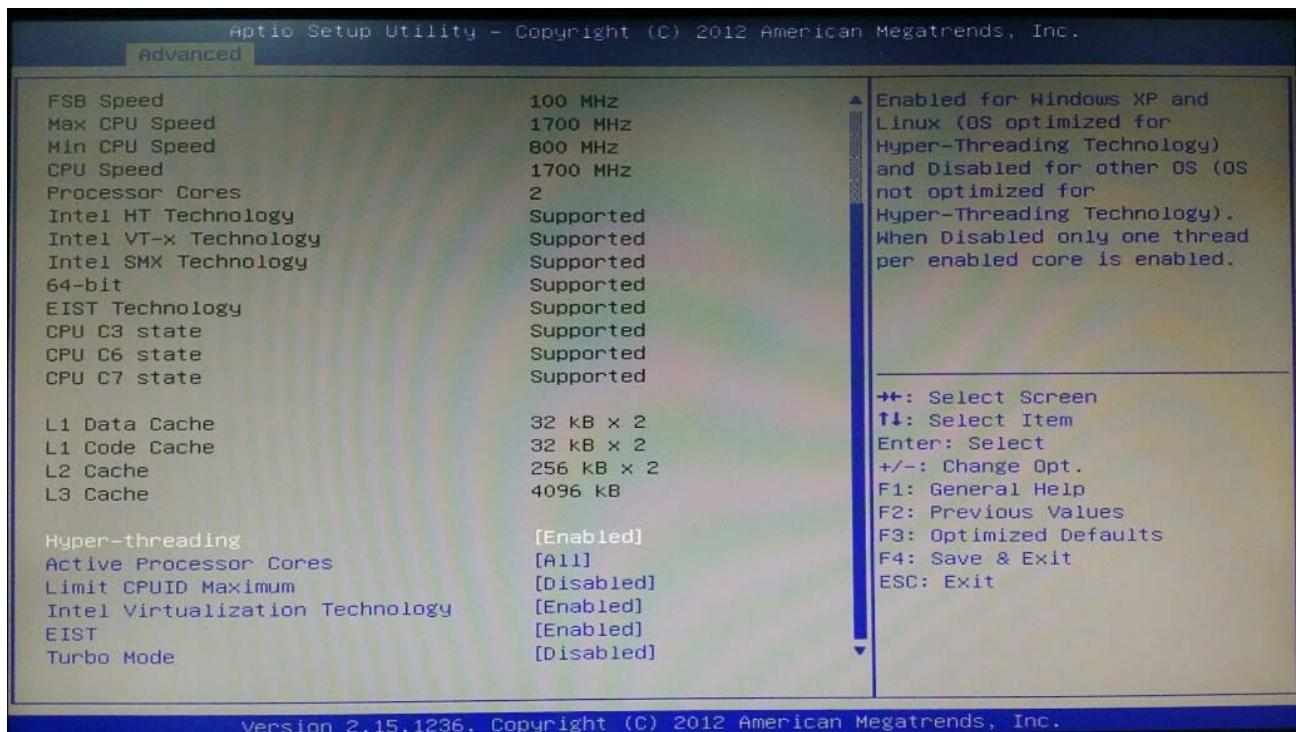
» System Time

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

5.3 Advanced



CPU Configuration



» Limit CPUID Maximum

The CPUID instruction of some newer CPUs will return a value greater than 3. The default is Disabled because this problem does not exist in the Windows series operating systems. If you are using an operating system other than Windows, this problem may occur. To avoid this problem, enable this field to limit the return value to 3 or less than 3.

