

# PICO313

Intel<sup>®</sup> Pentium<sup>®</sup> N4200/ Celeron<sup>®</sup> N3350 Processor Pico-ITX Board

**User's Manual** 



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## CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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# **ESD** Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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# Chapter 1 Introduction



The PICO313 is a Pico-ITX board with Intel<sup>®</sup> Pentium<sup>®</sup> N4200/ Celeron<sup>®</sup> N3350 processor that deliver outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions.

The board has one 204-pin unbuffered SO-DIMM socket for DDR3L 1867MHz SO-DIMM memory with maximum capacity up to 8GB. It also features one Gigabit/Fast Ethernet, one SATA port with transfer rates up to 6Gb/s, one USB 2.0 high speed compliant, and built-in high definition audio codec that can achieve the best stability and reliability for industrial applications. The board can be enhanced by its built-in watchdog timer function, a special industrial feature not commonly seen on other motherboards.

# 1.1 Features

- Intel<sup>®</sup> Pentium<sup>®</sup> N4200 and Celeron<sup>®</sup> N3350
- One DDR3L SO-DIMM supports up to 8GB memory capacity
- One full-size PCI-Express Mini Card
- One half-size PCI-Express Mini Card
- One USB 2.0 port and one Gigabit Ethernet port
- I/O expansion board supported
- One SIM Card
- +12V only DC-in supported

#### **Specifications** 1.2

#### CPU

- Intel<sup>®</sup> Pentium<sup>®</sup> N4200 1.1GHz quad core. Intel<sup>®</sup> Celeron<sup>®</sup> N3350 1.1GHz dual core.

#### **Thermal Solution**

Fanless. 

#### **Operating Temperature**

Temperature: -20°C ~ +70°C (-4°F ~ +158°F), operation. 

#### BIOS

- American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
- 64Mbit SPI Flash, DMI, Plug and Play.
- PXE Ethernet Boot ROM.

#### System Memory

- One 204-pin unbuffered DDR3L SO-DIMM socket.
- Maximum up to 8GB DDR3L 1867MHz memory. -

#### Serial ATA .

One SATA-600 connector. 

#### **USB** Interface

- One USB port with fuse protection and complies with USB Spec. Rev. 2.0.
- . Display
  - One 2x20-pin connector for 18/24-bit single and dual channel LVDS and one 8-pin wafer connector for inverter control. LVDS resolution is up to 1920x1200 in 24-bit dual channel.

#### Watchdog Timer •

1~65536 seconds or minutes; up to 65535 levels. 

#### Ethernet •

- One 1000/100/10Mbps Gigabit/Fast Ethernet port in wafer connector.
- Support Wake-on-LAN, PXE Boot ROM with Intel<sup>®</sup> i211AT. -

#### **Expansion Interface**

- One full-size PCI-Express Mini Card socket with mSATA supported.
- One half-size PCI-Express Mini Card socket.
- One board to board connector (high speed signal).
- One board to board connector (low speed signal).
- 4-bit digital I/O

#### **Power Input** •

- DC jack power connector, co-layout with 1x2-pin right angle connector.
- +12V DC-in only.
- AT auto power on function supported.
- **Power Management** .
  - ACPI (Advanced Configuration and Power Interface).
- **Form Factor** •
  - Pico-ITX form factor.



All specifications and images are subject to change without notice.

Note

#### 1.3 **Utilities**

- Chipset and graphics driver .
- Intel<sup>®</sup> Trusted Execution Engine (Intel<sup>®</sup> TXE) driver •
- Ethernet driver (i211AT) •
- Audio driver •

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# Chapter 2 Board and Pin Assignments



# 2.1 Board Dimensions and Fixing Holes

**Top View** 





# 2.3 Assembly Drawing

For thermal dissipation, a thermal solution enables the PICO313's components to dissipate heat efficiently. All heat generating components are thermally conducted to the heat spreader in order to avoid hot spots. Images below illustrate how to install the thermal solution on PICO313.

1. Heatsink and heat spreader for PICO313 (see image below):



2. First of all, use the following four screws to secure heatsink on heat spreader.



3. The PICO313 has four assembly holes for installation. Align and firmly secure thermal solution and AX93A07 I/O board to PICO313. Be careful not to over-tighten the screws.



#### AX93A07:

- ① 1pcs, 5943A072700E AX93A07 LAN Cable (15P) L=50mm
- 2 1pcs, 5943A074000E AX93A07 LVDS 24BIT Ycable L=60mm
- (3) 1pcs, 5943A078100E AX93A07 SMBus Cable L=70mm
- (4) 1pcs, 59413020450E AX93267 Power Cable
- (5) 1pcs, 72932670100e AX93A07 Bracket
- 6 2pcs, 793703ZZ600E 5H\*7L\*M3 Hex Female Copper Stand-off, True Color
- 2 2pcs, 75111630400E M3\*4L Pan Head Phillips Machine Nickel-plated Screw (RC)

# 2.4 Jumper Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. Below illustration shows how to set up jumper.



Properly configure jumper settings on the PICO313 to meet your application purpose. Below you can find a summary table of jumpers and onboard default settings.



Once the default jumper setting needs to be changed, please do it under power-off condition.

Jumper	Description	Setting
JP2	LVDS +3.3V/+5V/+12V Voltage Selection Default: +3.3V	1-2 Close
JP3	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 Close
JP4	Auto Power On Default: Enable	2-3 Close

2 4 6

### 2.4.1 LVDS +3.3V/+5V/+12V Voltage Selection (JP2)

The board supports voltage selection for flat panel displays. Use this jumper to set LVDS connector (CN10) pin 1~6 +DVCCM1 to +3.3V, +5V or +12V. To prevent hardware damage, before connecting please make sure that the input voltage of flat panel is correct.

Function	Setting	1 🔳 🗖
+3.3V level (Default)	1-2 close	3 0 0
+5V level	2-4 close	5 0 0
+12V level	5-6 close	° U U

### 2.4.2 Restore BIOS Optimal Defaults (JP3)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. Doing this procedure can restore BIOS optimal defaults.

Function	Setting	1 🛙
Normal (Default)	1-2 close	2
Restore BIOS optimal defaults	2-3 close	3

#### 2.4.3 Auto Power On (JP4)

If JP4 is enabled for power input, the system will be automatically power on without pressing soft power button. If JP4 is disabled for power input, it is necessary to manually press soft power button to power on the system.

Function	Setting	1
Disable auto power on	1-2 close	2
Enable auto power on (Default)	2-3 close	2

# 2.5 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connector	Description
CN1	Board to Board Connector 1 (Low Speed Signal)
CN2	Board to Board Connector 2 (High Speed Signal)
CN4	USB 2.0 Wafer Connector
CN5	SATA Power Connector
CN6	SMBus Connector
CN7	Front Panel Connector
CN8	Digital I/O Connector
CN9	I2C Connector
CN10	LVDS Connector
CN11	Power Connector
CN12	Inverter Connector
BAT1	CMOS Battery Connector
LAN1	Ethernet Connector
SATA1	SATA Connector
SCN1	Full-size PCI-Express Mini Card or mSATA Connector
SCN2	SIM Card Socket
SCN3	Half-size PCI-Express Mini Card Connector
SSDIMM1	DDR3L SO-DIMM Connector

## 2.5.1 Board to Board Connectors (CN1 and CN2)

CN1 is a 2x30-pin board to board connector. The pin assignments of CN1 are given as follows.

