

MBE70

Motherboard User Manual

(Preliminary)

SBC

with Dual Cortex-A72 @2.0Ghz
+ Quad Cortex-A53 @ 1.5Ghz Core

Version: V1.2

Document No: doc-mbe7018w40v12

PCB Bare Board: PB70m68v12

**The content of this document is subject to be change without notice*

Packing List

- ☑ 1 x MBE70 Motherboard.

Ordering Information

Part number : MBE70C(E)-[abcxyMN](#)

- [abc](#) : The type of RK3399 Processor

R39: Dual Core-A72 @2.0Ghz,+ Quad Core-A53 @ 1.5Ghz, (0 ~ 85°C).

K39: Dual Core-A72 @2.0Ghz,+ Quad Core-A53 @ 1.5Ghz, (-20° ~ 105°C).

- [x](#) : The size code of DDR3 Memory on board

1 1GB of DDR3.

2 2GB of DDR3.

- [y](#) : The size code of eMMC on board

4 4GB of eMMC.

8 8GB of eMMC.

F 16GB of eMMC.

- [MN](#) : The Function Summary code

SS HDMI 2.0, eDP1.3 (2xlane), Gigabit Ethernet, 5G-wifi,
OTG-USB 3.0 (Type-A), USB2.0 (Type-A), Micro-SD Socket,
GPIOs, IR Port, Debug Port, Audio, Usb-Hub, DC-Jack.

S1 SS - Audio Codec - Usb-HUB.

S2 S1 + Audio Codec.

S3 S1 - GigEthernet.

PS SS + 802.3at (Mode A&B, PoE+).

P1 S1 + 802.3at (Mode A&B, PoE+).

Optional Accessories

- ☑ WFS001I401[nnn](#)O8 SMA(ST. JR)to IPEX(IV) cable, 50Ω, [nnn](#)=130/230/400mm.
- ☑ LN1RF2G20M0 2.4/5Ghz, 2dBi-antenna, SMA(ST. PR), bendable, 110mm.
- ☑ FR2136 eDP to dual LVDS converter board.
- ☑ FR-48522 UART to RS422/485 Breakout Board

Revision histories

Rev. No.	Date	Substantial Changes
1.0	2019/04	First issue.
1.1	2020/05	Updated Block Diagram
1.2	2021/06	Modify pin assignment of W8

Table of Contents

1. General Information	6
1-1. Features	6
1-2. Function Block Diagram	8
1-3. Board Dimension.....	9
1-4. I/O Connector Summary	10
1-5. I/O Connector Placement	11
2. Peripherals Port Description	12
2-1. Power Jack (J4).....	12
2-2. Power Switch & Power Button, Header (H15).....	12
2-3. RTC Battery Backup Connector (W1)	12
2-4. IR Receiver Connector (IR1)	13
2-5. Power LED Connector (W7)	13
2-6. Image File Update Jumper (JP1)	13
2-7. USB 3.0 Type-A Port (J2)	14
2-8. USB 2.0 Type-A Port (J3)	14
2-9. Gigabit Ethernet Port (J6)	15
2-10. HDMI® 2.0 Port (J5).....	15
2-11. Micro SD/SDHC Card Slot (J1)	16
2-12. RS232 Debug & Buzzer-Out Combo Interface (H4).....	16
2-13. KeYPAD & GPIOs Combo Interface (H1).....	16
2-14. eDP Interface (ZIF2)	17
2-15. LCD Panel Power Selection (H2)	18
2-16. LCD Backlight Control Connector (W2).....	18
2-17. PCAP Touch Interface (W3).....	18
2-18. Multi-Role Interface (W10).....	19
2-19. HUB Extended Ports (W8 & H9).....	20

2-20.	MEMS Interface (H3) (Optional)	20
2-21.	Audio Codec Interface (H10).....	21
2-22.	MIPI-CSI Interface (ZIF1) (Optional).....	21
3.	Software Programming Guide	22
3-1.	Android Programming Guide	22
3-1-1.	ADB installation	22
3-1-2.	To install APK software over the ADB function of PC :	25
3-1-3.	GPIO installation.....	25
3-2.	Linux Programming Guide.....	26
3-2-1.	GPIO installation.....	26

1. General Information

The MBE70 Series of motherboard integrated various useful peripheral circuit that provides a completed connectivity for a wide variety of industrial automation, transportation applications, besides that the high performance media-processor also especially for infotainment/entertainment, HMI applications.

The heart of the motherboard MBE70 is the Dual Cortex-A72 @2.0Ghz + Quad Cortex-A53 @ 1.5Ghz processor which provides complete platform for project evaluation and solution feasibility testing that decreases the time to market and lowers initial cost.

1-1. Features

Processor:

- ✓ Dual Cortex-A72 @2.0Ghz + Quad Cortex-A53 @ 1.5Ghz (MBE70Kxx)
- ✓ Dual Cortex-A72 @2.0Ghz + Quad Cortex-A53 @ 1.5Ghz (MBE70xx)

System Memory:

- ✓ 1GB up to 2GB DDR3-1066 SDRAM onboard

Storage:

- ✓ 4GB up to 16GB of eMMC Flash memory

Graphics:

ARM Mail-T860MP4 (Embedded 3D GPU), AFBC supported

- ✓ Supports completely compatible with OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, DX11
- ✓ Video Decoder:
 - H.264/H.265, 10bit, up to 4Kx2K@60fps,
 - VP9, 8bit, up to 4Kx2K@60fps,
 - MPEG-4/MPEG-2/VP8 up to 1080p@60fps
- ✓ Video Encoder:
 - H.264/MVC/VP8 encoders by 1080p@30fps

Display Interfaces:

- ✓ Supports eDP 1.3, 2 lane (2.7Gbps per lane) , Res. up to1920x1200p@60fps , 4 lane (2.7Gbps per lane) , Res. up to2560x1600p@60fps
- ✓ Supports HDMI® V2.0, Res. up to 4Kx2K @60fps, HDCP1.4 /2.2

Audio:

- ✓ RealtekALC5640 low power stereo codec
- ✓ Inside Stereo Class-D speaker amplifiers provide 1.5W per channel into 8Ω or 2W per channel into 4Ω

LAN:

- ✓ RealtekRTL8211E Gigabit Ethernet transceiver with RGMII support

WLAN:

- ✓ AMPAK ENL-B6356S WIFI SIP module 802.11 (a/b/g/n/ac, 2Tx2R)+ Bluetooth (4.1 LE), build-in Broadcom BCM4356 chipsets

Extension USB device:

- ✓ MicroChip USB2514 USB 2.0 high speed 4-port hub controllers

External extension memory Slot:

- ✓ Micro SD3.0 card slot enable capacity up to 32GB

Various interfaces for expansion peripherals:

- ✓ MIPI-CSI interface
- ✓ KeyPAD, DIO interface
- ✓ Multi-Role Interface
- ✓ MEMS interface
- ✓ IR receiver interface

Dimension (W x D x H):

- ✓ 126.5mm x 90mm x 18.7mm (4.98" x 3.5" x 0.76")

Operating Temperature (3G and Wi-Fi not included):

- ✓ -20°C ~ 70°C(MBE70E-K39 series)
- ✓ 0°C ~ 70°C(MBE70C-R39 series)

Operating Humidity:

- ✓ 0% ~ 90% relative humidity (non-condensing)

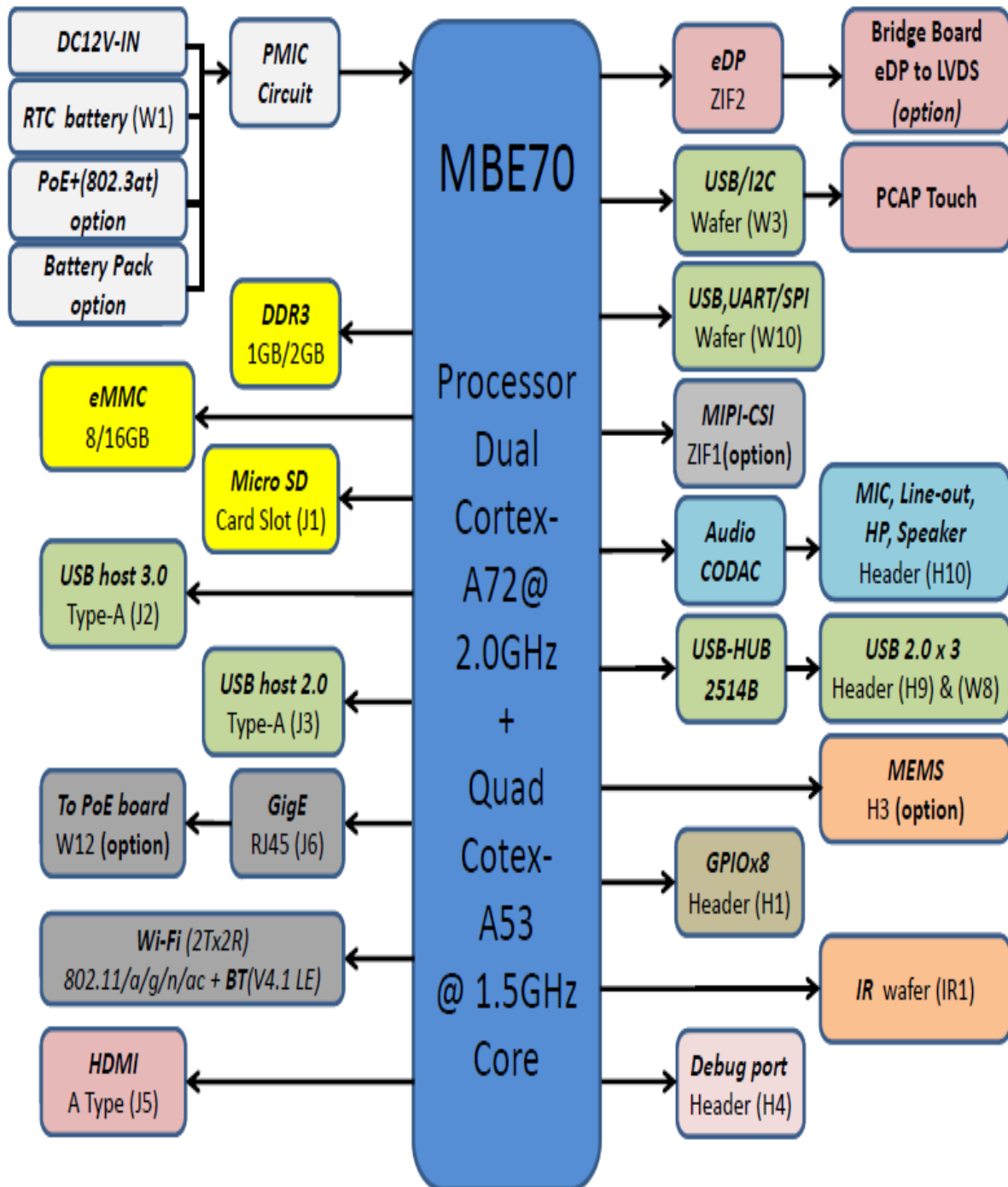
Operating System:

- ✓ Android 7.1
- ✓ Debian 9

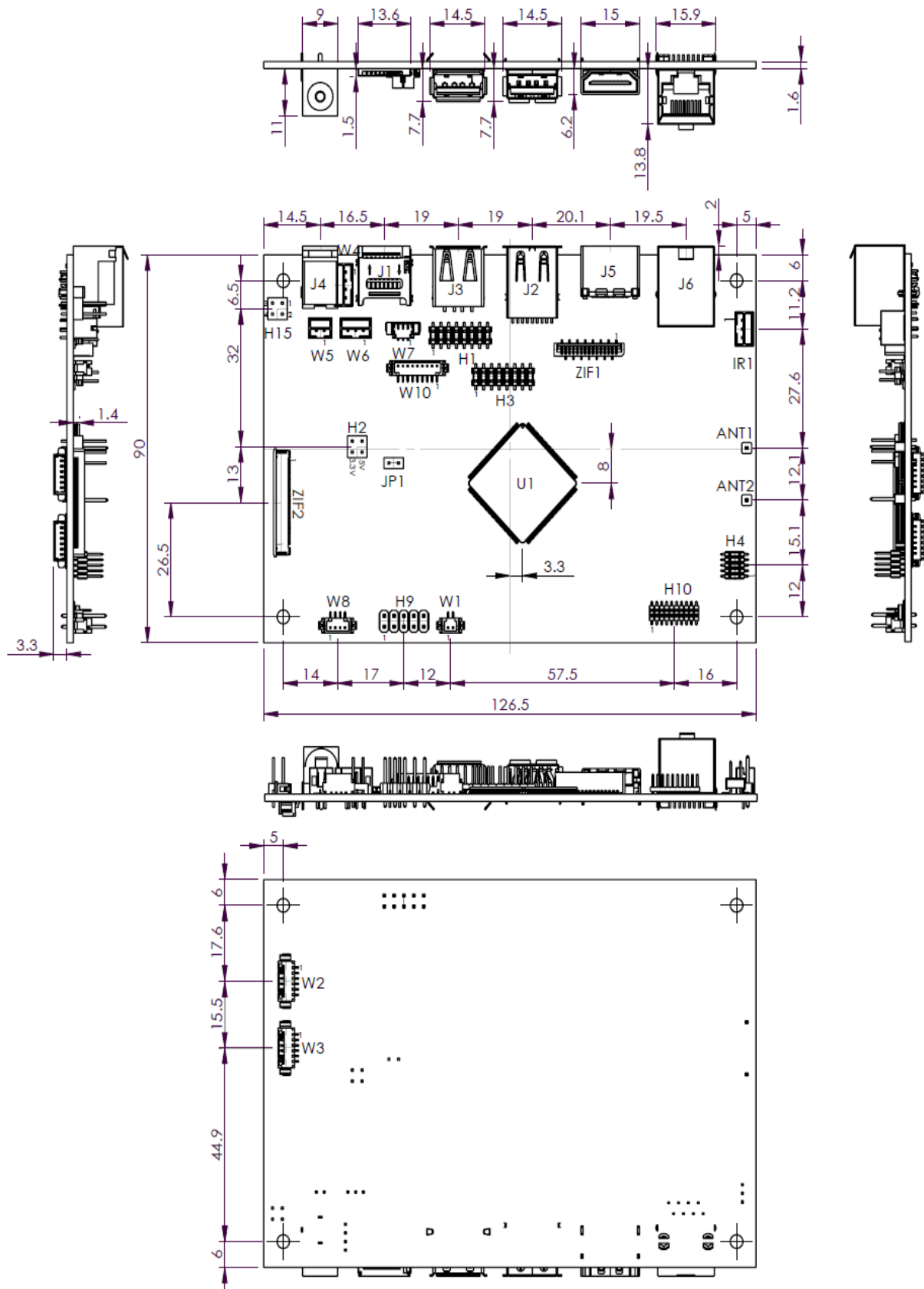
Note:

1. The Operating Temperature is a result of the test performed in experimental chamber. It is highly suggested to execute a solid testing under actually application environment.
2. More frequent and larger data access on eMMC memory makes its lifespan shorter. Therefore, it is highly recommended to use a Micro SD card for large data access.

1-2. Function Block Diagram



1-3. Board Dimension



1-4. I/O Connector Summary

External I/O (On board side):

- ✓ Power Jack (**J4**)
- ✓ Micro SD Socket (**J1**)
- ✓ USB 3.0 Type-A Port (**J2**)
- ✓ USB 2.0 Type-A Port (**J3**)
- ✓ HDMI® Port (**J5**)
- ✓ Gigabit Ethernet Port w/PoE+ (**J6**)

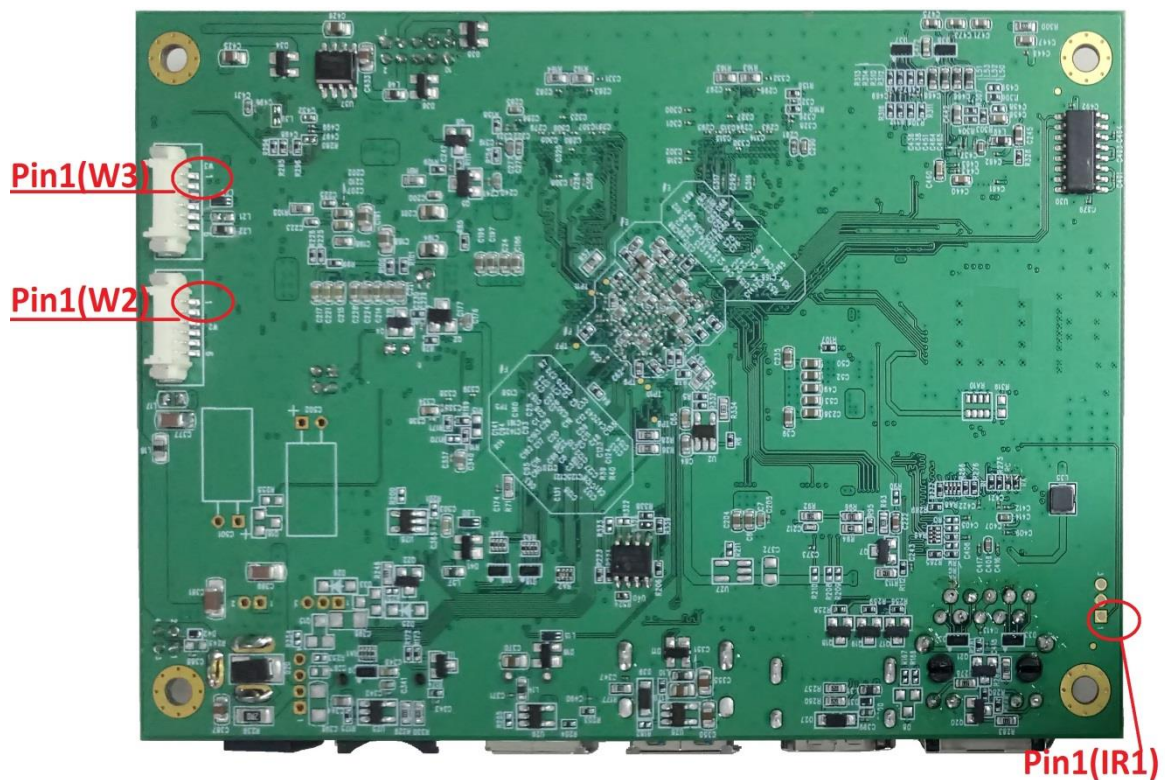
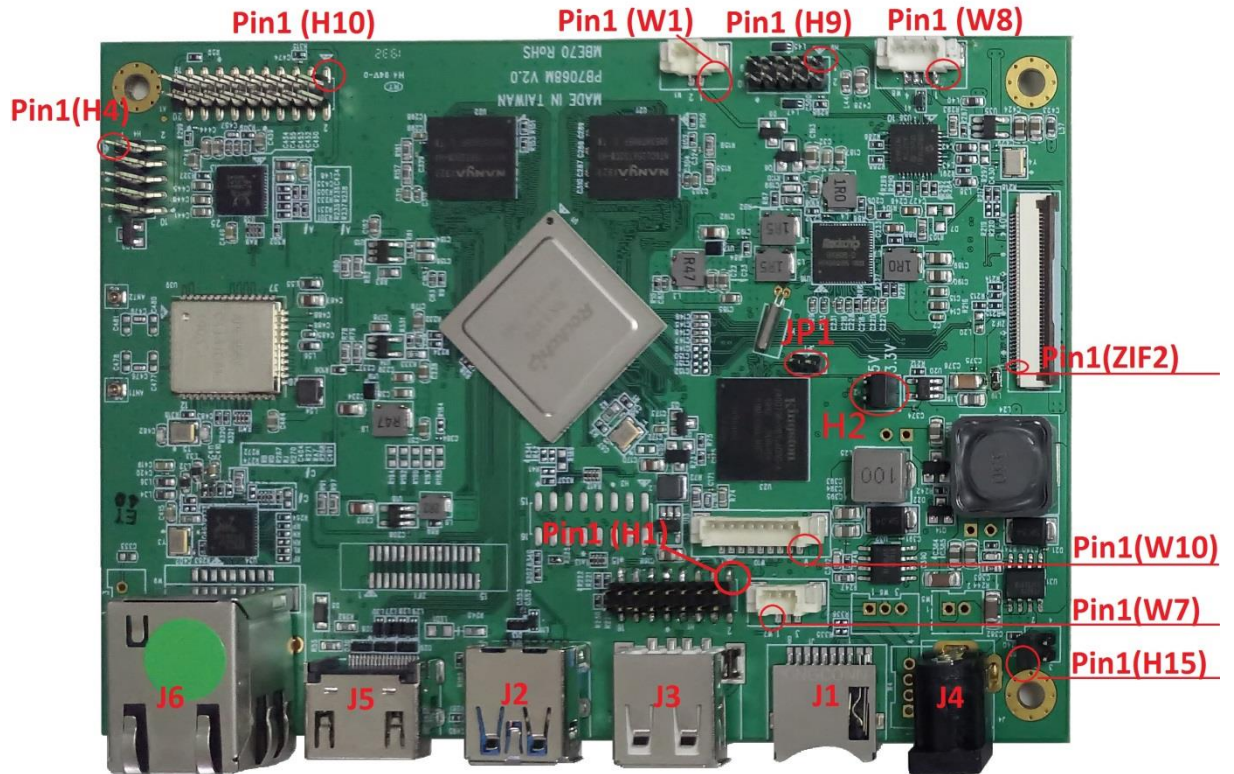
Internal I/O

