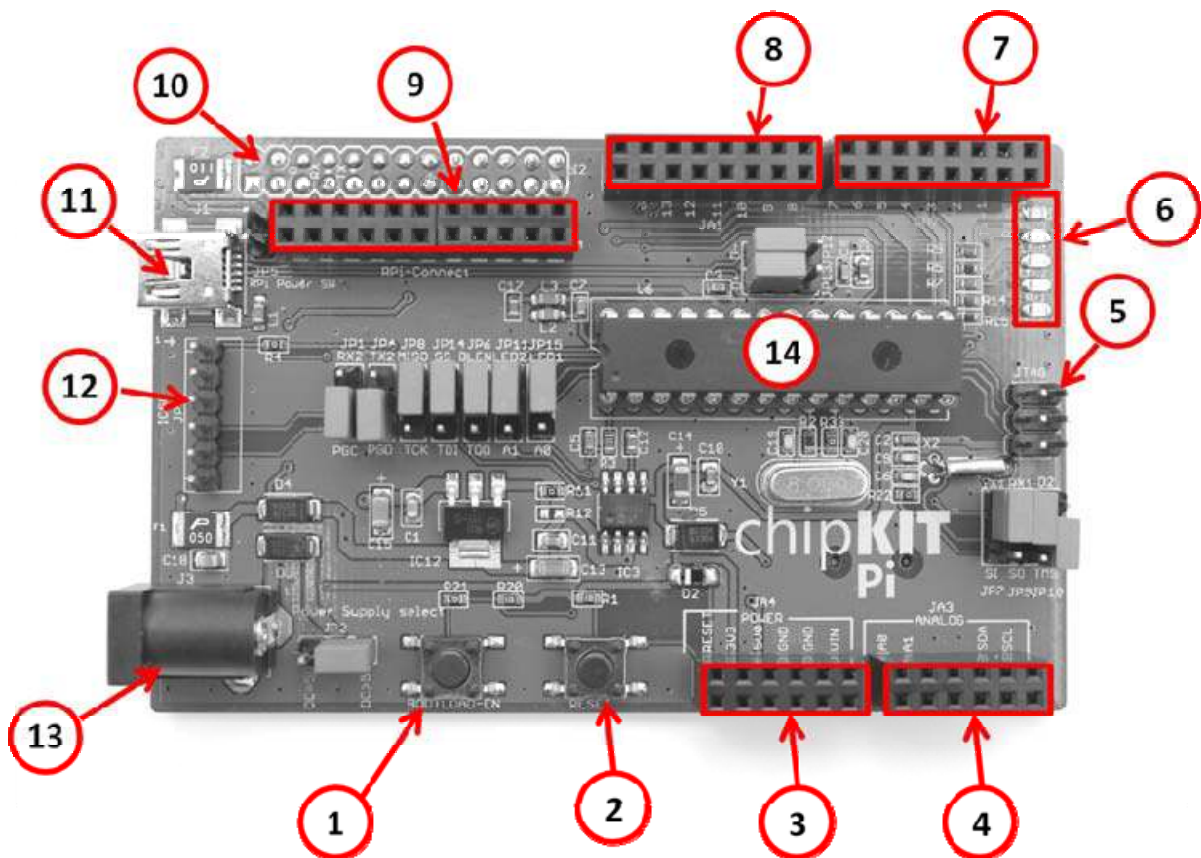


Overview: chipKIT Pi

Introduction

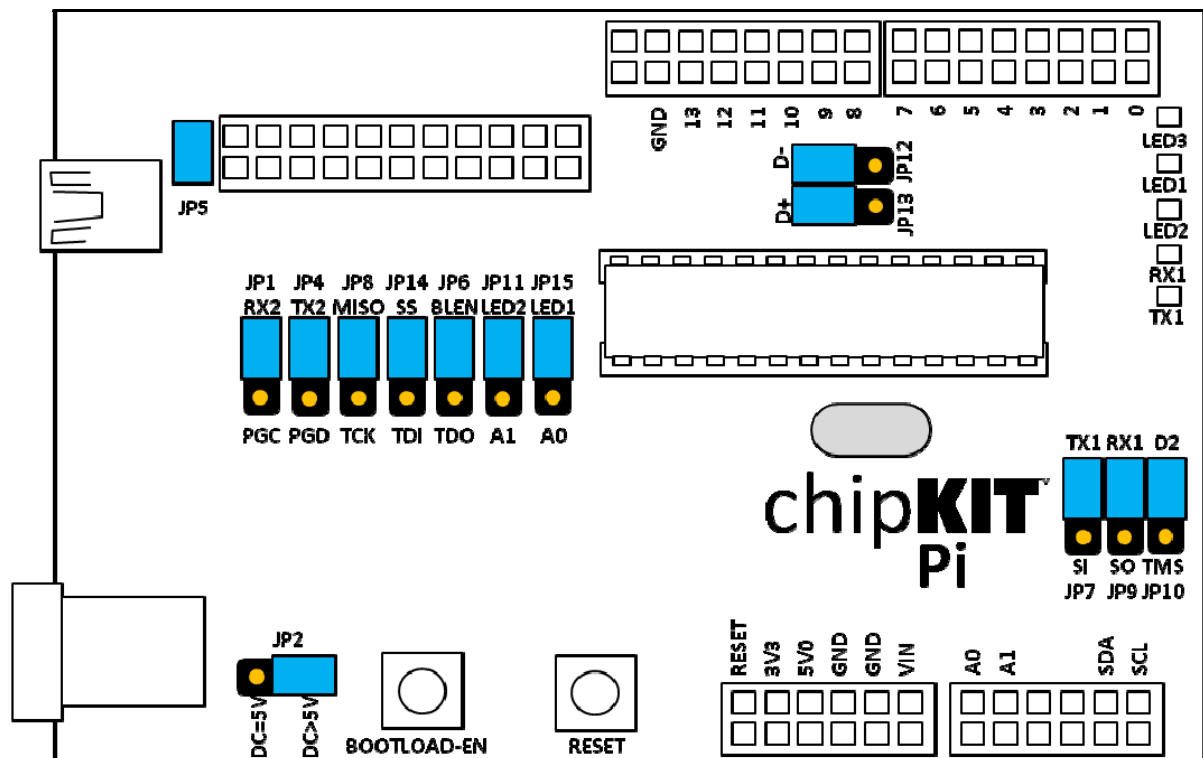
chipKIT™ Pi (Designed for Raspberry Pi) is the latest Arduino™ compatible chipKIT™ platform from Microchip and element14. It features a 32-bit PIC32 microcontroller in a prototyping-friendly, low pin count SPDIP package. The PIC32's performance, memory and integrated peripherals allow users to create applications including touch sensing, audio processing and advanced control. The board is supported by the free chipKIT™ Multi-Platform IDE (MPIDE) that can be hosted on the Raspberry Pi.

Getting familiar with chipKIT™ Pi



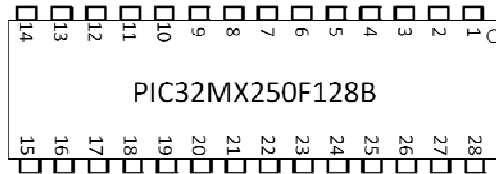
1	Bootloader Enable Button
2	RESET Button
3	JA4: Power Header
4	JA3: Analog/Digital Header
5	JTAG Connector
6	LEDs
7	JA2: Digital/Serial Header
8	JA1: Digital/Serial Header
9	Raspberry Pi Breakout Header
10	Raspberry Pi Connection Header (underside of board)
11	USB Connection
12	ICSP Connection (not populated)
13	Power Connector
14	PIC32MX250F128B Microcontroller

chipKIT Pi Jumper Settings



Jumper	Function	Description	
		Jumper across pins 1 and 2	Jumper across pins 2 and 3
