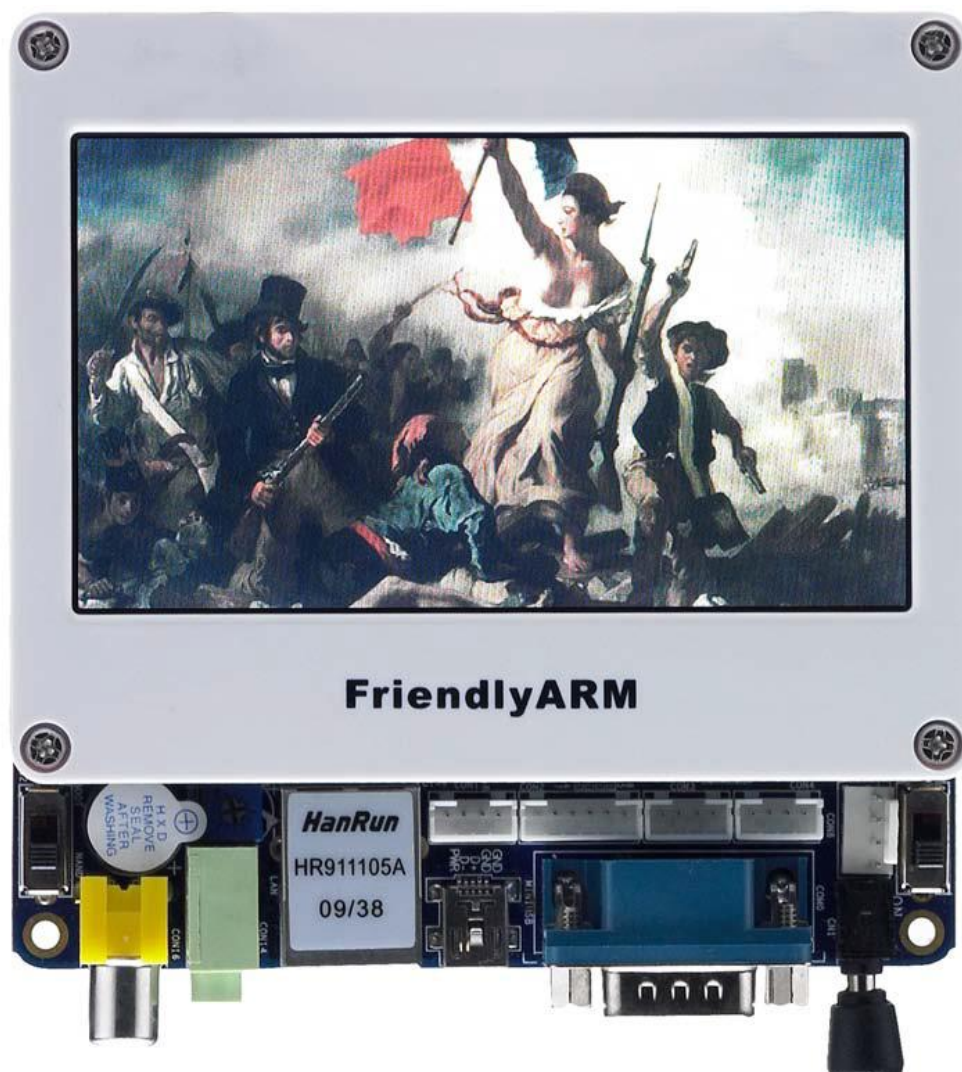


Mini6410 Hardware Spec



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This manual is intended to provide the user with an overview of the Mini6410 board, its benefits, features, specifications, and set up procedures.



1 Introduction to Mini6410

The Mini6410 development board is an excellent ARM11 board offering a comprehensive solution integrating both hardware and software. It is designed, developed and distributed by FriendlyARM in Guangzhou, China. It applies the Samsung S3C6410 microprocessor and inherits all the features and benefits of our most popular Mini2440 products excelling in quality and easy to use with low cost. Compared to our previous products it has more reliable design and varied interfaces. These features make it easily and widely used in MID development, auto electronic devices, industrial applications, GPS systems and multimedia systems. It is good for educational training, embedded development and DIY as well.

In general the Mini6410 board has the following interfaces:

double LCD interfaces,

1* 4-wire resistor touch screen interface,

1 * 100M Ethernet interface,

1 * DB9 5-wire serial port

1 * Mini USB 2.0-OTG interface

1 * USB Host 1.1 interface,

1 * 3.5mm audio output

1 * on board microphone interface,

1 * TV-OUT



- 1 * SD card socket,
- 1 * Infrared receiver,
- 4 * TTL serial port,
- 1 * CMOS camera interface,
- 1 * 40pin bus interface,
- 1 * 30pin GPIO interface (it can be multiplexed to SPI, I2C and interrupts. It includes 3 ADC and 1 DAC.),
- 1 * SDIO2 interface (can be connected to SD WiFi module),
- 1 * 10pin JTAG interface,
- 1 * PWM buzzer,
- 1 * I2C-EEPROM,
- 1 * backup battery for RTC,
- 1 * AD adjustable resistor,
- 8 * User button,
- 4 * LED

All these benefits, combined with our dedicated 4.3-inch LCD, bring you wonderful experience: all in your hand!