Pin	Signal	Pin	Signal
1	HDA_SYNC_1P8	2	HDA_CLK_1P8
3	HDA_SDI0_1P8	4	HDA_RST_1P8_N
5	HDA_SDO_1P8	6	HDA_VDDIO
7	DCD2/COM3_EN	8	DSR2/COM4_EN
9	RXD2/COM3_TERM	10	RTS2/COM4_TERM
11	TXD2/COM3_GPIO0	12	CTS2/COM4_GPIO0
13	DTR2/COM3_GPIO1	14	RI2/COM4_GPIO1
15	DCD1/COM1_EN	16	DSR1/COM2_EN
17	RXD1/COM1_TERM	18	RTS1/COM2_TERM
19	TXD1/COM1_GPIO0	20	CTS1/COM2_GPIO0
21	DTR1/COM1_GPIO1	22	RI1/COM2_GPIO1
23	N/A	24	N/A
25	LPC_CLK0_25M_BTB	26	L_AD3
27	L_FRAME_N	28	L_AD2
29	SER_IRQ	30	L_AD1
31	N/A	32	L_AD0
33	USB_OC1_3P3_N	34	USB_OC1_3P3_N
35	GND	36	GND
37	USB_DP0	38	USB_DP2
39	USB_DN	40	USB_DN2
41	GND	42	GND
43	USB_DP1	44	USB_DN3
45	USB_DN1	46	USB_DP3
47	GND	48	GND
49	FP_PSIN_N	50	+5V_SBY
51	SATA_LED_3P3_N	52	+5V_SBY
53	FP_RST_N	54	+5V_SBY
55	PLTRST_1_N	56	GND
57	+V3.3S	58	+V5S
59	+V3.3S	60	+V5S





CN2 is a 2x30-pin board to board connector. The pin assignments of CN2 are given as follows.

Pin	Signal	Pin	Signal
1	USB3_P0_RX_DP	2	PCIE_P1_RXP
3	USB3_P0_RX_DN	4	PCIE_P1_RXN
5	GND	6	GND
7	USB3_P0_TX_DP	8	PCIE_P1_TXP
9	USB3_P0_TX_DN	10	PCIE_P1_TXN
11	GND	12	GND
13	USB3_P1_RX_DP	14	PCIE_REFCLK1_DP
15	USB3_P1_RX_DN	16	PCIE_REFCLK1_DN
17	GND	18	GND
19	USB3_P1_TX_DP	20	DDI0_TX0_DP
21	USB3_P1_TX_DN	22	DDI0_TX0_DN
23	GND	24	GND
25	USB3_P2_RX_DP	26	DDI0_TX1_DP
27	USB3_P2_RX_DN	28	DDI0_TX1_DN
29	GND	30	GND
31	USB3_P2_TX_DP	32	DDI0_TX2_DP
33	USB3_P2_TX_DN	34	DDI0_TX2_DN
35	GND	36	GND
37	USB3_P3_RX_DP	38	DDI0_TX3_DP
39	USB3_P3_RX_DN	40	DDI0_TX3_DN
41	GND	42	GND
43	USB3_P3_TX_DP	44	DDI0_3P3_DATA
45	USB3_P3_TX_DN	46	DDI0_3P3_CLK
47	GND	48	GND
49	DDI0_AUX_DP	50	DDI03P3_HPD_C
51	DDI0_AUX_DN	52	PCIE_WAKE1_N_B2B
53	GND	54	SMB_DATA_3P3_MAIN
55	+V12S	56	SMB_CLK_3P3_MAIN
57	+3.3V_SBY	58	+V5S
59	+3.3V_SBY	60	+V5S

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It is suggested to insert I/O board (AX93A00, AX93A01, AX93A02 or AX93A09 ) into CN1 and CN2 on PICO313.

#### 2.5.2 USB 2.0 Wafer Connector (CN4)

This is a 4-pin (pitch=1.25mm) wafer connector, which is compliant with Molex 530470410, for USB 2.0 interface.

Pin	Signal
1	USB_PWR (+5V_SBY level)
2	D+
3	D-
4	GND



#### 2.5.3 SATA Power Connector (CN5)

The CN5 is a 4-pin (pitch=2.0mm) wafer connector, which is compliant with JST B4B-PH-K-S, for SATA power interface.

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

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#### 2.5.4 **SMBus Connector (CN6)**

This is a 3-pin (pitch=1.5mm) wafer connector for SMBus (System Management Bus) interface.

Pin	Signal
1	SMB_CLK_3P3_MAIN
2	SMB_DATA_3P3_MAIN
3	GND

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## 2.5.5 Front Panel Connector (CN7)

The CN7 is 2x5-pin header (pitch=2.0mm) for front panel interface.

Pin	Signal
1	GND
2	PWR_PSON#
3	PWRLED-
4	PWRLED+
5	PWRSW-
6	PWRSW+
7	HW RST-
8	HW RST+
9	HDDLED-
10	HDDLED+



#### **Power Status**

Pin 1 and pin 2 are for power status button; letting user know the power status of this board.

#### Power LED

Pin 4 connects anode (+) of LED and pin 3 connects cathode(-) of LED. The power LED lights up when the system is powered on.

#### Power On/Off Button

Pin 5 and 6 connect the power button on front panel to CPU board, which allows users to turn on or off power supply.

#### System Reset Switch

Pin 7 and 8 connect the case-mounted reset switch that reboots your computer without turning off the power switch. It is a better way to reboot your system for a longer life of system power supply.

#### HDD Activity LED

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 9 and 10 connect the hard disk drive to the front panel HDD LED, pin 9 is assigned as cathode(-) and pin 10 is assigned as anode(+).

# 2.5.6 Digital I/O Connector (CN8)

This is a 2x3-pin (pitch=2mm) connector. The board is equipped with a 4-bit digital I/O that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. You may use software programming to control these digital signals, please refer to Appendix D.

Pin	Signal	Pin	Signal
1	DIO 0	2	DIO 3
3	DIO 1	4	DIO 2
5	+5V	6	GND





## 2.5.7 I2C Connector (CN9)

This is a 3-pin (pitch=1.25mm) wafer connector for I2C interface.

Pin	Signal	1.0 1
1	I2C_CLK_SBY	
2	I2C_DAT_SBY	പ്പി
3	GND	3

## 2.5.8 LVDS Connector (CN10)

This board has a 2x20-pin connector for LVDS LCD interface. It is strongly recommended to use the matching JST SHDR-40VS-B connector for LVDS interface. Pin  $1\sim6$  +DVCCM1 can be set to +3.3V, +5V or +12V by setting JP2 (see section 2.4.1).

#### 18-bit single channel

Pin	Signal	Pin	Signal		
1	+DVCCM1	2	+DVCCM1		
3	+DVCCM1	4	+DVCCM1		
5	+DVCCM1	6	+DVCCM1		
7	N.C	8	N.C		
9	GND	10	GND		
11	N.C	12	N.C		
13	N.C	14	N.C		
15	GND	16	GND		
17	N.C	18	N.C		
19	N.C	20	N.C		
21	GND	22	GND		
23	Channel A D0-	24	N.C		
25	Channel A D0+	26	N.C		
27	GND	28	GND		
29	Channel A D1-	30	N.C		
31	Channel A D1+	32	N.C		
33	GND	34	GND		
35	Channel A D2-	36	Channel A CLK-		
37	Channel A D2+	38	Channel A CLK+		
39	GND	40	GND		



#### PICO313 Pico-ITX Board

#### 24-bit single channel

Pin	Signal	Pin	Signal
1	+DVCCM1	2	+DVCCM1
3	+DVCCM1	4	+DVCCM1
5	+DVCCM1	6	+DVCCM1
7	N.C	8	N.C
9	GND	10	GND
11	N.C	12	N.C
13	N.C	14	N.C
15	GND	16	GND
17	N.C	18	N.C
19	N.C	20	N.C
21	GND	22	GND
23	Channel A D0-	24	N.C
25	Channel A D0+	26	N.C
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND

#### 18-bit dual channel Pin Signal Pin Signal +DVCCM1 +DVCCM1 1 2 3 +DVCCM1 4 +DVCCM1 6 +DVCCM1 5 +DVCCM1 7 N.C 8 N.C 9 GND 10 GND 12 Channel B D0-11 N.C 13 N.C 14 Channel B D0+ 15 GND 16 GND 17 Channel B CLK-18 Channel B D1-19 Channel B CLK+ 20 Channel B D1+ 21 GND 22 GND 23 Channel A D0-24 Channel B D2-25 Channel A D0+ 26 Channel B D2+ 28 GND 27 GND 29 Channel A D1-30 N.C 32 N.C 31 Channel A D1+ 33 GND 34 GND 35 Channel A D2-36 Channel A CLK-37 Channel A D2+ 38 Channel A CLK+ 40 GND 39 GND

#### 24-bit dual channel

Pin	Signal	Pin	Signal
1	+DVCCM1	2	+DVCCM1
3	+DVCCM1	4	+DVCCM1
5	+DVCCM1	6	+DVCCM1
7	N.C	8	N.C
9	GND	10	GND
11	Channel B D3-	12	Channel B D0-
13	Channel B D3+	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND

## 2.5.9 Power Connector (CN11)

The CN11 is a 4-pin (pitch=2.5mm) wafer connector in right angle for DC +12V input. Gently connect CN11 to AX93A07 I/O board's CN2.