- ✓ Image File Update Jumper, (**JP1**)
- ✓ RTC Battery Backup Connector, Wafer (**W1**)
- ✓ Power Switch & Power Button, Header (**H15**)
- ✓ Power LED Connector, Wafer (**W7**)
- ✓ IR Receiver Connector, Wafer (**IR1**)
- ✓ eDP Interface (**ZIF2**)
- ✓ LCD Panel Power Selection, Header (**H2**)
- ✓ LCD Backlight Control Connector, Wafer (**W2**)
- ✓ PCAP Touch Interface, Wafer (**W3**)
- ✓ Multi-Role Interface, Wafer (**W10**)
- ✓ KeYPAD & GPIOs Combo Interface, Header (**H1**)
- ✓ RS232 Debug & Buzzer-Out Combo Interface, Header (**H4**)
- ✓ WLAN and Bluetooth Antenna Connector, MHF-IV Receptacle(**ANT1,ANT2**)
- ✓ HUB Extended Ports, Wafer & Header (**W8, H9**)
- ✓ Audio Codec Interface, Header (**H10**)

----- **Here provides below are optional items** -----

- ✓ MEMS Interface, Header (**H3**)
- ✓ MIPI-CSI Interface (**ZIF1**)

1-5. I/O Connector Placement



2. Peripherals Port Description

2-1. Power Jack (J4)

- Carries external power input.
- Pin Assignment:

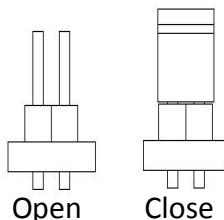
DC Plug-in $\Phi 2.0$



Connector: (Power Barrel Jack 6.3mm/ Tip 2.0mm/ 90°)	
Pin number	Description
Sleeve	GND
Tip	DC12V

2-2. Power Switch & Power Button, Header (H15)

- Shorts the Pin 1&2 of the H15, to power up MBE70 mainboard.
- The Pin 3&4 of the H15 reserved.



Connector: (Header 2x2 pin/ 2.0mm/ 180°)		
Pin number	Status	Description
Pin 1-2	Open	Power off
	Close	Power on
Pin 3-4	Leave Open	Reserved

2-3. RTC Battery Backup Connector (W1)

- Connect to the non-rechargeable coin battery.
- Pin Assignment:

Connector: (wafer-2P/ 1.25mm/ 180°)	
Pin number	Description
1	3.0V(+)
2	GND(-)

2-4. IR Receiver Connector (IR1)

- Connects an external IR-38.8Khz receiver module
- Pin Assignment:

Connector: (wafer-3P/ 1.25mm/ 180°)	
Pin number	Description
1	IR Signal input(1k ohm of Series resistor inside)
2	GND
3	3.3V supply

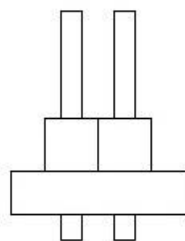
2-5. Power LED Connector (W7)

- The green LED indicates the system's power is plugged.
- Pin Assignment:

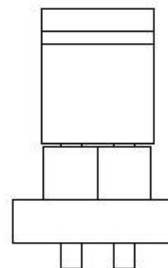
Connector: (wafer-3P/ 1.25mm/ 180°)	
Pin number	Description
1	Green Light
2	GND
3	Reserved for Red Light

2-6. Image File Update Jumper (JP1)

- To open the JP1 before power-on that would make system to enter Image-File-Update mode at power re-plug-in. After that, close the JP1 and beginning update Image File from the USB port (J2).



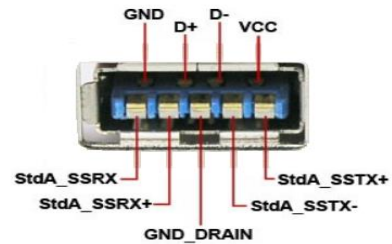
JP1 Open



JP1 Close

2-7. USB 3.0 Type-A Port (J2)

- The dedicated USB port to in charge of updating the Image File while the MBE70 board being enter update mode. Refer to Section 2-6.
- Under Linux OS environment, the J2 is regarded as an USB3.0 host. And gives complete hot plug capability and complies with USB xHCI, Rev. 3.x(USB 3.1 Gen 1).
- Under Android OS environment, the J2 can be set to host or device mode. The detail refer to Section 3-1. Android Programming Guide.



