

Specification of Cortex Board

(LVDS, HDMI, eDP , MIPI supportable)

Model Name : Orion3368

Part No. : ORN-3368- xxx....xxx
(xxx...xxx : mating LCD part number)

November 2017

Revision History

PCB Version	Rev. date	Revision Details
1.0	Nov. 2017	Initial Version issue
	14.Nov.2017	MIPI DSI -> MPIP CSI revised(P.10/P.14)
	22 Nov. 2017	J11 Pin name revised
	25 Nov.2017	J4 Pin No. revised(P.16)

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The information presented in this document may form a part of quotation or contract under the agreement of both parties. Otherwise, this datasheet is subject to change without notice.

1. Spec Summary

- RockChip RK33688 Octa-core
- 1GByte DDR3 Memory (Optional upto 4GByte)
- 8GByte eMMC Memory (Optional upto 64GByte)
- Dual-channels TFT LCD interface with 4-layers, 3840x2160 maximum display size.
- 1CH/2CH LVDS Interface for LCD – 6bits, 8 bits
- 1lane/2lane eDP interface for LCD – 1.62Gbps/2.7Gbps
- HDMI 1.4/v2.0 Support (4K2K support)
- MIPI DSI Interface
- 6-Port USB – external 2port / internal 4port
- IEEE802.3 10/100/1000Mbps with Twisted-Pair
- IEEE802.11b/g/n WIFI with Bluetooth 4.0(Optional IEEE802.11a/b/g/n/ac)
- MicroSD/SDHC 1 Slot(Max. 32GByte)
- UART : internal 1port
- External Speaker : 2W + 2W (8Ω), 2.9W + 2.9W(4Ω)
- Headset interface port(stereo headphone with MIC)
- MicroUSB OTG 1port
- Camera Interface : 1port – MIPI CSI
- Keypad Interface : Back, Home, Volume+/-, PowerOn(Optional board)
- G-Sensor
- IR Remote control interface
- Form factor: 140 x 95 x 20 mm
- I2C Interface for Touch(Optional)
- Operating temperature: 0 to 50 °C
- Power: 12V DC Power adaptor, SMPS (Optional select)

2. General Description

RK3368 is a low power, high performance processor for mobile phones, personal mobile internet device and other digital multimedia applications, and integrates octa-core Cortex-A53 with separately NEON coprocessor.

Many embedded powerful hardware engines provide optimized performance for high-end application. RK3388 supports almost full-format H.264 decoder by 4Kx2K@30fps; H.265 decoder by 4Kx2K@60fps, also support H.264/MVC/VP8 encoder by 1080p@30fps, high-quality JPEG encoder/decoder, and special image preprocessor and postprocessor.

Embedded 3D GPU makes RK3368 completely compatible with OpenGL ES3.1, OpenCLES3 and DirectX 9.3. Special 2D hardware engine with MMU will maximize display performance and provide very smoothly operation.

RK3368 has high-performance external memory interface (DDR3/DDR3L /LPDDR2/LPDDR3) capable of sustaining demanding memory bandwidth, also provides a complete set of peripheral interface to support very flexible applications.

The HDMI quality of this ARM board is real FHD resolution at the true color 30 bit(RGBx10bits) setting

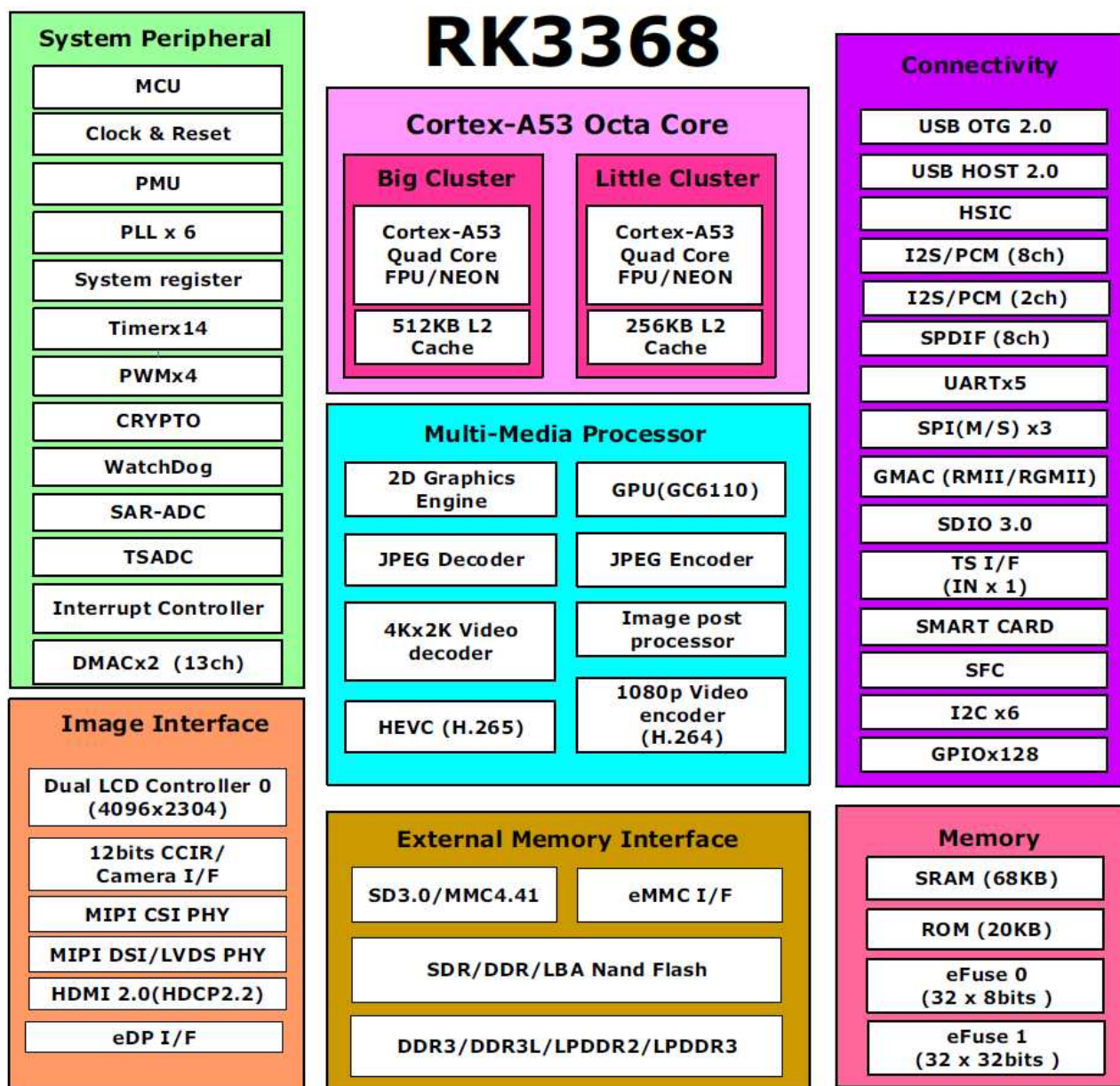
[Special Note] : the reserved firmware status for the GUI / Graphic User Interface