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

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1 4			-

### 2.5.10 Inverter Connector (CN12)

This is a Hirose DF13-8P-1.25C 8-pin connector for inverter. We strongly recommend you to use the matching DF13-8P-1.25C connector to avoid malfunction.

Pin	Signal
1	+12VM1 (+12V level)
2	+12VM1 (+12V level)
3	+V5S
4	LVDS Enable Control
5	GND
6	GND
7	GND
8	LVDS Brightness Control





## 2.5.11 CMOS Battery Connector (BAT1)

This is a 2-pin (pitch=1.25mm) wafer connector for CMOS battery interface.

Pin	Signal
1	+3.3V
2	GND

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## 2.5.12 Ethernet Connector (LAN1)

This is a JST BM16B-SRSS-TB 15-pin wafer connector for Ethernet interface. Gently connect LAN1 to AX93A07 I/O board's CN1.

Pin	Signal
1	LAN_1000_LED-
2	LAN_100_LED-
3	GND
4	MDI3-
5	MDI3+
6	MDI1-
7	MDI2-
8	MDI2+
9	MDI1+
10	MDI0-
11	MDI0+
12	GND
13	+3.3V_SBY
14	LAN_LINK_ACT
15	GND



### 2.5.13 SATA Connector (SATA1)

This Serial Advanced Technology Attachment (Serial ATA or SATA) connector is for high-speed SATA interface port. It is a computer bus interface for connecting to devices such as hard disk drives.

Pin	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND





# 2.5.14 Full-size PCI-Express Mini Card or mSATA Connector (SCN1)

This is a full-size PCI-Express Mini Card connector on the bottom side complying with PCI-Express Mini Card Spec. V1.2. It supports either PCI-Express, USB 2.0 or SATA (mSATA). Since the default setting is mSATA, if the PCI-Express Mini Card is needed to insert, please refer to section 4.4 to change the setting.

Pin	Signal	Pin	Signal
1	PCIE_WAKE2_ N	2	+3.3V_SBY
3	No use	4	GND
5	No use	6	+V1.5S
7	GND	8	SIM_PWR
9	GND	10	SIM_DATA
11	PCIE_REFCLK 2_DN	12	SIM_CLK
13	PCIE_REFCLK 2_DP	14	SIM_REST
15	GND	16	SIM_VPP
17	No use	18	GND
19	No use	20	+3.3V_SBY
21	GND	22	PLTRST_1_N
23	PCIE_mSATA_ Card_RXN	24	+3.3V_SBY
25	PCIE_mSATA_ Card_RXP	26	GND
27	GND	28	+V1.5S
29	GND	30	SMB_CLK_3P3_ SBY
31	PCIE_mSATA_ Card_TXN	32	SMB_DATA_3P3 _SBY
33	PCIE_mSATA_ Card_TXP	34	GND
35	GND	36	USB_DN5
37	GND	38	USB_DP5
39	+3.3V_SBY	40	GND
41	+3.3V_SBY	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+V1.5S
49	No use	50	GND
51	No use	52	+3.3V_SBY



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## 2.5.15 SIM Card Socket (SCN2)

This board has SCN2 socket on the bottom side for inserting SIM Card. In order to work properly, the SIM Card must be used together with 3G module inserted to SCN1 or SCN3. It is mainly used in 3G wireless network application.

Pin	Signal
1	SIM_PWR
2	SIM_REST
3	SIM_CLK
4	No use
5	GND
6	SIM_VPP
7	SIM_DATA
8	No use



### 2.5.16 Half-size PCI-Express Mini Card Connector (SCN3)

This is a half-size PCI-Express Mini Card connector on the bottom side complying with PCI-Express Mini Card Spec. V1.2. It supports either PCI-Express or USB 2.0.

Pin	Signal	Pin	Signal
1	PCIE_WAKE3_N	2	+3.3V_SBY
3	No use	4	GND
5	No use	6	+1.5V
7	GND	8	SIM_PWR
9	GND	10	SIM_DATA
11	PCIE_REFCLK3_DN	12	SIM_CLK
13	PCIE_REFCLK3_DP	14	SIM_REST
15	GND	16	SIM_VPP
17	No use	18	GND
19	No use	20	+3.3V_SBY
21	GND	22	PLTRST_1_N
23	PCIE_P3_RXN	24	+3.3V_SBY
25	PCIE_P3_RXP	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK_3P3_SBY
31	PCIE_P3_TXN	32	SMB_DATA_3P3_SBY
33	PCIE_P3_TXP	34	GND
35	GND	36	USB_DN6
37	GND	38	USB_DP6
39	+3.3V_SBY	40	GND
41	+3.3V_SBY	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3V_SBY



# Chapter 3 Hardware Description

# 3.1 Microprocessors

The PICO313 supports Intel<sup>®</sup> Pentium<sup>®</sup> N4200 and Celeron<sup>®</sup> N3350 processors, which enables your system to operate under Windows<sup>®</sup> 10 environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

# 3.2 BIOS

The PICO313 uses AMI Plug and Play BIOS with a single 64Mbit SPI Flash.

# 3.3 System Memory

The PICO313 supports one 204-pin DDR3L SO-DIMM socket for maximum memory capacity up to 8GB DDR3L SDRAMs. The memory module comes in sizes of 2GB, 4GB and 8GB.

# 3.4 I/O Port Address Map

mp	ad output (io)
	[00000000000000 - 00000000000006F] PCI Express Root Complex
	[000000000000020 - 000000000000021] Programmable interrupt controller
	[00000000000024 - 000000000000025] Programmable interrupt controller
	[00000000000028 - 000000000000029] Programmable interrupt controller
	[0000000000002C - 0000000000002D] Programmable interrupt controller
	[0000000000002E - 0000000000002F] Motherboard resources
	[000000000000030 - 0000000000000031] Programmable interrupt controller
	[000000000000034 - 0000000000000035] Programmable interrupt controller
	[00000000000038 - 000000000000039] Programmable interrupt controller
	[0000000000003C - 00000000000003D] Programmable interrupt controller
	[000000000000040 - 000000000000043] System timer
	[0000000000004E - 0000000000004F] Motherboard resources
	[000000000000050 - 00000000000053] System timer
	[000000000000061 - 000000000000061] Motherboard resources
	[000000000000062 - 000000000000062] Microsoft ACPI-Compliant Embedded Controller
	[00000000000063 - 00000000000063] Motherboard resources
	[000000000000065 - 000000000000065] Motherboard resources
	[000000000000066 - 000000000000066] Microsoft ACPI-Compliant Embedded Controller
	[000000000000067 - 00000000000067] Motherboard resources
	[000000000000070 - 000000000000000] Motherboard resources
	[000000000000070 - 000000000000077] System CMOS/real time clock
	[00000000000078 - 00000000000CF7] PCI Express Root Complex
	[00000000000080 - 000000000008F] Motherboard resources
	[00000000000092 - 00000000000092] Motherboard resources
	[0000000000000A0 - 0000000000000A1] Programmable interrupt controller
	[000000000000A4 - 000000000000A5] Programmable interrupt controller
	[000000000000A8 - 0000000000000A9] Programmable interrupt controller
	[000000000000AC - 000000000000AD] Programmable interrupt controller
	[0000000000000B0 - 0000000000000B1] Programmable interrupt controller
	[000000000000B2 - 000000000000B3] Motherboard resources
	[000000000000B4 - 0000000000000B5] Programmable interrupt controller
	[0000000000000B8 - 00000000000000B9] Programmable interrupt controller
	[000000000000BC - 000000000000BD] Programmable interrupt controller
	[000000000002F8 - 000000000002FF] Communications Port (COM2)
	[000000000002F8 - 000000000002FF] Communications Port (COM2)
-	[000000000003B0 - 000000000003BB] Intel(R) HD Graphics
100	[000000000003C0 - 000000000003DF] Intel(R) HD Graphics
	[000000000003E8 - 000000000003EF] Communications Port (COM3)
ė.	[000000000003F8 - 000000000003FF] Communications Port (COM1)
÷.	[000000000003F8 - 000000000003FF] Communications Port (COM1)
t.	[000000000000400 - 0000000000047F] Motherboard resources
	[0000000000004D0 - 0000000000004D1] Programmable interrupt controller
	[000000000000000 - 000000000005FE] Motherboard resources
	[000000000000000 - 00000000000061F] Motherboard resources
	[00000000000680 - 00000000000069F] Motherboard resources
	[000000000000000 - 00000000000000000000
	[0000000000164E - 0000000000164F] Motherboard resources
	[0000000000000000 - 000000000000EFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8
181	[0000000000000000000000000000000000000
181	[000000000000000 - 0000000000000F03F] Intel(R) HD Graphics
181	[000000000000000 - 000000000000F03F] Intel(R) HD Graphics
	[000000000000000000000000000000000056] Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
-	[00000000000006060 - 0000000000000F07F] Standard SATA AHCI Controller
-	[0000000000000000000000000000000000000
	[0000000000000000000000000000000000000

