BYARM-W071-PC

User Manual

Revision	Release Date
V1.0	2015/12/15

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Safety Information

Your BYARM-W071-PC is designed and tested to meet the latest standards of safety for information technology equipment. However, to ensure your safety, it is important that you read the following safety instructions

Setting up your system

- Read and follow all instructions in the documentation before you operate your system.
- Do not use this product near water.
- Set up the system on a stable surface. Do not secure the system on any unstable plane.
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- Slots and openings on the chassis are for ventilation. Do not block or cover these openings. Make sure you leave plenty of space around the system for ventilation. ***Never insert objects of any kind into the ventilation openings***.
- This system should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Use this product in environments with ambient temperatures between -20°C and 60°C.
- If you use an extension cord, make sure that the total ampere rating of the devices plugged into the extension cord does not exceed its ampere rating.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THESTORAGE TEMPERATURE MAY GO BELOW -30° C OR ABOVE 80° C. THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

Care during use

- Do not walk on the power cord or allow anything to rest on it.
- Do not spill water or any other liquids on your system.
- When the system is turned off, a small amount of electrical current still flows. Always unplug all power, and network cables from the power outlets before cleaning the system.
- If you encounter the following technical problems with the product, unplug the power cord and contact a qualified service technician or your retailer.
  - ➢ The power cord or plug is damaged.
  - ➢ Liquid has been spilled into the system.
  - ➢ The system does not function properly even if you follow the operating instructions.
  - ➢ The system was dropped or the cabinet is damaged.

Lithium-Ion Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

NO DISASSEMBLY

The warranty does not apply to the products that have been disassembled by users.

WARNING
HAZARDOUS MOVING PARTS
KEEP FINGERS AND OTHER BODY PARTS AWAY

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Acknowledgments

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CHAPTER 1 INTRODUCTION

1.1 General Description

BYARM-W071-PC, a 7" ARM Based i.MX6 All-in-One Panel PC, utilizes the Freescale I.MX6 Dual-Core Processor that provides high computing performance with low power consumption.

Well suited for industrial applications, BYARM-W071-PC comes with 1GB DDR3L memory, one 4GB eMMC and one SD card slot for data storage. It has one Gigabit Ethernet LAN, one RS-232/422/485 port and USB OTG. The unit is equipped with front bezel IP65 protection and supports Android 4.x and 12V~24V DC power input.

BYARM-W071-PC Overview

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1.2 System Specifications

1.2.1 Hardware Specifications

|	
Model Name	BYARM-W071-PC
System Mainboard	IB113A-PPC
CPU	Freescale i.MX6 Dual-Core @ 800MHz
Memory	1GB DDR3L memory
I/O Interface	1x USB (USB Host. A-Type) 1x USB OTG (mini USB B Type) 1x RS-232/422/485 via RJ45 connector 1x Power reset button Switch 1x 12V~24V DC-in power jack
Storage	1x 4GB eMMC onboard 1x SD card slot
Expansion Slots	None
Power Supply	12V~24V DC input
LCD Size	7" TFT LCD
LCD Color	16.7M
LCD Resolution	1024 x 600
LCD Brightness	500
LCD View Angle (H°/V°)	160/160
Backlight MTBF	50,000 hrs
Touch Screen	Projected capacitive touch
Construction	Aluminum front bezel and White steel back cover with aluminum heat-sink
Mounting	Panel mount and VESA 50x50 mm
Dimensions (W)x(D)x(H) mm	211.5 x 143.5 x 45.8
Operating Temperature	-20°C~ 60°C
Storage Temperature	-30°C~80°C
Relative Humidity	10%~90% (non-condensing)
Protection Class	IP65 front bezel
Certification	CE/FCC Class B
Operating System Support	Android4.X