-. the first Product Group : for the users of " Digital Signage Monitor "

the adoption of " **Android** " : version **6.0.1** so called " **Marshmallow** "
Linux Kernel Version : 3.10.92

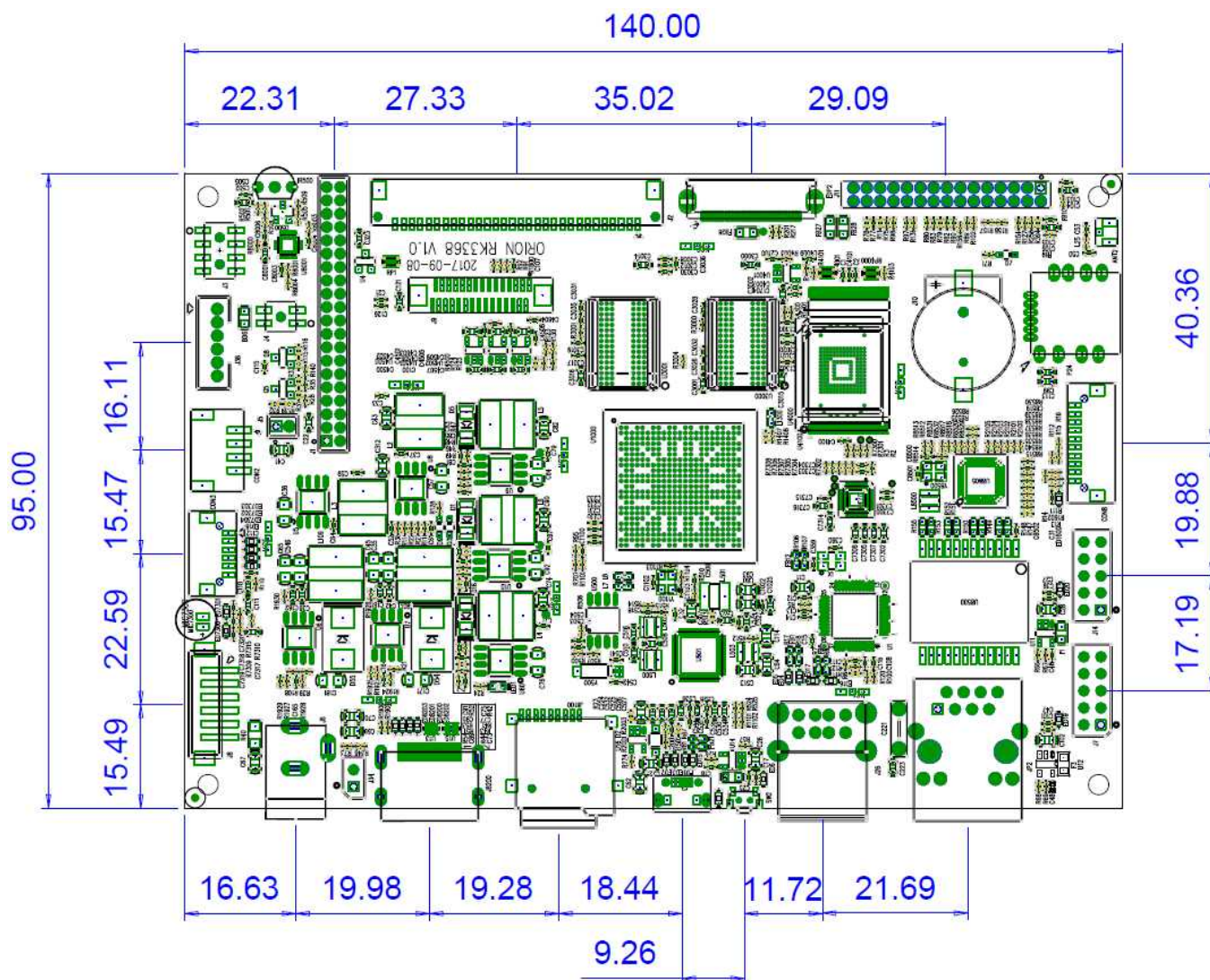
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3. RK3368 Block Diagram