# 3.5 Interrupt Controller (IRQ) Map

The interrupt controller (IRQ) mapping list is shown as follows:

~	$\square$	Int	errupt	request (IRQ)	
			(ISA)	0x00000000 (00)	System timer
		Ψ.	(ISA)	0x0000003 (03)	Communications Port (COM2)
		Ψ.	(ISA)	0x0000003 (03)	Communications Port (COM2)
		Ψ,	(ISA)	0x0000004 (04)	Communications Port (COM1)
		÷.	(ISA)	0x0000004 (04)	Communications Port (COM1)
		Ψ.	(ISA)	0x0000007 (07)	Communications Port (COM3)
			(ISA)	0x0000008 (08)	High precision event timer
		-181	(ISA)	0x0000000B (11)	Intel(R) HD Graphics
		-181	(ISA)	0x000000B (11)	Intel(R) HD Graphics
			(ISA)	0x0000036 (54)	Microsoft ACPI-Compliant System
			(ISA)	0x00000037 (55)	Microsoft ACPI-Compliant System
			(ISA)	0x0000038 (56)	Microsoft ACPI-Compliant System
			(ISA)	0x00000039 (57)	Microsoft ACPI-Compliant System
		-	(ISA)	0x0000003A (58)	Microsoft ACPI-Compliant System
			(ISA)	0x0000003B (59)	Microsoft ACPI-Compliant System
		-	(ISA)	0x0000003C (60)	Microsoft ACPI-Compliant System
		-	(ISA)	0x0000003D (61)	Microsoft ACPI-Compliant System
			(ISA)	0x0000003E (62)	Microsoft ACPI-Compliant System
			(ISA)	0x000003F (63)	Microsoft ACPI-Compliant System
		-	(ISA)	0x00000040 (64)	Microsoft ACPI-Compliant System
		1	(ISA)	0x00000041 (65)	Microsoft ACPI-Compliant System
		2		0x00000042 (66)	Microsoft ACPI-Compliant System
		2		0x00000045 (67)	Microsoft ACPI-Compliant System
		2		0x00000044 (08)	Microsoft ACPI-Compliant System
		2		0x00000045 (03)	Microsoft ACPI-Compliant System
		2	(ISA)	0x00000047 (71)	Microsoft ACPI-Compliant System
		1	(ISA)	0x00000048 (72)	Microsoft ACPI-Compliant System
		2	(ISA)	0x00000049 (72)	Microsoft ACPI-Compliant System
		Ē.	(ISA)	0x0000004A (74)	Microsoft ACPI-Compliant System
		Ē	(ISA)	0x0000004B (75)	Microsoft ACPI-Compliant System
			(ISA)	0x0000004C (76)	Microsoft ACPI-Compliant System
			(ISA)	0x0000004D (77)	Microsoft ACPI-Compliant System
			(ISA)	0x0000004E (78)	Microsoft ACPI-Compliant System
			(ISA)	0x0000004F (79)	Microsoft ACPI-Compliant System
			(ISA)	0x00000050 (80)	Microsoft ACPI-Compliant System
			(ISA)	0x00000051 (81)	Microsoft ACPI-Compliant System
			(ISA)	0x00000052 (82)	Microsoft ACPI-Compliant System
			(ISA)	0x00000053 (83)	Microsoft ACPI-Compliant System
			(ISA)	0x00000054 (84)	Microsoft ACPI-Compliant System
			(ISA)	0x00000055 (85)	Microsoft ACPI-Compliant System
			(ISA)	0x00000056 (86)	Microsoft ACPI-Compliant System
			(ISA)	0x00000057 (87)	Microsoft ACPI-Compliant System
			(ISA)	0x00000058 (88)	Microsoft ACPI-Compliant System
			(ISA)	0x00000059 (89)	Microsoft ACPI-Compliant System
		2		0x0000005A (90)	Microsoft ACPI-Compliant System
		2		0x00000056 (91)	Microsoft ACPI-Compliant System
		2	(ISA)	0x0000005D (93)	Microsoft ACPI-Compliant System
		E.	(ISA)	0x0000005E (94)	Microsoft ACPI-Compliant System
			(ISA)	0x0000005F (95)	Microsoft ACPI-Compliant System
			(ISA)	0x0000060 (96)	Microsoft ACPI-Compliant System
			(ISA)	0x00000061 (97)	Microsoft ACPI-Compliant System
			(ISA)	0x0000062 (98)	Microsoft ACPI-Compliant System
			(ISA)	0x0000063 (99)	Microsoft ACPI-Compliant System
			(ISA)	0x00000064 (100)	Microsoft ACPI-Compliant System
		Ľ,	(ISA)	0x00000065 (101)	Microsoft ACPI-Compliant System
		Þ	(ISA)	0x00000066 (102)	Microsoft ACPI-Compliant System
		Þ	(ISA)	0x00000067 (103)	Microsoft ACPI-Compliant System
		P	(ISA)	0x00000068 (104)	Microsoft ACPI-Compliant System
			(ISA)	Ux00000069 (105)	Microsoft ACPI-Compliant System
			(ISA)	0x0000006A (106	) Microsoft ACPI-Compliant System

	(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
	(ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
	(ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
	(ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
	(ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
	(ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
	(ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
	(ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
	(ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
	(ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
	(ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
	(ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
	(ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
	(ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
	(ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
	(ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
	(ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
	(ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
	(ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
	(ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
	(ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
	(ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System
	(ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
	(ISA) 0x00000086 (134)	Microsoft ACPI-Compliant System
	(ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
	(ISA) 0x00000088 (136)	Microsoft ACPI-Compliant System
	(ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008A (138)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System
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	(ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008F (143)	Microsoft ACPI-Compliant System
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ĩ.	(ISA) 0x00000199 (409)	Microsoft ACPI-Compliant System
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to (ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System		
to (ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System		
E (PCI) 0x00000019 (25)	High Definition Audio Controller		
(PCI) 0xFFFFFFF1 (-15)	Intel(R) HD Graphics		
(PCI) 0xFFFFFFF2 (-14)	Intel(R) Trusted Execution Engine Interface		
PCI) 0xFFFFFFF3 (-13)	Intel(R) I211 Gigabit Network Connection		
PCI) 0xFFFFFFF4 (-12)	Intel(R) I211 Gigabit Network Connection		
PCI) 0xFFFFFFF5 (-11)	Intel(R) I211 Gigabit Network Connection		
(PCI) 0xFFFFFFF6 (-10)	Intel(R) I211 Gigabit Network Connection		
(PCI) 0xFFFFFFF7 (-9)	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)		
(PCI) 0xFFFFFF8 (-8)	Standard SATA AHCI Controller		
E (PCI) 0xFFFFFFF9 (-7)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD7		
E (PCI) 0xFFFFFFA (-6)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD6		
(PCI) 0xFFFFFFB (-5)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADB		
(PCI) 0xFFFFFFC (-4)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADA		
(PCI) 0xFFFFFFD (-3)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9		
(PCI) 0xFFFFFFFE (-2)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8		

