SNJB's KBJ College of Engineering

Chandwad–423101 (Nashik)

Department
of
Information Technology

Subject : Internet of Things (IOT) of BE 2015 Pattern

Unit 5
IoT PLATFORMS

What is an IoT Device

- A "Thing" in IoT can be any object that has unique identifier and which can send/receive data over a network
- IoT devices are connected to the Internet and send information about themselves or about their surroundings over a network
- Allow actuation upon the physical entities/ environment around them remotely

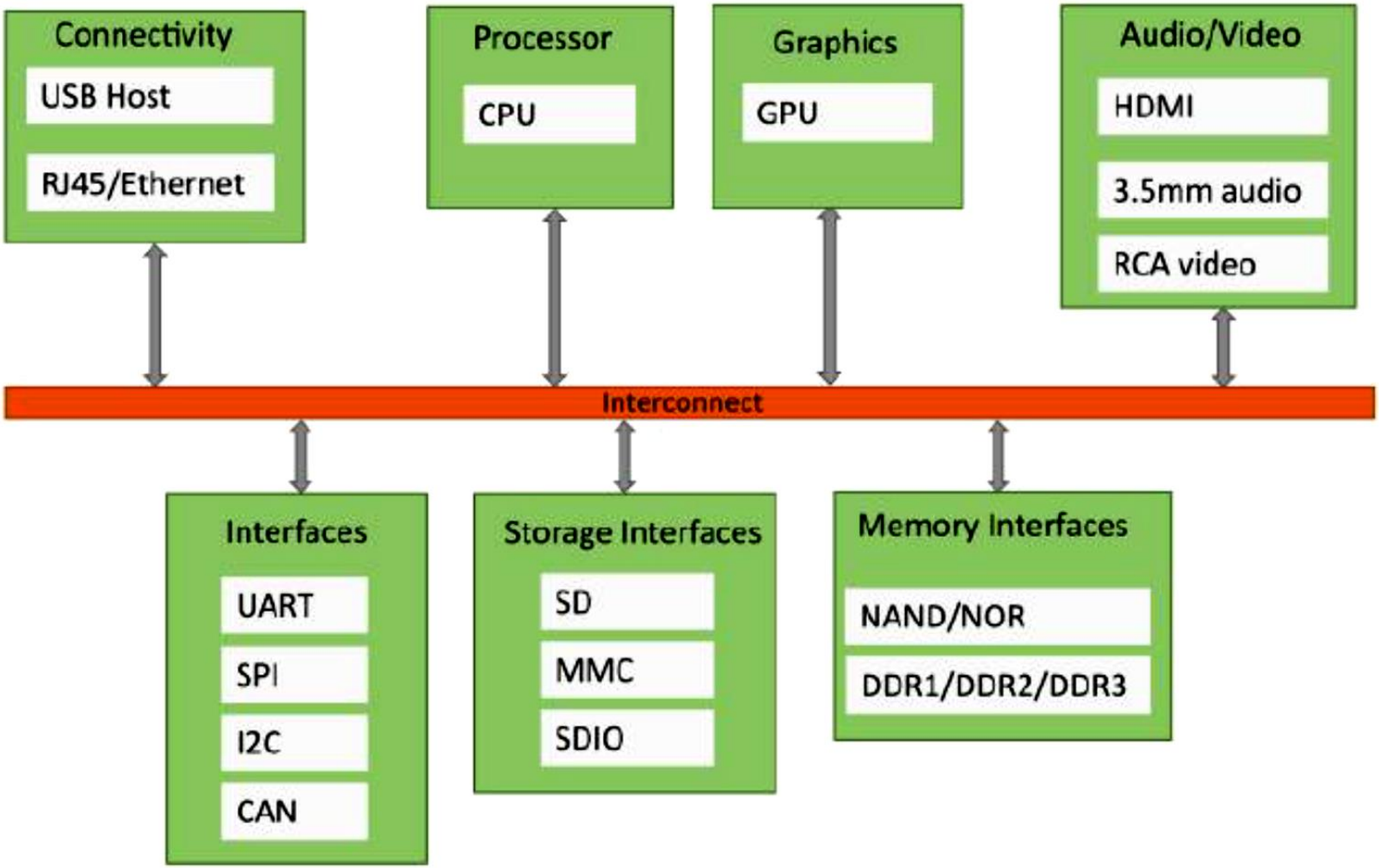
IoT Device Examples

- A home automation device
- An industrial machine
- A car
- A wireless-enabled wearable device