4. Dimension

Main Board (140 x 95 mm) - **PCB version 1.0**

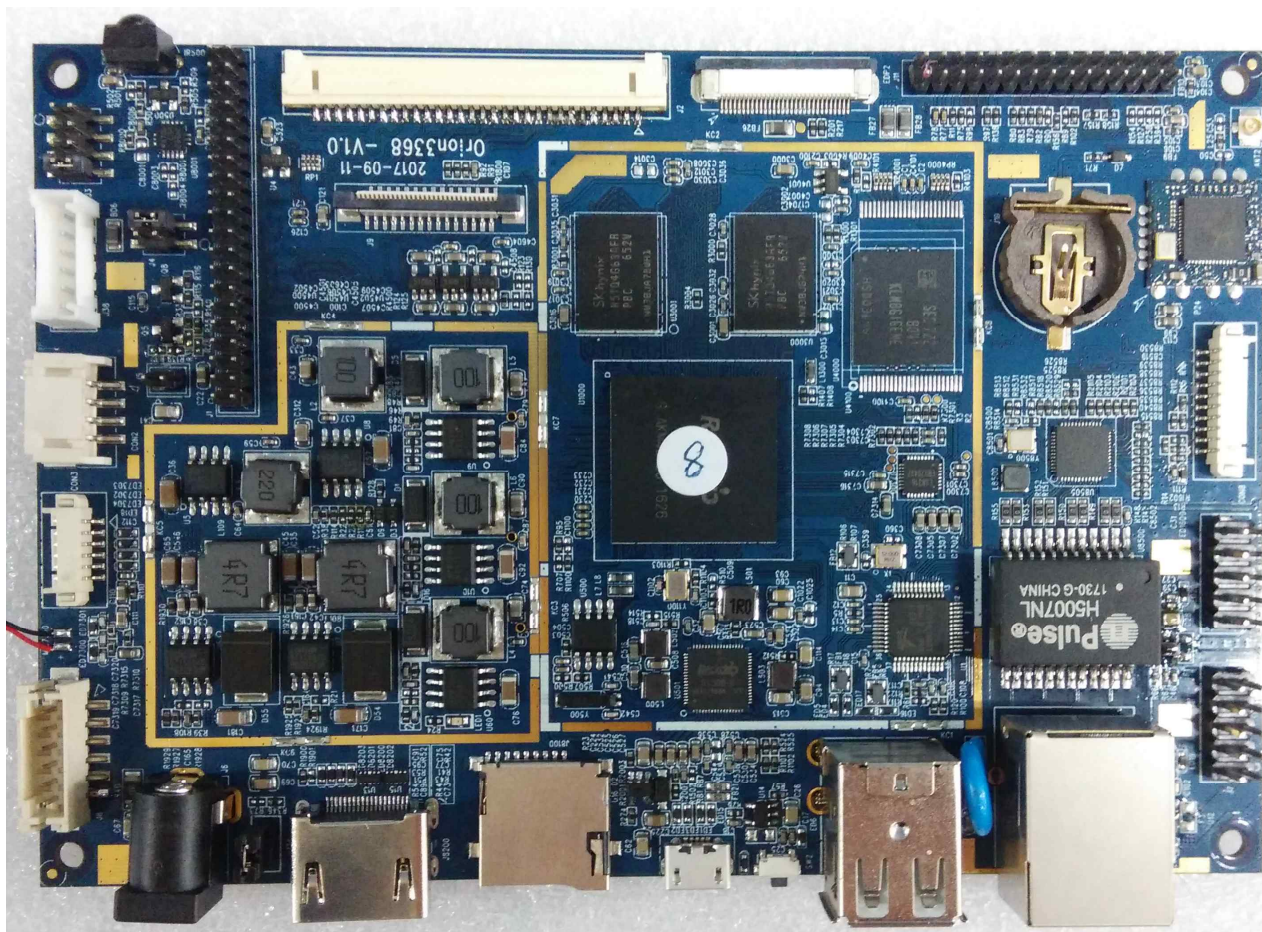


Mount hole : $\varnothing 3$

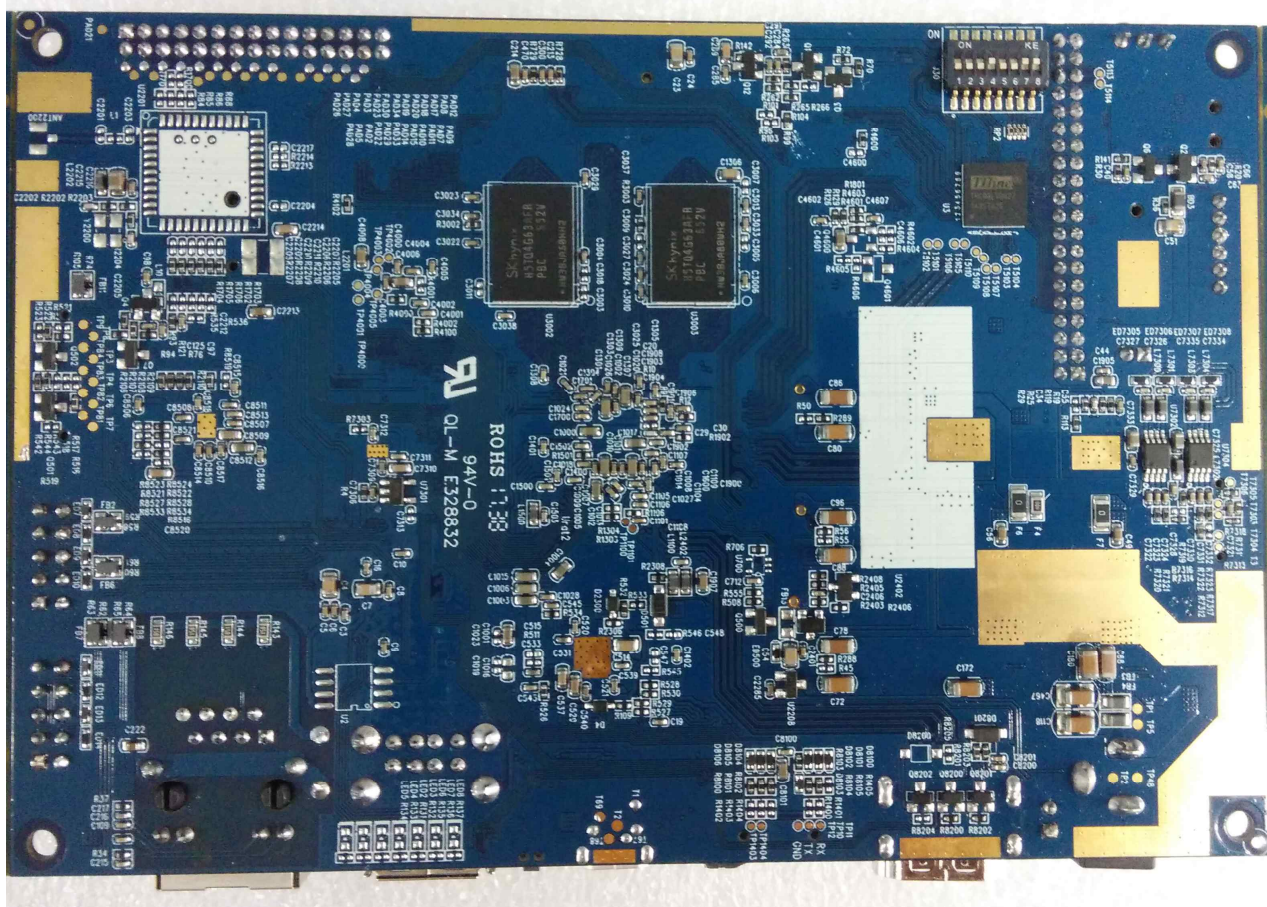
5. Pictures

PCB version 1.0

Top Side View



Rear Side View



6. Connectors and Pin information

6.1 Connectors Summary

Connector No	Description	Type	Manufacturer
CON2	Speaker Output	S4B-PH-SM4-TB(LF)(SN)	JST
CON3	Headset Output	12505WR-06	Yeon-Ho
CON8	Keypad Interface	12505WR-10	Yeon-Ho
J1	TTL RGB/LVDS(1ch)MIPI DSI Interface	2.0mm pitch 2x20p male pin header	
J2	Single/Dual LVDS	DF14-30P-1.25H	Hirose
J5	PWM/Analog Selector	2.0mm pitch 2x1p male pin header	
J6	Power Supply	DC3-3.5	
J7/J14	USB Host Connector	2.54mm pitch 2x5p male pin header	
J8	Extra Power Input(SMPS etc.)	A2001AWV-06	
J9	Camera CSI	FPC30P_SMT_V	
J10	RTC Backup battery holder	CR1220	
J11	GPIO/I2C/SPI etc.	2.0mm pitch 2x15p male pin header	
J13	Micro USB	HUM011D-5-S	
J26	External USB Host	2 stories, Dual USB Host	
J34	Initial Power Selector	2.54mm pitch 1x2p male pin header	
J38	Backlight Power Supply	A2001A-6P	
J8100	Micro SDHC		
J8200	HIDMI Output	HDA107F-01JY01B	
JP2	Ethernet Port	RK45-LED-U	
EDP2	eDP standard Connector	05002HR-H30J05	Yeon-Ho

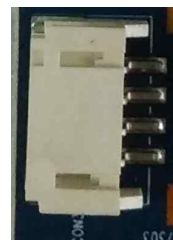
6.2 Pin Information Detail