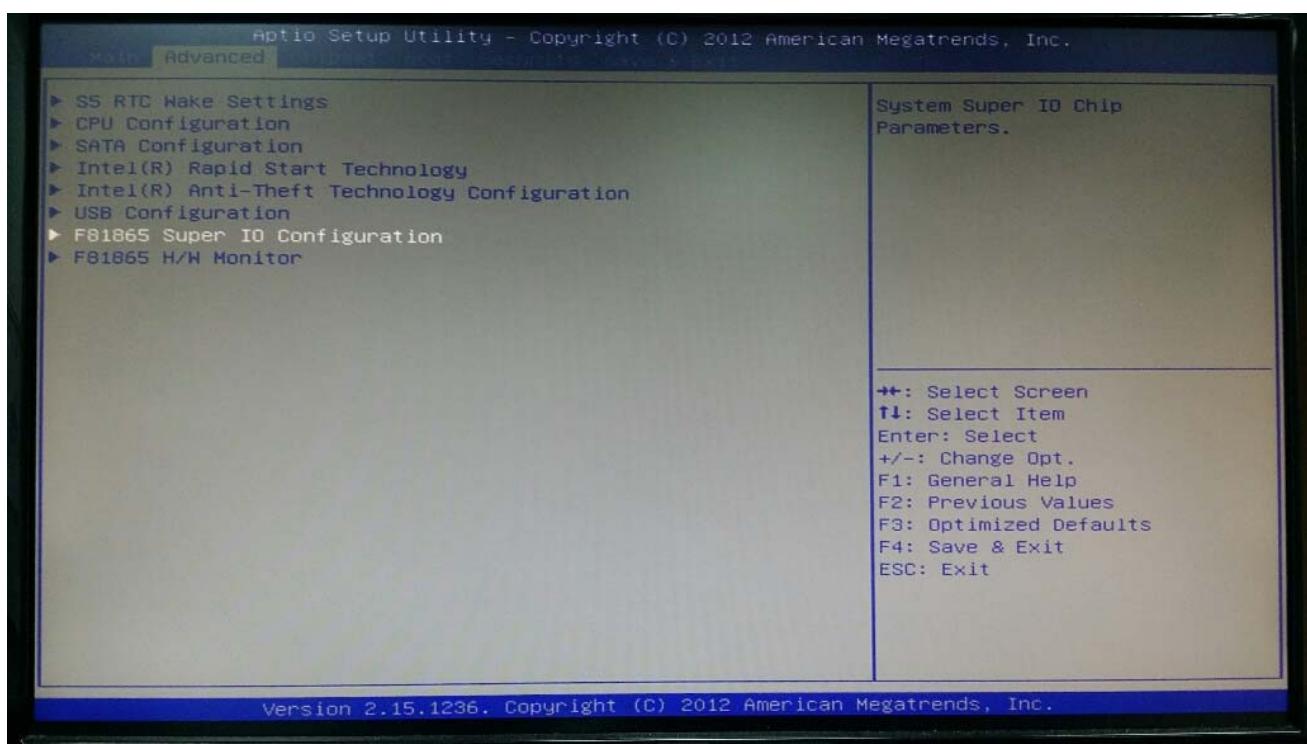
» Intel Virtualization Technology

When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

» EIST

This field is used to enable or disable the Intel Enhanced SpeedStep Technology

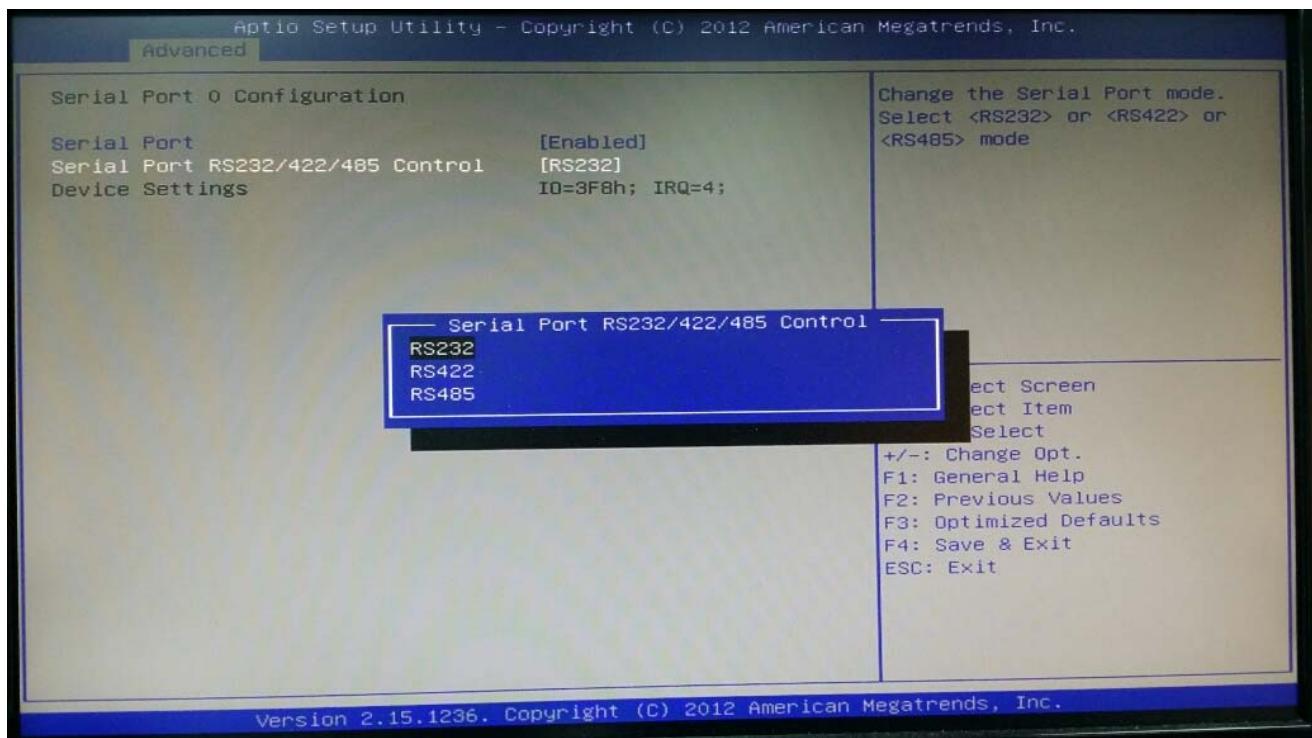
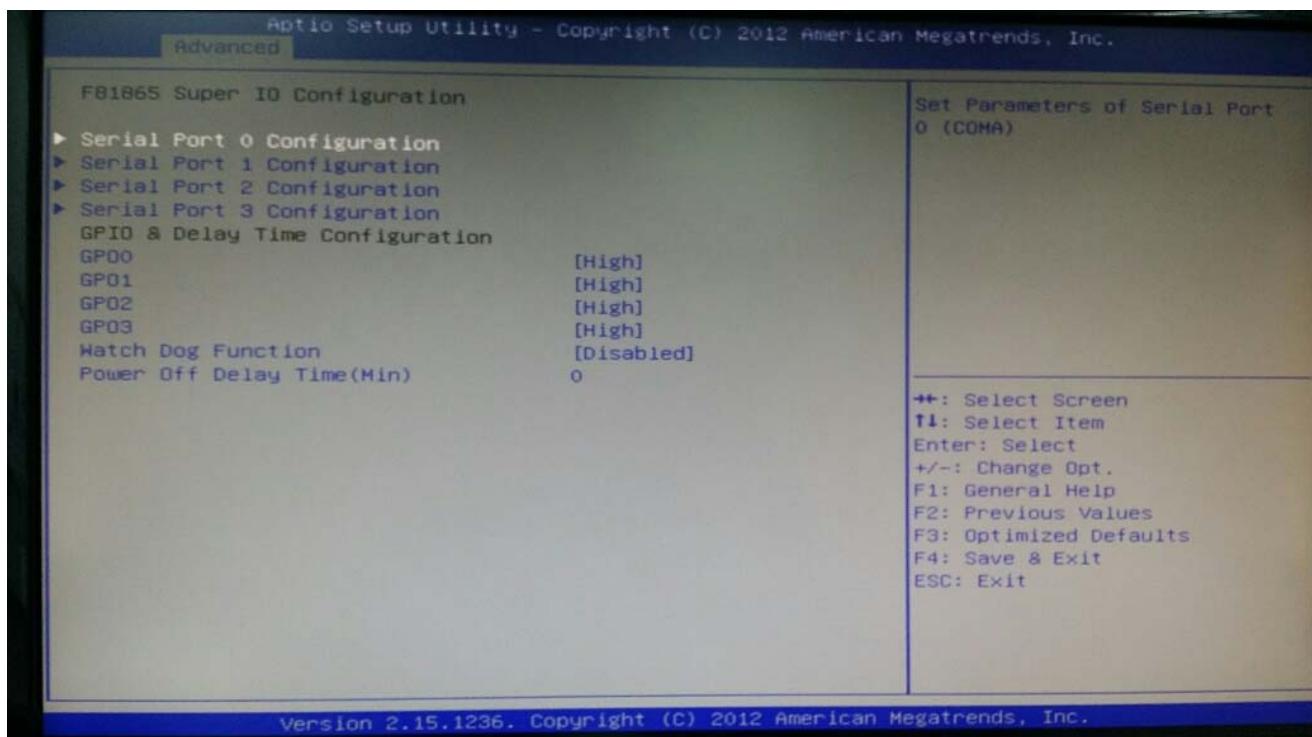
Super IO Configuration



