



深圳市海天雄电子有限公司  
Shenzhen Haitianxiong Electronic Co., Ltd.

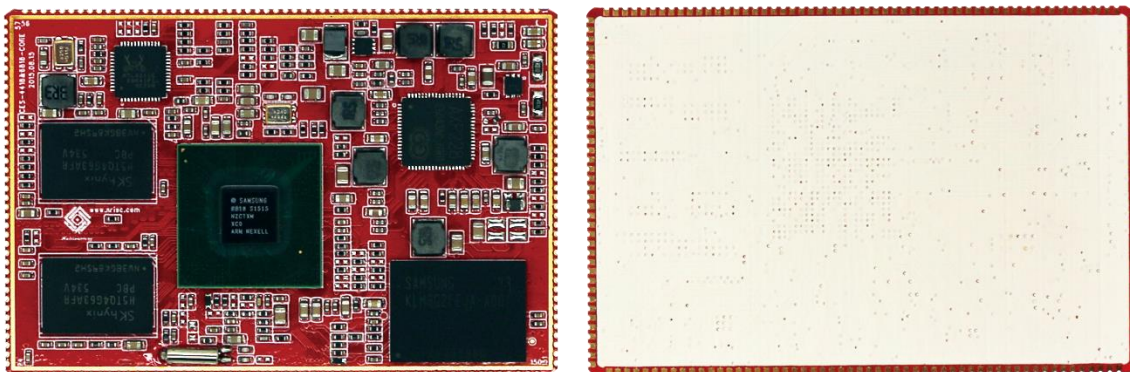
# CES-6818-CORE (Stamps)

## Product Manual

ARM SOC Module

Rev. V1.0

Date: 2017-06-02



## Introduction

CES-6818-CORE is a high-performance, low-power consumption embedded ARM motherboard. Adopt Samsung high-end mainstream ARM processor S5P6818, 64-bit Cortex-A53 eight-core CPU, frequency 1.4 ~ 1.6GHz, with 2 \* 512KByte two Level cache, using 28nm production process, equipped with Mali-400GPU, with features of high memory bandwidth, full HD display, 1080P hardware codec, high-speed interface powerful performance and so on. This board integrates the core components such as S5P6818 processor, memory unit, eMMC storage unit, PMU power management unit and Gigabit Ethernet. Provide rich interfaces. Support LVDS and RGB dual display control interfaces, HDMI1.4a and MIPI -DSI interfaces, providing 4xUSB 2.0 HOST, 1xUSB OTG, 4x UART serial port, expanded GPIO and other peripheral interfaces.

CES-6818-CORE suitable for different product applications, including medical equipment, automotive electronic, POS machine, touch control machine, industrial control equipment, self-service refueling equipment, handheld PDA and other industry products.

## Features

- Based on Samsung ARM Cortex-A53 S5P6818 Octa-core High Performance Processor
- Onboard 1GB DDR3 Memory and 8GB eMMC Storage
- Support LVDS、MIPI DSI、RGB、CVBS、HDMI etc.
- Support 1080p 60fps Full HD Video Hardware Codec and 3D Graphic Hardware
- Support Android5.1, Embedded Linux3.4, Ubuntu12.04 Operating System

## Specification

<b>Processor</b>	
CPU	Samsung ARM Cortex-A53 S5P6818 Octa-core high performance processor
Cache	32KB (Instruction) /32KB (Data) Cache and 1MB L2 Cache
<b>Storage</b>	
Process	32-bit DDR3/LVDDR3 800MHz
Memory	1GB DDR3, optional 2GB DDR3
FLASH	8GB eMMC
<b>Power Management Unit</b>	
Chipset	AXP228
<b>B2B Connector</b>	
Connector Type	Stamps, SMD
PIN Number	1.1mm pitch, 188PIN
PIN Function	POWER、GPIO、ADC、MIPI DSI/CSI、LVDS、RGB、HDMI、I2C、I2S、UART、SPI、USB、PWM、RESET etc.
<b>B2B Fixing Hole</b>	
Fixing hole	NO
<b>Operating System</b>	
Operating System	Support Android 5.1、Embedded Linux 3.4、Ubuntu12.04
<b>Environment</b>	
Working Environment	Temperature: -10~60℃, Humidity: 5%~95%RH@31℃ no condensation
Storage Environment	Temperature: -40~85℃, Humidity: 5%~95%RH@39℃ no condensation
<b>Size</b>	
Size(mm)	43.7*65.5mm