- Pin Assignment:

Connector: (USB 3.0 Type-A)			
Pin number	Description	Pin number	Description
1	VBUS	6	SSRX+
2	D-	7	GND
3	D+	8	SSTX-
4	GND	9	SSTX+
5	SSRX-		

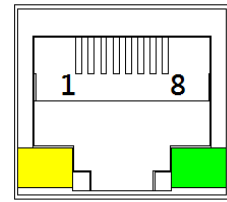
2-8. USB 2.0 Type-A Port (J3)

- The MBE70 provides one USB 2.0 host port on board side that gives complete hot plug capability and complies with USB UHCI, Rev. 2.0.
- Pin Assignment:

Connector: (USB Type A)	
Pin number	Description
1	VBUS1(+5V)
2	USB1 Data -
3	USB1 Data +
4	USB1_GND

2-9. Gigabit Ethernet Port w/PoE+ (J6)

- The integrated 8-pin Gigabit Ethernet port is using an 8 Position 8 Contact (8P8C) receptacle connector (commonly referred to as RJ-45).
- Supports IEEE802.3 at compliant (type2) PD.
- The Gigabit Ethernet port (RJ-45 port) has two individual LED indicators located on the front side to show
 - ◆ Active LED is blinking in green color means that activity of data flow IN or OUT of the device.

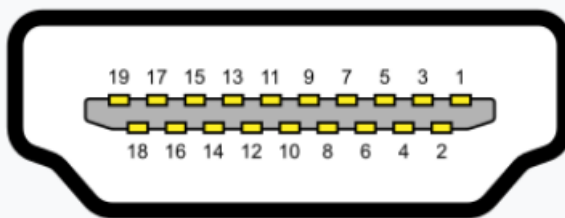


100M/Giga Act

- ◆ Link LED is in Red color means devices is operating in speeds 10/100Mbps.
Link LED is in Green color means devices is operating in speeds 1000Mbps.

2-10. HDMI® 2.0 Port (J5)

- The HDMI port uses an HDMI Type-A receptacle connector. It allows connecting the digital video devices which utilize a high definition video signal without a HDCP.
- Supports HDMI® V2.0, Res. up to 4Kx2K(30-bit/pixel) @60fps, HDCP1.4 /2.2



- Pin Assignment:

Type A (Receptacle) HDMI

Connector: (19-pin HDMI Type A Receptacle, 4.45 mm×13.9 mm)			
Pin	Description	Pin	Description
1	TMDA_Data2+	2	Data2_GND
3	TMDA_Data2-	4	TMDA_Data1+
5	Data1_GND	6	TMDA_Data1-
7	TMDA_Data0+	8	Data0_GND
9	TMDA_Data0-	10	TMDA_CLK+
11	CLK_GND	12	TMDA_CLK-
13	NC	14	NC
15	DDC-SCL, logical high level(5V)	16	DDC-SDA, logical high level(5V)
17	CEC GND	18	Power 5V supply
19	Hot Plug Detect		

2-11. Micro SD/SDHC Card Slot (J1)

- Micro SD/SDHC card slot enable SD card capacity up to 32GB.
- Providing as an extra-storage device. Prevent more frequent and larger data access on eMMC memory makes its lifespan shorter.

2-12. RS232 Debug & Buzzer-Out Combo Interface (H4)

- The debug port supports TX/RX with RS232 level and only use for debug purpose.
- Pin Assignment:

<i>Connector: (Header 2x5 pin/ 2.0mm/ 180°)</i>			
<i>Pin number</i>	<i>Description</i>	<i>Pin number</i>	<i>Description</i>
1	COM_GND	2	Debug-RX(SIN)
3	Debug-TX(SOUT)	4	NC
5	COM_GND	6	NC
7	NC	8	NC
9	Buzzer-	10	Buzzer+

2-13. Keypad & GPIOs Combo Interface (H1)

- Supports Non-isolated GPIOs: GPI x4, GPO x4
- Reserved 4 keys for Keypad usage, the Max. Input Voltage =1.8V, Res. 10bit, tCLK=75ns, conversion time= 13tCLK, setup time=0.5tCLK.
- Pin Assignment:

<i>Connector: (Header 2x8 pin/ 2.0mm/ 180°)</i>			
<i>Pin</i>	<i>Description</i>	<i>Pin</i>	<i>Description</i>
1	DIN0, logical high level(3.3V)	2	DOUT0, logical high level(3.3V)
3	DIN1, logical high level(3.3V)	4	DOUT1, logical high level(3.3V)
5	DIN2, logical high level(3.3V)	6	DOUT2, logical high level(3.3V)
7	DIN3, logical high level(3.3V)	8	DOUT3, logical high level(3.3V)
9	GND	10	3.3V
11	GND Reserved	12	GND Reserved
13	Reserved for VOL+ key	14	Reserved for ESC key
15	Reserved for VOL- key	16	Reserved for MENU key

2-14. eDP Interface (ZIF2)

- Supports eDP 1.3(2.7Gbps per lane).4Lane with connector A1253WR-S-40P is defaulted in factory, it can change to 2 Lane interface before ordering
- Supports 2 Lane, Res. up to1920x1200p@60fps with connector A1253WR-S-30P.
- Supports 4Lane, Res. up to2560x1600p@60fpswith connector A1253WR-S-40P.
- Pin Assignment: (**The blue signals reserved for future usage*)

Connector: (TFP584-30P/40P, 0.5mm, 90°)			
Pin number	Description	Pin number	Description
1	NC	21	BL_GND
2	GND	22	BL_EN_H
3	Lane1_N	23	BL_PWM_DIM
4	Lane1_P	24	NC/Lane2_N
5	GND	25	NC/Lane2_P
6	Lane0_N	26	BL_VLED_12V
7	Lane0_P	27	BL_VLED_12V
8	GND	28	BL_VLED_12V
9	AUX_P	29	BL_VLED_12V
10	AUX_N	30	NC/Lane3_N
11	GND	31	NC/TP_USB_DM
12	LCD_VDD	32	NC/TP_USB_DP
13	LCD_VDD	33	GND
14	LCD_VDD	34	NC/TP_PWR
15	GND	35	NC/TP_PWR
16	GND	36	NC/Lane3_P
17	HPD	37	NC/TP_SCL
18	BL_GND	38	NC/TP_SDA
19	BL_GND	39	NC/TP_INT
20	BL_GND	40	NC/TP_RST

2-15. LCD Panel Power Selection (H2)

- Provides 3.3V to LCD_VDD
- Provides 5V to LCD_VDD



2-16. LCD Backlight Control Connector (W2)

- The voltage of BL_VDD is same as DC_IN, due to the power source of BL_VDD is passed from DC-in Jack (J4) directly.
- Pin Assignment:

Connector: (Wafer-6p/ 1.25mm/ 90°)	
Pin number	Description
1	BL_VDD(12V)
2	BL_VDD(12V)
3	GND
4	GND
5	Backlight_EN (active high), logical high level(3.3V)
6	Backlight_PWM (300Hz), logical high level(3.3V)

2-17. PCAP Touch Interface (W3)

- USB interface is defaulted touch port in factory; it can change to I2C interface before ordering.
- Pin Assignment:

Connector: (Wafer-6p/ 1.25mm/ 90°)	
Pin number	Description
1	Reset, logical high level(3.3V)
2	INT, logical high level (3.3V)
3	USB_DM (default)/ SDA (option), logical high level(3.3V)
4	USB_DP (default)/ SCL (option), logical high level(3.3V)
5	Power supply DC-5V
6	GND

2-18. Multi-Role Interface (W10)

- The interface of W10 can be either used as an extra USB 2.0 individually.
- Or operating RS422/485 with a daughter board (FR-48522).
- Or use for a 4G LTE modem module application.
- Or use for a SPI application.(have to inform factory before order)
- Pin Assignment:

Connector: (Wafer 1x9/ 1.25mm/ 90°)	
Pin number	Description
1	VBUS(+5V)
2	USB Data -
3	USB Data +
4	USB_GND
5	3.0V-UART4_TX(default)/ GPIO-pullup/ SPI1_TXD
6	3.0V-UART4_RX(default)/ GPIO-pullup/ SPI1_RXD
7*	3.0V-Data Flow(default)/ GPIO-pullup/ SPI1_CS _{n0}
8	3.0V-GPO-pullup(default)/ SPI1_CLK
9	3.0V-GPI-pullup

* The pin7 is used as data-in/out control in RS422/485 operation.
The detailed, Refer to section 3-1-3.

2-19. HUB Extended Ports (W8 & H9)

- The Wafer (W8) is designed to extend one more USB port.
- The Header (H9) is designed to extend two more USB port.
- The all of three extended USB ports give complete hot plug capability and complies with USB UHCI, Rev. 2.0.
- The Pin Assignment of W8:

Connector: (Wafer 1x4/ 1.25mm/ 90°)	
Pin number	Description
1	VBUS3(+5V)
2	USB3 Data -
3	USB3 Data +
4	USB3_GND

- The Pin Assignment of H9:

Connector: (Header 2x5 pin/ 2.0mm/ 180°)			
Pin number	Description	Pin number	Description
1	DNC	2	Shield_GND
3	VBUS4(+5V)	4	VBUS5(+5V)
5	USB4 Data -	6	USB5 Data -
7	USB4 Data +	8	USB5 Data +
9	USB4_GND	10	USB5_GND

2-20. MEMS Interface (H3) (Optional)

- Reserved for various MEMS modules.
- Pin Assignment:

Connector: (Header 2x5 pin/ 2.0mm/ 180°)			
Pin	Description	Pin	Description
1	Power supply 3.3V	2	Power supply 3.3V
3	GND	4	GND
5	GYR_INT_L	6	MEMS_SDA
7	COMPASS_INT_L	8	MEMS_SCL
9	LIGHT_INT_L	10	G_SENSOR_INT_L

2-21. Audio Codec Interface (H10)

- Supports speaker amplifiers 1.5W per channel into 8Ω or 2W per channel into 4Ω.
- Pin Assignment:

Connector: (Header 2x10 pin/ 2.0mm/ 180°)			
Pin	Description	Pin	Description
1	GND	2	HP_R
3	MIC_IN	4	HP_L
5	HP_GND	6	HP Plug-in detection, logical high level(3.3V)
7	SPK_R-	8	SPK_R+
9	SPK_L-	10	SPK_L+
11	GND	12	GND
13	Stereo_MIC_R /(LINE_IN_R)	14	Stereo_MIC_L /(LINE_IN_L)
15	LINE_OUT_L	16	LINE_OUT_R
17	Reserved for SPDIF_GND	18	GND
19	Reserved for SPDIF_VCC	20	Reserved for SPDIF_TX

2-22. MIPI-CSI Interface (ZIF1) (Optional)

- Supports 2 Lane, (1.5Gbps per lane).
- Pin Assignment:

Connector: (TFP618-15P/ 1.0mm/ 180°)			
Pin number	Description	Pin number	Description
1	GND	9	MIPI_RX0_CLKp
2	MIPI_RX0_D0N	10	GND
3	MIPI_RX0_D0P	11	MIPI_RST
4	GND	12	MIPI_CLK
5	MIPI_RX0_D1N	13	MIPI_SCL
6	MIPI_RX0_D1P	14	MIPI_SDA
7	GND	15	CAM_POWER_3V0
8	MIPI_RX0_CLKN		