Basic building blocks of an IoT Device

- Sensing
  - Sensors can be either on-board the IoT device or attached to the device
- Actuation
  - IoT devices can have various types of actuators
- Communication
  - Exchanging of data between client-server or cloud
- Analysis & Processing

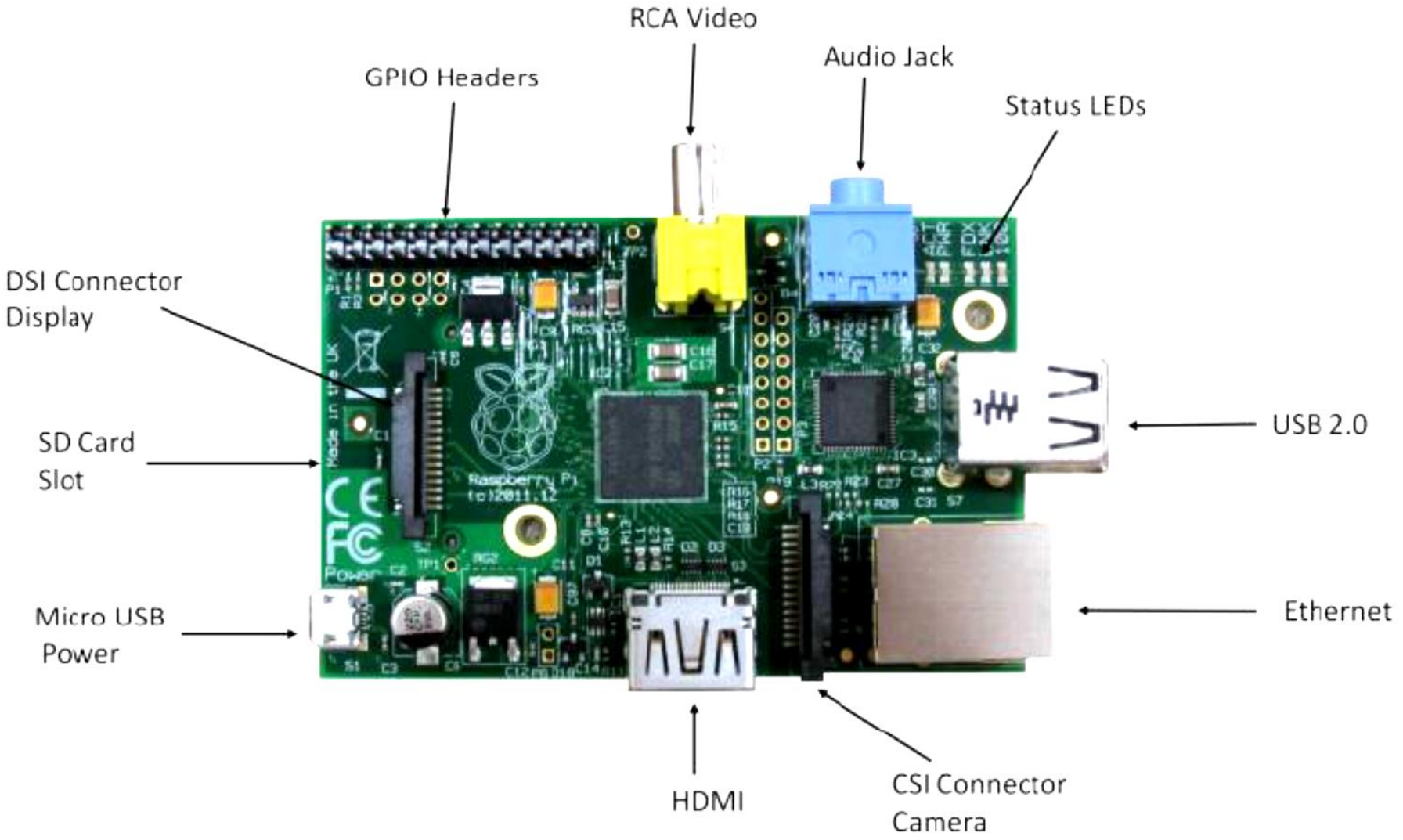
Block diagram of an IoT Device



Exemplary Device: Raspberry Pi

- Low-cost mini-computer with the physical size of a credit card
- Runs various flavors of Linux and can perform almost all tasks that normal desktop can do
- Also allows interfacing sensors and actuators through the general purpose I/O (GPIO) pins
- Since Raspberry Pi runs Linux operating system, it supports Python