## Pin Definition

Pin Definition				
PIN NO.	Signal Name	CPU Ball Number	CPU Ball Name	Remark
1	VBAT_SYS			IPSOUT (Output)
2	GND			Power Ground
3	MCU_CVBS_OUT	AE2	CVBS	CVBS OUT
4	MCU_CVBS_GND			CVBS GND
5	MCU_USB_HOST_D-	L24	USB2.0HOST_DM	USB HOST
6	MCU_USB_HOST_D+	L25	USB2.0HOST_DP	USB HOST
7	MCU_USB-	J24	USB2.0OTG_DM	USB OTG
8	MCU_USB+	J25	USB2.0OTG_DP	USB OTG
9	MCU_USB_ID	H25	USB2.0OTG_ID	USB OTG
10	MCU_OTG_PWRON	AB21	GPIOC28/ NSCS1/ UARTnRI1	USB OTG
11	MCU_SDA_0	AC19	GPIOD3/ SDA0/ ISO7816	I2C
12	MCU_SCL_0	AC20	GPIOD2/ SCL0/ ISO7816	I2C
13	MCU_HDMI_CEC	W18	SA3/ GPIOC3/ HDMI_CEC/ SDnRST0	HDMI
14	MCU_HDMI_HPD	U19	HDMI_HOT5V	HDMI
15	MCU_HDMI_TXCN	A25	HDMI_TXNCLK	HDMI
16	MCU_HDMI_TXCP	B25	HDMI_TXPCLK	HDMI
17	MCU_HDMI_TX0N	A24	HDMI_TXN0	HDMI
18	MCU_HDMI_TX0P	B24	HDMI_TXP0	HDMI
19	MCU_HDMI_TX1N	A23	HDMI_TXN1	HDMI
20	MCU_HDMI_TX1P	B23	HDMI_TXP1	HDMI
21	MCU_HDMI_TX2N	A22	HDMI_TXN2	HDMI
22	MCU_HDMI_TX2P	B22	HDMI_TXP2	HDMI
23	GND			Power Ground
24	MCU_LVDS_CLKP	B16	LVDS_TPCLK	LVDS
25	MCU_LVDS_CLKM	A16	LVDS_TNCLK	LVDS
26	MCU_LVDS_Y3P	B17	LVDS_TP3	LVDS
27	MCU_LVDS_Y3M	A17	LVDS_TN3	LVDS
28	MCU_LVDS_Y2P	B15	LVDS_TP2	LVDS
29	MCU_LVDS_Y2M	A15	LVDS_TN2	LVDS
30	MCU_LVDS_Y1P	B14	LVDS_TP1	LVDS
31	MCU_LVDS_Y1M	A14	LVDS_TN1	LVDS
32	MCU_LVDS_Y0P	C15	LVDS_TP0	LVDS
33	MCU_LVDS_Y0M	C14	LVDS_TN0	LVDS
34	GND			Power Ground
35	MIPIDSI_DP3	B11	MIPIDSI_DP3	MIPI DSI

36	MIPIDSI_DN3	A11	MIPIDSI_DN3	MIPI DSI
37	MIPIDSI_DP2	B10	MIPIDSI_DP2	MIPI DSI
38	MIPIDSI_DN2	A10	MIPIDSI_DN2	MIPI DSI
39	MIPIDSI_DP1	B9	MIPIDSI_DP1	MIPI DSI
40	MIPIDSI_DN1	A9	MIPIDSI_DN1	MIPI DSI
41	MIPIDSI_DP0	B8	MIPIDSI_DP0	MIPI DSI
42	MIPIDSI_DN0	A8	MIPIDSI_DN0	MIPI DSI
43	MIPIDSI_DPCLK	B7	MIPIDSI_DPCLK	MIPI DSI
44	MIPIDSI_DNCLK	A7	MIPIDSI_DNCLK	MIPI DSI
45	GND			Power Ground
46	MIPICSI_DN3	A5	MIPICSI_DN3	MIPI CSI
47	MIPICSI_DP3	B5	MIPICSI_DP3	MIPI CSI
48	MIPICSI_DN2	A4	MIPICSI_DN2	MIPI CSI
49	MIPICSI_DP2	B4	MIPICSI_DP2	MIPI CSI
50	MIPICSI_DN1	A3	MIPICSI_DN1	MIPI CSI
51	MIPICSI_DP1	B3	MIPICSI_DP1	MIPI CSI
52	MIPICSI_DN0	A2	MIPICSI_DN0	MIPI CSI
53	MIPICSI_DP0	B2	MIPICSI_DP0	MIPI CSI
54	MIPICSI_DNCLK	A1	MIPICSI_DNCLK	MIPI CSI
55	MIPICSI_DPCLK	B1	MIPICSI_DPCLK	MIPI CSI
56	GND			Power Ground
57	SPEED_LED			Ethernet LED
58	LINK_LED			Ethernet LED
59	MDI0_P			Ethernet signal
60	MDI0_N			Ethernet signal
61	MDI1_P			Ethernet signal
62	MDI1_N			Ethernet signal
63	MDI2_P			Ethernet signal
64	MDI2_N			Ethernet signal
65	MDI3_P			Ethernet signal
66	MDI3_N			Ethernet signal
67	GND			Power Ground
68	MCU_CAM1_D7	V19	GPIOB10/VID1[7]/SDEX7/I2SDIN2	CAMERA/GPIO
69	GPIOB8	V20	GPIOB8/VID1[5]/SDEX5/I2SDOUT2	GPIO/CAMERA
70	MCU_CAM1_D4	R19	GPIOB6/VID1[4]/SDEX4/I2SDOUT1	CAMERA/GPIO
71	MCU_CAM1_D3	R20	GPIOB4/VID1[3]/SDEX3/I2SLRCK2	CAMERA/GPIO
72	MCU_CAM1_D2	P19	GPIOB2/VID1[2]/SDEX2/I2SBCLK2	CAMERA/GPIO
73	MCU_CAM1_D1	P20	GPIOB0/VID1[1]/SDEX1/I2SLRCK1	CAMERA/GPIO
74	MCU_CAM1_D0	N19	GPIOA30/VID1[0]/SDEX0/I2SBCLK1	CAMERA/GPIO
75	MCU_CAM0_D7	AE11	GPIOE3/VID0[7]/TSIDATA1[7]	CAMERA