In addition we make the best use of the SD booting feature, by using our specially developed Superboot, enabling the board bootable from an SD card. With Superboot users can copy various systems (WindowsCE6/Linux/Android/Ubuntu/uCos2) into an SD card (up



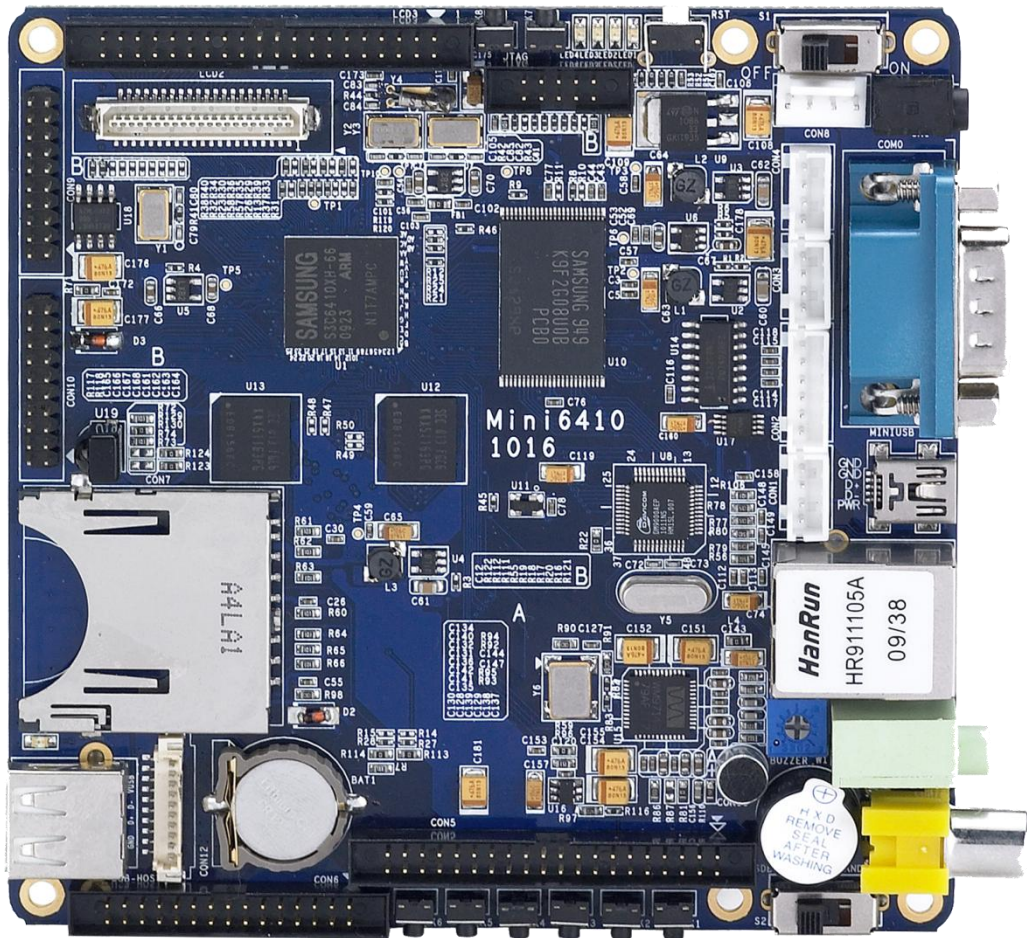
to a maximum memory of 32G) and install them on the board without connecting to a PC, or run them on the SD card without burning systems onto the board. In one word, this one-minute booting process is “Revolutionary to System Installation and Running”.

Customers can get the latest information and news about our products by visiting:

<http://www.arm9.net>

1.1 Mini6410 Overview

The Mini6410 development board is a 110 x 110(mm) board equipped with a wide variety of connectors, interfaces and ports. Here’s the layout:



1.2 Mini6410 Hardware Features

- **CPU**
 - Samsung S3C6410A, ARM1176JZF-S, 533Mhz, maximum 667Mhz
- **DDR RAM**
 - On board 256M DDR RAM (128M Optional)
 - 32bit Data Bus
- **FLASH Memory**



- On board 128M/256M/1GB SLC Nand Flash or 2GB MLC Nand Flash

● LCD

- Four-wire touch screen interface
- Support black and white, 4 level grayscale, 16 level grayscale, 256-color、 4096-color STN LCD, 3.5-inch to 12.1-inch, screen resolution 1024x768;

- Support black and white, 4 level grayscale, 16 level grayscale, 256-color, 64K-color, true color TFT LCD, 3.5-inch to 12.1-inch, screen resolution 1024x768,

● Interfaces and External Accessories

- 1 * 100M Ethernet RJ-45 port (powered by the DM9000 network chip)
- 1 * DB9 RS232 five-wire serial port (with 4 TTL serial ports)
- 1 * mini USB Slave 2.0 with OTG
- 3.5mm dual stereo audio output and single microphone input
- 1 * TV-OUT output with RCA port
- 1 * USB Host 1.1 port
- 1 * standard SD card socket
- 1 * Infrared receiver
- 5V power supply
- 1 * I2C-EEPROM chip (256 byte), for I2C Bus test
- 4 * USER LED (green)
- 8 * USER Button (interrupt pins, extended from board)



- 1 * Adjustable resistor, for AD conversion testing

- 1 * PWM buzzer

- Onboard real-time clock backup battery

● **Extended Interfaces**

- 4 * Serial port socket (TTL, 2.0mm spaced socket)

- 1 * 10 pin 2.0mm spaced JTAG interface

- Double LCD Interfaces (one 41 pin connector compatible with Mini2440 LCD and the other 40 pin 2.0 mm spaced doubled line connector)

- 1 * 20pin 2.0mm spaced SDIO interface (can be connected to SD WiFi and include an SPI and an I2C)

- 1 * 20pin 2.0mm spaced CMOS camera interface

- 1 * 30 pin 2.0mm spaced GPIO port

- 1 * 40 pin 2.0mm spaced system bus interface

- 1 * 10pin 2.0mm spaced button socket including 8 interrupt pins, power and ground