6.2.1 CON2 : Speaker Out

Mating connector – PHR-4

Pin No.	Function	Pin No.	Function
1	SP_LN	3	SP_RN
2	SP_LP	4	SP_RP

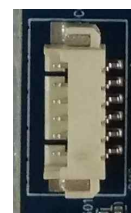
- 2W + 2W (8Ω), 2.9W + 2.9W(4Ω)



6.2.2 CON3 : Headset Output

Mating connector – 12505HS-06

Pin No.	Function	Pin No.	Function
1	GND	4	HPO_R
2	HPO_L	5	NC
3	HP Detect	6	MIC+



6.2.3 CON8 : Keypad Interface

Mating connector – 12505HS-10

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	VOL+	5	Home	9	Work LED+
2	Standby LED +	6	Power On Key	10	Workd LED-
3	VOL-	7	Back		
4	Standby LED -	8	Ground		



– short press : Screen Off, long press : Power Off menu display

6.2.4 J1 : TTL RGB/LVDS(1Ch)/MIPI DSI Interface

Mating connector – 2.0mm pitch 2x20 female socket

6.2.4.1. TTL RGB

Pin No.	Function	Pin No	Function	Pin No.	Function	Pin No.	Function
1	Panel VCC	11	LCDC_D12	21	LCDC_D17	31	LCDC_D22
2	Panel VCC	12	LCDC_D7	22	LCDC_D3	32	LCDC_DEN
3	VCC 3.3V	13	LCDC_D13	23	LCDC_D18	33	LCDC_D23
4	Panel VCC	14	LCDC_D6	24	LCDC_D0	34	LCDC_DCLK
5	GND	15	LCDC_D14	25	LCDC_D19	35	BL_EN
6	GND	16	LCDC_D5	26	LCDC_D1	36	BL_PWM
7	LCDC_D10	17	LCDC_D15	27	LCDC_D20	37	I2C2_SDA
8	LCDC_D9	18	LCDC_D4	28	LCDC_HSYNC	38	I2C21_SCL
9	LCDC_D11	19	LCDC_D16	29	LCDC_D21	39	GND
10	LCDC_D8	20	LCDC_D2	30	LCDC_VSYNC	40	GND