‧*This specification is subject to change without prior notice.*

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1.2.2 Dimensions

BYARM-W071-PC
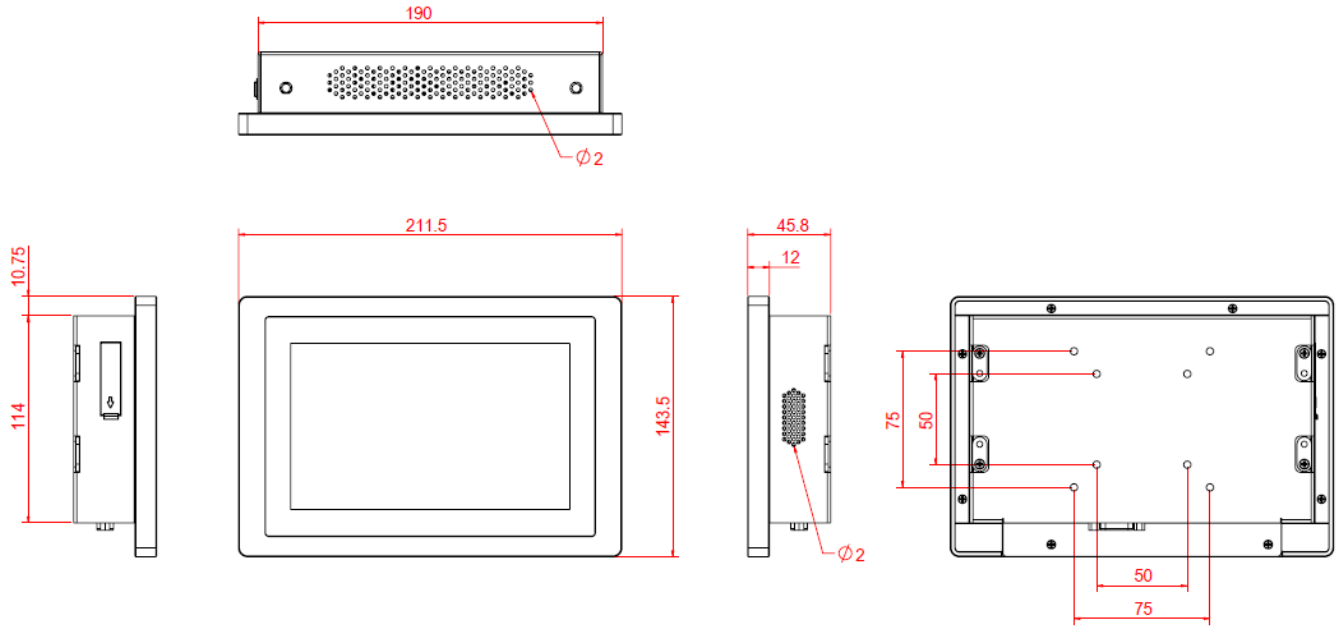
1.2.3 I/O View
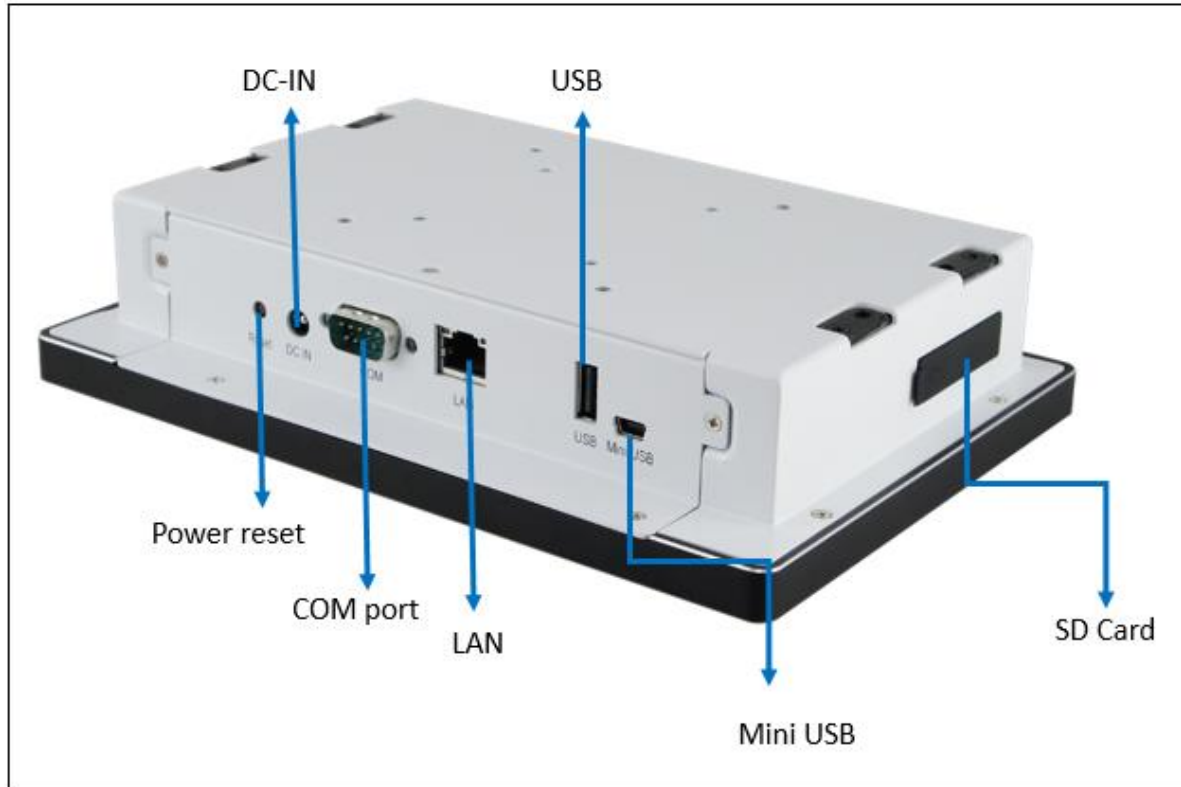
1.3 Packing List

Part No.	Description	Quantity
1	40W power adaptor	1 pc
2	Panel mount bracket	1 set
3	Rubber	1 set

1.4 Installation

1.4.1 Installing SD card

1. Remove the SD cover as shown in the picture to install the SD card.

CHAPTER 2 MOTHERBOARD INTRODUCTION

2.1 Introduction

BYARM-W071-PC uses the iBASE designed motherboard B113A-PPC, which has settings for BYARM-W071-PPC. IBASE technical support staff needs to be contacted for any changes require in the motherboard settings.

IB113A-PPC is a 3.5" Disk-Size SBC with an ARM-based Freescale i.MX6 Cortex-A9 800Mhz processor. IB113A-PPC fulfill supports industrial ambient operating temperature from -40C to +85C. The device offers 3D graphics acceleration, while also supporting numerous peripherals, including RS232/422/485, USB, USB OTG, one LAN port, that are well suited for industrial applications. All components are selected from industrial grade parts for wide-temperature environment operation.