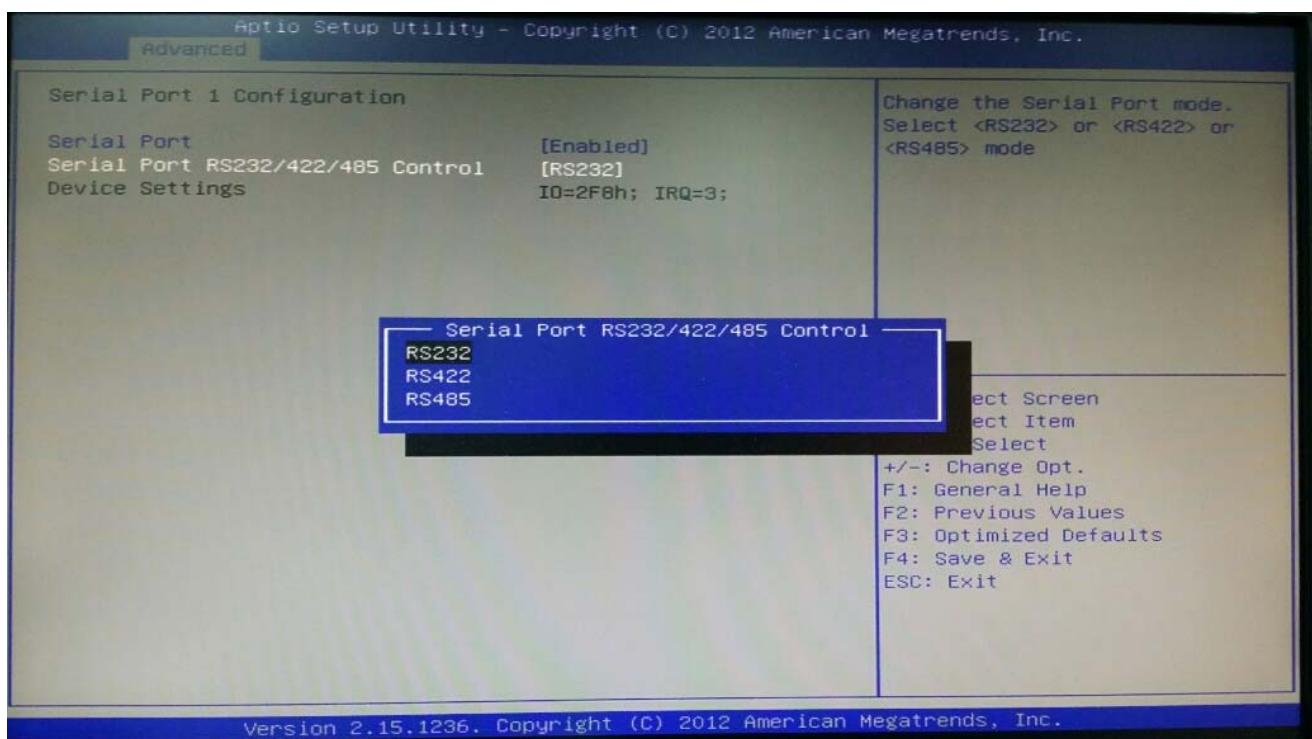
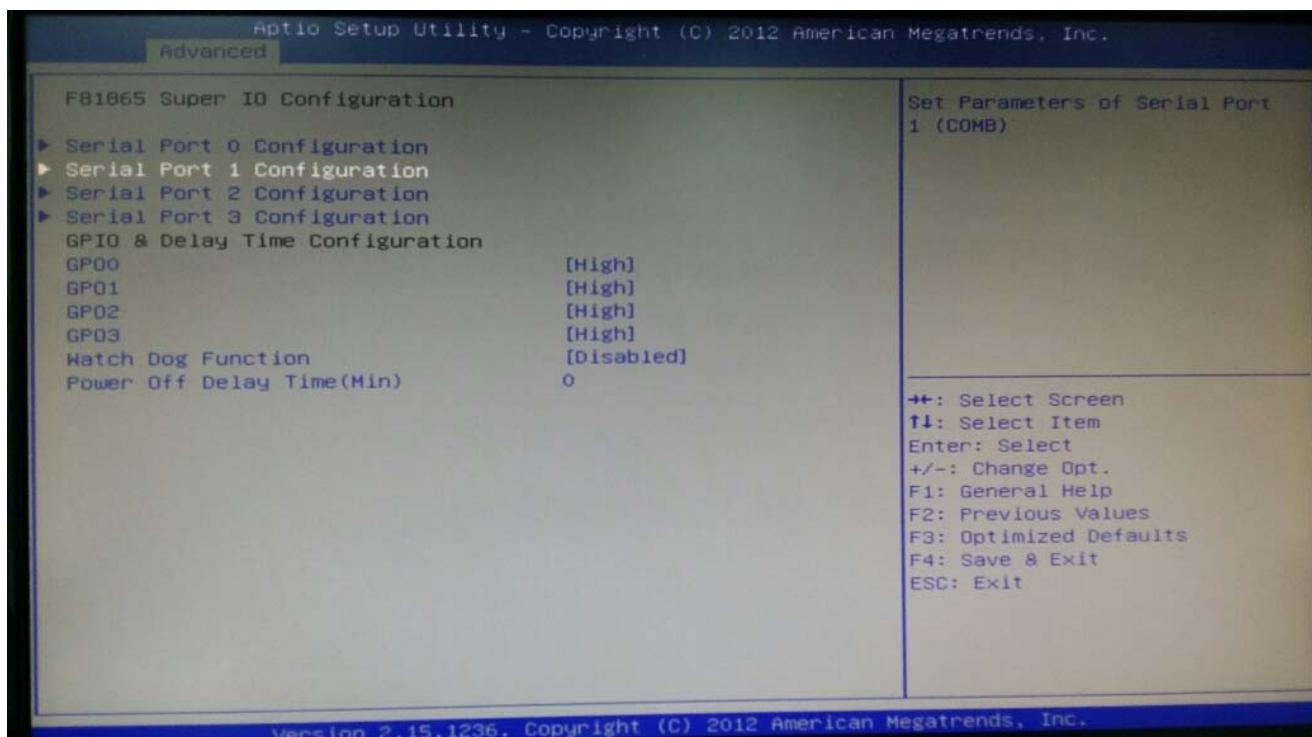
» Serial Port 0/1/2/3 Enable or Disable

Select an Enable or Disable for the specified serial ports.

