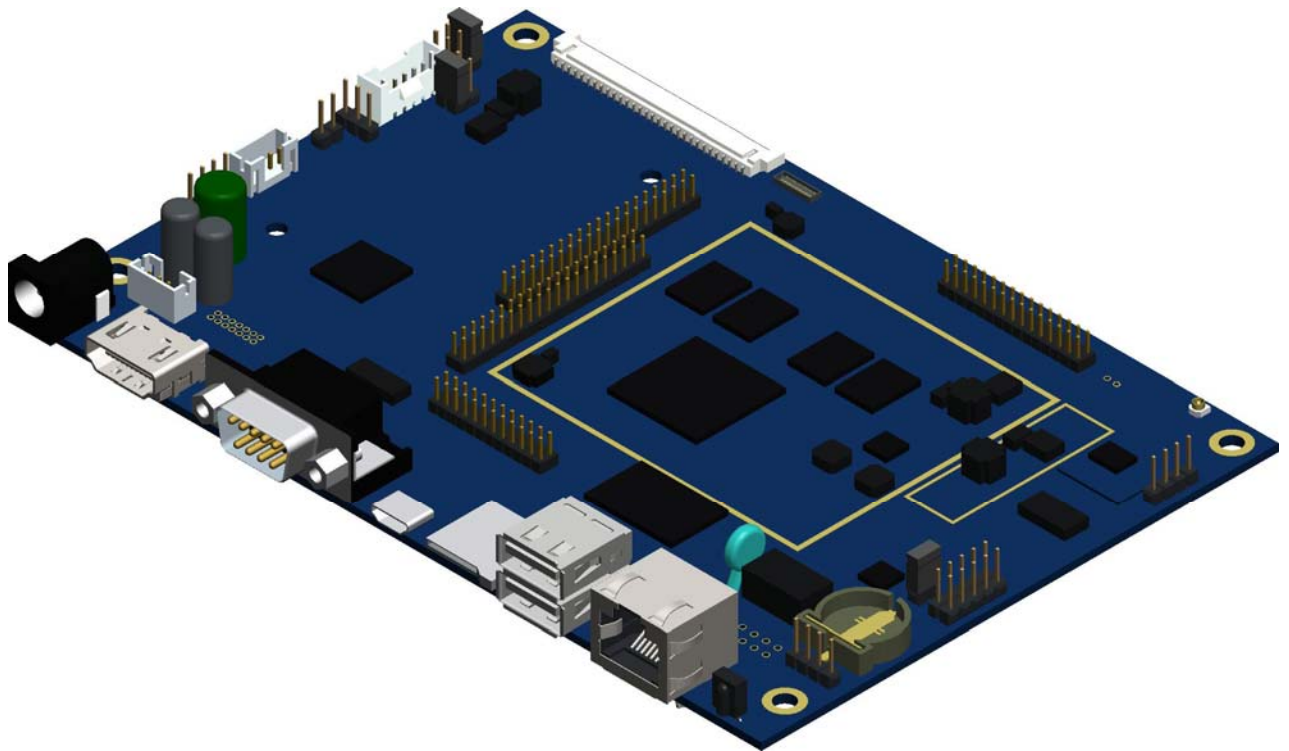


Specification of Cortex Board *(LVDS, HDMI supportable)*

Model Name : Orion3188

Part No. : ORN-3188-xxx....xxx



January 2014

Revision History

PCB Version	Rev. date	Revision Details
0.0	Nov 2013	Initial Version issue
1.0	Jan 2014	First mass production
1.2	May 2014	Revised Connector No. CN7 -> J18
1.2	Apr 2015	New Connector : J10
		Appendix A,B