Specifications – Mainboard	
Product Name	**IB113A-PPC**
Form Factor	3.5" Disk-Size SBC, 102mm x 147mm
CPU	Freescale Cortex™-A9 i.MX6 Dual 800MHz, automotive grade CPU
System Memory	1GB DDR3 on board
Data Memory	4GB eMMC on board SD socket (up to 32GB)
Display	18/24 bit dual channel LVDS (up to 1920 x 1080)
Video Codec	Decode: 1080p, 30fps Encode: 1080p, 30fps
LAN	1st LAN : 10/100/1000 Base-T Ethernet (Gb LAN)
Touch	USB/ I2C header on board (for capacitive touch)
Audio	Audio pin header (1x microphone, 1x speaker)
RTC	Seiko RTC IC on board
Watchdog	256 Levels
Edge I/O	1x 1st 10/100/1000 LAN 1x USB 2.0 Host (Type-A) 1x USB OTG (mini-USB Type-B) 1x COM RS-232/422/485 1x SD socket (up to 32GB) 1x DC-in jack 1x Reset button

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Headers & Expansion Slots	Headers: 1x GPIOx8 pin header 1x Debug port pin header 1x USB2.0 Host box header 1x I2C pin header 1x Dual channel LVDS box header (supports full HD) 1x Audio pin header (1x microphone, 1x speaker) Slots: 1x Full size Mini PCIe with USB interface
Power	12V~24V DC-in
Operating Temperature	-40°C~ 85°C (-40°F ~ 185°F)
Devices	WiFi / GPS / 3G module (option)
Software Support	Ubuntu Linux 12.04(kernel 3.0.35)/ Android 4.3
Relative Humidity	10%~90% (non-condensing)

*This specification is subject to change without prior notice.*

I/O View
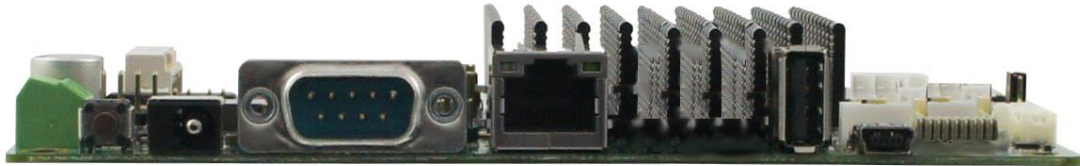
2.2 Jumper setting on IB113A-PPC

[Important] Do not adjust the jumper settings by yourself to avoid unexpected problems. IBASE shall not be responsible for any resulting product damage. Please contact your IBASE sales window or FAE before making any changes.

Jumpers are used on IB113A-PPC to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on IB113A-PPC and their respective functions.
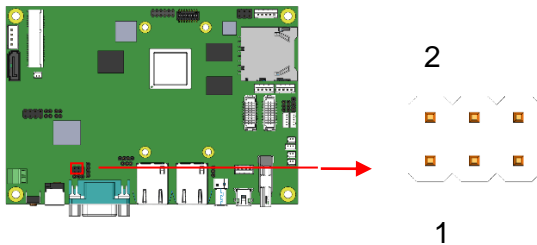
Jumper Locations on IB113A-PPC