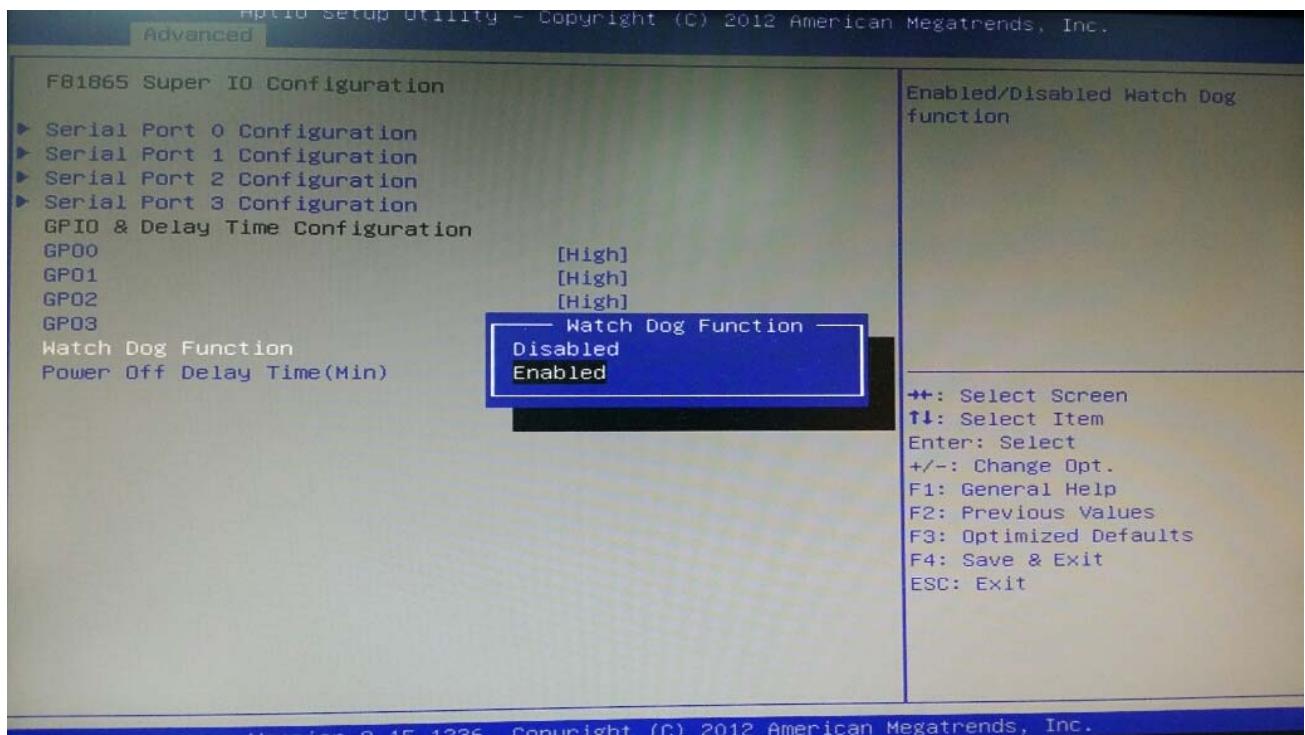
» COM1 RS232/422/485 Select



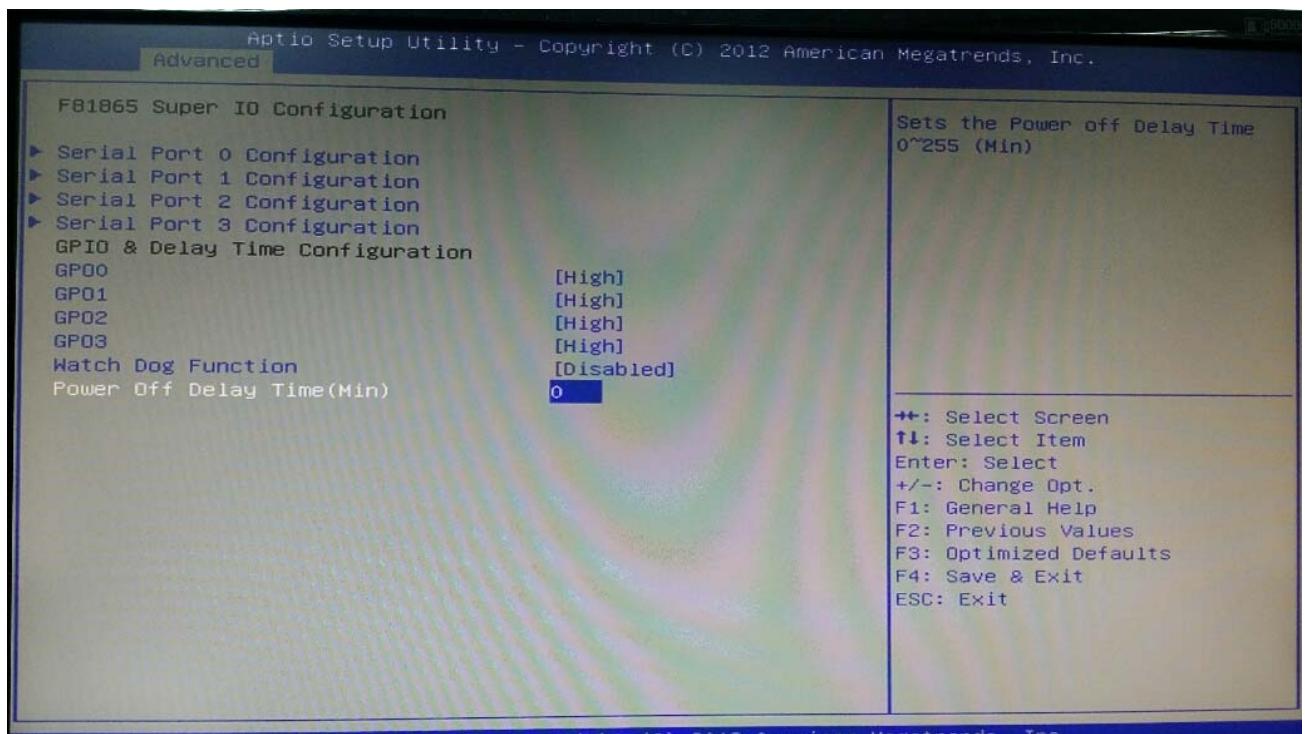
» COM2 RS232/422/485 Select



» Watch Dog Function



» GPIO Configuration – Power off delay time setting 0-255

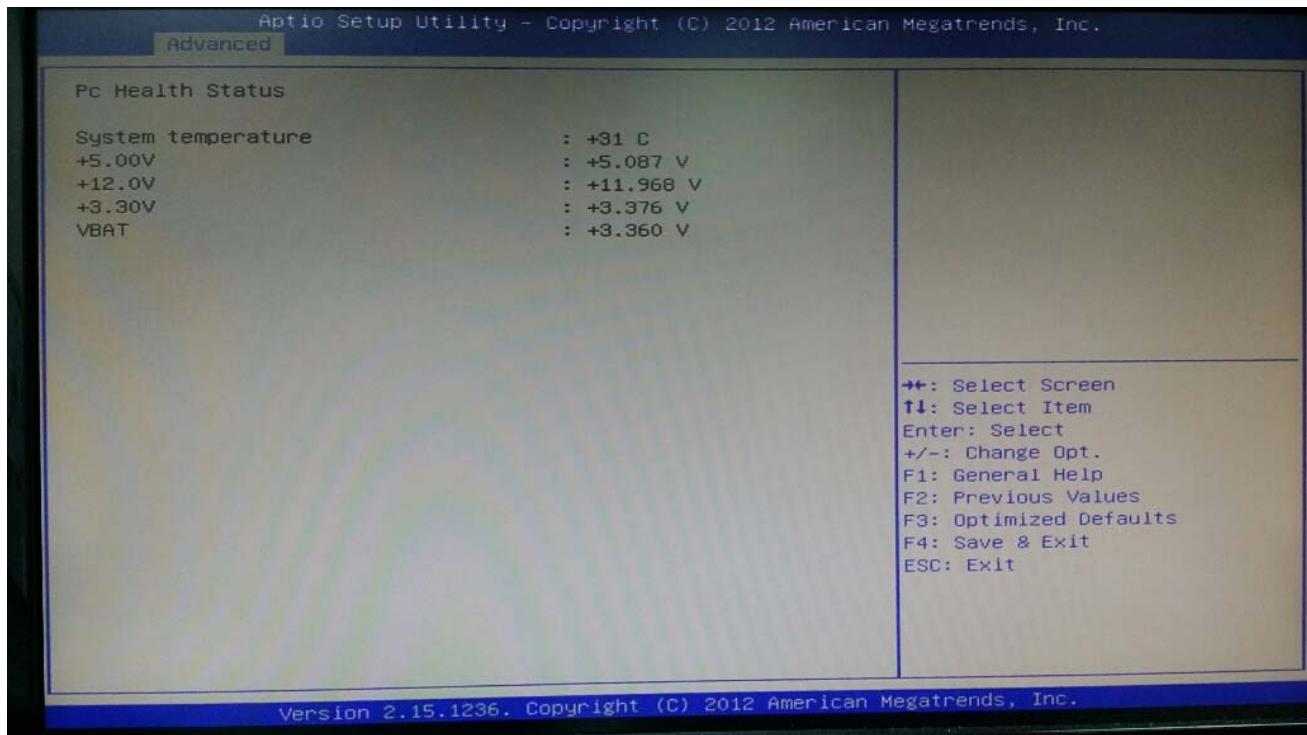


» GPO 0/ 1/ 2/ 3/ Data

These settings configure special GPIO data.