● **PCB Overview**

- PCB layer: 6

- 110 x 110 mm

● **OS Support**

The Mini6410 development board currently can load the following operating systems:

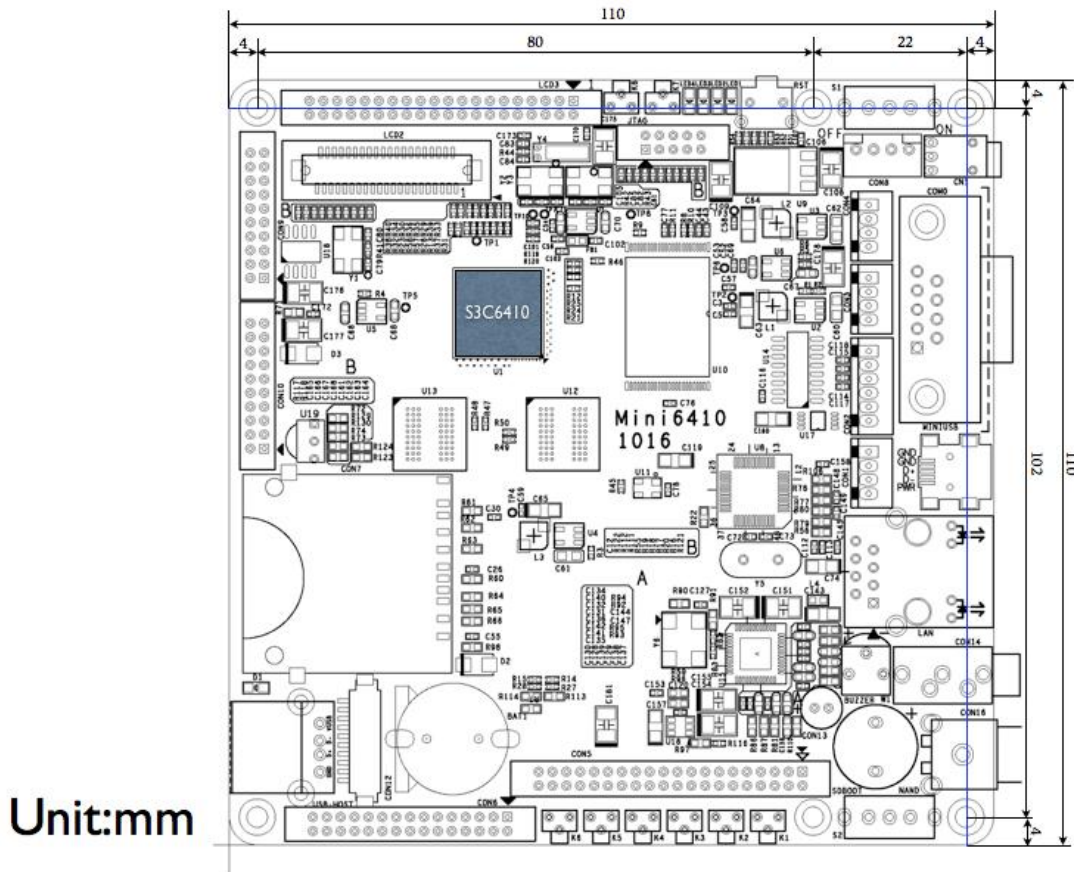
- Linux2.6.38(or latest) + Qtopia-2.2.0 + QtE-4.7.0



- WindowsCE.NET 6.0(R3)
- Android 2.3.2 (or latest)
- Ubuntu-0910

1.3 Board Dimension

Below is a detailed Mini6410 board drawing:





1.4 Linux Features

● Kernel Version

- Linux 2.6.38(or latest)

● Boot Loader

- U-boot-1.6.1: open source, can be configured as Nand booting or SD booting
- Superboot: developed by FriendlyARM, not open sourced

● File Systems

- YAFFS2: recommended
- UBIFS: recommended for MLC nand Flash
- CRAMFS
- EXT2/3
- FAT32
- NFS

● Drivers (all open source)

- Driver for 4 serial ports
- DM9000 driver
- Audio driver (WM9714)
- RTC driver
- Drivers for 4 User LEDs



- USB host driver
- LCD driver (it supports 3.5-inch, 4.3-inch, 7-inch, 8-inch, LCD2VGA1024x768, LCD2VGA800x600, LCD2VGA640x480 and EZVGA800x600)
- 4-wire touch screen driver and 1-wire precise touch driver
- USB camera driver
- Drivers for USB mouse, keyboard, flash drive and portable hard disk
- SD card driver, up to 32 GB
- I2C driver
- ADC driver
- LCD backlight driver
- Watchdog driver (watchdog reset is cold reset)
- Multimedia drivers(including JPEG, FIMC, MFC, 2D/3D Accelerator, TVENC and TVSCALER)
- CMOS camera driver
- Back light adjustor. This allows users to adjust the board's backlight up to 127 levels and experience a gradually dim effect when turning it down.
- SPI driver

● Basic Applications and Utilities

- Busybox1.17 (Linux tool kit including basic Linux commands)
- Telnet, FTP and inetd (remote login tool)



- boa (web server)
- Madplay (command line mp3 player)
- Snapshot (command line screenshot tool)
- ifconfig, ping, route and so on (basic network commands)

● **Graphic User Interface**

- Qtopia-2.2.0: open source, including two versions: one for x86 and the other for ARM
- QtE-4.7.0: open source, only for ARM
- Qt-extended -4.4.3: open source, Qtopia for handset, alternatively named Qtopia4

● **Qtopia Applications and Utilities (Note: the following GUI applications are developed by FriendlyARM, which are not open sourced)**