Raspberry Pi



Linux on Raspberry Pi

Raspbian

- Raspbian Linux is a Debian Wheezy port optimized for Raspberry Pi

Arch

- Arch is an Arch Linux port for AMD devices

Pidora

- Pidora Linux is a Fedora Linux optimized for Raspberry Pi

RaspBMC

- RaspBMC is an XBMC media-center distribution for Raspberry Pi

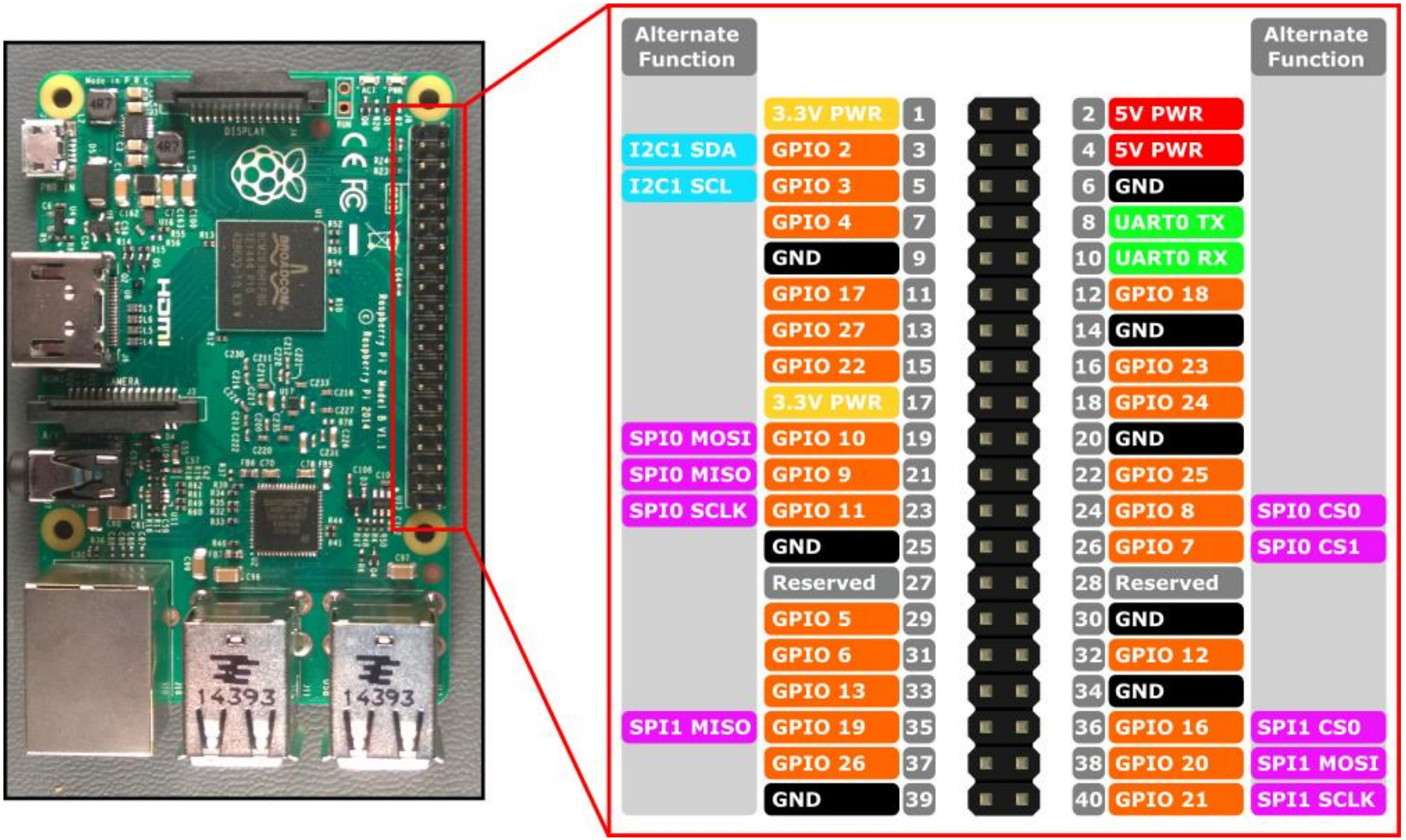