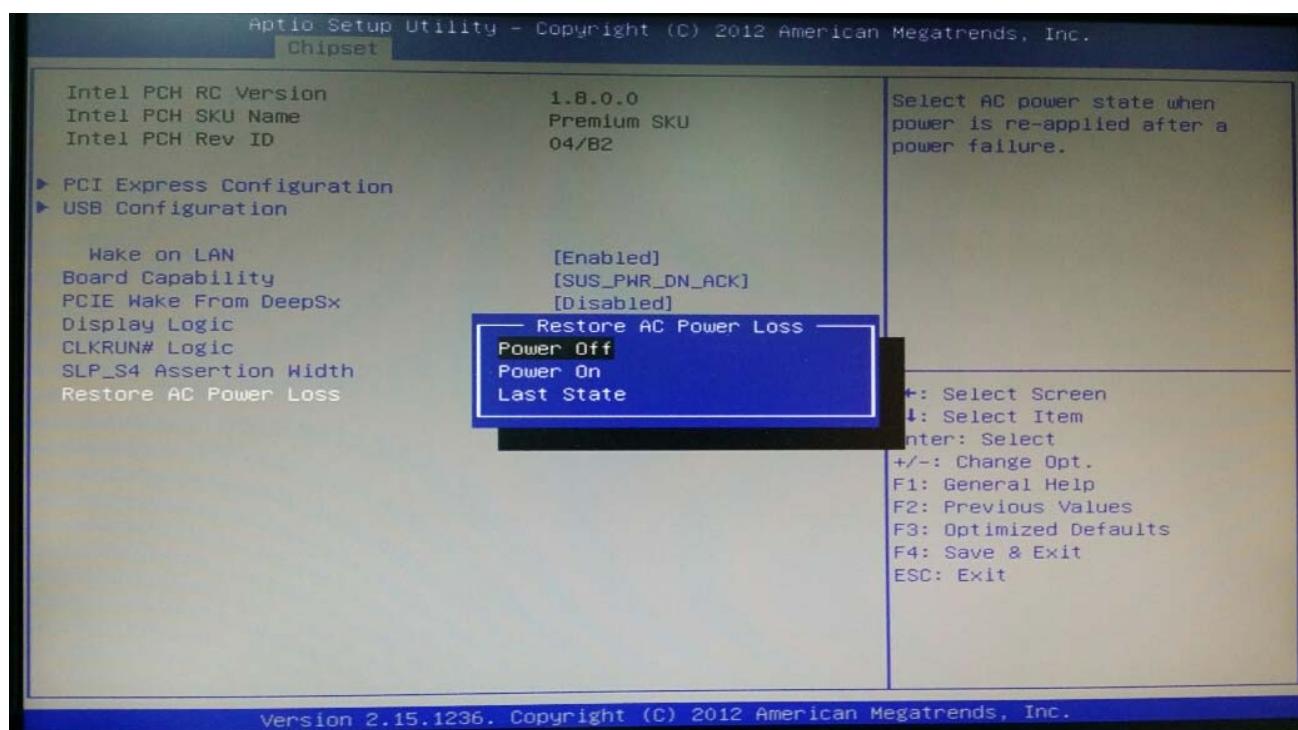
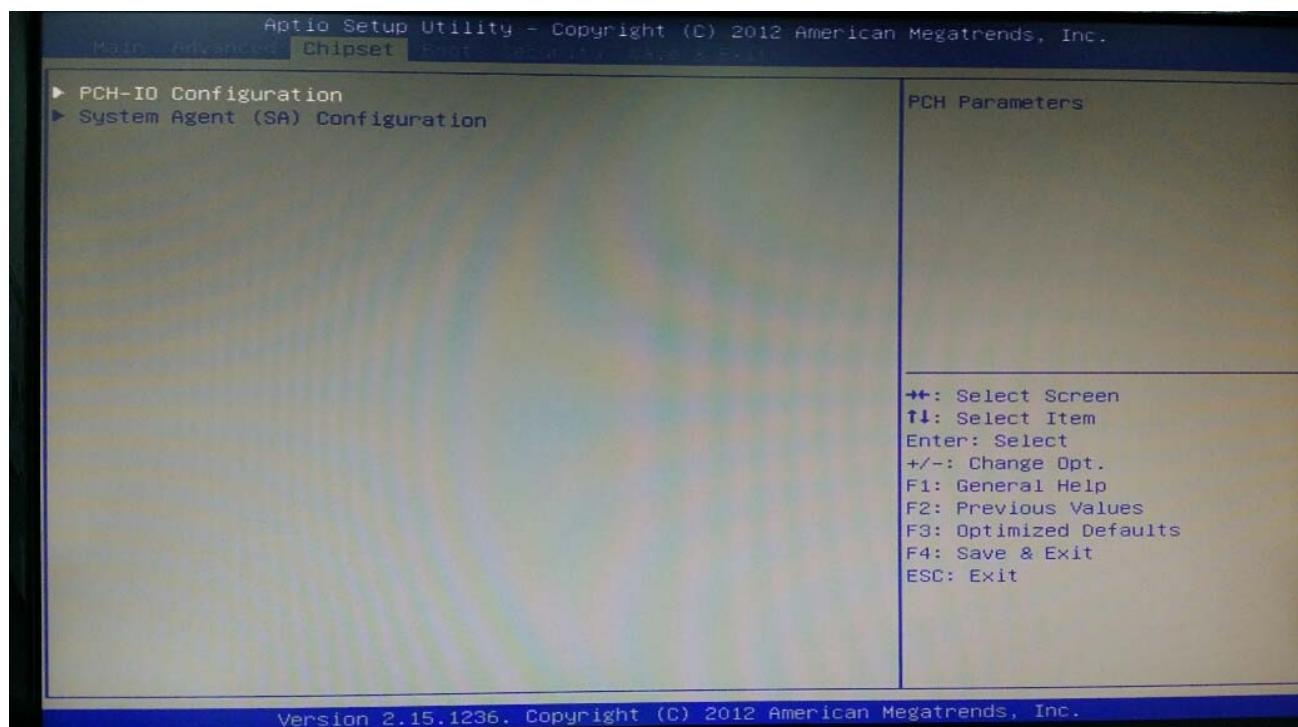
Hardware Health Configuration

These items display the current status of all monitored hardware devices/components such as voltages, temperatures and all fans' speeds.