- A/D conversion test utility
- LED test utility
- User button test utility
- I2C-EEPROM read/write test utility
- LCD test utility
- Ping test utility
- USB camera preview and picture taking
- Audio recorder
- Web browser(konquor, open sourced)
- Watchdog test utility



- Network configuration utility
- Backlight control utility
- Language setting utility (English, Chinese and Japanese)
- Penpad utility (for touch pen testing)
- MMC/SD card and flash drive utility enabling auto mounting and unmounting
- Qt4 switcher
- Qtopia4 switcher
- SMPLAYER
- arm-none-linux -4.5.1-v6-vfp: cross compiler

1.5 WinCE 6.0 Features

● Version

- Windows CE Embedded 6.0 R3

● Features

- Fast booting (boot up within 15 seconds)
- Support bootlogo download via USB, or SD Card only.
- Configurable NBOOT header files: Users can customize the process bar's color, position, length and width, and startup image's position and background.
- CMOS camera driver
- LED driver



- Driver for 8 user buttons
- PWM buzzer driver
- LCD driver (it supports 3.5-inch, 4.3-inch, 7-inch, 8-inch, LCD2VGA1024x768, LCD2VGA800x600, LCD2VGA640x480 and EZVGA800x600)
- RTC driver
- DM9000 driver
- Large memory high speed SD/SDHC card driver(up to 32GB)
- Touch screen driver
- Audio input/output driver (WM9714 chip)
- Drivers for USB keyboard, mouse, flash drive
- Drivers for serial ports COM2, 3 and 4
- Multimedia driver (including JPEG, FIMC, 2D/3D Accelerator, MFC, TVENC and TVSCALER)
- USB WiFi plug and play(only for RT2070/RT3070 based card)
- USB Bluetooth plug and play
- 1-wire precise touch screen driver. It supports 4.3-inch to 21-inch touch screen
- Back light adjustor. This allows users to adjust the board's backlight up to 127 levels and experience a gradually dim effect when turning it down.

● Utility Highlights

- Super media player: TCPMP, it supports decoding and H.264/263, MPEG4 video files



- Serial port assistant
- User button test utility
- LED test utility
- PWM buzzer test utility
- Audio recorder
- OpenGL utility
- Autorun setup utility: to set up applications to be run at startup
- Painter: for touch screen test
- Notepad

1.6 Android Features

● Linux Kernel

- Linux-2.6.36

● Boot Loader

- U-boot-1.6

● File Systems

- FAT32
- YAFFS2
- UBIFS(recommended)



- EXT2/3

● **Android Version and Features**

- Android 2.3
- Support SD WiFi, USB WiFi
- Support GPS
- Support CMOS camera
- Support USB 3G Card: more than one hundred kinds of USB 3G cards which cover all three systems: WCDMA, CDMA2000 and TD-SCDMA etc.
- Flash drive plug and play: up to a maximum memory of 32G
- USB Bluetooth plug and play
- Support accurate touch
- Support screen rotation
- Back light adjustor. This allows users to adjust the board's backlight up to 127 levels and experience a gradually dim effect when turning it down
- GUI utility for Ethernet configuration, enabling both auto and manual IP setup
- Support USB ADB debug and download
- Support simplified Chinese, traditional Chinese, English and Japanese
- Optimized web browser featuring fast internet surfing



1.7 Ubuntu Features

- **Linux Kernel**

- Linux-2.6.38

- **Boot Loader**

- Superboot: boot from SD card and load the kernel and file system

- **File Systems**

- FAT32
- UBIFS
- EXT2/3



2. Board Schematic

2.1 Jumper

There are no jumpers on this board. This design makes the board easy for users.