OpenELEC

- OpenELEC is a fast and user-friendly XBMC media-center distribution

RISC OS

- RISC OS is a very fast and compact operating system

Raspberry Pi GPIO



Raspberry Pi Interfaces

Serial

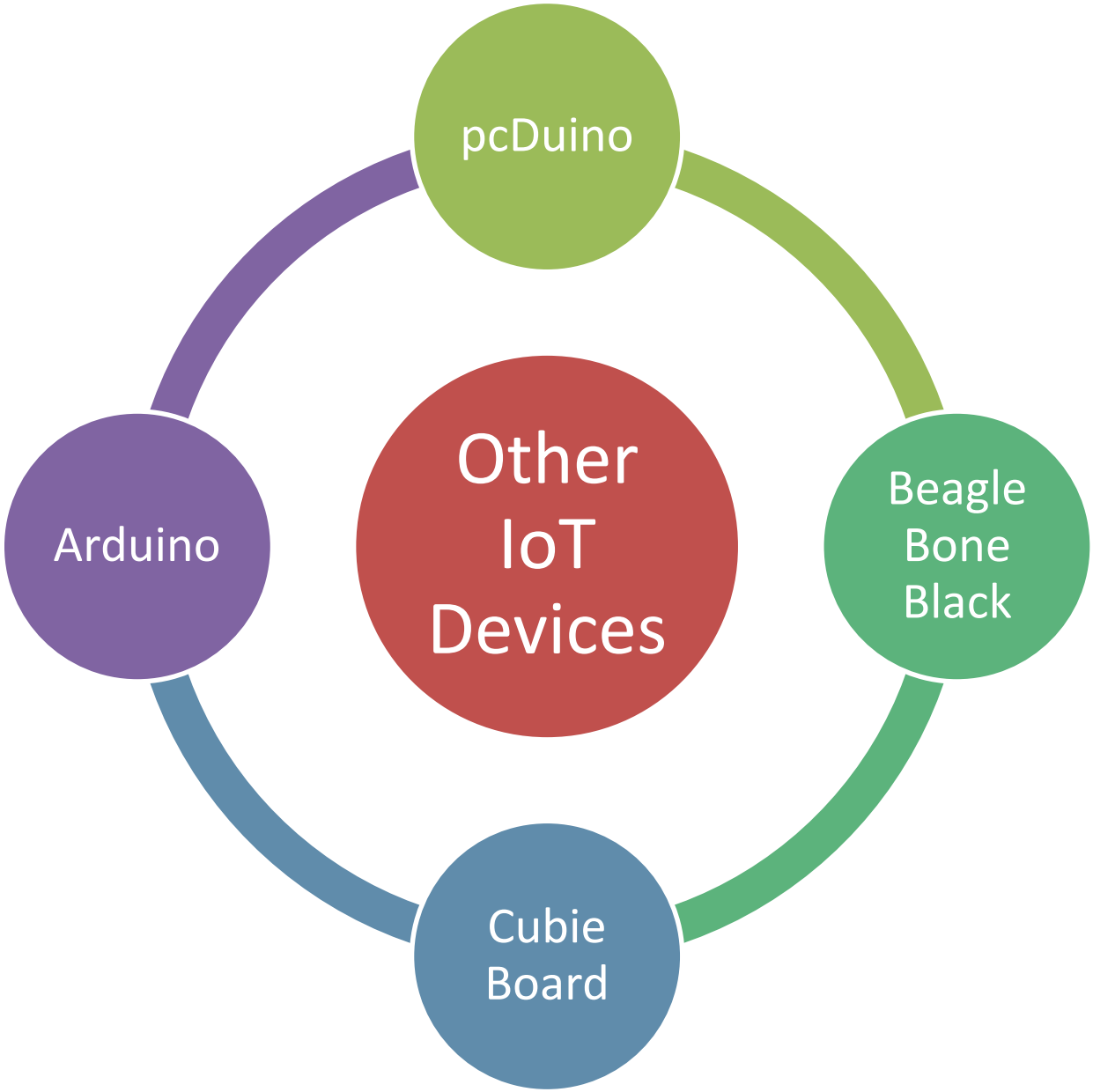
- Has receive (Rx) and transmit (Tx) pins for communication with serial peripherals