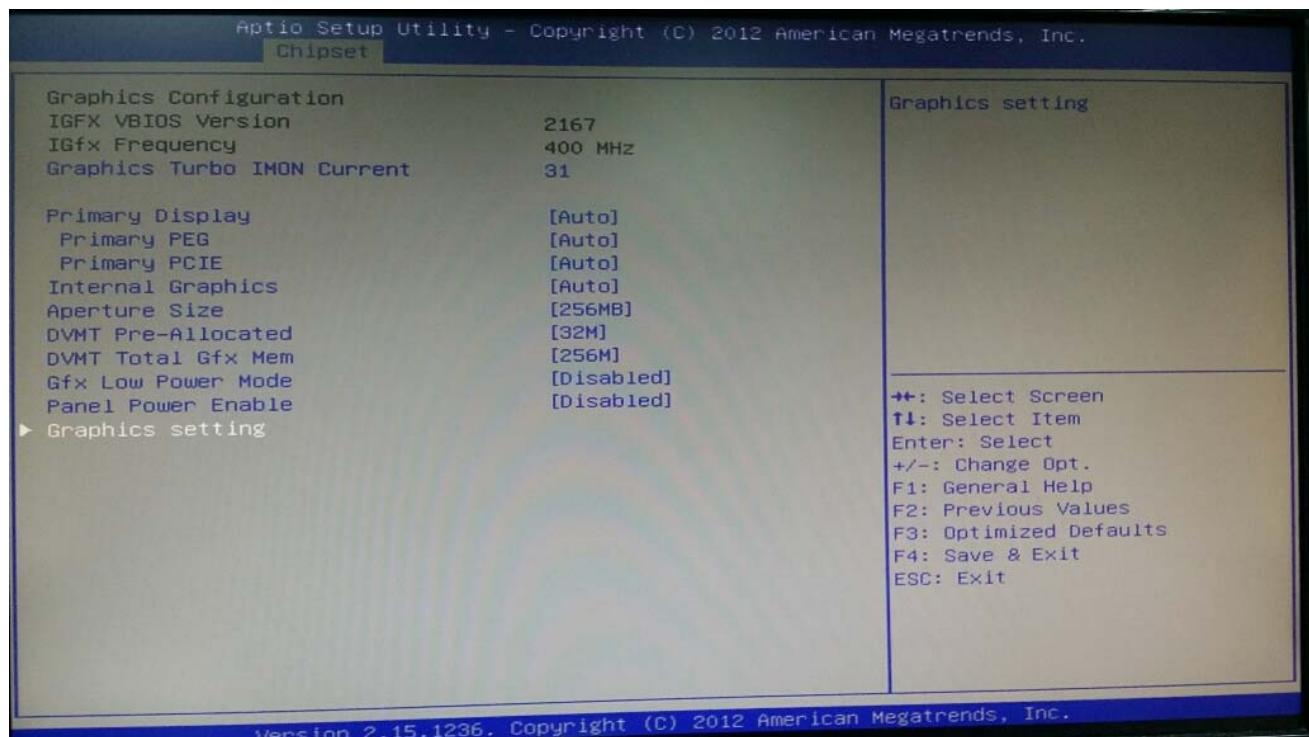
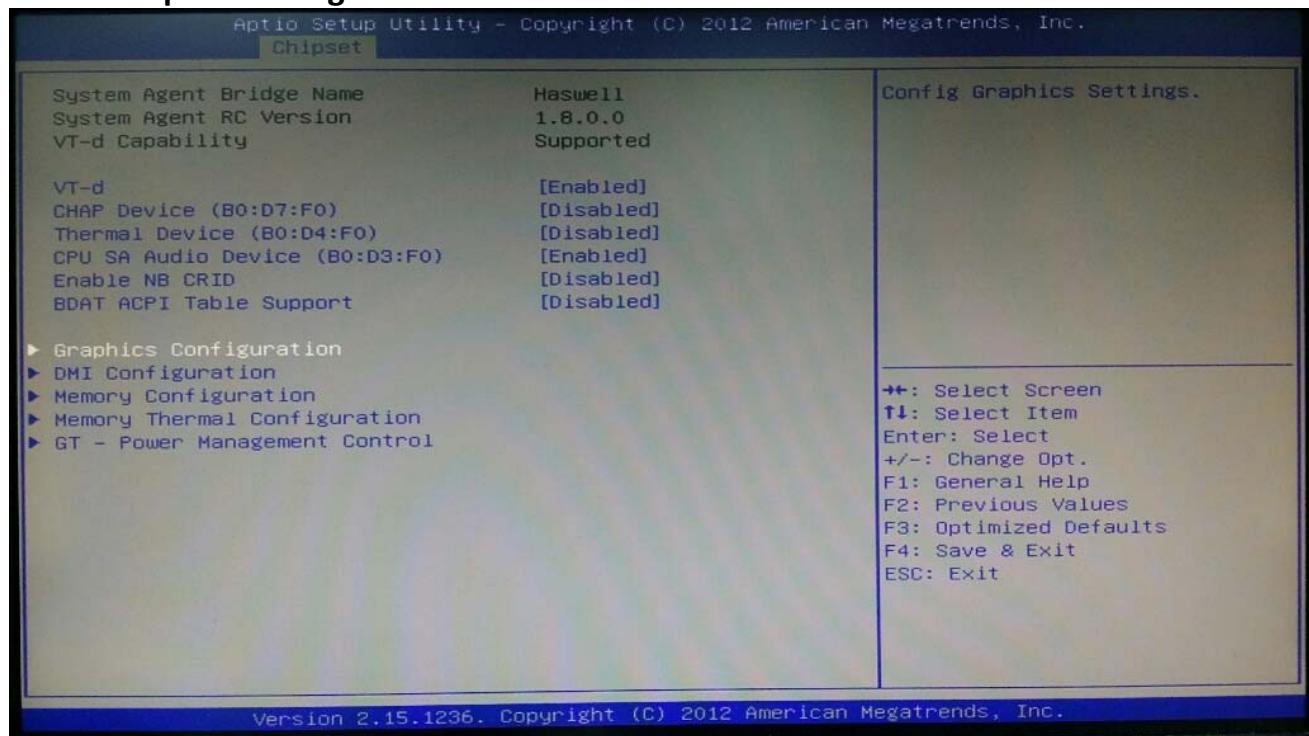
5.4 Chipset

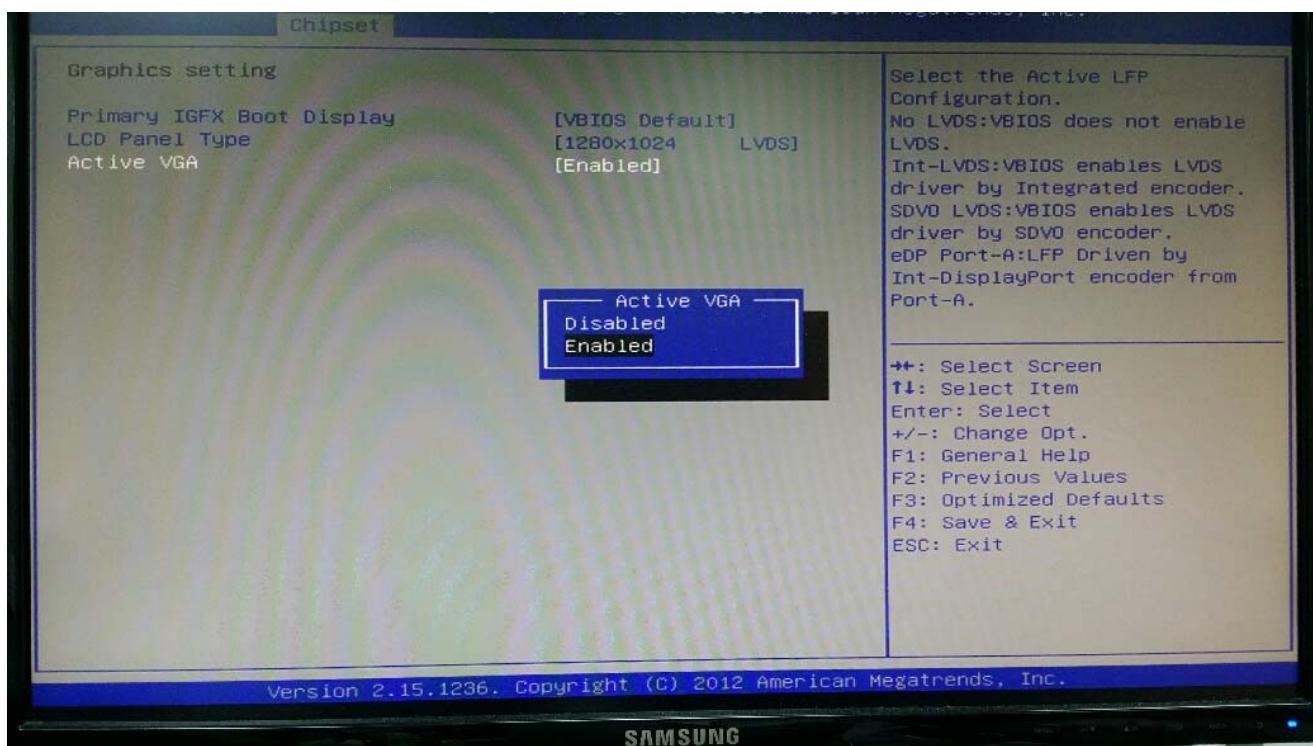
PCH-IO Configuration – Restore AC Power Loss