LCDC_D0~D7 : Blue, LCDC_D8~D15 : Green, LCDC_D16_D23 : Red

6.2.4.2. LVDS 1CH

Pin No.	Function	Pin No	Function	Pin No.	Function	Pin No.	Function
1	Panel VCC	11	NC	21	NC	31	NC
2	Panel VCC	12	LVDS_DN1	22	LVDS_DP2	32	NC
3	VCC 3.3V	13	NC	23	NC	33	NC
4	Panel VCC	14	LVDS_DP1	24	LVDS_DN3	34	NC
5	GND	15	NC	25	NC	35	BL_EN
6	GND	16	LVDS_CLKN	26	LVDS_DP3	36	BL_PWM
7	NC	17	NC	27	NC	37	I2C2_SDA
8	LVDS_DN0	18	LVDS_CLKP	28	NC	38	I2C21_SCL
9	NC	19	NC	29	NC	39	GND
10	LVDS_DP0	20	LVDS_DN2	30	NC	40	GND

6.2.4.3. MIPI DSI

Pin No.	Function	Pin No	Function	Pin No.	Function	Pin No.	Function
1	Panel VCC	11	NC	21	NC	31	NC
2	Panel VCC	12	MIPI_TX_DN1	22	MIPI_TX_DP2	32	NC
3	VCC 3.3V	13	NC	23	NC	33	NC
4	Panel VCC	14	MIPI_TX_DP1	24	MIPI_TX_DN3	34	NC
5	GND	15	NC	25	NC	35	BL_EN
6	GND	16	MIPI_TX_CLKN	26	MIPI_TX_DP3	36	BL_PWM
7	NC	17	NC	27	NC	37	I2C2_SDA
8	MIPI_TX_DN0	18	MIPI_TX_CLKP	28	NC	38	I2C21_SCL
9	NC	19	NC	29	NC	39	GND
10	MIPI_TX_DP0	20	MIPI_TX_DN2	30	NC	40	GND



6.2.5 J2 : Single/Dual LVDS

Mating connector – DF14-30S-1.25C

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Panel VCC	9	RXE3-	17	GND	25	RXO2+
2	Panel VCC	10	RXEC+	18	RXE0+	26	RXO2-
3	Panel VCC	11	RXEC-	19	RXE0-	27	RXO1+
4	NC	12	RXE2+	20	RXO3+	28	RXO1-
5	GND	13	RXE2-	21	RXO3-	29	RXO0+
6	3.3V	14	GND	22	RXOC+	30	RXO0-
7	GND	15	RXE1+	23	RXOC-		
8	RXE3+	16	RXE1-	24	GND		



6.2.6 J6 : 12V DC In :

DC3-3.5 (Barrel Jack type)

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	+12V	2	Detect	3	GND

6.2.7 J7/J14 : USB Host Connector

2.54mm pitch 2x5 male pin header

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	USB 5V	5	DP1(D+)	9	NC
2	USB 5V	6	DP2(D+)	10	NC
3	DM1(D-)	7	GND		
4	DM2(D+)	8	GND		



6.2.8 J8 : Extra Power Input(SMPS etc.)

Mating connector – PHR-6

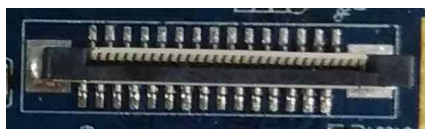
Pin No.	Function	Pin No.	Function	Pin No.	Function
1	+12V	3	+12V	5	GND
2	+12V	4	GND	6	GND



6.2.9 J9 : Camera CSI

FFC 0.5mm pitch 30pin , Mating Camera : OV8858

Pin No	Function	Pin No	Function	Pin No	Function
1	NC	11	RST	21	GND
2	AF-VDD(2.8V)	12	PWDN	22	D1P
3	DVDD(1.2V)	13	GND	23	D1N
4	DOVDD(1.8V)	14	MCLK	24	GND
5	NC	15	GND	25	CLK_P
6	AGND	16	D3P	26	CLK_N
7	AVDD(2.8V)	17	D3N	27	GND
8	DGND	18	GND	28	D0P
9	I2C-SDA	19	D2P	29	D0N
10	I2C-SCL	20	D2N	30	GND



6.2.10 J11 : GPIO/I2C/SPI etc.

Mating Connector – 2.0mm pitch 2x15 Female socket

Pin No	Function	Pin No	Function	Pin No	Function
1	5V	11	SPI_RX	21	SPDIF_TX1
2	3.3V	12	SPI_CLK	22	OPT_NET4
3	OPT_SCL	13	SPI_TX	23	NC
4	OPT_SDA	14	SPI_CS	24	OPT_NET5
5	TP_SCL	15	UART0_RX	25	HSIC_STROBE
6	TP_SDA	16	UART0_CTS	26	HSIC_DATA
7	TP_RST	17	UART0_TX	27	R_LINEIN
8	TP_INT	18	UART0_RTS	28	L_LINEIN
9	OPT_NET2	19	GND	29	GND
10	OPT_NET3	20	GND	30	GND



6.2.11 J38 : Backlight Power Supply

Mating Connector – SMW200-06

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	+12V	3	GND	5	On/Off
2	+12V	4	GND	6	Dimmer



6.2.12 EDP2 : eDP standard Connector

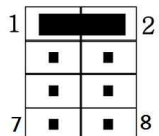
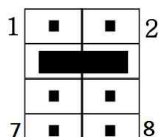
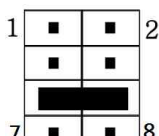
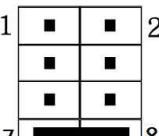
FFC 0.5mm pitch 30pin