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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 RK3188 Quadcore
- 1GByte DDR3 Memory(Option 2GByte)
- 8GByte NAND Memory (option : extension of another 8G Byte Memory on the rear surface)
- Dual-channels TFT LCD interface with 4-layers, 2048x1536 maximum display size.
- 1CH/2CH LVDS Interface for LCD – 6bits, 8 bits, 10bits(Option)
- HDMI/MIPI Interface
- 4-Port USB – external 2port/internal 2port
- IEEE802.3 10/100Mbps with Twisted-Pair
- IEEE802.11b/g/n WIFI
- MicroSD/SDHC 1 Slot(Max. 32GByte)
- RS-232C : external 1Port/internal 2port
- MicroUSB OTG 1port
- Camera Interface : 1port
- Keypad Interface : ESC, Volume+/-, PowerOn(Option board)
- IR Remote control interface
- Form factor: 160 x 110 x 20 mm
- I2C Interface for Touch(Option)
- Speaker : 2 x 2 W(stereo)
- Operating temperature: 0 to 50 °C
- Power: 12V DC Power adaptor, SMPS (Optional select)

2. General Description

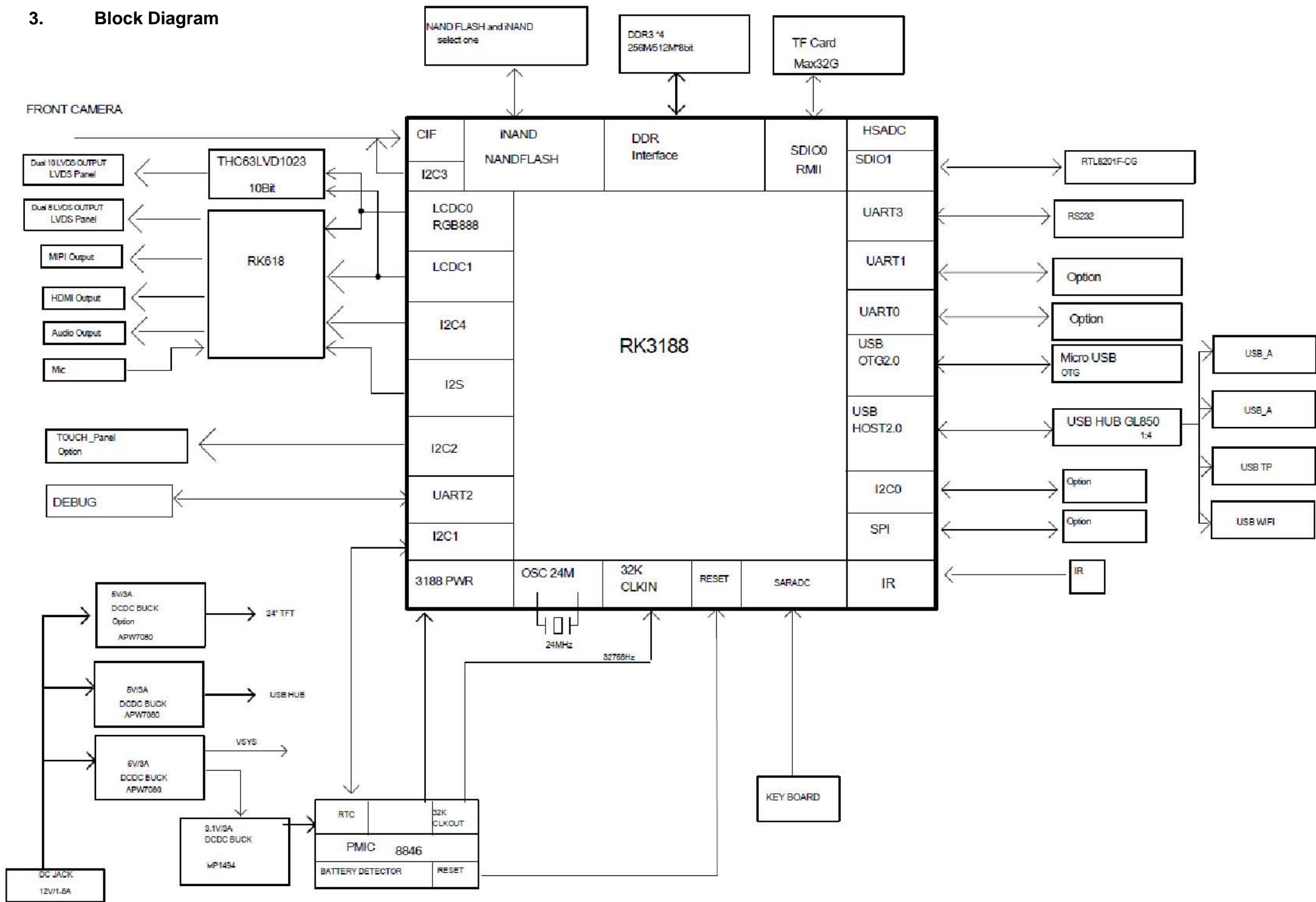
RK3188 is a low power, high performance processor for mobile phones, personal mobile internet device and other digital multimedia applications, and integrates quad-core Cortex-A9 with separately NEON and FPU coprocessor.