JP2	Input Voltage Selection (If you are unclear as to the function of this jumper leave in the default right-most position. Potential for Microcontroller (MCU) damage if configured incorrectly)	Two left-most pins bypasses voltage regulator	Right-most pins connects input voltage to 5 V regulator
JP1	Function Select	UART 2 Receive (RX2) (position required to program chipKIT Pi via MPIDE over serial)	ICSP Function PGEC
JP4	Function Select	UART 2 Transmit (TX2) (position required to program chipKIT Pi via MPIDE over serial)	ICSP Function PGED
JP8	Function Select	SPI connector MISO on JA1	JTAG Function TCK
JP14	Function Select	SPI connector SS on JA1	JTAG Function TDI
JP6	Function Select	Bootload Button Enable	JTAG Function TDO
JP11	Function Select	Board LED2	A1 on JA3
JP15	Function Select	Board LED1	A0 on JA3
JP12	Function Select	USB function D-	
JP13	Function Select	USB function D+	
JP7	Function Select	UART 1 Transmit (TX1)	Connect to SOSCI for X2 Oscillator
JP9	Function Select	UART 1 Receive (RX1)	Connect to SOSCO for X2 Oscillator
JP10	Function Select		JTAG function TMS
JP5	5V Connection	Connect to 5V supply off of Pi	Power chipKIT Pi from external supply