Pin No	Function	Pin No	Function	Pin No	Function
1	NC	11	GND	21	GND(LED)
2	GND	12	VCC(+3.3V)	22	LED_EN
3	LANE1N	13	VCC(+3.3V)	23	PWM
4	LANE1P	14	NC	24	NC
5	GND	15	GND	25	NC
6	LANE0N	16	GND	26	VLED
7	LANE0P	17	HPD	27	VLED
8	GND	18	GND(LED)	28	VLED
9	AUX_P	19	GND(LED)	29	VLED
10	AUX_N	20	GND(LED)	30	NC



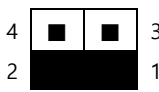

7. Option Jumper Setting

7.1 J3 : Panel VCC Selector


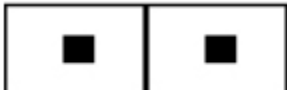
Panel Vcc	Jumper Setting
+12.0V	
+10V	
+5V	
+3.3V	

7.2 J4 Inverter Vcc Selection Jumper

Pin '1 + 2' or '3 & 4' select

Panel Vcc	Jumper Setting
+5.0V	
+12V(Default)	

7.3 J5 : Inverter Control type Selection Jumper

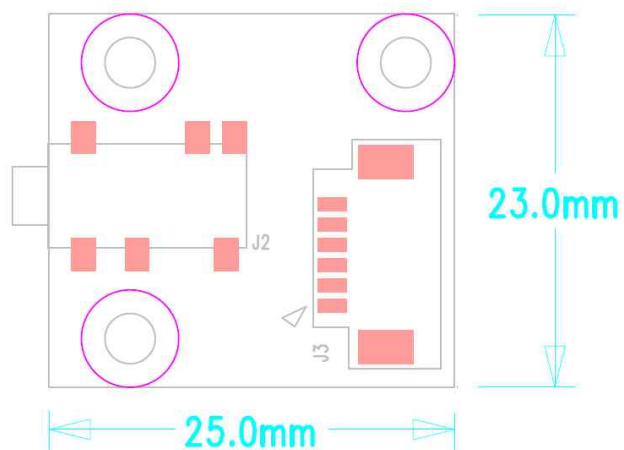
Panel Vcc	Jumper Setting
DC Level(Short)	
PWM(Open)	

Appendix - A : Ordering Information for Customer Support

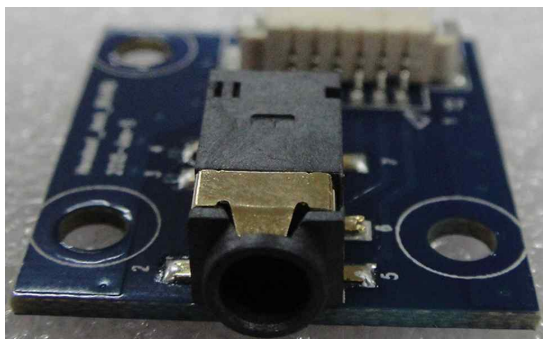
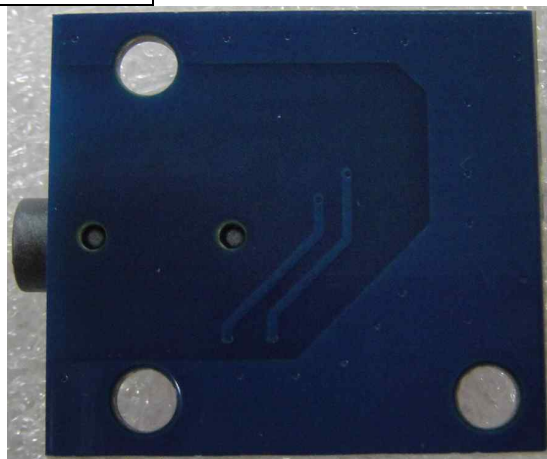
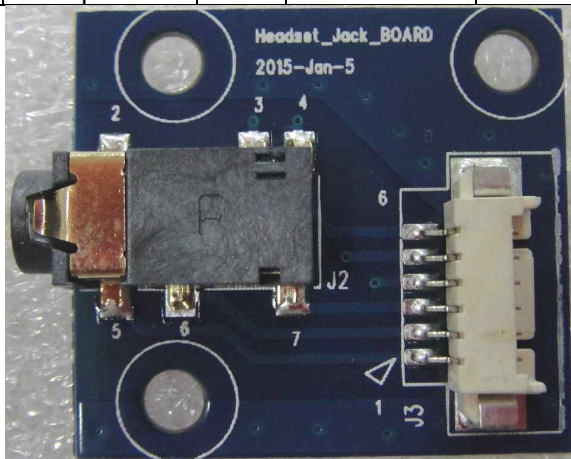
1. **Android Version or Ubuntu support**
2. **Mating LCD Part No. Or HDMI Only**
3. **SMPS Part No.**
4. **Screen Orientation – Landscape or Portrait**
5. **Default Country : ex) UK, France, Germany etc.**
6. **Timezone : ex) GMT, GMT+9 etc.**
7. **Touchscreen Support or not : In case of Support, Mating Touchscreen controller Part No.**
8. **Camera Support : USB Camera Model No.**
9. **User Request**