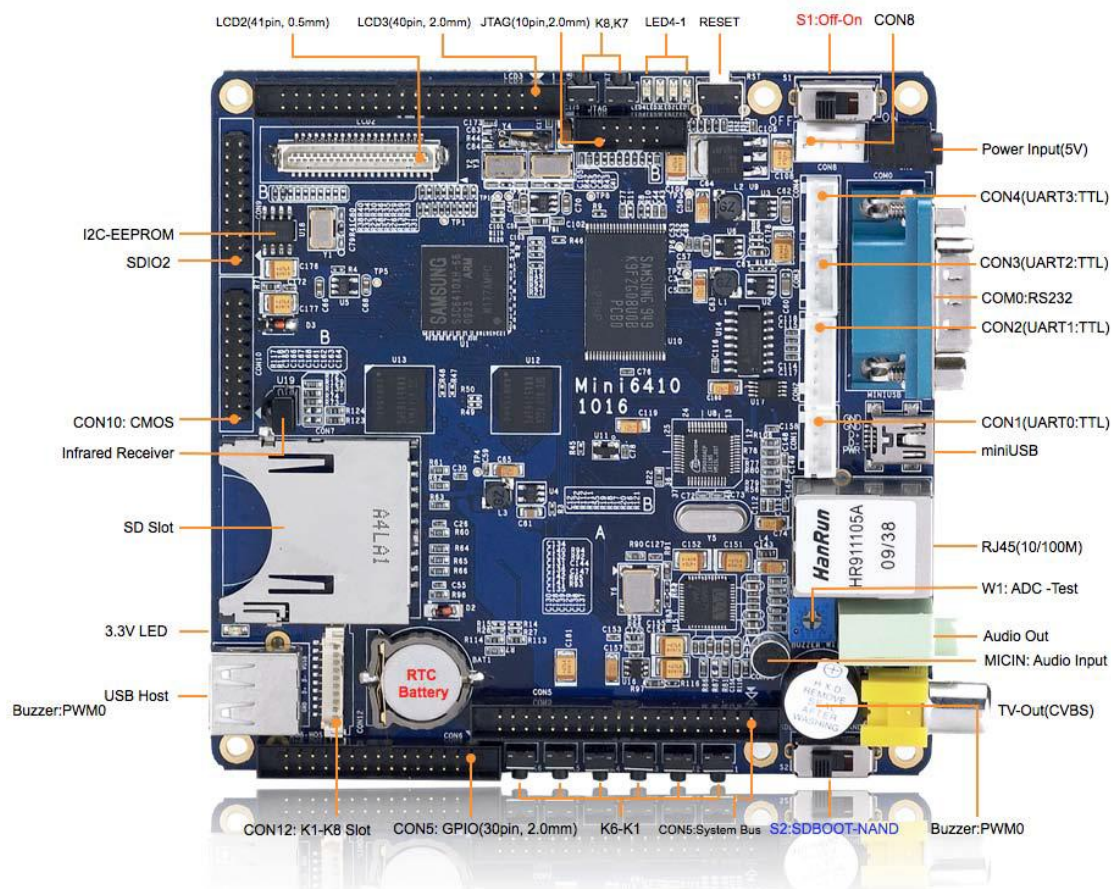
2.2 Schematic

The Mini6410 schematic is presented as below. It includes most of the popular interfaces, ports, IOs and buses on a 110 x 110 mm board.

Note: in the diagram below those orange points indicate the first pins of those interfaces/ports/connectors accordingly.



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3 Interface Specifications

This section describes in detail each interface/port on the board. For more details users can refer to the complete schematics (in PDF and Protel99SE) in the CDs shipped together with this product.

3.1 Address Space

The following data is from the S3C6410 data sheet 2.2.

Address		Size (MB)	Description
0x0000_0000	0x07FF_FFFF	128MB	BOOT
0x0800_0000	0x0BFF_FFFF	64MB	ROM
0x0C00_0000	0x0FFF_FFFF	128MB	Stepping Stone(8KB)
0x1000_0000	0x17FF_FFFF	128MB	
0x1800_0000	0x1FFF_FFFF	128MB	DM9000AEP
0x2000_0000	0x27FF_FFFF	128MB	
0x2800_0000	0x2FFF_FFFF	128MB	
0x3000_0000	0x37FF_FFFF	128MB	
0x3800_0000	0x3FFF_FFFF	128MB	
0x4000_0000	0x47FF_FFFF	128MB	
0x4800_0000	0x4FFF_FFFF	128MB	
0x5000_0000	0x5FFF_FFFF	256MB	128M DDR RAM
0x6000_0000	0x6FFF_FFFF	256MB	

3.2 Power

The Mini6410 is powered by an external 5V power supply. It has two power inlets: CN1 is

for 5V power adapter and the white CON8 is a 4 pin socket used to connect an external power supply when the board is embedded in a closed box. The voltage is 5V and current is 800mA.

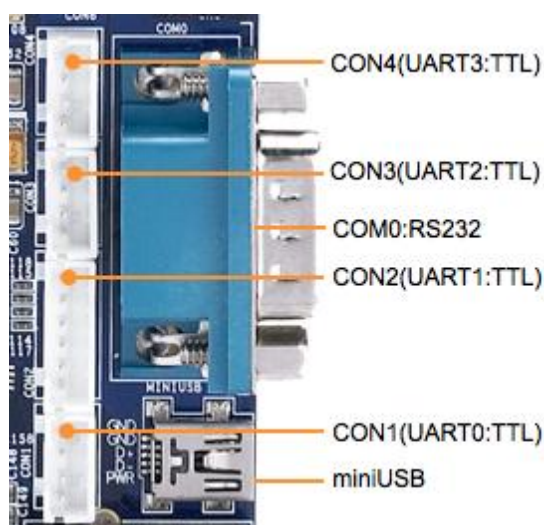
CON8	PIN Spec
1	VDD5V
2	GND
3	GND
4	VDDIN
Note: when connected to an extended cable, the S1 switch works too.	

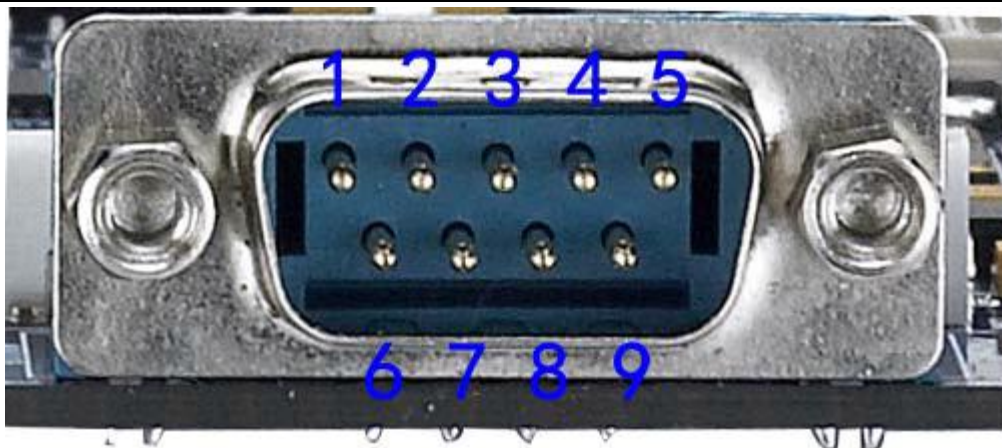
3.3 Serial Port

S3C6410 has 4 serial ports: UART0, 1, 2 and 3. UART0 and 1 are 5 wire serial ports and the other two are 3 wire serial ports.

On this board, UART0 is converted via RS232 to COM0 and can communicate with a PC via a serial port cable.