Many embedded powerful hardware engines provide optimized performance for high-end application. RK3188 supports almost full-format video decoder by 1080p@60fps, also support H.264/MVC/VP8 encoder by 1080p@30fps, high-quality JPEG encoder/decoder, special image preprocessor and postprocessor. Embedded 3D GPU makes RK3188 completely compatible with OpenGL ES2.0 and 1.1, OpenVG 1.1. Special 2D hardware engine with MMU will maximize display performance and provide very smoothly operation.

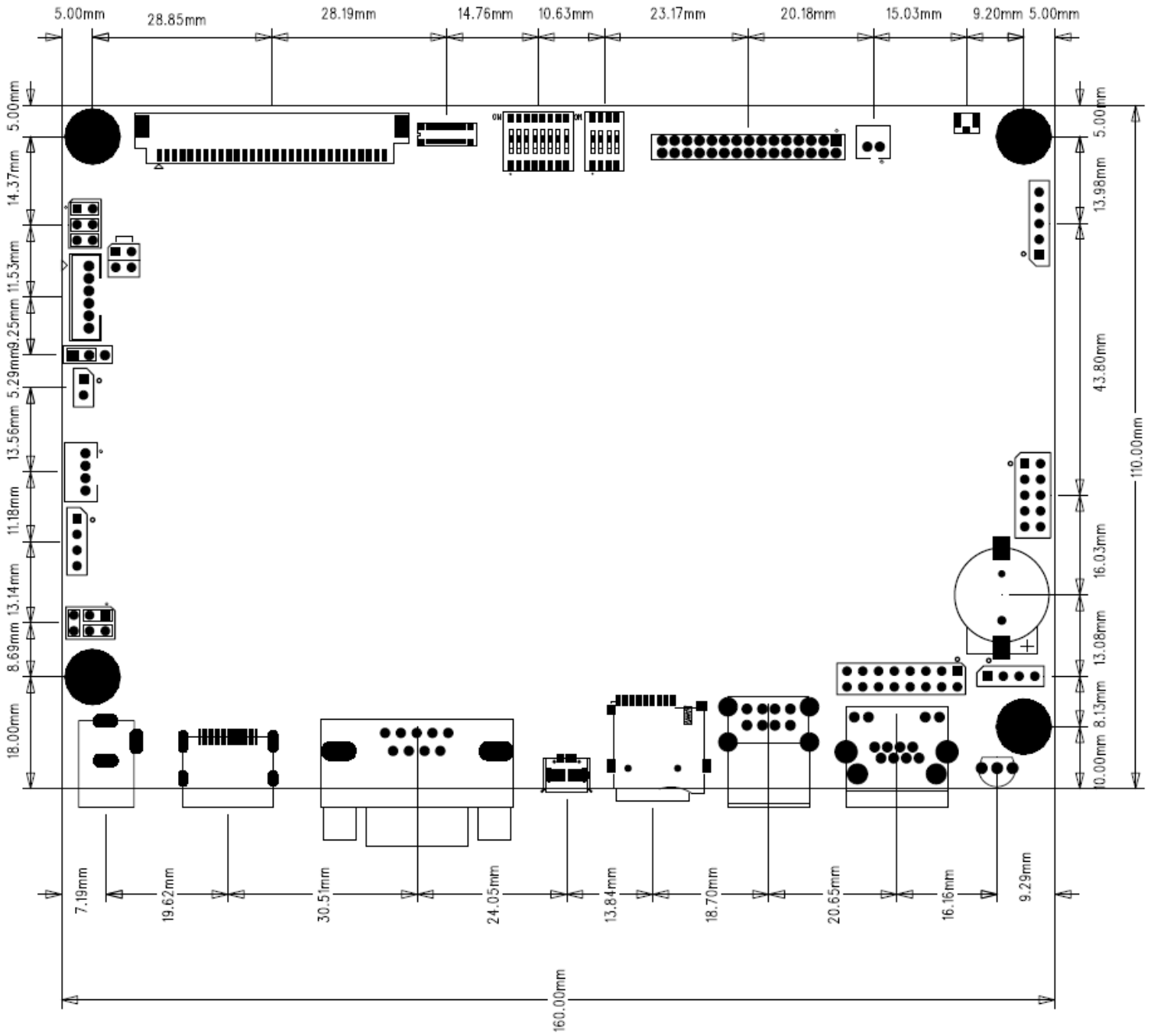
RK3188 has high-performance external memory interface(DDR3/LPDDR2/LVDDR3) capable of sustaining demanding memory bandwidths, also provides a complete set of peripheral interface to support very flexible applications.