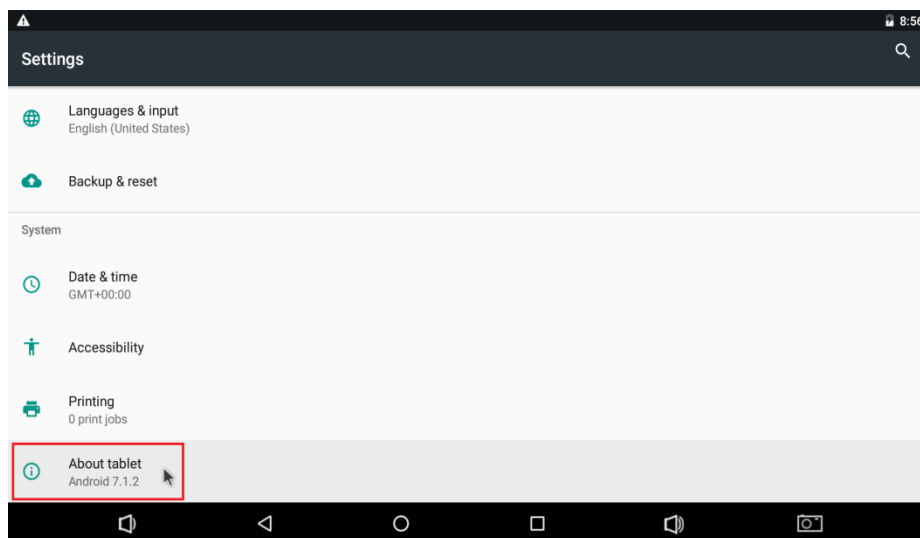
3. Software Programming Guide

3-1. Android Programming Guide

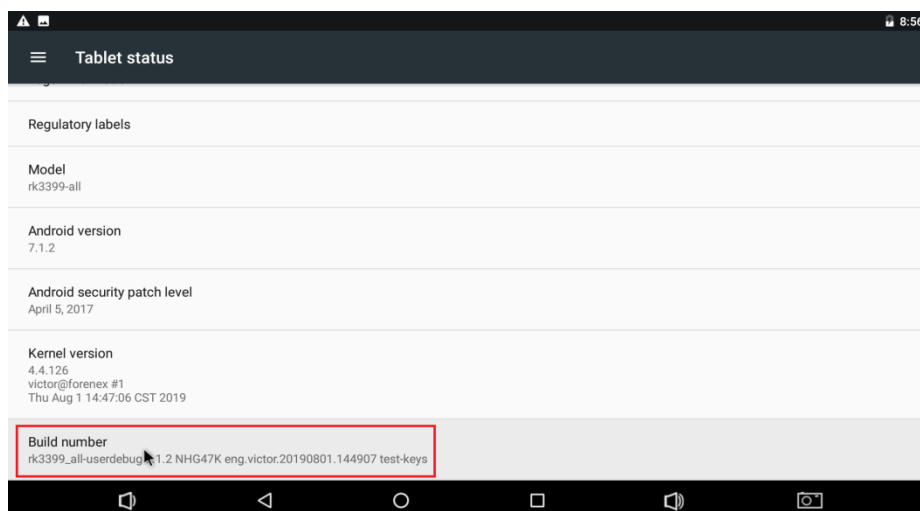
3-1-1. ADB installation

Originally, the USB3.0 was defaulted as host mode. Before use function ADB, the USB 3.0 Port have to be set to device mode by following steps.

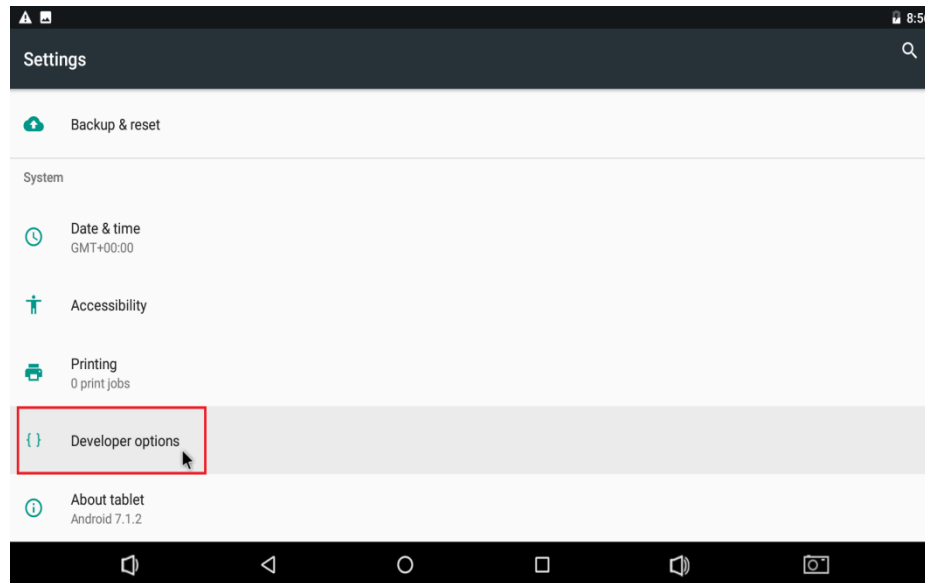
Step1. Scroll to "Settings > About Tablet"



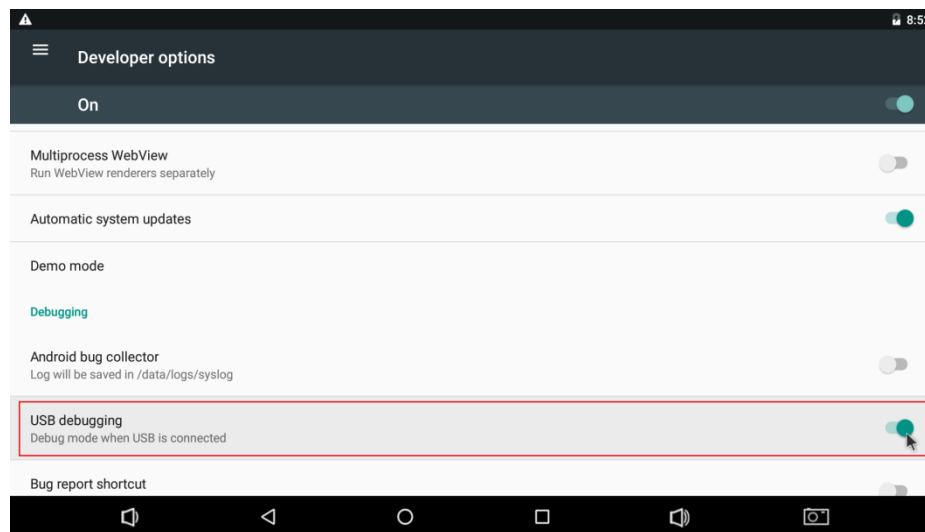
Step2. From "Settings" select "About tablet" to enter the dialog, and then click "Build number" in the dialog as shown. Android will pop up a countdown message. Keep clicking it until zero for Android to authorize the user to be a Developer.



Step3. After finished above action, a new item "Developer Options" will appear in the system block.

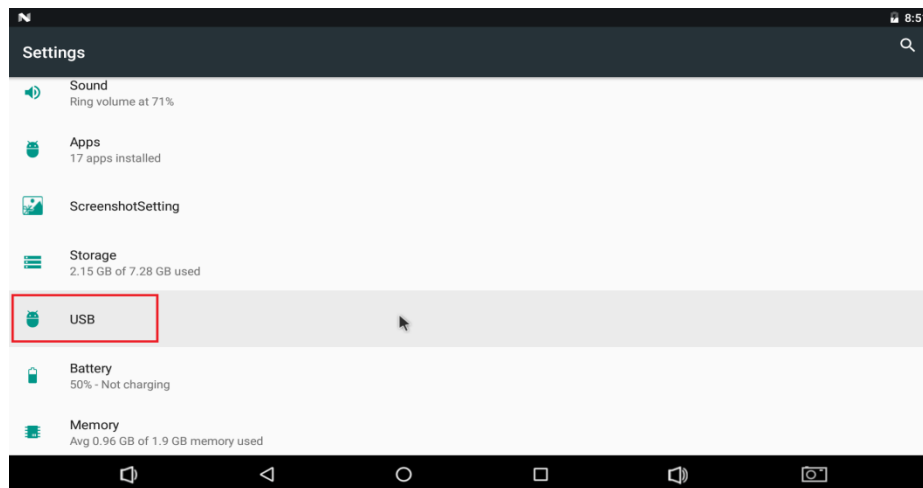


Step4. Get into the new item "Developer Options" and turn on the USB debugging function.

