

三、BeagleBone Black硬件配置参数

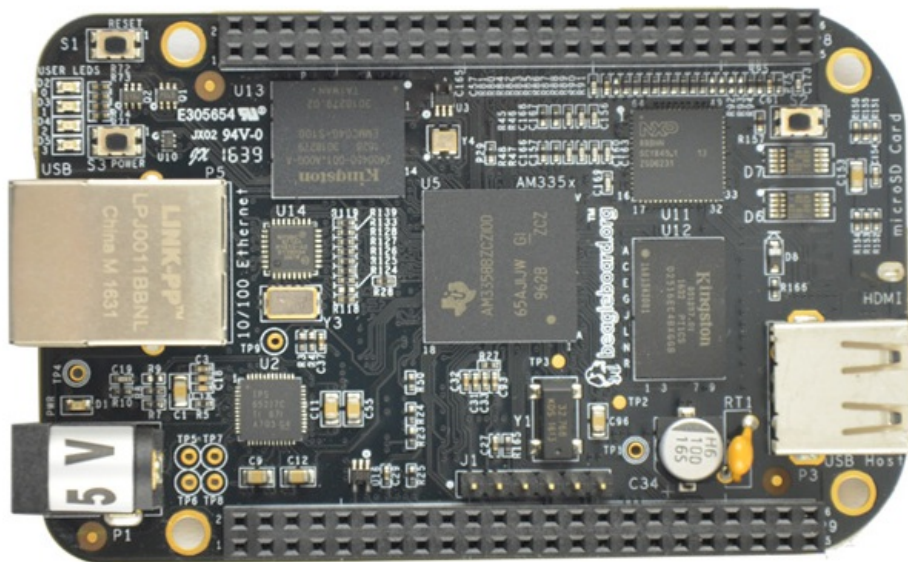
BeagleBone Black(Rev C)是BeagleBone组织授权生产的一款基于AM3358处理器的开发套件。处理器集成了高达1GHz的ARM Cortex™-A8 内核，并提供了丰富的外设接口。BeagleBone Black(Rev C)的扩展接口包括网口、USB Host、USB OTG、TF卡接口、串口、JTAG接口（默认不焊）、HDMI D Type接口、eMMC、ADC、I2C、SPI、PWM和LCD屏接口。

BeagleBone Black(Rev C)的应用场景非常广泛，能够满足包括游戏外设、家庭和工业自动化、消费类医疗器械、打印机、智能收费系统、智能售货机称重系统、教育终端和高级玩具等在内的各个领域的不同需求。

通用接口包括4组通用输入输出接口（GPIO），每一组GPIO模组提供32个专用的通用接口输入输出管脚，因此通用的GPIO可以高达128个（4x32）管脚。可编程实时单元和工业通讯子系统（PRU-ICSS）包含了两个32位RISC内核（可编程实时单元，即PRUs）、存储器、终端控制器以及能够支持更多周边接口和协议的内部外设。

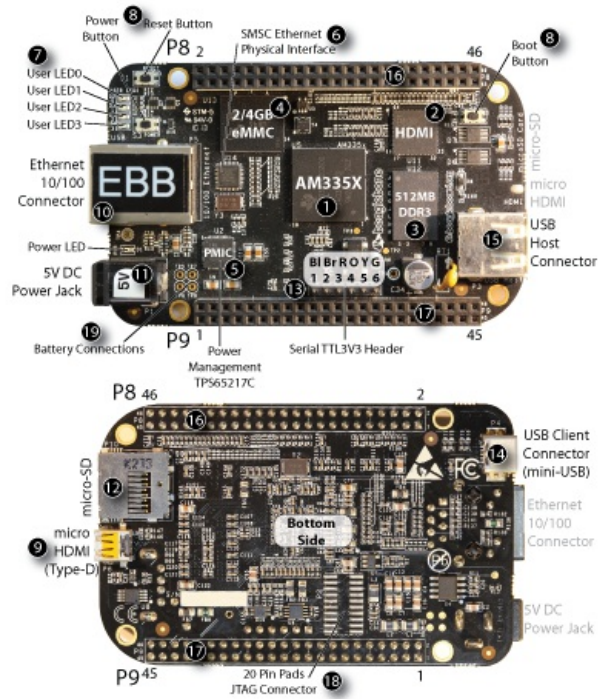
POWERVR® SGX图形加速器子系统用于3D图形加速以支持显示和游戏效果，该子系统的主要特性如下：

- Tile-Based架构，处理能力高达20Mpoly/秒
- 通用可扩展渲染引擎是一个具有像素和顶点渲染功能的多线程引擎
- 超过Microsoft VS3.0、PS3.0和OGL2.0的高级渲染功能指令集
- 工业标准API，支持Direct3D Mobile、OGL-ES 1.1和2.0、OpenVG 1.0和OpenMax