Top Side
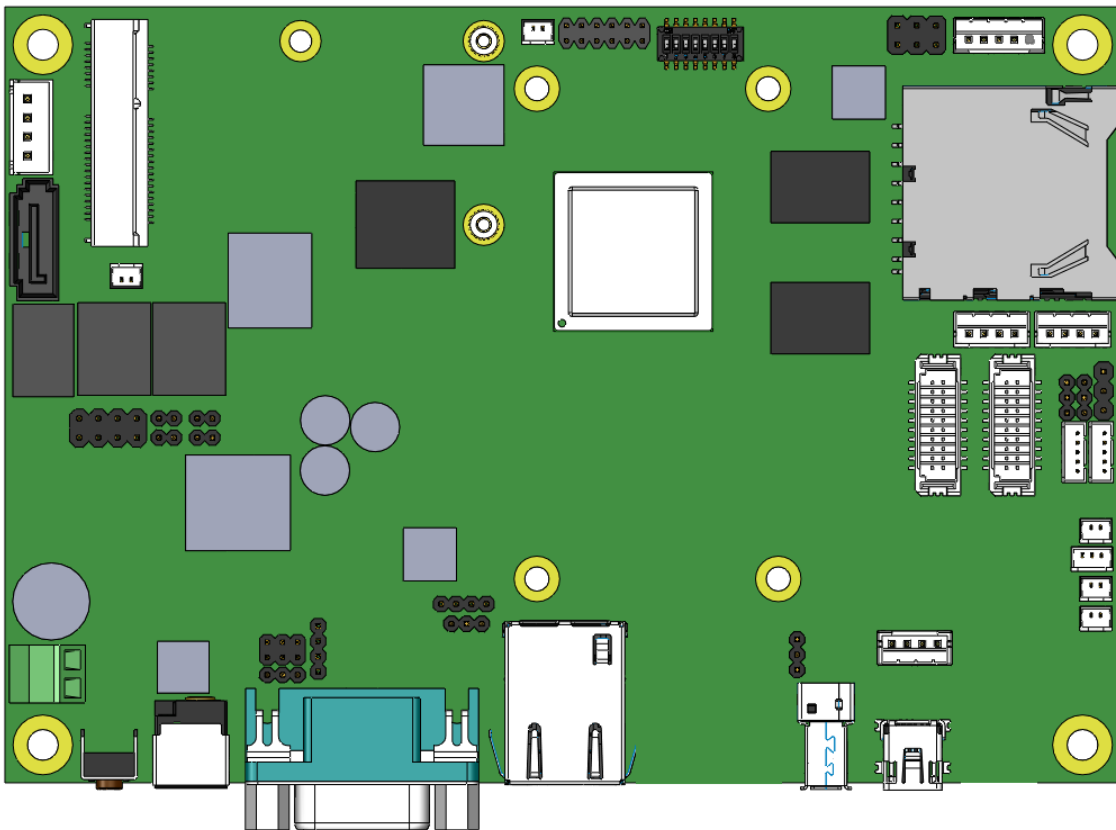
SW1: System Boot Configuration (factory use only)
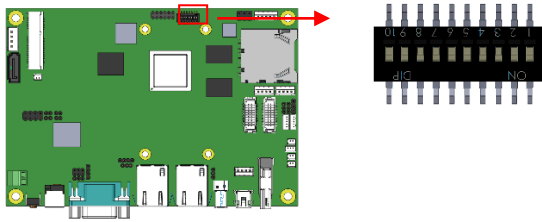
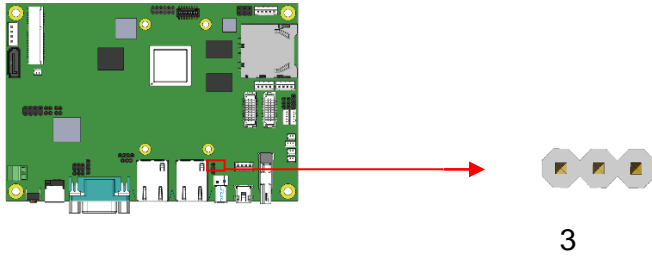| SW1	Boot From
10101010	SD
01100110	EMMC

JP9: COM2 RS232, RS422, RS485 Selection

Mode	JP9
RS232	2-4 Short
	3-5 Short
RS422	3-5 Short
	4-6 Short
RS485	1-3 Short
	4-6 Short

Default setting is RS232 mode. JP9 setting for COM2.

JP6: USB +3.3V/+5V Power Setting(factory use only)

3

JP6	Setting
1 2 3	+3.3V
1 2 3	+5V

Default setting is +5V.
JP6 setting for J9.

JP4: LVDS +3.3V/+5V Power Setting (factory use only)

1

3
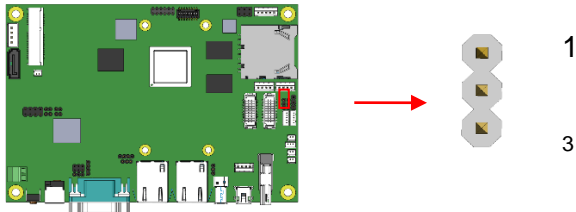
JP4	Setting
1 2 3	+3.3V
1 2 3	+5V

Default setting is +3.3V. ; JP4 setting for CH1, CH2.

JP3: LED Brightness +5V/+12V Power Setting (factory use only)

1

3
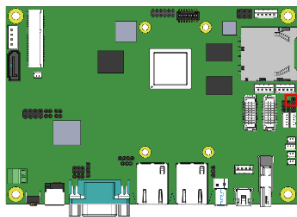
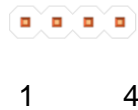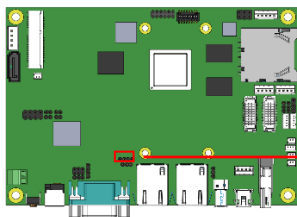| JP3	Setting
□ □ □ 1 2 3	+5V
□ □ □ 1 2 3	+12V

Default setting is +5V.
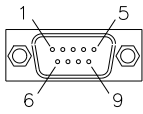JP3 setting for CH1, CH2

CN1: SD Card Connector
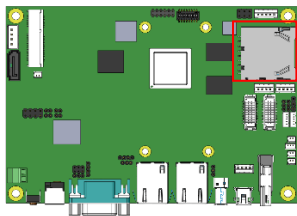
COM1 PORT: COM1 RS232 Connector

(Debug Port, factory use only)

Part Number: 0195-01-200-040
Description: Pin Header 2.0*2.0mm S/T Single Row 4pin

1   4

Pin #	Signal Name
1	COM1 RX, Receive data
2	COM1 TX, Transmit data
3	GND, ground
4	NC

COM2 : RS232/RS422/RS485 Serial Port

Pin #	Signal Name		
	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	NC	NC	NC

Note: Please refer to JP9 setting for RS232, RS422 and RS485 mode selection.