# 3.6 Memory Map

The memory mapping list is shown as follows:

~	Memory	
	[0000000000000000 - 0000000000BFFFF] Intel(R) HD Graphics	
	ta [0000000000000000 - 00000000000BFFFF] PCI Express Root Complex	
	a [000000000000000 - 0000000000000000000	
	ta [0000000000000000 - 000000000000000000	
	a [000000007B800001 - 000000007BFFFFFF] PCI Express Root Complex	
	a [00000007C000001 - 000000007FFFFFFF] PCI Express Root Complex	
	[0000000080000000 - 00000008FFFFFF] Intel(R) HD Graphics	
	[0000000080000000 - 00000008FFFFFF] Intel(R) HD Graphics	
	[0000000080000000 - 00000008FFFFFF] Intel(R) HD Graphics	
	a [000000080000000 - 00000000CFFFFFFF] PCI Express Root Complex	
	[0000000090000000 - 0000000090FFFFF] Intel(R) HD Graphics	
	[0000000090000000 - 0000000090FFFFF] Intel(R) HD Graphics	
	[0000000090000000 - 0000000090FFFFF] Intel(R) HD Graphics	
	🏣 [0000000091000000 - 00000000910FFFFF] High Definition Audio Controller	
	🕎 [0000000091100000 - 000000009111FFFF] Intel(R) I211 Gigabit Network Connection	
	p [0000000091100000 - 00000000911FFFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8	
	[0000000091120000 - 0000000091123FFF] Intel(R) I211 Gigabit Network Connection	
	[0000000091200000 - 00000009120FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)	
	🏣 [0000000091210000 - 0000000091213FFF] High Definition Audio Controller	
	[0000000091214000 - 0000000091215FFF] Standard SATA AHCI Controller	
	a [000000091216000 - 0000000912160FF] Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4	
	a [000000091217000 - 00000000912177FF] Standard SATA AHCI Controller	
	[0000000091218000 - 00000000912180FF] Standard SATA AHCI Controller	
	ta [000000009121B000 - 000000009121BFFF] Intel(R) Trusted Execution Engine Interface	
	[00000000E0000000 - 0000000EFFFFFF] Motherboard resources	
	[00000000E0000000 - 0000000EFFFFFF] PCI Express Root Complex	
	[00000000FEA00000 - 00000000FEAFFFF] Motherboard resources	
	a [00000000FED00000 - 00000000FED003FF] High precision event timer	
	[00000000FED01000 - 00000000FED01FFF] Motherboard resources	
	[00000000FED03000 - 00000000FED03FFF] Motherboard resources	
	[00000000FED06000 - 00000000FED06FFF] Motherboard resources	
	[00000000FED08000 - 00000000FED09FFF] Motherboard resources	
	[00000000FED1C000 - 00000000FED1CFFF] Motherboard resources	
	[00000000FED40000 - 00000000FED40FFF] Trusted Platform Module 1.2	
	[00000000FED80000 - 00000000FEDBFFF] Motherboard resources	
	I00000000FEE00000 - 00000000FEEFFFF1 Motherboard resources	

# Chapter 4 AMI BIOS Setup Utility

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

# 4.1 Starting

To enter the setup screens, follow the steps below:

- 1. Turn on the computer and press the <Del> key immediately.
- 2. After you press the <Del> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

ĥ	-	7
	ĸ.	4
	2	18
		10.

If your computer cannot boot after making and saving system changes with BIOS setup, you can restore BIOS optimal defaults by setting JP3 (see section 2.4.2).

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

# 4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.



Some of the navigation keys differ from one screen to another.

Hot Keys	Description
→← Left/Right	The Left and Right <arrow> keys allow you to select a setup screen.</arrow>
∱↓ Up/Down	The Up and Down <arrow> keys allow you to select a setup screen or sub-screen.</arrow>
+- Plus/Minus The Plus and Minus <arrow> keys allow you to change the field value particular setup item.</arrow>	
Tab	The <tab> key allows you to select setup fields.</tab>
F1	The <f1> key allows you to display the General Help screen.</f1>
F2	The <f2> key allows you to Load Previous Values.</f2>
F3	The <f3> key allows you to Load Optimized Defaults.</f3>
F4	The <f4> key allows you to save any changes you have made and exit Setup. Press the <f4> key to save your changes.</f4></f4>
Esc	The <esc> key allows you to discard any changes you have made and exit the Setup. Press the <esc> key to exit the setup without saving your changes.</esc></esc>
Enter	The <enter> key allows you to display or change the setup option listed for a particular setup item. The <enter> key can also allow you to display the setup sub- screens.</enter></enter>

# 4.3 Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.

BIOS Information		
Project Version Build Date and Time EC Information Firmware Version System Date System Time	PICO313 X001 01/04/2017 17:18:34 PICO313 X03 [Tue 01/01/2115] [00:03:19]	Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 2005-2099 Months: 1-12 Days: dependent on month
Access Level	Administrator	<pre>++: Select Screen  \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$</pre>

• BIOS and EC Information

Display BIOS and EC firmware information.

• System Date/Time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

#### Access Level

Display the access level of current user.

# 4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- Hardware Monitor
- ACPI Settings
- Trusted Computing
- CPU Configuration
- SATA Configuration
- USB Configuration
- Utility Configuration
- Device Configuration (This option appears only if an I/O board is connected.)

For items marked with "▶", please press <Enter> for more options.

Aptio Setup Utility Main Advanced Chipset Secu	- Copyright (C) 2017 American Megatrends, Inc. rity Boot Save & Exit
<ul> <li>Hardware Monitor</li> <li>ACPI Settings</li> <li>Trusted Computing</li> <li>CPU Configuration</li> <li>SATA Configuration</li> <li>USB Configuration</li> <li>Utility Configuration</li> <li>Device Configuration</li> </ul>	Monitor hardware status.
	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.18.1263.	Copyright (C) 2017 American Megatrends, Inc.

#### • Hardware Monitor

This screen monitors hardware health status.

PC Health Status		
CPU Temperature System Temperature VBAT +3.3V +3.3V_SBY +5V	: +51 °C : +35 °C : +2.96 V : +3.32 V : +3.34 V : +5.02 V	
		<pre> ++: Select Screen  11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

This screen displays the temperature of system and CPU, system voltages (VBAT, +3.3V, +3.3V\_SBY and +5V).

#### ACPI Settings

You can use this screen to select options for the ACPI configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

ACPI Settings		Select the highest ACPI slee state the system will enter when the SUSPEND button is pressed.
	ACPI Sleep State Suspend Disabled S3 (Suspend to RAM)	<pre>→+: Select Screen  ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

#### **ACPI Sleep State**

Select the ACPI (Advanced Configuration and Power Interface) sleep state. Configuration options are Suspend Disabled and S3 (Suspend to RAM). The default setting is S3 (Suspend to RAM); this option selects ACPI sleep state the system will enter when suspend button is pressed.

#### • Trusted Computing

This screen provides function for specifying the TPM settings.

Configuration		Enables or Disables BIOS
	[Enable]	support for security device.
TPM Device	[Enabled]	0.S. will not show Security Device. TCG EFI protocol and
Current Status Information		INT1A interface will not be
TPM Enabled Status:	Enable	available.
TPM Active Status:	Activated	
TPM Owner Status:	Unowned	
	Enable	<pre>++: Select Screen  ↑↓: Select Item Enter: select</pre>
	Enable	↔: Select Screen †↓: Select Item Enter: Select
	Enable	++: Select Screen †!: Select Item Enter: Select +/-: Change Opt. F1: General Help
	Enable	++: Select Screen †1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
	Enable	<pre>++: Select Screen  1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults</pre>
	Enable	<pre>++: Select Screen  1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit</pre>
	Enable	<pre>*+: Select Screen  fl: Select Item Enter: Select +/-: Change Opt. Fl: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

#### Security Device Support

Enable or disable BIOS support for security device. The default setting is Enable.