SPI

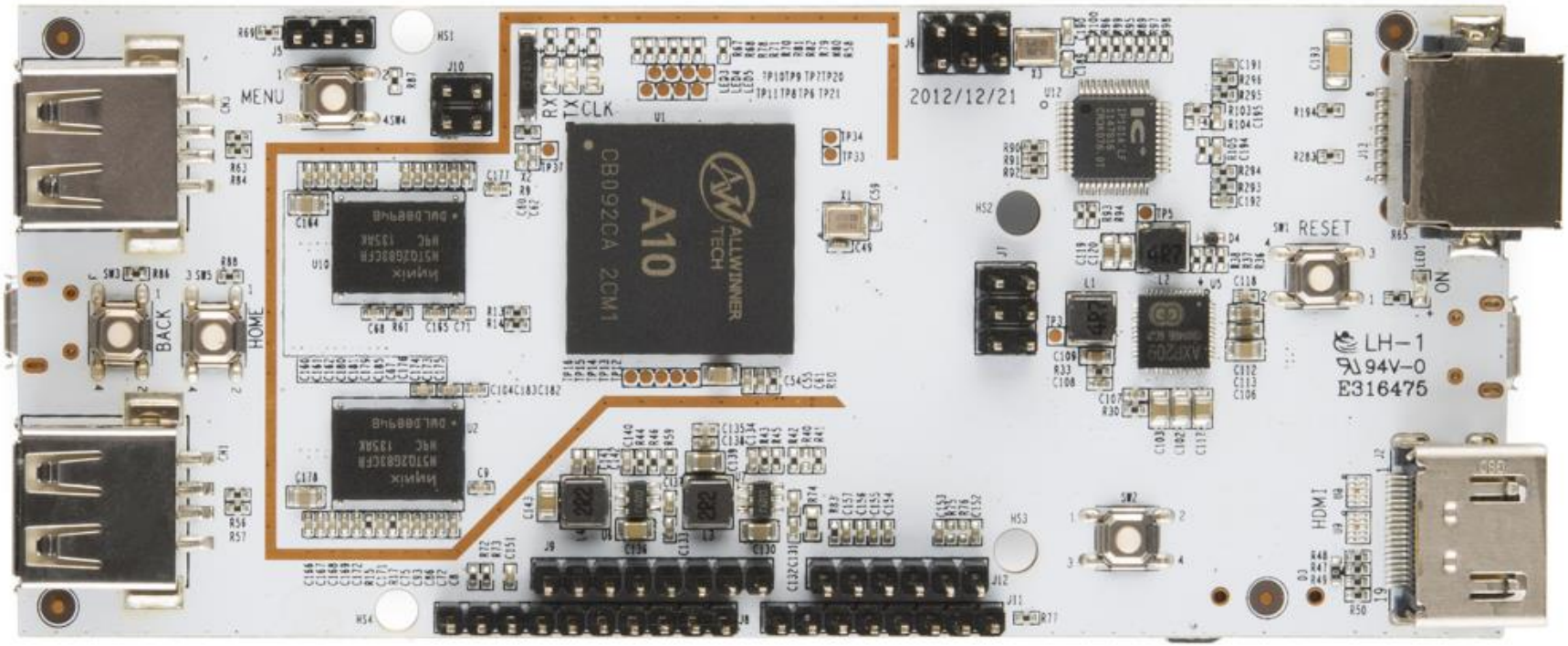
- Serial Peripheral Interface
- Synchronous serial data protocol used for communicating with one or more peripheral devices