76	MCU_CAM0_D6	AD10	GPIOE2/VID0[6]/TSIDATA1[6]	CAMERA
77	MCU_CAM0_D5	AE9	GPIOE1/VID0[5]/TSIDATA1[5]	CAMERA
78	MCU_CAM0_D4	AB9	GPIOE0/VID0[4]/TSIDATA1[4]	CAMERA
79	MCU_CAM0_D3	AC11	GPIOD31/VID0[3]/TSIDATA1[3]	CAMERA
80	MCU_CAM0_D2	AD9	GPIOD30/VID0[2]/TSIDATA1[2]	CAMERA
81	MCU_CAM0_D1	AC9	GPIOD29/VID0[1]/TSIDATA1[1]	CAMERA
82	MCU_CAM0_D0	AA9	GPIOD28/VID0[0]/TSIDATA1[0]/SA24	CAMERA
83	MCU_CAM0_HSYNC	AA11	GPIOE5/VIHSYNC0/TSISYNC1	CAMERA
84	MCU_CAM0_VSYNC	AD11	GPIOE6/VIVSYNC0/TSIDP1	CAMERA
85	MCU_CAM0_PCLK	AE10	GPIOE4/VICLK0/TSICLK1	CAMERA
86	MCU_CAMERA_MCLK	W13	SA13/GPIOC13/PWM1/SDnINT2	CAMERA
87	MCU_CAMERA_PN	AC22	SA4/GPIOC4/UARThDCD1/SDnINT0	CAMERA
88	MCU_CAMERA_RST	AD22	SA5/GPIOC5/UARThCTS1/SDWP0	CAMERA
89	MCU_CAMERA_PD	AE22	SA6/GPIOC6/UARThRTS1/SDnCD0	CAMERA
90	GND			Power Ground
91	SPDIF_TX	AC21	nSWAIT/GPIOC25/SPDIFTX	SPDIF
92	SPDIF_RX	AE12	LATADDR/GPIOC24/SPDIFRX/VID2[7]	SPDIF
93	MCU_NRESETIN	AE3	nRESET	nRESET
94	IR	Y12	GPIOD8/PPM	GPIO/PPM
95	MCU_NRESETOUT	AB7	nGRESETOUT	NGRESETOUT
96	ADC0	AD2	ADC0	ADC
97	ADC1	AB5	ADC1	ADC
98	MCU_I2S_SDIN	AC15	GPIOD11/I2SDIN0/AC97_DIN	I2S AUDIO
99	MCU_I2S_SDOUT	AD15	GPIOD9/I2SDOUT0/AC97_DOUT	I2S AUDIO
100	MCU_I2S_MCLK	AA15	GPIOD13/I2SMCLK0/AC97_nRST	I2S AUDIO
101	MCU_I2S_BCK	AB15	GPIOD10/I2SBCLK0/AC97_BCLK	I2S AUDIO
102	MCU_I2S_LRCK	AC17	GPIOD12/I2SLRCK0/AC97_SYNC	I2S AUDIO
103	MCU_SCL_1	AB17	GPIOD4/SCL1	I2C
104	MCU_SDA_1	AB18	GPIOD5/SDA1	I2C
105	MCU_SCL_2	AC18	GPIOD6/SCL2	I2C
106	MCU_SDA_2	AB19	GPIOD7/SDA2	I2C
107	MCU_KEY_VOLDN	AC24	SD15/GPIOB31/TSIDATA0[7]	Button (volume -)
108	MCU_KEY_VOLUP	AD24	SD14/GPIOB30/TSIDATA0[6]	Button (volume +)
109	MCU_PWRKEY	AE6	nVDDPWRTOGGLE	Button (power)
110	MCU_TOUCH_INT	AE24	SD13/GPIOB29/TSIDATA0[5]/UARTTXD4	Interrupt ( TOUCH )
111	MCU_SEN0_INT	AE25	SD12/GPIOB28/TSIDATA0[4]/UARTRXD4	Interrupt (SENSOR)
112	MCU_HP_DET	AD25	SD11/GPIOB27/TSIDATA0[3]	Interrupt (AUDIO)
113	MCU_VG_EN	W16	SA10/GPIOC10/SPIFRM2	Control pin (LCD)
114	GPIOB25	AB25	SD9/GPIOB25/TSIDATA0[1]	GPIO
115	MCU_SD1_CLK	AA20	GPIOD22/SDCLK1	SD/MMC