Advanced	
Configuration	(
Security Device Support	[Enabled]
IPM Device	
Current Status Information	
TPM Enabled Status:	Enable
TPM Active Status:	Activated
TPM Owner Status:	Unowned
	TPM Device
	Disabled
	Enabled

#### **TPM Device**

Enable or disable TPM device that supports TPM 1.2 specifications, for example: ST Microelectronics TPM1.2 ST33ZP24AR28PVSP.

#### **Current Status Information**

Display current TPM status information.

#### • CPU Configuration

This screen shows the CPU Configuration and you can change the value of the selected option.



#### Intel Virtualization Technology

Enable or disable Intel Virtualization Technology. When enabled, a VMM (Virtual Machine Mode) can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a computer system to work as several virtual systems.

#### • SATA Configuration

In the SATA Configuration menu, you can see the current installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.

Aptio Setu Advanced	p Utility - Copyright (C) 2017 Amer	ican Megatrends, Inc.
Chipset SATA	[Enable]	Enables or Disables the Chipset SATA Controller. The
Port 0	[Enabled]	Chipset SATA controller
Port 1	[Enabled]	supports the 2 black internal
PCIE/mSATA	[mSATA Device]	SATA ports (up to 3Gb/s
SATA Port 0		supported per port).
Not Present		
SATA Port 1		
Not Present		
	Disable	++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	.18.1263. Copyright (C) 20 <u>17 Americ</u>	can Megatrends, Inc.

#### **Chipset SATA**

Enable or disable the SATA chipset controller.



**Port 0~1** Enable or disable SATA port 0~1.

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Advanced	
Chipset SATA	[Enable]
Port 0	[Enabled]
Port 1	[Enabled]
PCIE/mSATA	
SATA Port 0	
Not Present	
SATA Port 1	
Not Present	
	PCIE/mSATA
	mini PCIe
	mSATA Device

#### PCIE/mSATA

Choose PCIE or mSATA for PCI-Express Mini Card (see section 2.5.14). The default is mSATA.

#### • USB Configuration

JSB Configuration		Mass storage device emulation
JSB Module Version	16	devices according to their media format. Optical drives
JSB Controllers:		are emulated as 'CDROM',
1 XHCI		drives with no media will be
JSB Devices:		emulated according to a drive
1 Drive, 1 Keyboard		type.
Mass Storage Devices:		
JetFlashTranscend 16GB 1100		
		++: Select Screen
		<pre> tl: Select Item </pre>
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: EXIT

### **USB** Devices

Display all detected USB devices.

#### Mass Storage Devices

Mass storage device emulation type. Auto option enumerates devices according to their media format. Optical drives are emulated as CDROM, drives with no media will be emulated according to a drive type.

# • Utility Configuration

Aptio Setup Utility - Copyright (C) Advanced	) 2017 American Megatrends, Inc.
Utility Configuration ▶ BIOS Flash Utility	BIOS Flash Utility
Select File fr Acpi(a0341d0, 0)\PCI(15 0)\USB(	om a File system 2,0)\HD(Part1, Sig ?)\
	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18.1263. Copyright (C)	2017 American Megatrends, Inc.

**BIOS Flash Utility** BIOS flash utility configuration. For more detailed information, please refer to Appendix E.

#### • Device Configuration

A description of selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc. Advanced		
► Onboard Device Configuration ► Module Device Configuration	Onboard Device Configuration status	
	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
version 2.18.1263. Copyright (C) 20	17 American Megatrends, Inc.	

#### **Onboard Device Configuration**

Use this option to configure onboard device (e.g., digital I\O setting).

#### Module Device Configuration

This option appears only if an I/O board is installed. BIOS will auto-detect all supported functions and you can use it to change settings on the I/O board. The PICO313 supports the following I/O boards: AX93A00, AX93A01, AX93A02 and AX93A09.

### • Onboard DIO Configuration

You can use this screen to select options for the 4-bit digital I/O Configuration. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.

Onboard DIO Configuration	Onboard DIO status
	<pre> ++: Select Screen  1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

**Onboard DIO Configuration** Use this screen to set parameters related to digital I/O configuration.

Onboard DIO Configuration DIO Modification DIO port 1-4		Enabled or Disabled DIO Modification
	DIO Modification — Disabled Enabled	<pre> +: Select Screen '1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

#### **DIO Modification**

Enable or disable digital I/O modification. If modification is disabled, the DIO status sub screen is as follows:

Ad	vanced			
DIO Status 1. Input/O 2. Input/O 3. Input/O 4. Input/O	itput Status itput Status itput Status itput Status	Out In Out In	& High & High & High & High	
DIO Status 1. Input/O 2. Input/O 3. Input/O 4. Input/O	itput Status itput Status itput Status itput Status	Out In Out In	& High & High & High & High	

Once it is enabled, you can load manufacture default and access to the DIO status sub screen to set output or input, see image below.



#### • Module Device Configuration

This screen is available only if an I/O board with serial ports is connected. For items marked with "▶", please press <Enter> for more options.

AxiomType3 Super IO Configuration	System Super IO Chip Parameters.
	<pre>→+: Select Screen  ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

AxiomType3 Super IO Configuration



#### Serial Port 1~2 Configuration

Set parameters related to serial port 1~2 on the I/O board.

### • Serial Port 1 Configuration

Serial Port I Configuration		Enable or Disable Serial Port
		(COM)
Device Settings	IO=3F8h; IRQ=4;	
COM Port Type	[RS232]	
Terminal Mode	[Disabled]	
	Serial Port – Disabled Enabled	++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

#### **Serial Port**

Enable or disable serial port 1 on I/O board. The optimal setting for base I/O address is 3F8h and for interrupt request address is IRQ4.

Advanced	
Serial Port 1 Configuration	
Serial Port	[Enabled]
Device Settings	IO=3F8h; IRQ=4;
COM Port Type	[R5232]
Terminal Mode	[Disabled]
	COM Port Type
	RS232
	RS422
	RS485

#### COM Port Type

Use this item to set RS-232/422/485 communication mode.

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#### **Terminal Mode**

Enable or disable terminal mode.

• Serial Port 2 Configuration



#### **Serial Port**

Enable or disable serial port 2 on I/O board. The optimal setting for base I/O address is 2F8h and for interrupt request address is IRQ3.



#### **COM Port Type**

Use this item to set RS-232/422/485 communication mode.

Advanced	
Serial Port 2 Configuration	
Serial Port Device Settings	[Enabled] IO=2F8h; IRQ=3;
<b>COM Port Type</b> Terminal Mode	[RS232] [Disabled]
	Terminal Mode Disabled Enabled

#### **Terminal Mode**

Enable or disable terminal mode.

# 4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

► North Bridge

For items marked with "▶", please press <Enter> for more options.

Main Advanced Chipset Security Boot Save & Exit	t
▶ North Bridge	North Bridge Parameters
	<pre>++: Select Screen  \$ 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

• North Bridge This screen allows users to configure parameters of North Bridge chipset.

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc. Chipset		
► IGFX	Config Graphics settings	
	++: Select Screen †1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
version 2.18.1263. Copyright (C) 2017	7 American Megatrends, Inc.	

### IGFX

This item allows you to configure graphics settings. Please press <Enter> to go to the sub menus.

Chipset		
Primary IGFX Boot Display Secondary IGFX Boot Display LVDS Panel Type Memory Information	[LVDS] [Disabled] [1024x768 18Bit]	Select the Video Device which will be activated during POST This has no effect if externa graphics present. Secondary boot display
Total Memory	8192 MB (LPDDR3)	selection will appear based or your selection.
	Primary IGFX Boot Display	
	VGA	
		HE SPIELS STEPPI
		11: Select Item
		<pre> th: Select Screen th: Select Item Enter: Select +/-: Change Opt. </pre>
		<pre>11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values</pre>

#### For PICO313 with HDMI (AX93A01):

[LVDS] [Disabled] [1024x768 18Bit]
8192 MB (LPDDR3)
8192 MB (LPDDR3)
Primary IGFX Boot Display LVDS HDMI



The LVDS option can only be selected in Primary IGFX Boot Display.

