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

CES-KY4412
Product Manual

Cortex-A9 Research & Development Platform

Rev. V1.0

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Two Assemble Methods, Aluminum Box is Optional

Introduction

Cortex-A9 embedded scientific research and development platform combines the functions of embedded teaching and development of research project, takes the development platform of enterprise version as the prototype, configures a wealth of functional resources, provides real project examples, experimental analysis, open source packages. You may select functions according to the professional, different needs of scientific research projects and expand to meet the applications of embedded teaching, technological innovation, algorithm validation - scientific research, research projects, etc.
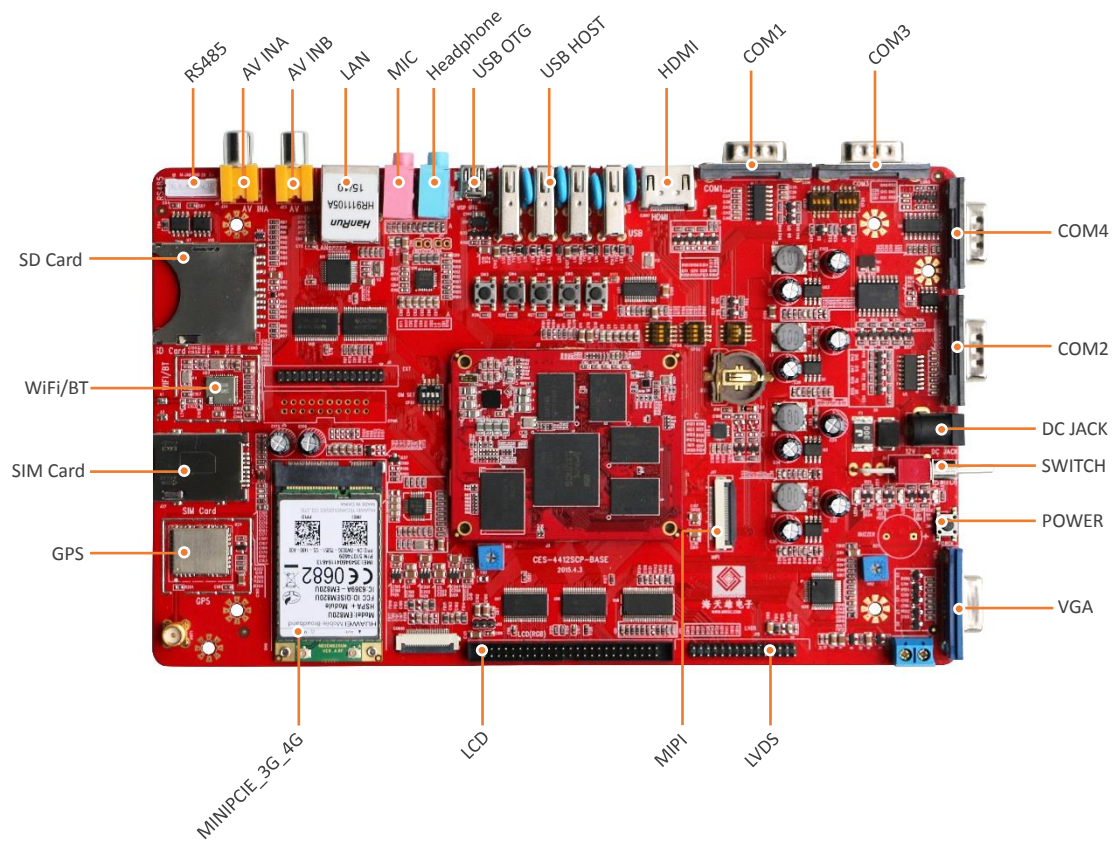
The platform is equipped with quad-core ARM Cortex-A9 processor, 32-bit RISC reduced instruction set, the internal bus supports 64-bit and 128-bit, support multimedia MPEG-2/4, H.263, H.264 and VC1 multi-format codec. Equipped with 2D / 3D image engine and external communication protocols of the processor including I2C bus protocol, I2S audio communication protocol, SPI communication protocol, serial communication port data transmission protocol and USB universal serial port data protocol. In addition to the common functional interfaces, the platform also supports for mobile units. It provides mobile 3G communication modules, WiFi wireless communication modules, and works with the LAN wired interface on the platform. Through these functional modules to achieve data connection between the devices and internet.