The rest 4 ports are connected to CPU via CON1-4. They are presented as below:



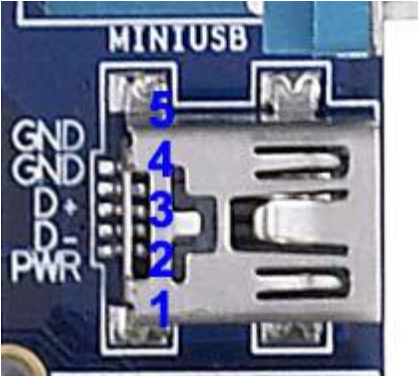


CON1,3,4	PIN Spec (TTL)	CON2	PIN Spec (TTL)	COM0	PIN Spec (RS232)
1	TXD	1	RTSn	1	NC
2	RXD	2	CTSn	2	RSRXD
3	5V	3	TXD	3	RSTXD
4	GND	4	RXD	4	NC
		5	5V	5	GND
			GND	6	NC
			7	RSCTSn	7
			8	RSRTSn	8
Note: NC means floating					

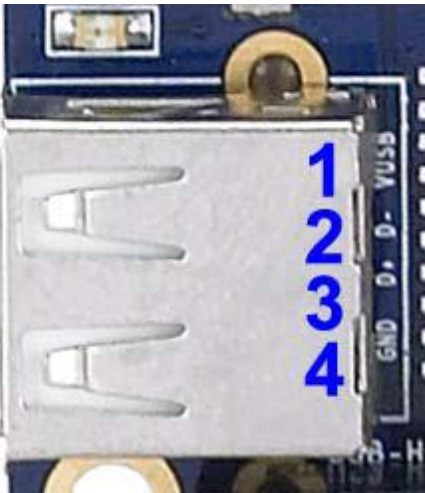
3.4 USB Interface

The Mini6410 board has two USB interfaces. One is a USB host 1.1 which is the same as a USB interface on a PC and can connect to a USB camera, keyboard, mouse, flash drive and other USB devices. The other is an OTG mini USB 2.0 which is usually used to download programs to a target board. When the board runs WinCE it can synchronize with a Windows via ActiveSync. For Linux there are no programs for synchronization for now.

Mini USB interface:

	Mini USB	PIN Spec
	5	GND
	4	OTGID
	3	D+
	2	D-
	1	Vbus

USB Host:

	USB Host	PIN Spec
	1	5V
	2	D-
	3	D+
	4	GND

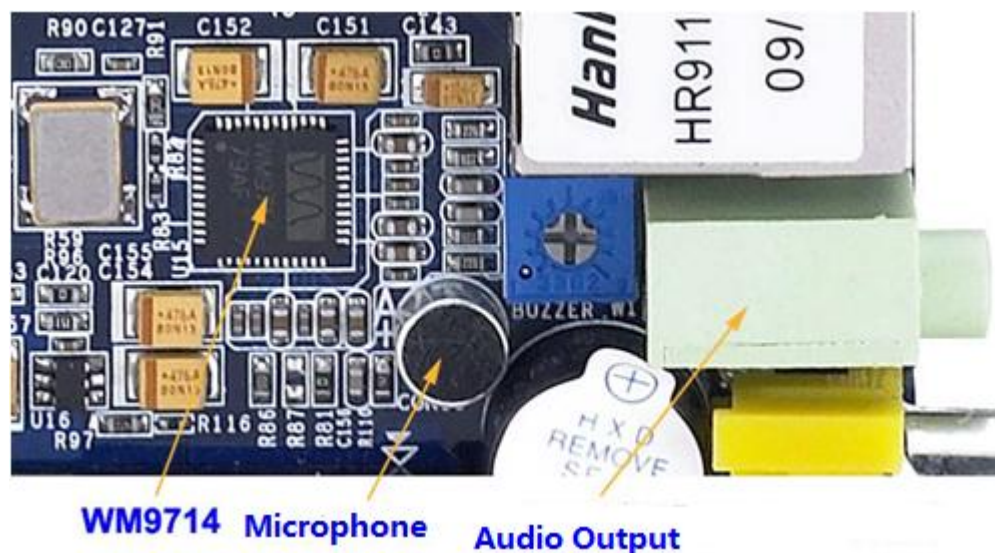
3.5 Network Interface

The Mini6410 incorporates a DM9000 chip and can communicate with 10/100M networks. The RJ45 connector includes coupling filters and does not need transformers. With a common network cable, you can connect a router or switch to the Mini6410.

3.6 Audio Interface

The S3C6410 supports I2S/PCM/AC97. The Mini6410 has an AC97 interface which uses WM9714 as the CODEC chip.

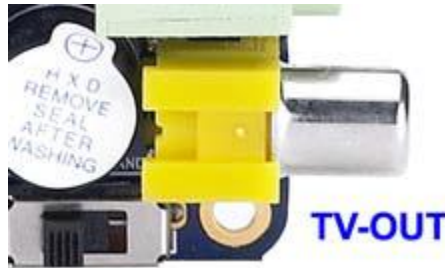
The audio output is a 3.5 mm spaced green plug and the input is an on-board microphone. To get better audio quality please move the microphone as close as possible to the audio source when recording.



3.7 TV Output

The S3C6410 has two TV outputs. The Mini6410 magnifies the output of DACOUT0, users can connect the board to a TV via an AV cable. The other TV output is extended from CPU to the 30th pin of CON6.

Note: when connecting DACOUT0 to a TV users need to switch the TV to the CVBS mode.