Appendix – B : IO Boards

Headset Jack Sub Board



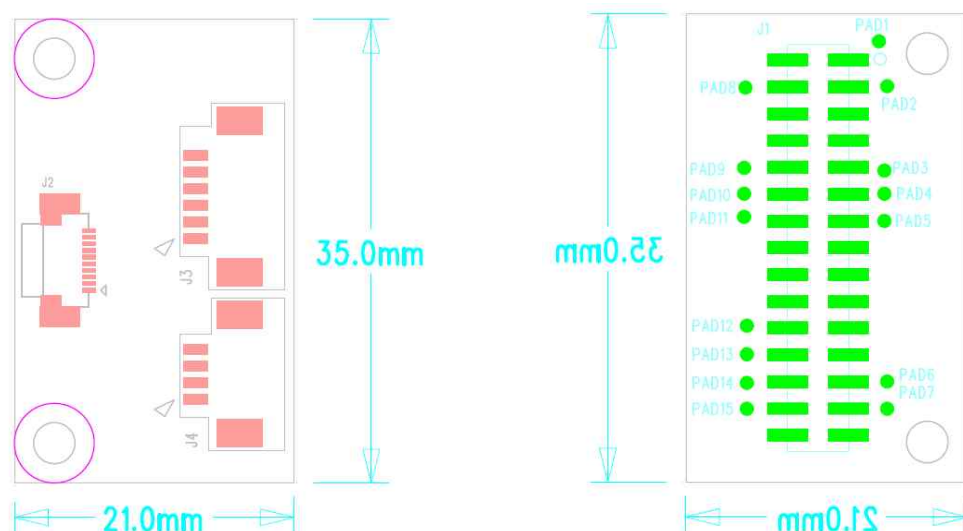
Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Detect	3	NC	5	Headphone L
2	Headphone R	4	NC	6	Ground



Data Sheet

IO Sub Board

For the purpose of easy way for users' convenience, this IO Sub board was designed and provided. The mating Pin map is based on 10.1" P-cap (made by DPTech Co. Ltd or B-Touch Co. Ltd located in ShenZhen Southern China) Touch Screen Connector and reserved UART extension Port on the main ARM board PCB..



2.1 J1 (2x15 2.00mm Female)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	NC	9	NC	17	UART0_TX	25	NC
2	3V	10	NC	18	UART0_RTS	26	NC
3	NC	11	NC	19	Ground	27	NC
4	NC	12	NC	20	Ground	28	NC
5	TP_SCL	13	NC	21	NC	29	Ground
6	TP_SDA	14	NC	22	NC	30	Ground
7	TP_RST	15	UART0_RX	23	NC		
8	TP_INT	16	UART0_CTS	24	NC		

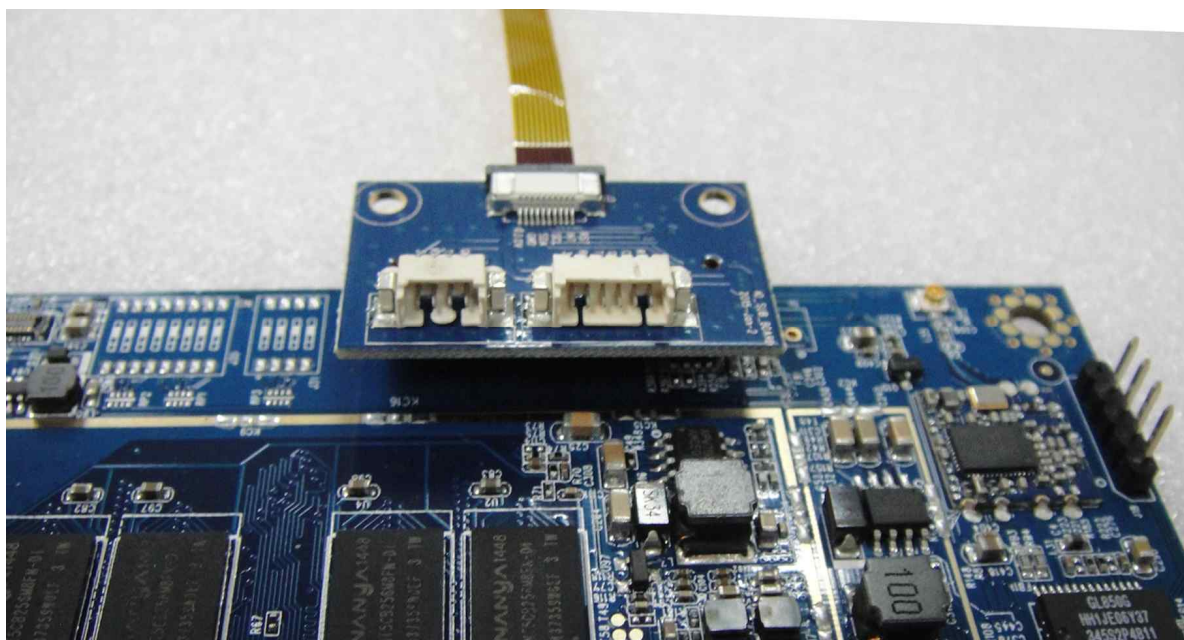
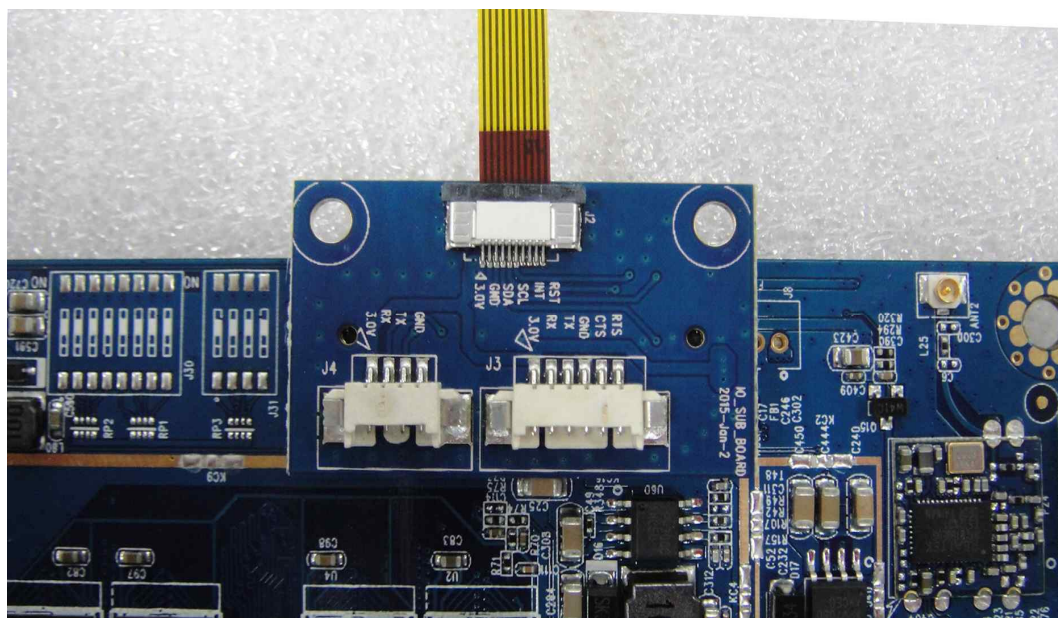
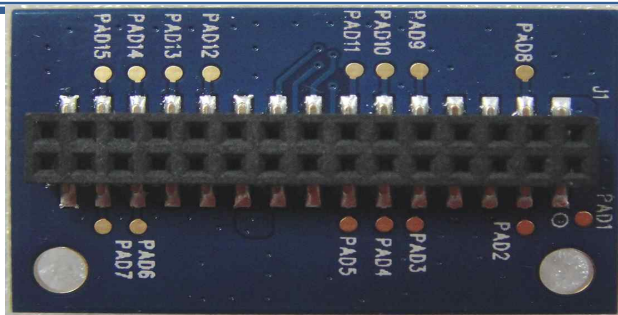
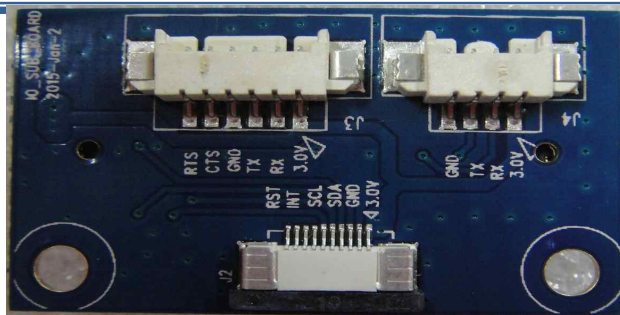
2.2 J2 YeonHo 05002HR-10(Bottom Contact)