chipKIT Pi Pin Out Map



PIC32MX250F128B Pin (Pins are 3.3V Tolerant only unless otherwise noted)	chipKIT Pi Pin Function	Notes
1 (5V Tolerant)	RESET	Connected to RESET Pushbutton
2	14/A0	Connected to LED1
3	11	
4	5/TX2	Connected to UART on Raspberry Pi
5	4/RX2	Connected to UART on Raspberry Pi
6	16/A4/SDA2	Connected to SDA on JA3 header
7	17/A5/SCL2	Connected to SCL on JA3 header
8	VSS	Not available
9	9	Used for 8MHz Oscillator
10	10	Used for 8MHz Oscillator
11	11/TX1	Connected to TX1 LED and can be used with 32.768kHz oscillator
12	12/RX1	Connected to RX1 LED and can be used with 32.768kHz oscillator
13	VDD	Not available
14 (5V Tolerant)	2	
15 (5V Tolerant)	VBUS	Not available
16 (5V Tolerant)	10	
17 (5V Tolerant)	12/SCL1	
18 (5V Tolerant)	18/SDA1/INT	Connected to BOOTLOAD-EN button
19	VSS	Not available
20	VCAP	Not available
21	8	Connected to D-
22	9	Connected to D+
23	VUSB 3V3	Not available
24	3	
25	13	
26	15/A1	Connected to LED1
27	AVSS	Not available
28	AVDD	Not available

Getting up and running with chipKIT™ Pi

chipKIT™ Pi relies on the open source MPIDE integrated development environment, a version of which has been ported to an operating system that runs on Raspberry Pi.

It is recommended, for ease and for first time use, that users download the complete operating system and MPIDE as a complete package. This can be downloaded at http://downloads.element14.com/downloads/chipkit_pi.zip, and should be saved to your computer. The file will be quite large (2GB), and will require unzipping once it has been downloaded. Once unzipped, you will be left with a .ISO image file, ready for flashing to your empty SD Card.

Choose an SD Card of at least 4GB capacity. Use a flashing utility like **Win32 Disk Imager** (available for free, from <http://sourceforge.net/projects/win32diskimager/>) to flash the .ISO image to your SD Card. When complete, insert the fully flashed SD Card to your Raspberry Pi.

Plug your new chipKIT™ Pi board into Raspberry Pi, and power up. As MPIDE is already installed, you should be able to start MPIDE from the desktop. For reliable operation, do not plug chipKIT™ Pi into a Raspberry Pi that is already powered up. Always power up both devices together.

Powering the chipKIT™ Pi

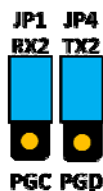
The chipKIT Pi can be powered in the following ways:

- Over the USB
- Via the ICSP Connection
- Through the Vin input
- From the Raspberry Pi
- Through the power jack

Programming the chipKIT Pi from MPIDE

In order to program the chipKIT Pi from MPIDE with your sketch, the board must be set to bootloader mode. To enter bootloader mode:

1. Ensure that both Jumpers JP1 and JP4 are connected to upper-most pins of their header



2. Press and hold the BOOTLOAD-EN button.
3. While the BOOTLOAD-EN button is still pressed, press and release the RESET button.
4. Release the BOOTLOAD-EN button.
5. Bootloader mode will be confirmed when the TX1 LED is on and the RX1 flashes.
6. After the sketch is uploaded, the TX1 and RX1 LEDs will turn off.

Example Sketches

Sketches are Arduino™ style programmes that allow you to simply control various aspects of the chipKIT Pi's processor, peripherals and GPIO. Some examples are built in to the MPIDE software. The best way to learn is to select one, load it and upload it into the chipKIT™ Pi.

Schematic

For the schematic information, please visit the element 14 community

http://www.element14.com/chipkit_pi

More Information

For more information, please visit

1. The element 14 community http://www.element14.com/chipkit_pi
2. The knode, element14
http://www.element14.com/community/community/knode/dev_platforms_kits/element14_dev_kits/microchip-chipkit/chipkit_pi
3. chipKIT website <http://chipkit.net/>
4. chipKIT forum <http://www.chipkit.org/forum/index.php>
5. PIC32MX250F128B Homepage
<http://www.microchip.com/wwwproducts/Devices.aspx?dDocName=en557425>
6. TCHIP-USB-MX250F128B (PIC32MX250F128B pre-programmed with USB bootloader)
<http://www.microchipdirect.com/productsearch.aspx?keywords=TCHIP-USB-MX250F128B>

The chipKIT Pi can also be used as a standalone chipKIT board. A version of the PIC32MX250F128B microcontroller is available preprogrammed with a USB bootloader that can be used to replace the PIC32 with UART bootloader that comes with the chipKIT Pi. In this way, the user would simply connect the chipKIT Pi via the USB connection to their personal computer's USB port and use the MPIDE version for their operating system. For instruction on how to download the MPIDE, see www.element14.com/chipkit_pi .