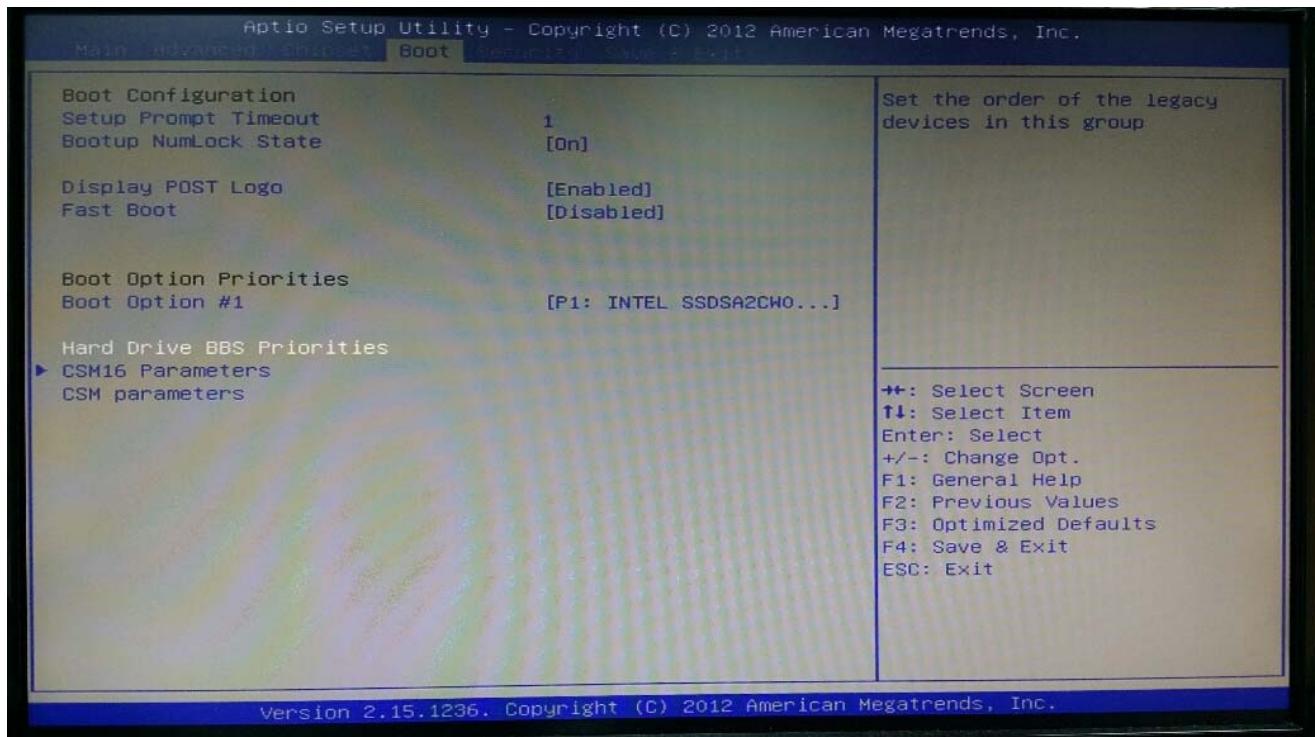
System Agent (SA) Configuration

» Graphics Configuration





5.5 Boot

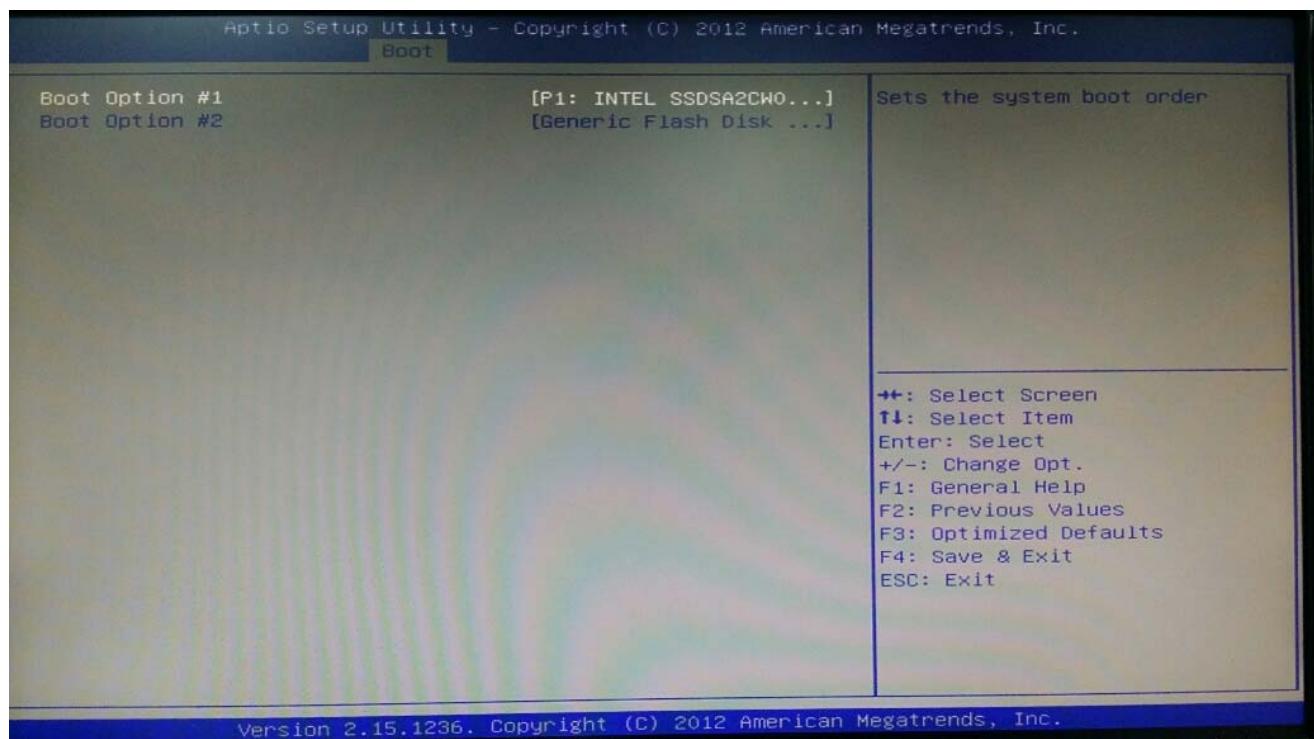


» 1st/2nd/3rd Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

» Try Other Boot Devices

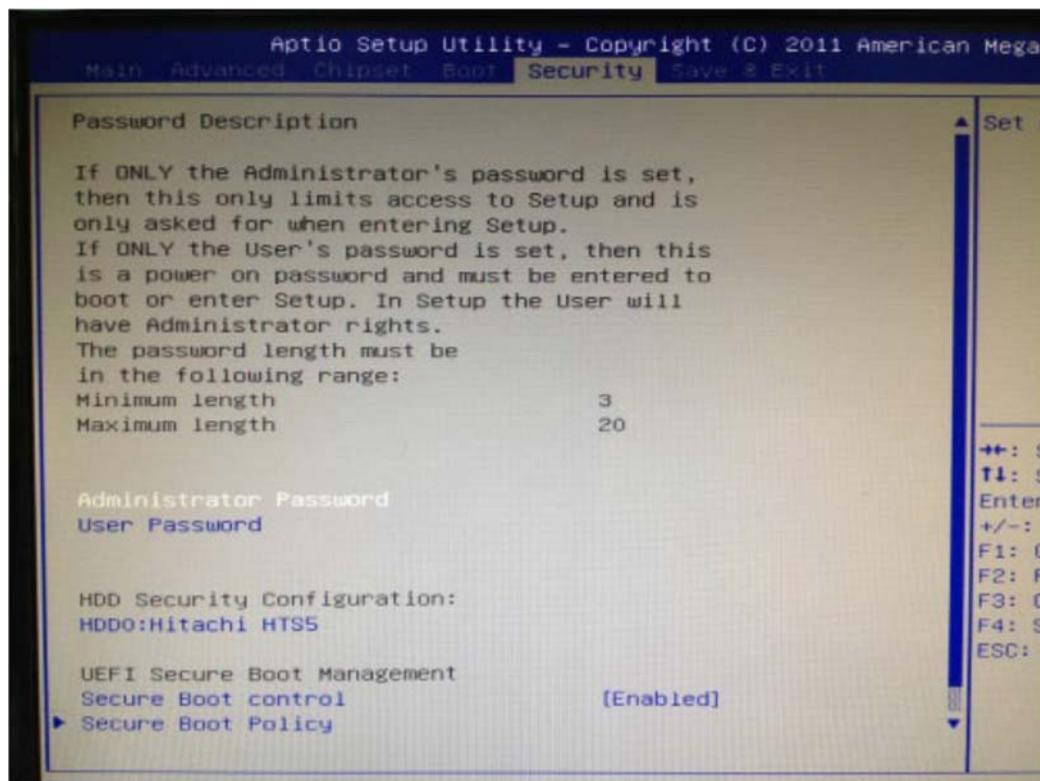
Setting the option to [Enabled] allows the system to try to boot from other device if the system fail to boot from the 1st/2nd/3rd boot device.



» Hard Disk Drives, CD/DVD Drives, USB Drives

These settings allow you to set the boot sequence of the specified devices.

5.6 Security



» Administrator Password

Administrator Password controls access to the BIOS Setup utility. These settings allow you to set or change the administrator password.

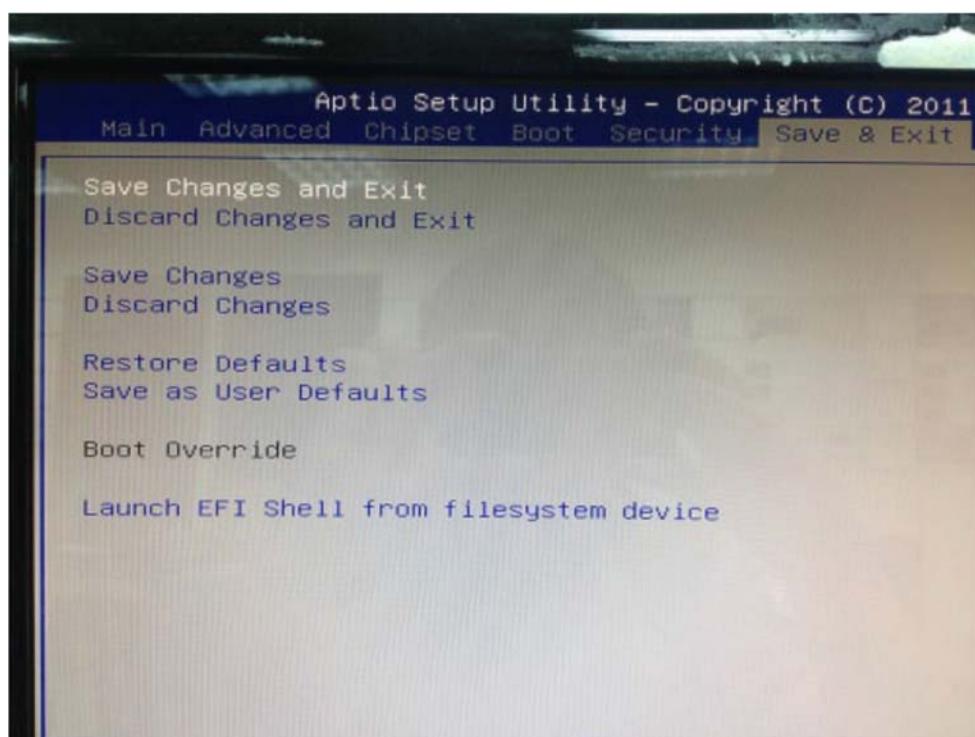
» User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

» Boot Sector Virus Protection

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you will need to disable this Flash Protection function.

5.7 Exit



» Save Changes and Exit

Save changes to CMOS and exit the Setup Utility.

» Discard Changes and Exit

Abandon all changes and exit the Setup Utility.

» Discard Changes

Abandon all changes and continue with the Setup Utility.

» Load Optimal Defaults

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

» Load Failsafe Defaults

Use this menu to load the default values set by the BIOS vendor for stable system performance

6.0

PACKING LIST

6.0 PACKING LIST

6.1 Packing List

System

Item	Part Number	Module Name
1	763620020004	VBOX-3620-M12X-i7 w/ Intel i7-6600U Barebone
1	763620020002	VBOX-3620-M12X-i5 w/ Intel i5-6300U Barebone
1	763620020001	VBOX-3620-M12X-i3 w/ Intel i3-6100U Barebone
1	763620020000	VBOX-3620-M12X-C1 w/ Intel Celeron 3955U Barebone

Accessory

Picture	Part Number	Module Name	Q'ty
	370832001100	VBOX-3600 Mount Bracket	2
	326910027661	Cabling MC421-350-02G F 90D	1
	351103040250	Screw F Type M3*4L ISO BK	8
	417290370250	HDD-RUBBER FOR H=7 mm	2
	344021002000	CB M12 A-code 5P Power Male 100cm	1