The HDMI quality of this ARM board is **real FHD resolution at the true color 24 bit(RGBx8bits) setting**

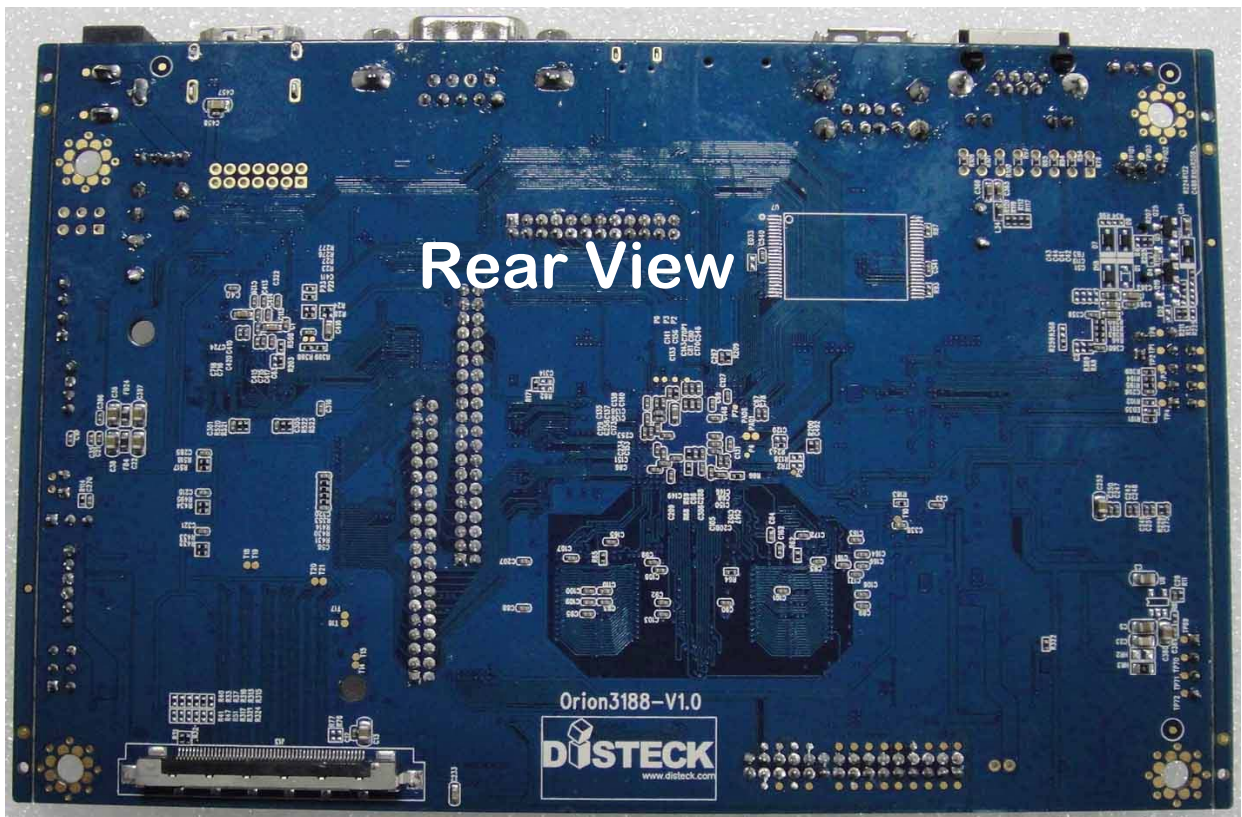
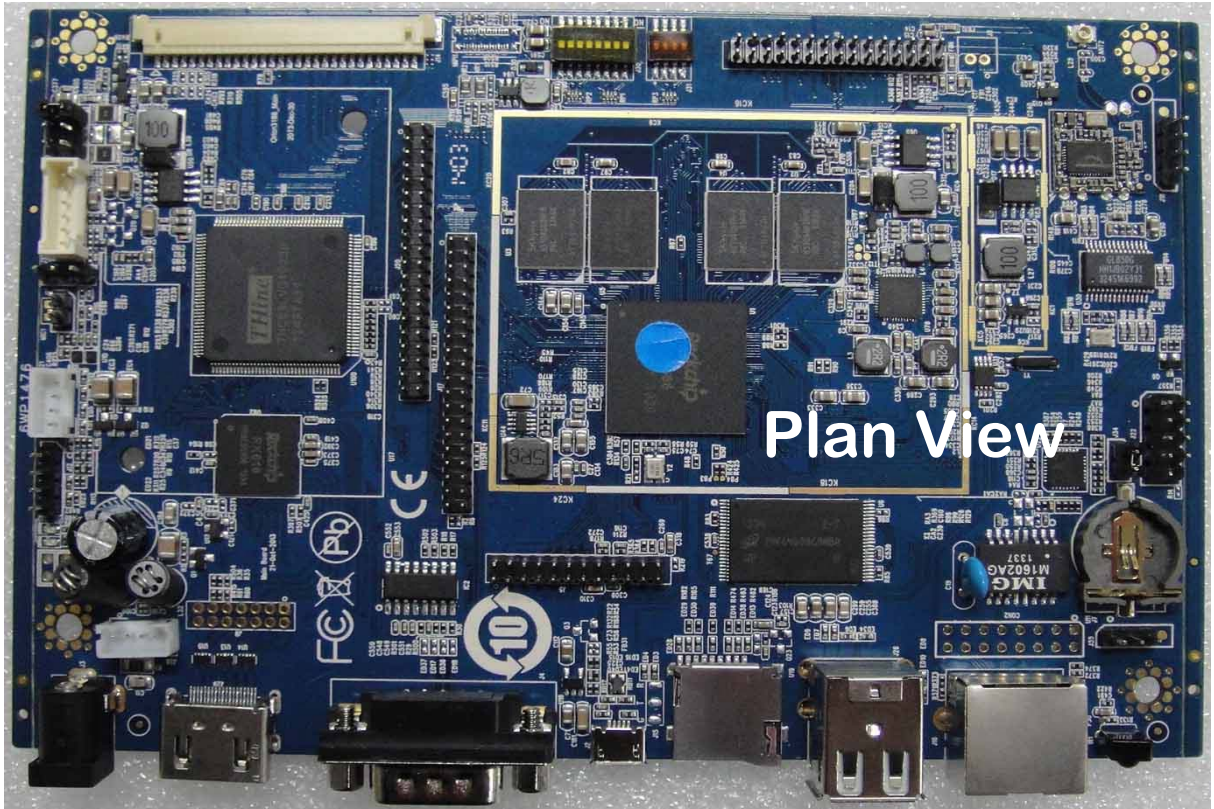
3. Block Diagram



4. Dimension



5. Pictures



6. Connectors and Pin information

6.1 Connectors Summary

Service	Maker	Part number	Description	Mating Housing
LCD I/F 8bits(LVDS)	Yeon-Ho	12507WR-30P	1.25mm, 30p SMD	YEON HO /12507HS-30
LCD I/F 10bits(LVDS)	Yeon-Ho	05030WR-51L	0.5mm, 51p SMD	
HDMI OUT		51L019S-333N	Right Angle	Standard HDMI cable(Male)
RS232C I/F Wafer		DB9		
Inverter I/F	Yeon-Ho	SMW200-06	2.0mm, 6P, S/T	SMH-06
OSD I/F			2.54mm, 9p S/T	
DC In (12V)	Yeon-Ho	DC-005(3.5PAI)		DC Adapter
USB Host		USB A type	2 x.4P, S/T	
USB OTG			microUSB x1	
microSD Card				
RJ-45		HR911105A		