I2C

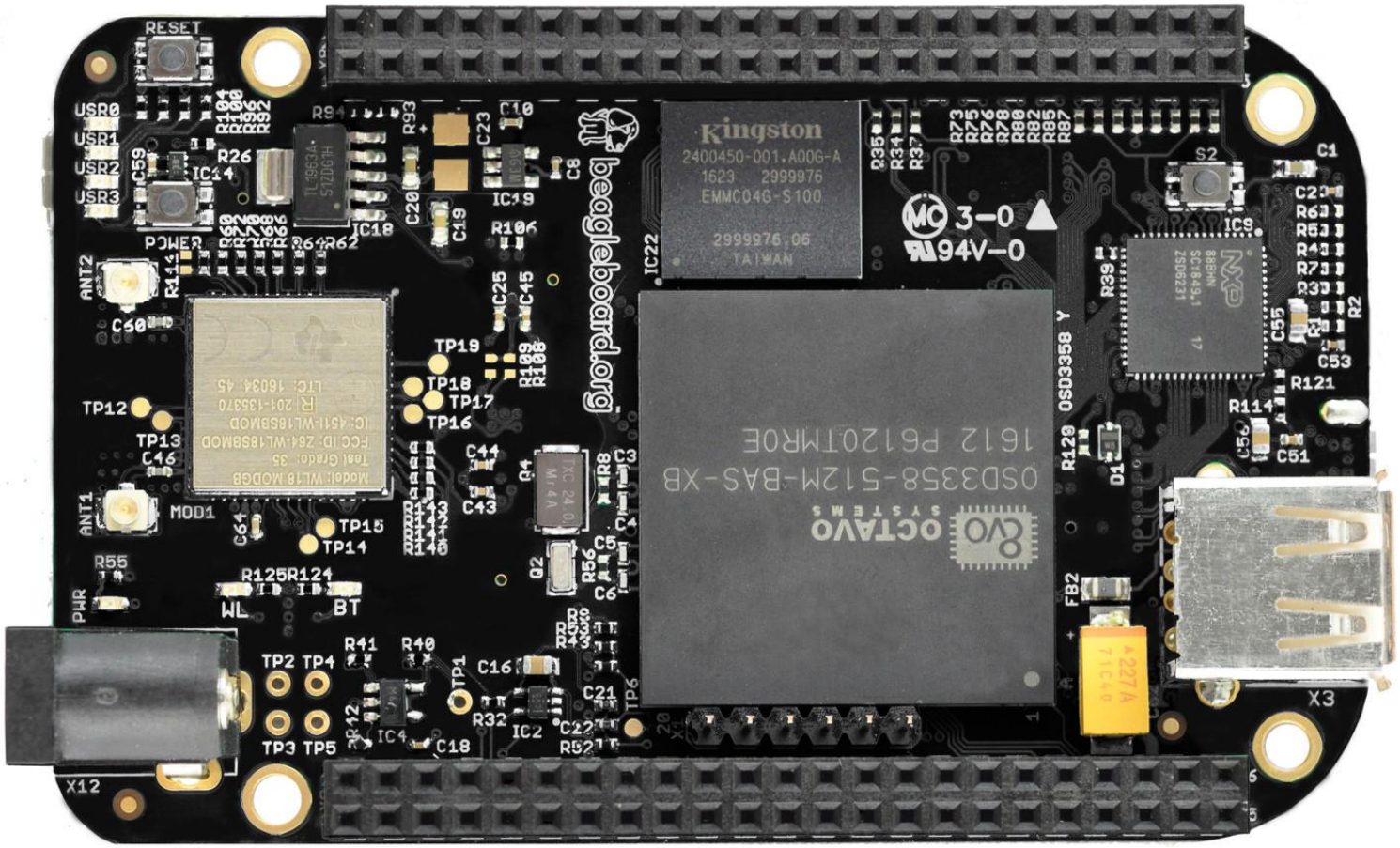
- Allows you to connect hardware modules
- Allows synchronous data transfer with just two pins - SDA (data line) and SCL (clock line)