116	MCU_SD1_CMD	AA19	GPIOD23/SDCMD1	SD/MMC
117	MCU_SD1_D0	AA18	GPIOD24/SDDAT1[0]	SD/MMC
118	MCU_SD1_D1	AA17	GPIOD25/SDDAT1[1]	SD/MMC
119	MCU_SD1_D2	Y15	GPIOD26/SDDAT1[2]	SD/MMC
120	MCU_SD1_D3	Y14	GPIOD27/SDDAT1[3]	SD/MMC
121	MCU_SD0_CD	AA8	AliveGPIO1	SD/MMC
122	MCU_SD0_CLK	T24	GPIOA29/SDCLK0	SD/MMC
123	MCU_SD0_CMD	U23	GPIOA31/SDCMD0	SD/MMC
124	MCU_SD0_D0	T25	GPIOB1/SDDAT0[0]	SD/MMC
125	MCU_SD0_D1	U24	GPIOB3/SDDAT0[1]	SD/MMC
126	MCU_SD0_D2	U25	GPIOB5/SDDAT0[2]	SD/MMC
127	MCU_SD0_D3	V24	GPIOB7/SDDAT0[3]	SD/MMC
128	MCU_SPI0_RXD	AD16	GPIOD0/SPIRXD0/PWM3	SPI
129	MCU_SPI0_TXD	AE16	GPIOC31/SPITXD0	SPI
130	MCU_SPI0_FRM	AD17	GPIOC30/SPIFRM0	SPI
131	MCU_SPI0_CLK	AE17	GPIOC29/SPICLK0	SPI
132	MCU_SPI_WP	AC25	SD10/GPIOB26/TSIDATA0[2]	SPI
133	GPIOE13	E14	GPIOE13/GMAC_COL/VIHSYNC1	GPIO
134	GPIOC11	W14	SA11/GPIOC11/SPIRXD2/USB2.0OTG_Drv VBUS	GPIO
135	GPIOC7	AE21	SA7/GPIOC7/UARTnDSR1/SDnRST1	GPIO
136	GPIOC12	W15	SA12/GPIOC12/SPITXD2/SDnRST2	GPIO
137	PWM2	AD12	SA14/GPIOC14/PWM2/VICLK2	PWM
138	GND			Power Ground
139	MCU_UART0_TX	AD19	GPIOD18/UARTTXD0/ISO7816/SDWP2	UART
140	MCU_UART0_RX	AE19	GPIOD14/UARTRXD0/ISO7816	UART
141	MCU_UART1_TX	AD18	GPIOD19/UARTTXD1/ISO7816/SDnCD2	UART
142	MCU_UART1_RX	AE18	GPIOD15/UARTRXD1/ISO7816	UART
143	MCU_UART2_TX	Y18	GPIOD20/UARTTXD2/RESERVED/SDWP 1	UART
144	MCU_UART2_RX	Y19	GPIOD16/UARTRXD2/RESERVED	UART
145	MCU_UART3_TX	W17	GPIOD21/UARTTXD3/RESERVED/SDnCD1	UART
146	MCU_UART3_RX	Y17	GPIOD17/UARTRXD3/RESERVED	UART
147	GND			Power Ground
148	GPIOA28	U21	GPIOA28/VICLK1/I2SMCLK2/I2SMCLK1	GPIO
149	GPIOB9	U20	GPIOB9/VID1[6]/SDEX6/I2SDIN1	GPIO
150	MCU_BACKLIGHT_PWM	AE15	GPIOD1/PWM0/SA25	PWM (LCD)
151	LCD_R7	R22	GPIOA24/DISD23	LCD (Digital RGB)