6.2 Pin Information Detail

6.2.1 LCD Interface : J14 - 8bits LVDS 30Pin – 2 channel(12507WR-30P)

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

6.2.2 LCD Interface : J14 - 8bits LVDS 30Pin – 1 channel(12507WR-30P)

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

6.2.3 LCD Interface : J13 - 10bits LVDS 51Pin (05030WR-51L) (Option)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	NC	14	RXO1-	27	Option	40	RXE4-
2	SCL	15	RXO1+	28	RXE0-	41	RXE4+
3	SDA	16	RXO2-	29	RXE0+	42	LD_EN
4	NC	17	RXO2+	30	RXE1-	43	NC
5	Option	18	GND	31	RXE1+	44	GND
6	Option	19	RXOC-	32	RXE2-	45	GND
7	Option	20	RXOC+	33	RXE2+	46	GND
8	Option	21	GND	34	GND	47	NC
9	Option	22	RXO3-	35	RXEC-	48	PANEL_Vcc
10	Option	23	RXO3+	36	RXEC+	49	PANEL_Vcc
11	GND	24	RXO4-	37	GND	50	PANEL_Vcc
12	RXO0-	25	RXO4+	38	RXE3-	51	PANEL_Vcc
13	RXO0+	26	NC	39	RXE3+		

6.2.4 HDMI Output Header(J9)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	HDMI_A_2+	5	HDMI_A_0+	9	A_CEC	13	GND
2	HDMI_A_2-	6	HDMI_A_0-	10	A_DDCSCL1	14	VSYS
3	HDMI_A_1+	7	HDMI_A_C+	11	A_DDCSDA1		
4	HDMI_A_1-	8	HDMI_A_C-	12	A_HPDP		

6.2.5 HDMI Output (J29)

Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	Dat2 +	5	Data1 Shield	9	Data0 -	13	CEC	17	DDC/CEC GND
2	Data2 Shield	6	Data1 -	10	CLK +	14	NC	18	DC +5V
3	Data2 +	7	Data0 +	11	CLK Shield	15	DDC SCL	19	HP Detect
4	Data1 +	8	Data0 Shield	12	CLK -	16	DDC SDA		

6.2.6 Ethernet Output : CON2 (2.54mm 2x8Pin)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	TX+	5	RX+	9	RXCT	13	Pin 7
2	TX+	6	RX+	10	RXCT	14	Pin 7
3	TX-	7	TXCT	11	RX-	15	Pin 8
4	TX-	8	TXCT	12	RX-	16	Pin 8

6.2.7 RS232C : J4 (DB9 Female)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	NC	2	RX	3	TX	4	NC
5	GND	6	NC	7	RTS	8	CTS
9	NC						

6.2.8 12V DC In : J3 (DC3-3.5)

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

6.2.9 Inverter Interface : J38 (SMW200-06)

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

Pin 1,2 Output please see 7.3

6.2.10 OSD Interface : J22(2x5 2.54mm)

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	VOL+	5	ESC	9	Ground
2	Power LED +	6	Power On Key	10	NC
3	VOL-	7	OPT		
4	Power LED -	8	P KEY_V		

6.2.11 Internal USB : J18 (1x5 2.54mm)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	+5V	2	DM	3	DP	4	GND

6.2.12 I2C/Touch/UART/SPI : J6 (2x15 2.00mm)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	5V	9	OPT_NET2	17	UART1_TX	25	HSIC_STROBE
2	3V	10	OPT_NET3	18	UART1_RTS	26	HSIC_DATA
3	OPT_SCL	11	SPI_RX	19	Ground	27	R_LINEIN
4	OPT_SDA	12	SPI_CLK	20	Ground	28	L_LINEIN
5	TP_SCL	13	SPI_TX	21	UART0_RX	29	Ground
6	TP_SDA	14	SPI_CS	22	OPT_NET4	30	Ground
7	TP_RST	15	UART1_RX	23	UART0_TX		
8	TP_INT	16	UART1_CTS	24	OPT_NET5		