CH1, CH2: LVDS Display Connector

Part Number: DF13-20DP-1.25V(95)
Description: P1.25 SMD 20PIN Male 180D 2R
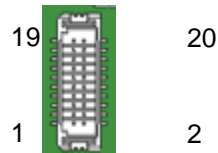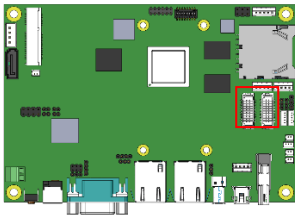
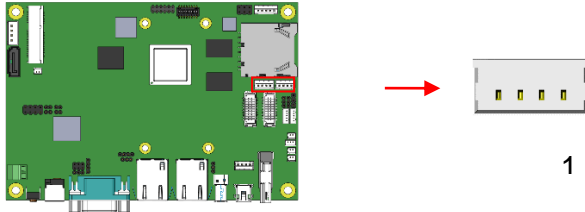| Signal Name	Pin #	Pin #	Signal Name
LCD1_TX0_P	1	2	LCD1_TX0_N
Ground	3	4	Ground
LCD1_TX1_P	5	6	LCD1_TX1_N
Ground	7	8	LCD_VDD
LCD1_TX3_P	9	10	LCD1_TX3_N
LCD1_TX2_P	11	12	LCD1_TX2_N
Ground	13	14	Ground
LCD1_CLK_P	15	16	LCD1_CLK_N
BTL_PWM	17	18	LCD_VDD
BKLT_VCC	19	20	BKLT_VCC

CN7: 100/1Gb LAN1   (From Freescale i.MX6)
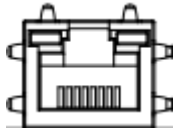
CN3, CN4: LED Backlight Control Connector(factory use only)

Part Number: 0110-2610040
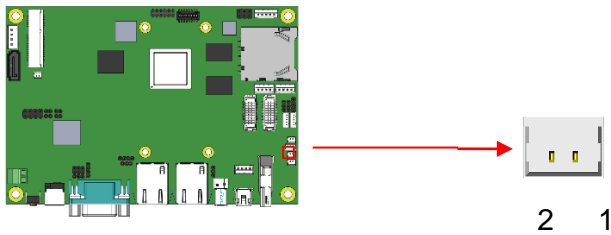Description: JST-PH Type Wafer 2.0mm 4Pin

1

Pin #	Signal Name
1	BKLT_VCC
2	LCD_BKLT_EN
3	LCD_BKLT_PWM
4	GND

J7: Speaker Right Out Connector

Part Number: 0110-2610020
Description: Molex 53047 1.25mm Wafer S/T Type 2pin

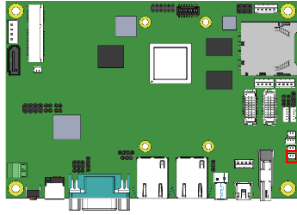

2   1

Pin #	Signal Name
1	SPEAKER_RIGHT-
2	SPEAKER_RIGHT+

Note: The maximun output power is 2 W with 4 Ω speaker
or 1.4 W with 8 Ω speaker

J8: Speaker Left Out Connector

Part Number: 0110-2610020

Description: Molex 53047 1.25mm Wafer S/T Type 2pin

2   1

Pin #	Signal Name
1	SPEAKER_LEFT-
2	SPEAKER_LEFT+

Note: The maximun output power is 2 W with 4 Ω speaker
or 1.4 W with 8 Ω speaker

JMIC1: Microphone Connector

Part Number: 0110-2610020

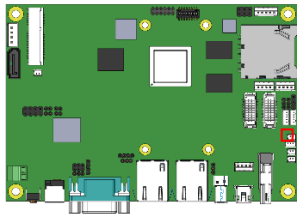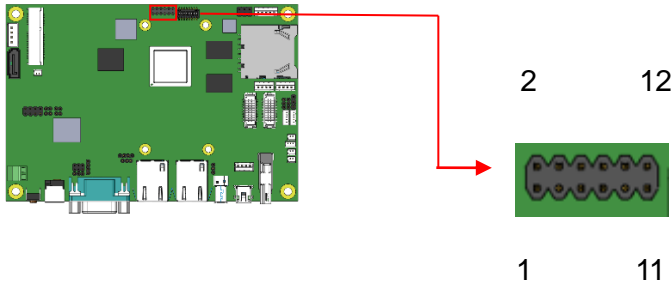**Description: Molex 53047 1.25mm Wafer S/T Type 2pin**

2   1

Pin #	Signal Name
1	GND
2	MIC_IN

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J1: Digital I/O 4 In/4 Out Connector

Part Number: 0196-01-200-120
Description: MALE HD;DIP MINI 180D 12PIN 2R

Signal Name	Pin #	Pin #	Signal Name
+3.3V	1	2	GND
GPIO_0	3	4	GPIO_1
GPIO_2	5	6	GPIO_3
GPIO_4	7	8	GPIO_5
GPIO_6	9	10	GPIO_7
GPIO_8	11	12	GPIO_9

Note: All In/Out signals level are 3.3V .

SW2: Push Button for Hardware Reset
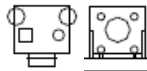
BAT: 3.0V Lithium Battery Connector

Part Number: 0110-2610020
 Description: Molex 53047 1.25mm Wafer S/T Type 2pin

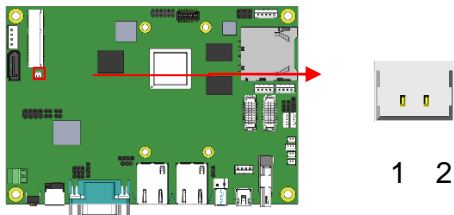| Pin #	Signal Name
1	+VCC
2	GND

CN9: 12V~24V Power Connector

This connector supplies the system board operating voltage.