pcDuino
Arduino
Other IoT Devices
Beagle Bone Black
Cubie Board

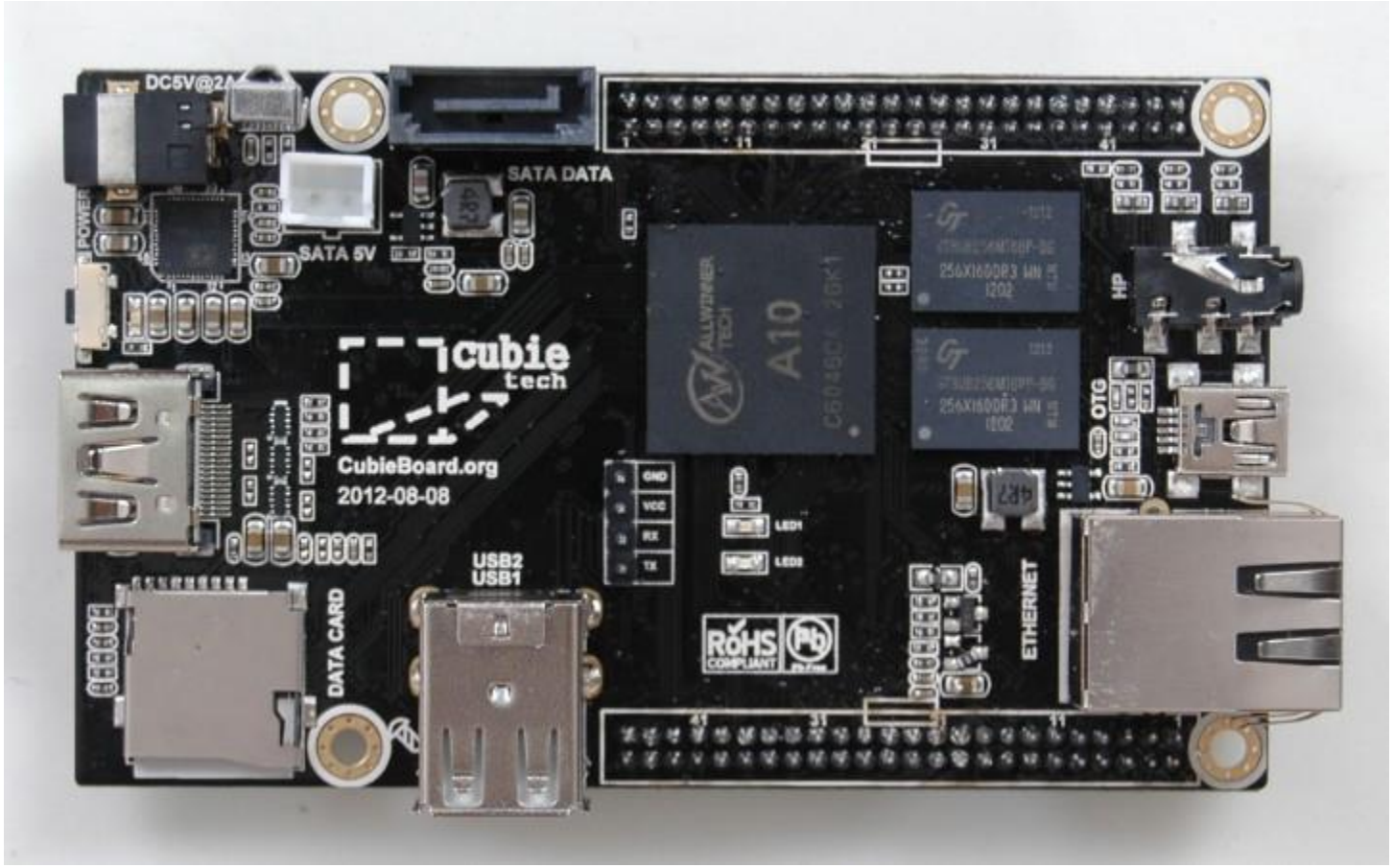
pcDuino


MENU
BACK
HOME
RX
TX
CLK
A10
ALLWINNER TECH
2012/12/21
RESET
ON
LH-1
94V-0
E316475
HDMI

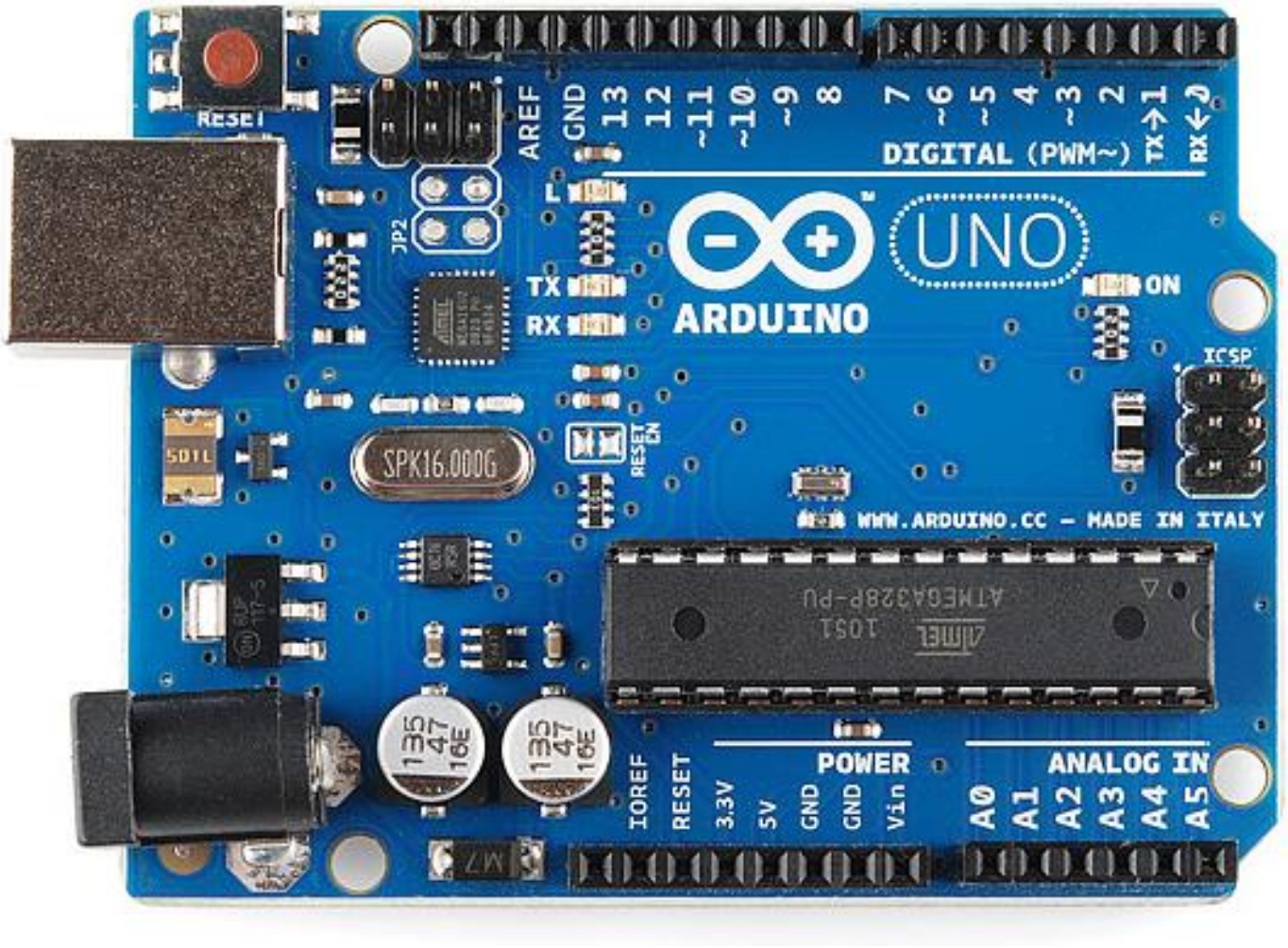
Beagle Bone Black



Cubie Board


DC5V@2A
SATA DATA
SATA 5V
POWER
cubie tech
CubieBoard.org
2012-08-08
A10
ALLWINNER TECH
HP
OTG
GND
VCC
RX
TX
LED1
LED2
USB2
USB1
DATA CARD
ETHERNET
RoHS COMPLIANT

Arduino


RESET
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
JP2
TX
RX
ARDUINO
UNO
ON
ICSP
SPK16.000G
RESET
WWW.ARDUINO.CC – MADE IN ITALY
POWER
ANALOG IN
IOREF
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5