6.2.13 Camera Interface : J5 (2x12 2.00mm)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	CIF0_CLKIN	7	CIF0_D7	13	CIF0_HREF	19	VCC15_CIF
2	Ground	8	CIF0_D6	14	CIF0_VSYNC	20	CIF0_PDN
3	CIF0_CLKOUT	9	CIF0_D5	15	VCC28_CIF	21	Ground
4	Ground	10	CIF0_D4	16	CIF0_RST	22	I2C3_SCL
5	CIF0_D9	11	CIF0_D3	17	CIF0_PDN	23	I2C3_SDA
6	CIF0_D8	12	CIF0_D2	18	VCC28_CIF	24	VDD18_CIF

6.2.14 Speaker Header : J21 (1x4 2.00mm)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	SPO_LN	2	SPO_LP	3	SPO_RN	4	SPO_RP

6.2.15 MIC Header : J11 (1x2 2.54mm)

Pin No.	Function	Pin No.	Function
1	MIC_P	2	MIC_N

6.2.16 Headphone Header : J12 (1x4 2.54mm)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Headphone L	2	Headphone R	3	INT_Headphone	4	Ground

7. Option Jumper Setting

7.1 LCD Vcc Selection Jumper (J23)

Panel Vcc	Jumper Setting
+3.3V	
+5V	
+12V	

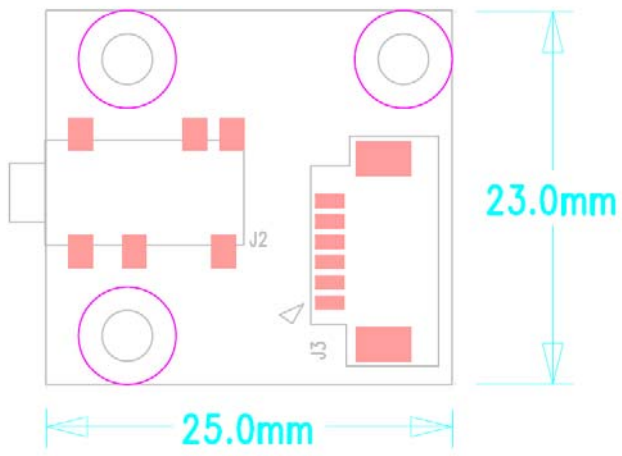
7.2 Inverter Control type Selection Jumper (J37)

Panel Vcc	Jumper Setting
DC Level(2-3)	
PWM(1-2)	