Pin 1
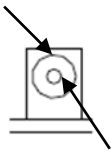
Pin 2

Pin #	Signal Name
1	+12V ~ +24V
2	GND

J10: 12V~24V Power Connector

1
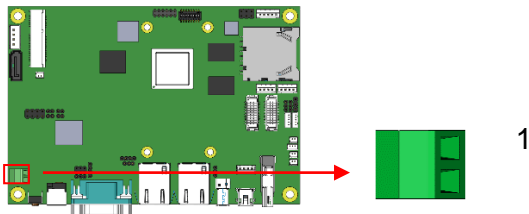
Pin #	Signal Name
1	+12V ~ +24V
2	GND

Note: J10 signals are the same as CN9.

JUSB1: USB2.0 Type A Connector
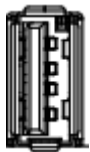
Pin #	Signal Name
1	+5V
2	D-
3	D+
4	GND

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CN10: Mini USB OTG Connector
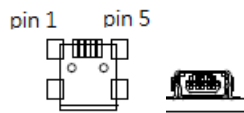
Pin #	Signal Name
1	+5V
2	D-
3	D+
4	ID
5	GND

Note: CN10 used as USB device while ID is floating.
              (CN16 support USB device only.)

J9: USB2.0 Connector

Part Number: B4B-PH-K-S(LF)(SN)
Description: Mini Base;DIP S 2mm 4P
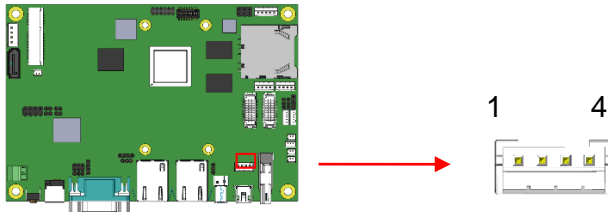
Pin #	Signal Name
1	+5V / +3.3V
2	D-
3	D+
4	GND

Default setting is +5V.
Please refer to JP6 setting for +5V and +3.3V selection.

J6: Line Out Connector

Part Number: 0110-2610030

Description: Molex 53047 1.25mm Wafer S/T Type 3pin

3

Pin #	Signal Name
1	LINE_OUTL
2	GND
3	LINE_OUTR

J4: Mini PCIE Connector

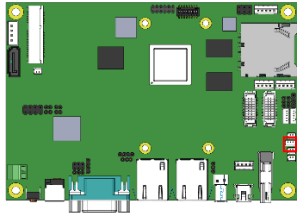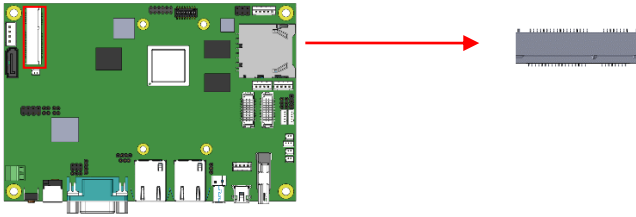| Signal Name	Pin #	Pin #	Signal Name
NC	1	2	+3.3V
NC	3	4	GND
NC	5	6	NC
NC	7	8	NC
GND	9	10	NC
PCIE_CLK1_N	11	12	NC
PCIE_CLK1_P	13	14	NC
GND	15	16	NC
NC	17	18	GND
NC	19	20	+3.3V
GND	21	22	RESET#
PCIE_RXM	23	24	+3.3V
PCIE_RXP	25	26	GND
GND	27	28	NC
GND	29	30	I2C2_SCL
PCIE_TXM	31	32	I2C2_SDA
PCIE_TXP	33	34	GND
GND	35	36	USB2.0 D-
GND	37	38	USB2.0 D+
+3.3V	39	40	GND
+3.3V	41	42	NC
GND	43	44	NC
NC	45	46	NC
NC	47	48	NC
NC	49	50	GND
NC	51	52	+3.3V

CHAPTER 3 Software Setup

[Important] Please ask for our FAE support for any software setting. iBASE may not offer a free service if the product is damaged due to incorrect software settings.

Basically, the IB113A-PPC is preloaded O.S (Android / Linux) into eMMC by default.

3.1 Make a Recovery SD Card (for advanced user only)

For advanced users who have IBASE standard image file, refer to this chapter to prepare the recovery boot-up SD card.

Preparing the Recovery SD card to install the Linux/ Android image into eMMC

Note: all data in the eMMC will be erased.
-- for IB113A-PPC

Please download the **Recovery SD card's image by FTP in advance.**
Host: 219.87.145.180 port: 21
User: bsp
Password: (please check with your sales contact window)
Image path: (image path may change / update)
/bsp/RISC_IMAGE/IB113A-PPC/IB113A-PPC/Linux/IB113A-PPC-Linux_ install_3.0.35-xxxxxx.7z
(xxxxxx is release date, ex:
IB113A-PPC-Linux_install_3.0.35-141104.7z)
/bsp/RISC_IMAGE/IB113A-PPC/IB113A-PPC/Android/IB113A-PPC-And roid_install_4.3-xxxxxx.7z
(xxxxxx is release date, ex:
IB113A-PPC-Android_install_4.3-141104.7z)
(based on Freescale BSP: L3.0.35-4.1.0)

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For advanced users who want to reset to factory status, follow the instructions below for installing a recovery program on your SD card to allow you to easily install the default OS's and to recover your card when needed.