152	LCD_R6	M20	GPIOA23/DISD22	LCD (Digital RGB)
153	LCD_R5	R21	GPIOA22/DISD21	LCD (Digital RGB)
154	LCD_R4	R24	GPIOA21/DISD20	LCD (Digital RGB)
155	LCD_R3	P21	GPIOA20/DISD19	LCD (Digital RGB)
156	LCD_R2	R23	GPIOA19/DISD18	LCD (Digital RGB)
157	LCD_R1	P22	GPIOA18/DISD17	LCD (Digital RGB)
158	LCD_R0	M21	GPIOA17/DISD16	LCD (Digital RGB)
159	LCD_G7	L23	GPIOA16/DISD15	LCD (Digital RGB)
160	LCD_G6	M22	GPIOA15/DISD14	LCD (Digital RGB)
161	LCD_G5	G22	GPIOA14/DISD13	LCD (Digital RGB)
162	LCD_G4	K19	GPIOA13/DISD12	LCD (Digital RGB)
163	LCD_G3	L21	GPIOA12/DISD11	LCD (Digital RGB)
164	LCD_G2	L22	GPIOA11/DISD10	LCD (Digital RGB)
165	LCD_G1	M19	GPIOA10/DISD9	LCD (Digital RGB)
166	LCD_G0	J22	GPIOA9/DISD8	LCD (Digital RGB)
167	LCD_B7	J19	GPIOA8/DISD7	LCD (Digital RGB)
168	LCD_B6	L20	GPIOA7/DISD6	LCD (Digital RGB)
169	LCD_B5	F21	GPIOA6/DISD5	LCD (Digital RGB)
170	LCD_B4	L19	GPIOA5/DISD4	LCD (Digital RGB)
171	LCD_B3	H20	GPIOA4/DISD3	LCD (Digital RGB)
172	LCD_B2	H21	GPIOA3/DISD2	LCD (Digital RGB)
173	LCD_B1	G21	GPIOA2/DISD1	LCD (Digital RGB)
174	LCD_B0	J23	GPIOA1/DISD0	LCD (Digital RGB)
175	LCD_CLK	R25	GPIOA0/DISCLK	LCD (Digital RGB)
176	LCD_DE	H22	GPIOA27/DISDE	LCD (Digital RGB)
177	LCD_HSYNC	J20	GPIOA26/DISHSYNC	LCD (Digital RGB)
178	LCD_VSYNC	J21	GPIOA25/DISVSYNC	LCD (Digital RGB)
179	GND			Power Ground
180	DC5V_OTG			USB power supply (input)
181	VCC3P3_SYS			Power 3V3 (Output)



---

182	VCC3P3_SYS			Power 3V3 (Output)
183	VDD_RTC			RTC power (input)
184	GND			Power Ground
185	VBAT			Single lithium battery powered (input)
186	VBAT			Single lithium battery powered (input)
187	DCIN			DC power supply (3.8 ~ 6.3V, input)
188	DCIN			DC power supply (3.8 ~ 6.3V, input)

## Service Support

Technical Support Mailbox:

TEL: +86-755-86325375 86325376

E-mail: ces\_support@ces-tech.com

Technical Support Service Hours:

Monday to Friday: 9: 00~12: 00, 13: 30~18: 00

## Statement

The information in this manual is for reference only and is subject to change without notice.

For more product information, visit [www.nrisc.com](http://www.nrisc.com)

### Shenzhen Haitianxiong Electronic Co., Ltd (Headquarters)

ADD: 6th Floor, Skyworth Digital Building, Songbai Road, Shiyan Street, Baoan District, Shenzhen, China.

TEL: +86-755-86325375 86325376

E-mail: ces\_market@ces-tech.com

URL: [www.nrisc.com](http://www.nrisc.com)

### Shenzhen Haitianxiong Electronic Co., Ltd (Chengdu Branch)

ADD: No. 27, Section 4, Renmin South Road, Chengdu, Sichuan, China.

TEL: +86-028-85123126

E-mail: cqmarket@ces-tech.com

URL: [www.nrisc.com](http://www.nrisc.com)