#### Primary IGFX Boot Display

Select the video device which will be activated during POST (Power-On Self Test).

The images below show Primary IGFX Boot Display option list when AX93A07 I/O board is installed.

#### For PICO313+AX93A07: Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc. Chipset Primary IGFX Boot Display [VGA(AX93A07)] LVDS Panel Type [1024x768 24Bit] Ch7036 Panel Type [1024x768] Memory Information Total Memory 8192 MB (LPDDR3) 8192 MB (LPDDR3) Memory Slot0 ++: Select Screen Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc

#### For PICO313+AX93A07 with VGA (AX93A00):

chipsee	
Primary IGFX Boot Display Secondary IGFX Boot Display LVDS Panel Type Ch7036 Panel Type Memory Information	[vGA(AX93A07)] [ <b>Disabled]</b> [1024x768 24Bit] [1024x768]
Total Memory	8192 MB (LPDDR3)
Memory SlotO	8192 MB (LPDDR3) Primary IGFX Boot Display VGA(AX93A07) VGA

#### For PICO313+AX93A07 with HDMI (AX93A01):

Chipsee	
Primary IGFX Boot Display Secondary IGFX Boot Display LVDS Panel Type Ch7036 Panel Type Memory Information	[VGA(AX93A07)] [Disabled] [1024x768 24Bit] [1024x768]
Total Memory	8192 MB (LPDDR3)
Memory Slot0	8192 MB (LPDDR3)
	VGA(AX93A07) HDMI

# Secondary IGFX Boot Display

Select secondary display device.

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Primary IGFX Boot Display	[LVDS]	Select LCD panel used by D
Secondary IGFX Boot Display	[Disabled]	Device by selecting the
LVDS Panel Type Memory Information		appropriate setup item.
	LVDS Panel Type	-
Total Memory	800x600 18Bit	
	1024x768 18Bit	
lemory Slot0	1024x768 24Bit	
	1280x768 18Bit	
	1280x800 18Bit	
	1280x960 18Bit	
	1280x1024 48Bit	
	1366x768 18Bit	→+: Select Screen
	1366x768 24Bit	tl: Select Item
	1440x900 48Bit	Enter: Select
	1440x1050 48Bit	+/-: Change Opt.
	1600x900 48Bit	F1: General Help
	1680×1050 48Bit	F2: Previous Values
	1920x1080 48Bit	E3: Optimized Defaults
	1920x1200 48Bit	F4: Save & Exit
		ESC: Exit

**LVDS Panel Type** Select LVDS panel resolution; see the selection options in image above.



The VGA resolution of PICO313+AX93A07 is only 1024x768 in 24-bit.

# 4.6 Security Menu

The Security menu allows users to change the security settings for the system.

Aptio Setup Utilit Main Advanced Chipset Se	y - Copyright (C) 2017 A <mark>curity</mark> Boot Save & E	American Megatrends, Inc. Exit
Password Description If ONLY the Administrator's pass then this only limits access to only asked for when entering Set If ONLY the User's password is s is a power on password and must boot or enter Setup. In Setup th have Administrator rights. The password length must be in the following range: Minimum length	word is set, Setup and is up. eet, then this be entered to he User will - -	Set Setup Administrator Password
Maximum length Setup Administrator Password User Password	20	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

- Setup Administrator Password. Set setup administrator password.
- User Password Set user password.

# 4.7 Boot Menu

The Boot menu allows users to change boot options of the system.

Boot Configuration		Number of seconds to wait for
Setup Prompt Timeout Bootup Numlock State	1 [on]	setup activation key. 65535(0xFFFF) means indefinite waiting.
Quiet Boot Launch PXE OpROM policy	[Disabled] [Disabled]	
Boot Option Priorities Boot Option #1 Boot Option #2 Boot Option #3	[UEFI: JetFlashTrans] [UEFI: Built-in EFI] [JetFlashTranscend 1]	
USB Device BBS Priorities		+++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

#### • Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Poot Configuration	
Boot Configuration	
Setup Prompt Timeout	1
Quiet Boot	[Disab]ed]
Launch PXE OpROM policy	[Disabled]
Boot Option Priorities	
Boot Option #1	Bootup NumLock State -
Boot Option #2	On
Barry Buttien HD	off

#### • Bootup NumLock State

Use this item to select the power-on state for the keyboard NumLock.



#### • Quiet Boot

Select to display either POST output messages or a splash screen during boot-up.

Main	Advanced	Chipset	Security	Boot	Save & Exit	
Boot Co	nfiguration	1				
Setup P	rompt Timeo	ut	1			
Bootup	Numlock Sta	te	D	On]		
Quiet B	oot		0	Disable	d]	
Boot Op	tion Priori	ties		_		
Boot Op	tion #1		Laun	ch PXE	Oprom policy -	٦
Boot Op	tion #2		Disable	ed		
Boot Op	tion #3		Enabled			
USB Dev	ice BBS Pri	orities				

#### • Launch PXE OpROM policy

Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

#### • Boot Option Priorities [Boot Option #1, ...]

These are settings for boot priority. Specify the boot device priority sequence from the available devices.

• USB Device BBS Priorities

These are settings for configuring the order for a specific device group. These options are only visible if at least one device for this group is present.

# 4.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.

Aptio Setup Utility - Copyright (C) 2017 American Main Advanced Chipset Security Boot <mark>Save &amp; Exit</mark>	Megatrends, Inc.
Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes Default Options	Exit system setup after saving the changes.
Restore Defaults Save as User Defaults Restore User Defaults Boot Override UEFI: Built-in EFI Shell UEFI: Ut163 TS1GJFV10 0.00, Partition 1 Ut163 TS1GJFV10 0.00	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

#### • Save Changes and Exit

When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

#### • Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

#### • Save Changes and Reset

When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

#### • Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

#### • Save Changes

When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

#### • Discard Changes

Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

#### • Restore Defaults

It automatically sets all Setup options to a complete set of default settings when you select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

#### • Save as User Defaults

Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

#### • Restore User Defaults

It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

#### Boot Override

Select a drive to immediately boot that device regardless of the current boot order.

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# Appendix A I/O Board

The AX93A07 is an I/O expansion board which is suggested to attach carefully to PICO313. Its specifications and detailed information are given in this appendix.

# A.1 AX93A07 Specifications

- Size
  - 100mm x 26mm
- Features
  - One D-Sub VGA port. VGA resolution is up to 1024x768 @60Hz.
  - One RJ-45 Ethernet port.
  - DC jack power connector.



All specifications and images are subject to change without notice.

# A.2 AX93A07 Dimensions and Fixing Holes



**Top View** 



# A.3 AX93A07 Board Layout



# A.4 AX93A07 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connector	Description
CN1	Ethernet Board to Board Connector
CN2	DC Power Output Connector
CN3	LVDS Input Connector
CN4	SMBus Connector
CN5	DC Jack Power Input Connector w/ Screw
CN6	RJ-45 Ethernet Port
CN8	D-Sub VGA Output Connector

# A.4.1 Ethernet Board to Board Connector (CN1)

This is a 15-pin wafer connector for Ethernet interface. Gently connect this CN1 to PICO313's LAN1.

Pin	Signal
1	1000 LAN LED
2	100 LAN LED
3	GND
4	MDI3-
5	MDI3+
6	MDI1-
7	MDI2-
8	MDI2+
9	MDI1+
10	MDI0-
11	MDI0+
12	GND
13	LAN_VDD33
14	LAN_LINK_ACT
15	GND

# A.4.2 DC Power Output Connector (CN2)

This is a 4-pin wafer connector for DC +12V. Gently connect this CN2 to PICO313's CN11.

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

# A.4.3 LVDS Input Connector (CN3)

This board has a 2x20-pin connector for LVDS LCD interface. It is strongly recommended to use the matching JST SHDR-40VS-B connector. The LVDS input signals go through this connector and converted by CH7036 IC to VGA signals on CN8. Note that pin 1~6 VCCM must be set to +5V. Gently connect this CN3 to PICO313's CN10.