1. Insert an SD card that is 8GB or greater in size into your computer
2. Format the SD card
    i. Download the SD Association's Formatting Tool (SD Card Formatter 4.0) from **https://www.sdcard.org/downloads/formatter_4/eula_windows/**
    ii. Install and run the Formatting Tool on your machine
    iii. Set "FORMAT SIZE ADJUSTMENT" option to "ON" in the "Options" menu
    iv. Check that the SD card you have inserted matches the one selected by the Tool
    v. Click the "Format" button
3. Download the target operating system image from the DVD/ or FTP (Descripted in previous page)
4. Download the Win32DiskImager from **http://sourceforge.net/projects/win32diskimager/ and use it to restore the target operating system.**
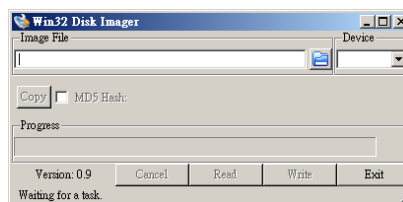
5. And then, flash the Android/ Linux image into your SD card in your PC (Windows).
6. Please check the boot device switch and make sure it can boot from the SD card.

SW1: System Boot Configuration (factory use only)
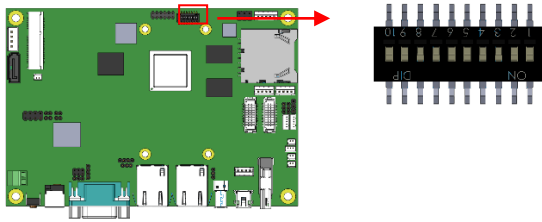
SW1	Boot From
10101010	SD
01100110	EMMC

--- *Boot Up with IB113A-PPC---*

Please double check the Boot device selection before powering on.

(IB113A-PPC, by default, is set to boot up from eMMC.)

1. Insert the SD card/MicroSD into the motherboard. Make sure the HDMI is connected and connect the power supply to boot up the system.

2. Recovery program on your SD card will execute automatically. The eMMC on the PCB will be formatted and the OS will be installed while the progress bar shows 100% complete.

3. Remove the power and the recovery SD. Remember to change the boot up device to EMMC by SW1.

Connect the power and boot up the IB113A-PPC to see the Linux/ Android boot up pages.

3.2 Parameter Setting on U-boot

IB113A-PPC supports HDMI output by default. If you have any other LVDS panel to be customized, please contact Ibase sales or FAE staff.

3.2.1 Preparation (debug console)

i.   The COM1 (Tx1, Rx1) is the default debug port. Check that it can be connected to (RX, Tx) in your PC environment.

ii.   Use 115200 bps (8n1, no flow control) in Windows terminal (for example Putty.exe)

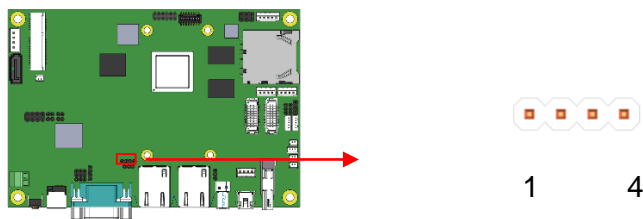iii.   During system boot up, ***press "Enter" t***o stop auto boot and modify your environment.

(Note: For users who are not sure about the COM connection, please check if Board.COM1.Tx1 is connected to PC.COM.Rx ;   Board.COM1.Rx1 to PC.COM.Tx)

COM1 PORT: COM1 RS232 Connector
(Debug Port, factory use only)
Part Number: 0195-01-200-040
Description: Pin Header 2.0*2.0mm S/T Single Row 4pin

Pin #	Signal Name
1	COM1 RX, Receive data
2	COM1 TX, Transmit data
3	GND, ground
4	NC

3.2.2 Display setting command For Linux and Android

With the debug port, follow the reference command examples to help you to be familiar with display modification. (For advanced software engineers only)

Command to set LVDS output to 1024x768, 24bit:

```
setenv xres 1024
setenv yres 768
run setlvds24
run setlvds
```

Command to set LVDS output to 1920x1080 with dual-link LVDS, 24bit:

```
setenv xres 1920
setenv yres 1080
run setlvds24
run setlvds2
```

Command to set LVDS0, LVDS1 and HDMI output, LVDS is 1024x768, 18bit:

```
setenv xres 1024
setenv yres 768
run setlvds18
run dul1
```

Dual display (same frame) output mode 1. (Only work in Android).

Command to set LVDS0 and LVDS1 (same frame), HDMI output with auto-detect, LVDS is 1024x768, 18bit:

```
setenv xres 1024
setenv yres 768
run setlvds18
run dul1
```

APPENDIX. ADB configuration (For Android only)

Update the ADB configuration to scan for the new vendor ID. Below are the steps to update the ADB configuration for Windows PC. These steps (and the steps for Linux PC as well) can also be found in the R10,3.x user guide.