Cortex-A9 embedded research and development platform, with the features of excellent platform performance, open software resources, streamlined experimental routines, is a new generation of professional laboratory and research equipment.
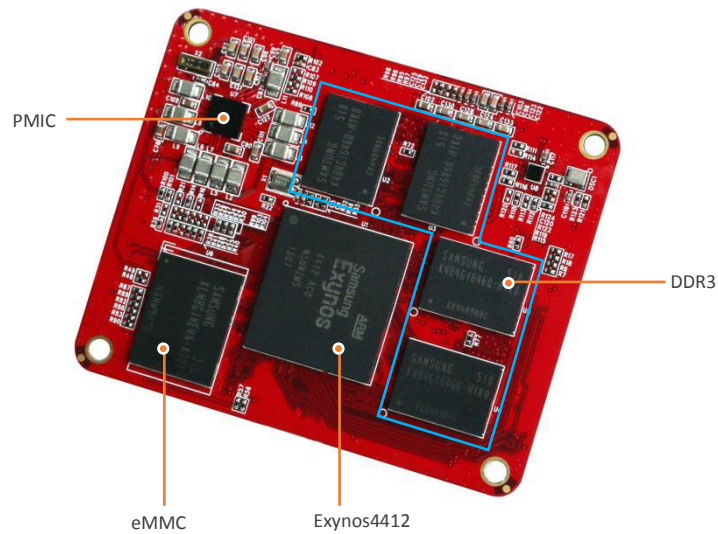
Features

- Embedded ARM Cortex-A9 Exynos4412, quad-core processor

- Configured with 10.1-inch capacitive touch screen

- Configured with mobile 4G module, WiFi module, GPS module, Camera module

- Support Android4.4 and Linux3.0 operating system

- Provide experimental routines and program analysis under this system

Function Interfaces

SOC Module

PMIC

DDR3

eMMC   Exynos4412

Hardware Parameters

CPU	Samsung Exynos4412 quad-core Cortex-A9 SCP package, frequency at 1.4GHz. Supports 1MB L2cache, 0.65mm Pitch FCFBGA-786, Dual Channels DDR3 (1066Mbps)
RAM	2GB DDR3 , speed rate is 800MHz
eMMC	8GB eMMC storage capacity
3D Accelerator	ARM Mali-400 MP Core（Quad Fragment processors）
PMIC	Samsung's S5M8767A, with 9* DC / DC and 28* LDO output power to achieve intelligent, low power consumption
SOC Socket	SOC module is Panasonic's 0.5mm chip with high precision, high contact, high stability socket, leads to 400 function pins, including I2C bus, I2S bus, SPI bus, 16-bit address / data bus, USB, HDMI, UART, LCD etc.
4G Module	To achieve internet access, send and receive messages
WiFi Wireless Module	Support 802.11b / g / n standard
GPS Module	Tracking sensitivity -165dBm, capture -148dBm
CMOS Camera	Support 3 million pixel camera
USB 2.0 HS OTG	Onboard 1*OTG 2.0 device port
USB HOST(HUB)2.0	Onboard 4*USB HOST 2.0 interface, or access a variety of USB devices such as keyboard, mouse, etc.

SD/HSMMC	4*SDIO port for eMMC, MMC / SD
UART	4* UART port, baud rate up to 115200bps, used to connect GPS, print debugging information
MIPI	Onboard 1*MIPI display interface
HDMI	Onboard 1*HDMI 1.4 (1080P / 60Hz) video output interface
LCD Screen	10.1-inch capacitive touch LCD display with resolution of 1024 * 600
VGA	Onboard 1*standard VGA output interface, support a variety of VGA LCD display
LVDS	Onboard 1*LVDS interface (using 4 differential signals)
Ethernet	Onboard 1*10M / 100M RJ45 ethernet interface
Audio	IIS signal, Wolf WM8960GEFL, stereo input / output
Digital Audio Output Interface	1channel S / PDIF5.1Channel Audio I / F, can transmit PCM stream and Dolby Digital, DTS surround compressed audio signal as an expansion interface
Function Button	Including power button, reset button, interrupt button
Scan Button	5*interrupt button
LED	3*GPIO controlled LED light
Accelerometer	±2g to±16g , I2C interface
Battery	Onboard 1*lithium battery button for RTC use
External Power Supply	Onboard DC JACK power socket, 12V / 5A DC power supply, with power switch and indicator
Extension Port	Leads to the user signals, including bus, interrupt, I / O and so on