#### 18-bit single channel

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	BKL_EN
9	GND	10	GND
11	N.C.	12	N.C.
13	N.C.	14	N.C.
15	GND	16	GND
17	N.C.	18	N.C.
19	N.C.	20	N.C.
21	GND	22	GND
23	Channel A D0-	24	N.C.
25	Channel A D0+	26	N.C.
27	GND	28	GND
29	Channel A D1-	30	N.C.
31	Channel A D1+	32	N.C.
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND



## A.4.4 SMBus Connector (CN4)

This is a 3-pin (pitch=1.5mm) wafer connector. The SMBus (System Management Bus) is a simple bus for the purpose of lightweight communication. Gently connect this CN4 to PICO313's CN6.

Pin	Signal	
1	SMBus clock	
2	SMBus data	
3	GND	

1	
---	--

## A.4.5 DC Jack Power Input Connector w/ Screw (CN5)

The CN5 is a DC jack with screw. Firmly insert at least 60W adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting.


#### A.4.6 RJ-45 Ethernet Port (CN6)

The board has one RJ-45 Ethernet connector. Connection can be established by plugging one end of the Ethernet cable into this RJ-45 and the other end (phone jack) to a 1000/100/10 Base-T hub.

Pin	Signal	Pin	Signal			
L1	MDIOP	L5	MDI2P			
L2	MDION	L6	MDI2N			
L3	MDI1P	L7	MDI3P			
L4	MDI1N	L8	MDI3N			
А	Active LED (Yellow)					
D	1000 LAN LED (Orange) / 100 LAN LED					
Б	(Green)					



#### A.4.7 D-Sub VGA Connector (CN8)

The CN8 is a standard 15-pin D-Sub connector which is commonly used for VGA display. This VGA interface configuration can be configured via software utility.

Pin	Signal	Pin	Signal
1	RED	2	GREEN
3	BLUE	4	N.C
5	GND	6	CRT_DETE
7	GND	8	GND
9	CRT_VCC	10	GND
11	N.C	12	DDC_DATA
13	HSYNC	14	VSYNC
15	DDC_CLK		



# Appendix B I/O Boards (Optional)

The AX93A00, AX93A01, AX93A02 and AX93A09 are I/O expansion boards which are suggested to insert carefully into CN1 and CN2 on PICO313. Their specifications and detailed information are given in this appendix.

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Please contact your local vendors if any damaged or missing items. DO NOT apply power to the board if there is any damaged component.

### B.1 AX93A00 Specifications

- Size
  - 118mm x 40mm
- Features
  - One D-Sub VGA port. VGA resolution is up to 1920x1200 @60Hz.
  - Audio jack (MIC-in/line-out).
  - Four USB 3.0.
  - Serial ports: Two port for RS-232/422/485 (CN4 is COM2 wafer connector).
  - Power-on, reset and red/green LED.



All specifications and images are subject to change without notice.

#### **Board Layout**



**Top View** 



Side View

Assembly Drawing



### B.2 AX93A01 Specifications

- Size
  - 118mm x 40mm
- Features
  - One HDMI port. HDMI resolution is up to 3840x2160 @30pHz.
  - One LAN port.
  - Audio connector (MIC-in/line-out/line-in).
  - Four USB 3.0.
  - Serial ports: Two ports for RS-232/422/485.
  - Power-on, reset and red/green LED.



All specifications and images are subject to change without notice.

#### **Board Layout**



**Top View** 



Side View

Assembly Drawing



### B.3 AX93A02 Specifications

- Size
  - 118mm x 40mm
- Features
  - Audio connector (MIC-in/line-out/line-in).
  - Four USB 3.0.
  - Serial ports: Two Ports for RS-232/422/485 (CN4 and CN5 are COM wafer connectors).
  - Power-on, reset and power/HDD LED.



All specifications and images are subject to change without notice.

#### **Board Layout**



## Assembly Drawing



## B.4 AX93A09 Specifications

- Size
  - 118mm x 33mm
- Features
  - Audio (MIC-in/line-out/line-in).
  - Four USB 2.0.
  - Serial ports: Two ports for RS-232/422/485.
  - Power-on, reset and power/HDD LED.



All specifications and images are subject to change without notice.

#### **Board Layout**



Top View

#### Assembly Drawing



# Appendix C Watchdog Timer

## C.1 About Watchdog Timer

After the system stops working for a while, it can be auto-reset by the watchdog timer. The integrated watchdog timer can be set up in the system reset mode by program.

## C.2 How to Use Watchdog Timer

Assembly	sample code :		
mov	dx, fa10	;;;	5 seconds (Maximum is 65535 seconds; fill in 0xFA10 and 0xFA11 register, ex: 0xFA11=0x01, 0xFA10=0x68 means 360 seconds)
mov out	al , 05 dx, al		
mov mov out	dx, fa12 al , 01 dx, al	;	Enable WDT

# Appendix D Digital I/O

## D.1 About Digital I/O

The onboard GPIO or digital I/O has 4 bits (DIO0~3). Each bit can be set to function as input or output by software programming. In default, all pins are pulled high with +5V level (according to main power). The BIOS default settings are 2 inputs and 2 outputs where all of these pins are set to 1.



## D.2 Digital I/O Programming

Assembly mov mov out	/ sample code : dx,fa18 al,f0 dx,al	;	Set DIO 0-3 to Output
mov mov out	dx, fa19 al , 0f dx, al	;	Set DIO 0-3 to High
mov mov out	dx, fa18 al , ff dx, al	;	Set DIO 0-3 to Input
mov in	dx, fa19 al, dx	;	Get DIO 0-3 status
mov mov out	dx, fa18 al , f3 dx, al	;;	Set DIO 0-1 to Input, 2-3 to Output al = $F3 => 11110011$
mov mov out	dx, fa19 al , 08 dx, al	;;	Set DIO 3 to High al = 08 => 00001000
in	al , dx	;	Get DIO 0-3 status

## Appendix E BIOS Flash Utility

The BIOS Flash utility is a new helpful function in BIOS setup program. With this function you can easily update system BIOS without having to enter operating system. In this appendix you may learn how to do it in just a few steps. Please read and follow the instructions below carefully.

1. In your USB flash drive, create a new folder and name it "Axiomtek", see figure below.



2. Copy BIOS ROM file (e.g. PICO313.005) to "Axiomtek" folder.



- 3. Insert the USB flash drive to your system.
- 4. Enter BIOS setup menu and go to Advanced\Utility Configuration. Select BIOS Flash Utility and press <Enter>.

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc. Advanced			
Utility Configuration	BIOS Flash Utility		

 BIOS automatically detect all USB drive(s) attached to the system. In this example only one USB drive is attached to the system. That's why, you can see only one device is displayed in figure below.



6. Select the USB drive containing BIOS ROM file you want to update using the < $\uparrow$ > or < $\downarrow$ > key. Then press <Enter> to get into "Axiomtek" folder.



7. Now you can see the BIOS ROM file on the screen, press <Enter> to select.



8. Select Start to flash system BIOS option to begin updating procedure.

Aptio Setup Advanced	Utility - Copyright (C) 2017 American I	Megatrends, Inc.
Utility Configuration		BIOS Flash Utility
	BIOS Flash Utility Return to BIOS Setup Menu Start to flash system BIOS	

9. Please wait while BIOS completes the entire flash update process: erase data, write new data and verify data.

o Setup	Utility	- Copyright	(C) 2(	)17 An	nerican	Megatrend
ion		Flash Updat Erase 13	e Prog data %	jress		BIOS Fla
o Setup	Utility	- Copyright	(C) 2(	017 An	nerican	Megatrend
ion		Flash Updat Write no 49	e Prog ew dat 6	a		BIOS Fla
o Setup	Utility	- Copyright	(C) 2(	)17 An	nerican	Megatrend
ion		Flash Updat Verify 10	e Prog / data %	jress		BIOS Fla

10. When you see the following figure, press <Enter> to finish the update process. After that the system will shut down and restart immediately.

Aptio Setup Utility - Copyright (C) 2017 American Advanced	Megatrends, Inc.
Utility Configuration > BIOS Flash Utility Flash Update Progress Flash system BIOS finish! OK	BIOS Flash Utility