THE BEAGLEBONE BLACK

Function	Physical	Details
1 Processor	AM335x	A powerful Texas Instruments Sitara 1 GHz ARM-A8 processor that is capable of 2 billion instructions per second.
	2 x PRUs	Programmable Real-time Units. Microcontrollers that allow for real-time interfacing. Discussed in Chapter 13.
	Graphics Engine	Processor has a 3D graphics engine (SGX530), which is capable of rendering 20 million polygons per second.
2 Graphics	HDMI Framer	The framer converts the LCD interface available on the AM335x processor into a HDMI signal (no HDCP).
3 Memory	512 MB DDR3	The amount of system memory affects performance and the type of applications that can be run.
4 Storage	eMMC (MMC1)	A 2/4 GB on-board embedded multi-media card (eMMC)—an SD card on a chip. The BBB can boot without an SD card.
5 Power Management	TPS65217C	Power management IC (PMIC). Sophisticated power management IC that has 4 LDO voltage regulators for the power rails. This IC is controlled via I ² C.
6 Ethernet Processor	Ethernet PHY (10/100)	Can be immediately connected to a network (supports DHCP). The physical interface LAN8710A connects the physical RJ45 connector to the ARM microprocessor.
7 LEDs	7 x LEDs	Power LED (blue), 4 user LEDs (blue), and 2 LEDs on the RJ45 Ethernet socket (yellow = 100M link up, green = traffic).
8 Buttons	3 x Buttons	Power button for powering on/off. Reset button for resetting the board and boot switch button for choosing to boot from the eMMC or the SD card.
Connectors		
9 Video Out	micro-HDMI (HDMI-D)	For connecting to monitors and televisions. Supports resolutions up to (1280x1024 at 60 Hz). It can run 1920x1080 but only at 24 Hz. Has HDMI CEC support.
10 Network	Audio Out (HDMI-D)	See the Optional Accessories section for details on how to break this out with a regular 3.5mm audio jack.
	Ethernet (RJ45)	10/100 Ethernet via a RJ45 connector. No on-board Wi-Fi. See the section on Optional Accessories in this chapter.
11 DC Power	5 V DC Supply (5.5 mm)	For connecting 5 V mains PSUs to the BBB. See the Highly Recommended Accessories section in this chapter.
12 SD Card	card slot (MMC0) (micro-SD)	3.3 V micro-SD card slot. BBB can be booted from this slot, flashed from this slot, or used for additional storage when booting from the eMMC.
13 Serial Debug	6 Pin Connector (6 x 0.1")	(UART0) Used with a serial TTL3V3 cable to connect to the serial console of the BBB (this is not a JTAG connector—see the Highly Recommended Accessories section).
14 USB	1x USB 2.0 Client (mini-USB)	(USB0) Connects to your desktop computer and can power the BBB directly and/or communicate to it.
15 USB	1x USB 2.0 Host (USB-A)	(USB1) You can connect USB peripherals (e.g., Wi-Fi, keyboard, webcam) to the BBB with this USB connector. You can use a USB hub to add more than one USB device.
16 P8 and P9 Expansion Headers	Two 2x23 pin 0.1" female headers	92 pins in two headers that are multiplexed to provide access to the features in Figure 1-5. Not all functionality is available at the same time. Can be used to connect capes.
18 Other Debug	JTAG	There is space for a JTAG connector on the bottom of the board. JTAG allows you to debug your board, but requires additional hardware and software.
19 Other Power	Battery Connectors	It is possible to solder pins and use these points to connect a battery supply. Read the SRM carefully!



EXPLORING BEAGLEBONE
TOOLS AND TECHNIQUES FOR BUILDING WITH EMBEDDED LINUX

www.ExploringBeagleBone.com

硬件特性：

产品参数：

- 产品尺寸：86.36 mm×54.61mm
- 工作温度：0~70℃
- 环境湿度：20% ~ 90%（无凝结）
- 输入电源：5V/0.35A

AM3358处理器：

- 集成1GHz ARM Cortex™-A8内核
- 集成NEON™ SIMD协处理器
- 集成SGX530图形引擎
- 集成可编程实时单元子系统
- 集成32KB指令缓存和32KB数据缓存，支持奇偶校验
- 集成256KB二级缓存，支持错误校验码

板载存储器：

- 4GB 8-bit eMMC 板载存储器 (rev. 2)
- 512MB DDR3 SDRAM存储器

板载接口：

- 一个HDMI D type接口（16位色输出，支持音频输出）
- 一个LCD接口（支持24位输出，P8扩展接口引出）
- 一个10/100M以太网接口（RJ45连接器）
- 一个集成了PHY的高速USB 2.0 OTG接口（Mini USB B型连接器）
- 一个集成了PHY的高速USB 2.0 HOST接口（USB A型连接器）
- 一个TF卡接口（兼容SD/MMC）
- 一个3线调试串口（6-pin 2.54间距连接器）

- ## 硬件尺寸:



Items	Notes	
操作系统		Debian, Angstrom, Ubuntu, Android
设备驱动	串口	串口接口驱动
	Rtc	硬件时钟驱动
	网络	10/100 IEEE1588
	显示	DVI模式驱动

Items	Notes
mmc/sd	SD 2.0接口和eMMC驱动
Usb	高速USB接口驱动 (一个OTG一个Host)
Led	用户Led驱动

P8和P9扩展接头