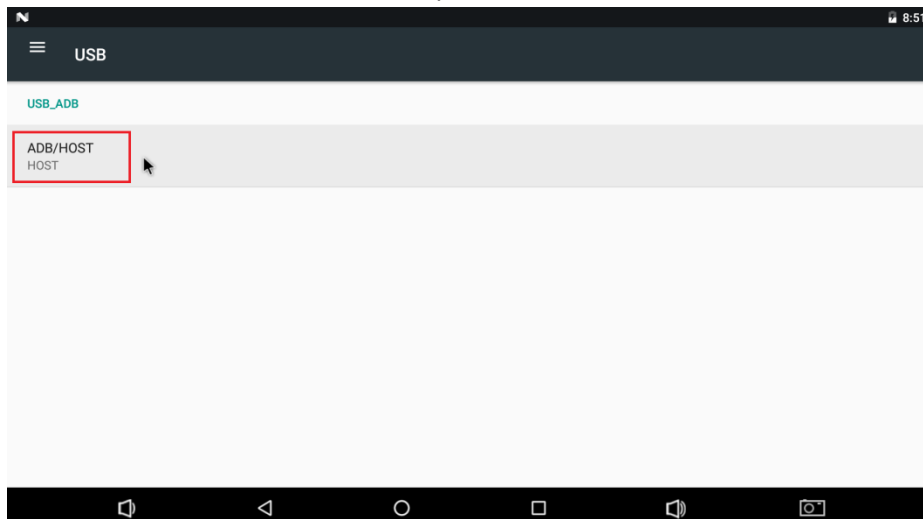


Note: Please do not change the others that you do not understand what it does.

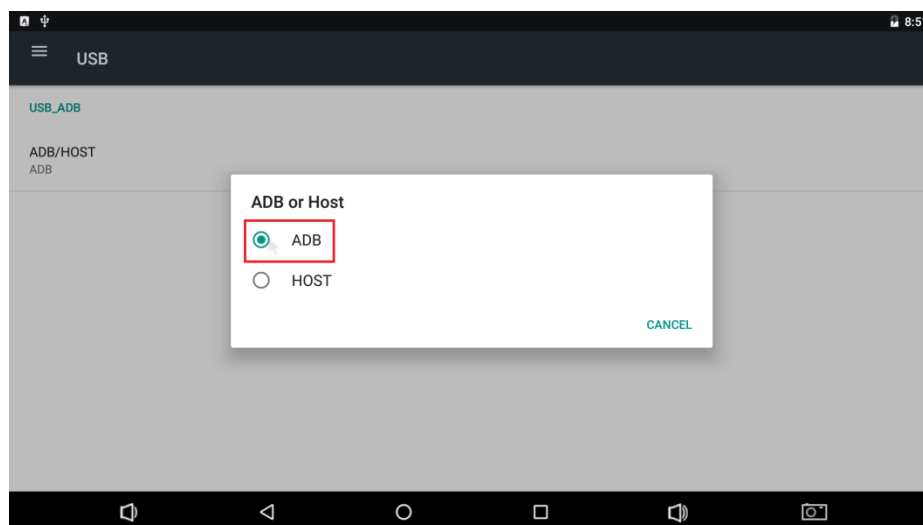
Step5. Scroll to "Settings > USB"



● Then Scroll to "USB > ADB/HOST"



● Set USB3.0 as ADB



3-1-2. To install APK software over the ADB function of PC :

1. Complete the connectivity between USB3.0 (Type A) port of MBE70 and USB port of PC.
2. Enter the command string "adb install xxxxx.apk" from pc that will begin user's APK software installation.

3-1-3. GPIO installation

- GPIOs definition

Position	PIN name	Linux node/Note	Direction
PIN 1	DIN2	/sys/class/gpio/gpio76/value	In
PIN 2	DOUT2	/sys/class/gpio/gpio69/value	Out
PIN 3	DIN0	/sys/class/gpio/gpio74/value	In
PIN 4	DOUT1	/sys/class/gpio/gpio68/value	Out
PIN 5	DIN1	/sys/class/gpio/gpio73/value	In
PIN 6	DOUT3	/sys/class/gpio/gpio67/value	Out
PIN 7	DIN3	/sys/class/gpio/gpio70/value	In
PIN 8	DOUT0	/sys/class/gpio/gpio66/value	Out
PIN 9	Ground		
PIN 10	3.3V	Power supply	Out

- GPIOs control method

The GPIOs can be write/read value with the Linux command echo/cat by debug port.

```
linaro@linaro-alip:~$ sudo -s
root@linaro-alip:/home/linaro# echo 1 > /sys/class/gpio/gpio69/value
root@linaro-alip:/home/linaro# cat /sys/class/gpio/gpio69/value
1
root@linaro-alip:/home/linaro# echo 0 > /sys/class/gpio/gpio69/value
root@linaro-alip:/home/linaro# cat /sys/class/gpio/gpio69/value
0
root@linaro-alip:/home/linaro# █
```

3-2. Linux Programming Guide

3-2-1. GPIO installation

- GPIOs definition

Position	PIN name	Linux node/Note	Direction
PIN 1	DIN2	/sys/class/gpio/gpio76/value	In
PIN 2	DOUT2	/sys/class/gpio/gpio69/value	Out
PIN 3	DIN0	/sys/class/gpio/gpio74/value	In
PIN 4	DOUT1	/sys/class/gpio/gpio68/value	Out
PIN 5	DIN1	/sys/class/gpio/gpio73/value	In
PIN 6	DOUT3	/sys/class/gpio/gpio67/value	Out
PIN 7	DIN3	/sys/class/gpio/gpio70/value	In
PIN 8	DOUT0	/sys/class/gpio/gpio66/value	Out
PIN 9	Ground		
PIN 10	3.3V	Power supply	Out

- GPIOs control method

The GPIOs can be write/read value with the Linux command echo/cat by debug port.

```
linaro@linaro-alip:~$ sudo -s
root@linaro-alip:/home/linaro# echo 1 > /sys/class/gpio/gpio69/value
root@linaro-alip:/home/linaro# cat /sys/class/gpio/gpio69/value
1
root@linaro-alip:/home/linaro# echo 0 > /sys/class/gpio/gpio69/value
root@linaro-alip:/home/linaro# cat /sys/class/gpio/gpio69/value
0
root@linaro-alip:/home/linaro# █
```