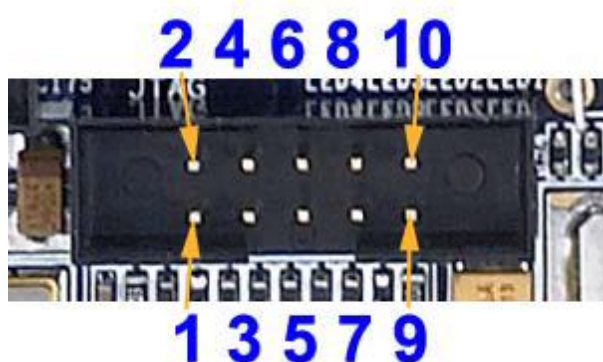


3.8 JTAG Interface

When a board just comes off from production lines it is just a bare board without any data and we usually have to burn the first program to it through the JTAG interface. However since the S3C6410 supports booting from SD card the JTAG is not significant to users any more. Now the JTAG is more often used for debugging. In fact, most of the widely used utilities in markets like JLINK, ULINK and other simulators actually work via the JTAG interface. A standard JTAG has 4 signals :TMS, TCK, TDI and TDO which are test mode select input, test clock, test data input and test data output. These 4 signal lines plus a power line and a ground line form 6 lines in total. In order for testing, most simulators even have a reset signal. Therefore, a standard JTAG is meant to have those signal lines, and it does not mean whether it is 20Pin or 10Pin. As long as a JTAG interface has those signal lines, it will be a standard JTAG interface. The Mini6410 has a 10Pin JTAG interface which has complete standard JTAG signals.

Notes: for beginners who just want to focus on Linux or WinCE development, the JTAG interface has no significance because most development boards already have a complete BSP


which includes commonly needed serial ports, network port and USB port. When a board runs with Linux or WinCE installed, users can fully utilize more convenient functions and utilities provided by the operating system to debug. They do not need a JTAG. Even if you can trace your programs it will be extremely tough to step debug because it will go into the operating system. This is not an easy job.



JTAG Spec				
2	4	6	8	10
3.3V	nRESET	TDO	GND	GND
1	3	5	7	9
3.3V	nTRST	TDI	TMS	TCK

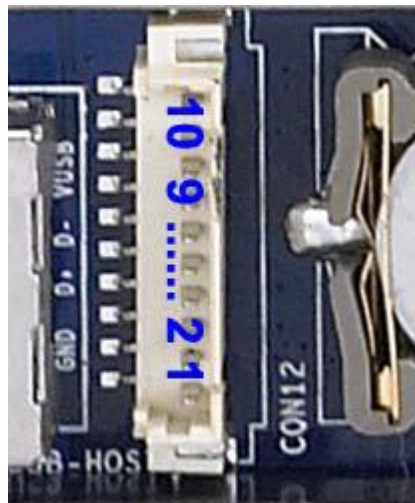
3.9 LED

A LED is commonly used as a status indicator. The Mini6410 has 4 user programmable LEDs which are directly connected to GPIO. The LEDs will be on at a low level voltage. Detailed information is as follows

		LED4	LED3	LED2	LED1
	GPIO	GPK7	GPK6	GPK5	GPK4

3.10 User Key

The Mini6410 has 8 test keys. They all are CPU interrupt input signals and will be triggered at a low level voltage. They can also be multiplexed to GPIO and other function interfaces. To multiplex them users can extend them through CON12. These 8 keys and CON12 are defined as follows



CON12

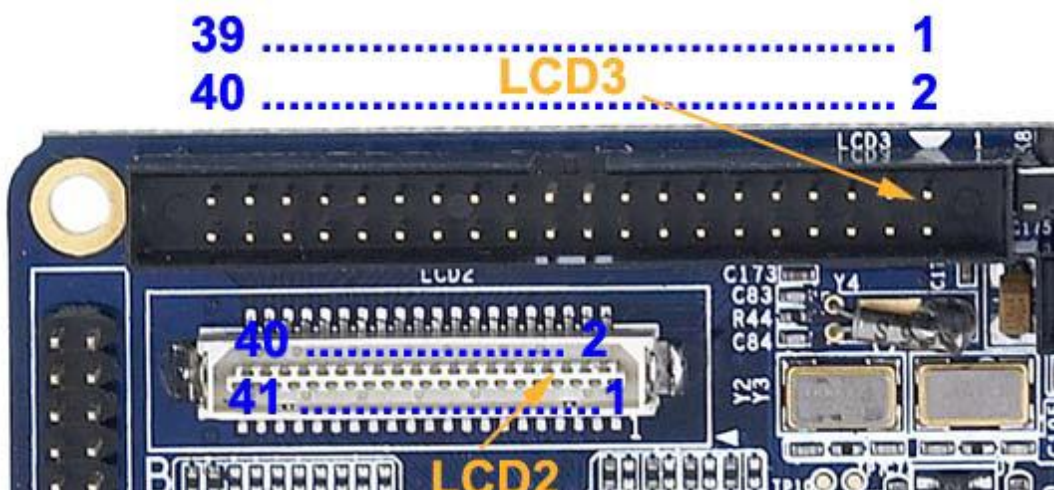
CON12	1	2	3	4	5	6	7	8
Key	K1	K2	K4	K4	K5	K6	K7	K8
Interrupt	EINT0	EINT1	EINT2	EINT3	EINT4	EINT5	EINT19	EINT20
Multiplexed GPIO	GPN0	GPN1	GPN2	GPN3	GPN4	GPN5	GPL11	GPL12
Note: CON12.9 connects to power (3.3V), CON12.10 connects to ground (GND)								

3.11 Double LCD Interface

For users' convenience we incorporate two LCD interfaces on the board: LCD2 and LCD3. LCD2 is a 0.5mm spaced 41 pin connector and compatible with Mini2440 LCD; LCD3 is a 2.0mm spaced 40 pin connector. Since LCD2.41 is grounded LCD3 can still work although it lacks one pin.