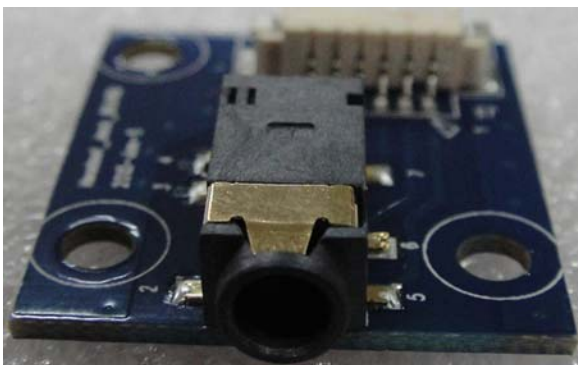
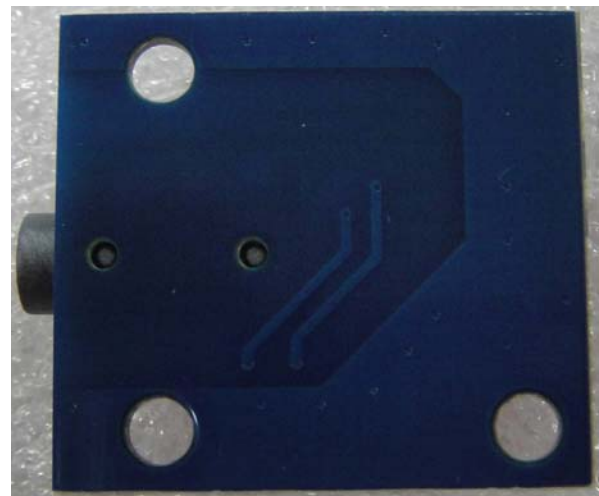
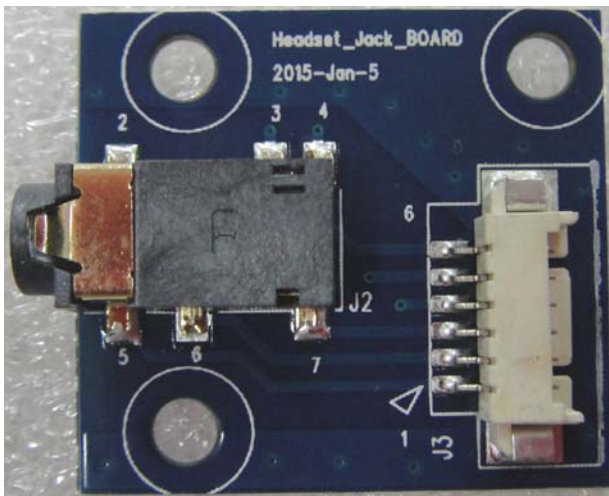
7.3 Inverter Vcc Selection Jumper (J10) : J38 – Pin 1,2 select

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

Appendix I Headphone Jack Sub Board

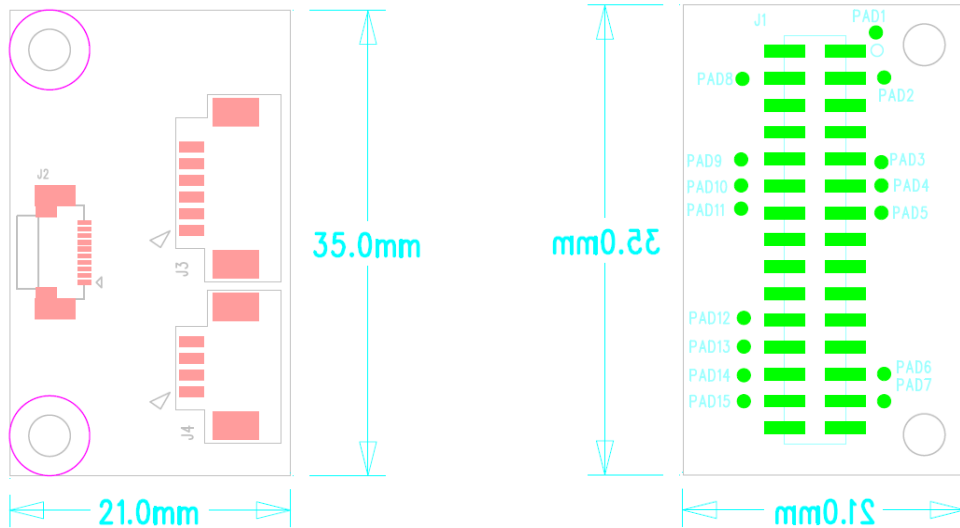


Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Detect	3	NC	5	Headphone L
2	Headphone R	4	NC	6	Ground



Appendix II IO Sub Board

DPTech Touch Screen Connector and UART extension Port.



II.1 J1 (2x15 2.00mm Female)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	NC	9	NC	17	UART1_TX	25	NC
2	3V	10	NC	18	UART1_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	UART0_RX	29	Ground
6	TP_SDA	14	NC	22	NC	30	Ground
7	TP_RST	15	UART1_RX	23	UART0_TX		
8	TP_INT	16	UART1_CTS	24	NC		

II.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		

II.3 J3 YeonHo 12505WR-06

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	VCC 3V	3	UART1_TX	5	UART1_CTS
2	UART1_RX	4	Ground	6	UART1_RTS

II.4 J4 YeonHo 12505WR-04

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	VCC 3V	2	UART0_RX	3	UART0_TX	4	Ground

Data Sheet