1. Download ADB driver from iBASE website, like:
    IB113A-PPC_ADB_usb_driver.7z

2. Enable the "USB debugging" option on the i.MX6 device

System settings -> Developer options -> ==USB debugging==

3. Connect the Android Device into PC, uninstall your old driver named "Android Phone" in the device manager, then re-install driver by scanning and locating .inf file under the directory you unpack the IB113A-PPC_ADB_usd_driver.7z manually:
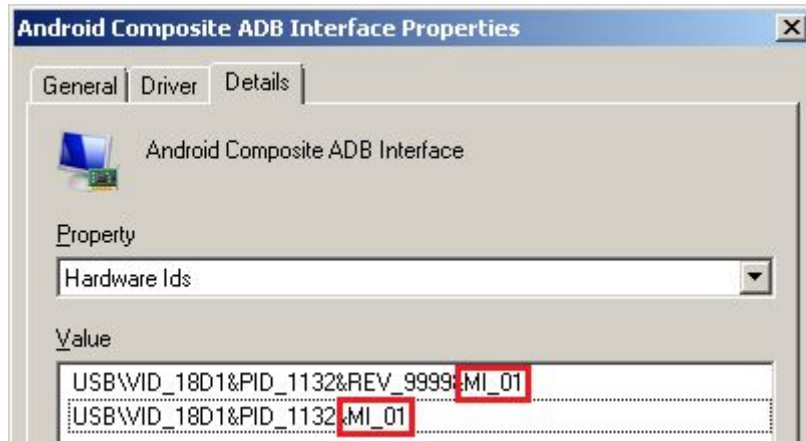
Unpack and install the driver
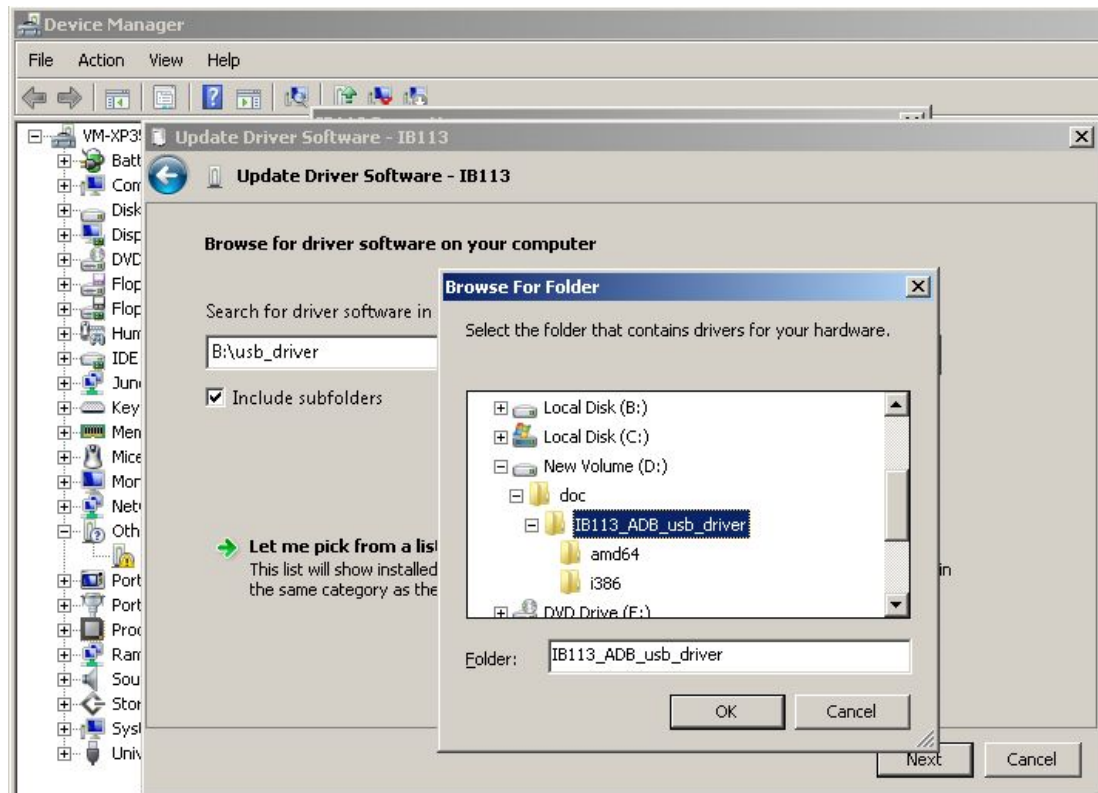
This is warning message should show If driver match.

If driver can not found, check device properties had "MI_01" string, if "MI_01" does not exist, the ADB and ADB driver not work.

4.   Restart the ADB server

    D:\adt-bundle-windows-x86_64-20130729\sdk\platform-tools> adb.exe kill-server
    D:\adt-bundle-windows-x86_64-20130729\sdk\platform-tools> adb.exe start-server

5.   Finally, test your ADB connection

    D:\ adt-bundle-windows-x86_64-20130729\sdk\platform-tools> adb.exe devices
    List of devices attached
    0e46dbc9b9d40f17   device

    ps. 0e46dbc9b9d40f17 id device UUID.