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	VCC 3V	5	TP_INT	9	NC
2	Ground	6	TP_RST	10	NC
3	TP_SDA	7	NC		
4	TP_SCL	8	NC		

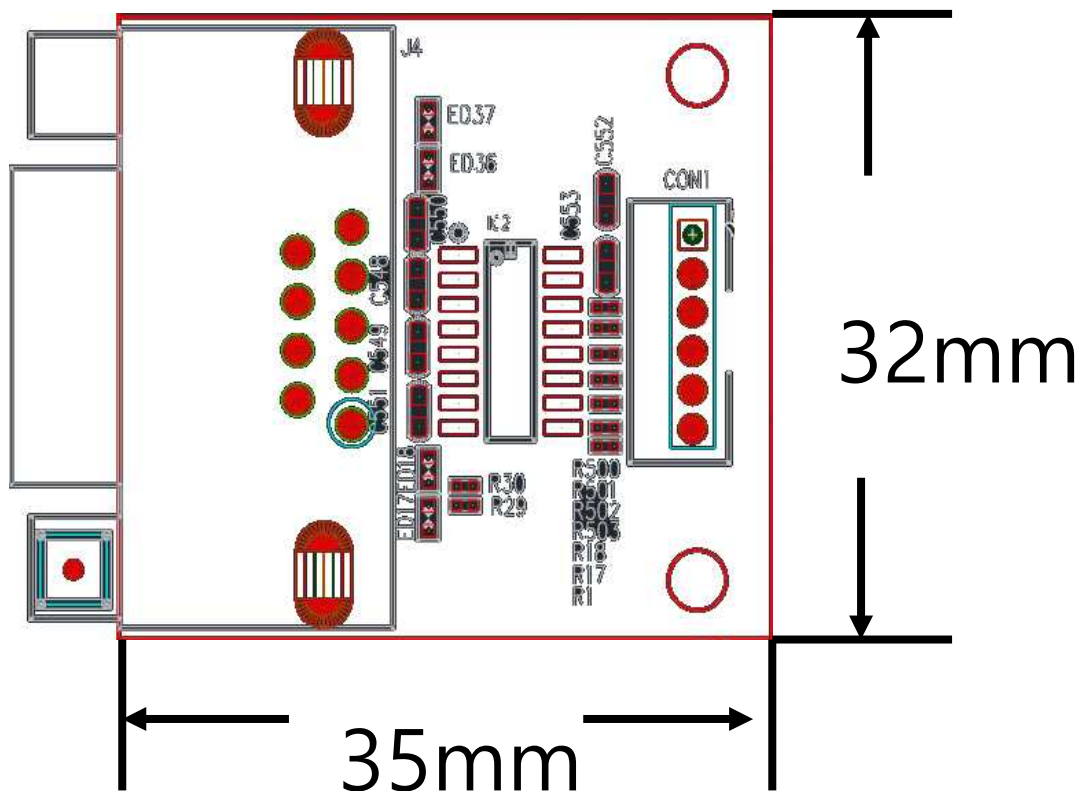
2.3 J3 YeonHo 12505WR-06

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	VCC 3V	3	UART0_TX	5	UART0_CTS
2	UART0_RX	4	Ground	6	UART0_RTS

Data Sheet



RS-232C Board



3.1 CON1 YeonHo 12505WR-06

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	VCC 3.3V	3	TX	5	RTS
2	RX	4	Ground	6	CTS