Software Parameters——Android 4.4.4

Operating system	Android 4.4.4 KitKat
Kernel	Linux 3.0.15
Bootloader	U-boot2010.12
Serial Debugging Tool	Minicom serial terminal
Cross Compiler	Arm-2009q3（gcc4.4.1）

File System	Ramdisk，Ext4
GUI	Android 4.4.4 KitKat
4G Module	Support SMS and internet access
WiFi Module	Support 802.11b/g/n to achieve internet access
Camera Module	Provide CMOS Camera driver, support for preview, camera, video features
USB Camera Module	Available
GPS Module	Support SIF Ⅲ global positioning, UART serial data interface
Ethernet Module	10M / 100M adaptive network port driver, support for ethernet function. Provide source code
HDMI Display	Support HDMI output, images and sound, provide the source code
Audio Driver	I2S communication protocol, support for audio playback, provide the source code
VGA Driver	The default resolution is 1024 * 768. Provide source code.
LCD	10.1-inch capacitive touch LCD screen
TOUCH Driver	I2S communication protocol, multi-point capacitive touch, provide source code
USB HOST Driver	Support mouse, keyboard, U disk. Provide source code
USB OTG Driver	Support ADB and MTP function, provide source code
Keypad Driver	Support 5*GPIO button function, provide source code
SD/MMC Driver	Software max support 32GB, provide source code
UART Driver	4*UART port, support for debugging serial and communication serial port
RTC Driver	Support RTC
G3D Driver	Support 3D

Software Parameters——Linux 3.0

Operating system	Linux 3.0
Kernel	Linux 3.0.15
Bootloader	U-boot2010.12
Cross Compiler	Arm-2009q3（gcc4.4.1）
File System	BusyBox1.19.2，Ext4
GUI	QT4.8.5
Video player	Support MPlayer1.1
WiFi Module	Support 802.11b/g/n to achieve internet access. Provide source code.
Camera Module	Support CMOS Camera and USB UVC Camera，provide source code.
Ethernet Module	10M / 100M adaptive network port driver, support for ethernet function. Provide source code
HDMI	Support HDMI output, images and sound, provide the source code
Audio Driver	I2S communication protocol, support for audio playback, provide the source code
VGA Driver	The default resolution is 1024 * 768. Provide source code.
LCD	10.1-inch capacitive touch LCD screen
TOUCH Driver	Single point capacitive touch，provide the source code
USB HOST Driver	Support HOST, mouse, keyboard, U disk. Provide source code
USB OTG Driver	Support g_file_storage、g_mass_storage、g_ether functions
Keypad Driver	GPIO Keypad Driver
MMC/SDIO Driver	Support SD/MMC
UART Driver	Support debugging and communication serial port
RTC Driver	Support RTC

Product Configuration List

	User CD		Camera
	Serial line		SD card（optional）
	LAN cable		4G module（optional）
	USB cable		Experimental tutorial（optional）
	Power adapter		Aluminum Case（optional）

Service Support

Technical Support Contact:

TEL：0755-86325375　86325376

E-mail：ces_support@ces-tech.com

Technical Support Service Hours:

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

Disclaimer

This manual information is for reference only, and is subject to change without notice.

For more product information, please visit www.nrisc.com

SHENZHEN HAITIANXIONG ELECTRONIC CO.,LTD (HEADQUARTERS)

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

TEL：(086) 0755-86325375　86325376

E-mail：ces_market@ces-tech.com

URL：www.nrisc.com

SHENZHEN HAITIANXIONG ELECTRONIC CO.,LTD (CHENGDU BRANCH)

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

TEL：(086)028-85123126

E-mail：cqmarket@ces-tech.com