The LCD connector has most of the commonly used control signals (line sweeping, clock, enable/disable) and complete RGB data signals (RGB output is 8:8:8 and can support LCDs up to 1.6M pixels). It has a PWM output and a reset signal (nRESET). LCD_PWR is the backlight switch signal.

37, 38, 39 and 40 are a 4 wire touch screen interface which can be directly connected to a 4 wire resistor touch screen.





LCD2 & LCD3	PIN Spec	LCD2 & LCD3	PIN Spec
1	5V	2	5V
3	VD0	4	VD1
5	VD2	6	VD3
7	VD4	8	VD5
9	VD6	10	VD7
11	GND	12	VD8
13	VD9	14	VD10
15	VD11	16	VD12
17	VD13	18	VD14
19	VD15	20	GND
21	VD16	22	VD17
23	VD18	24	VD19
25	VD20	26	VD21
27	VD22	28	VD23
29	GND	30	GPE0/LCD_PWR
31	PWM1/GPF15	32	nRESET
33	VDEN/VM	34	VSYNC
35	HSYNC	36	VCLK
37	TSXM	38	TSXP
39	TSYM	40	TSYP
		41	GND

3.12 ADC Input

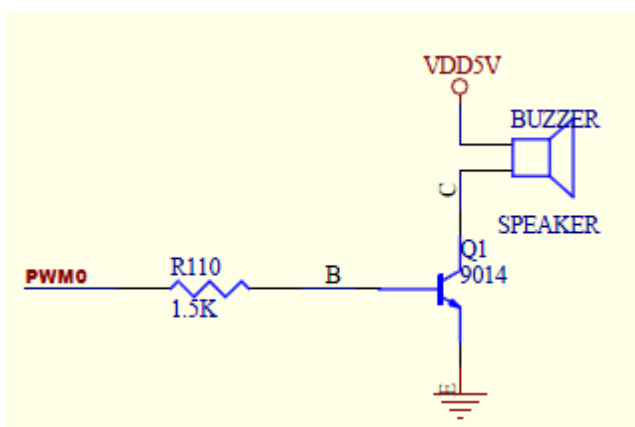
The Mini6410 has 4 A/D conversion channels. AIN0 is connected to the adjustable resistor W1; AIN1, 2 and 3 are extended via CON6's 27, 28 and 29. The S3C6410's AD conversion can be configured to 10-bit/12-bit. For more details please refer to Chapter 39 of the data sheet.

For users' convenience, W1 is placed close to one edge of the board and will not be hidden even when the board is equipped with a 4.3-inch LCD.



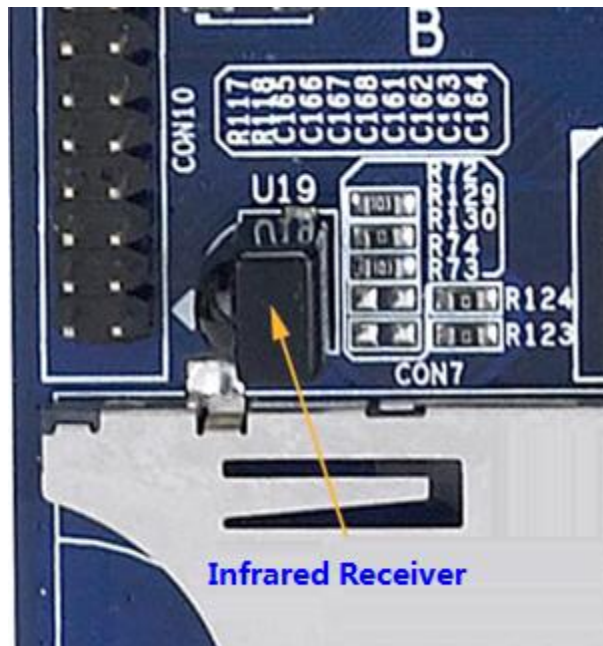
3.13 PWM Buzzer

The on-board SPEAKER is controlled by PWM, the diagram is shown below. PWM0 corresponds to GPF14 which can be configured as PWM output via software or used as a GPIO.



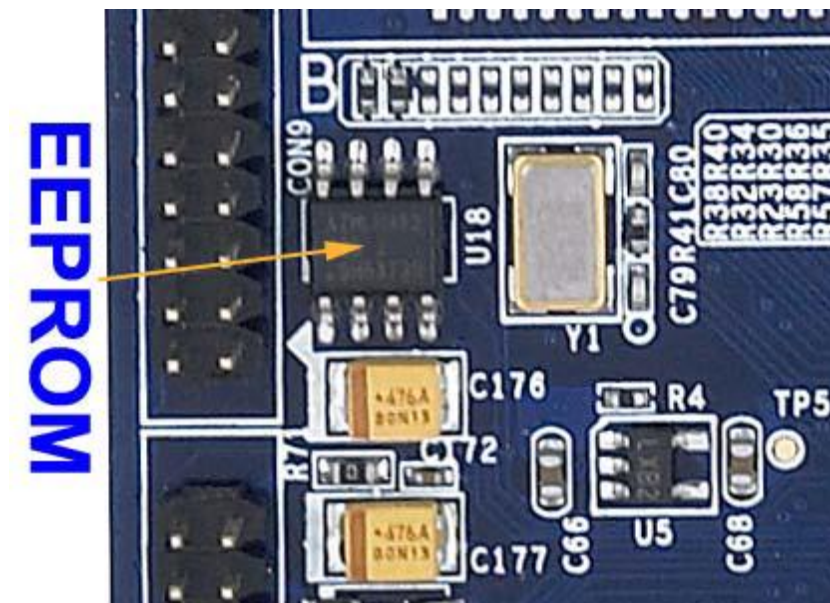
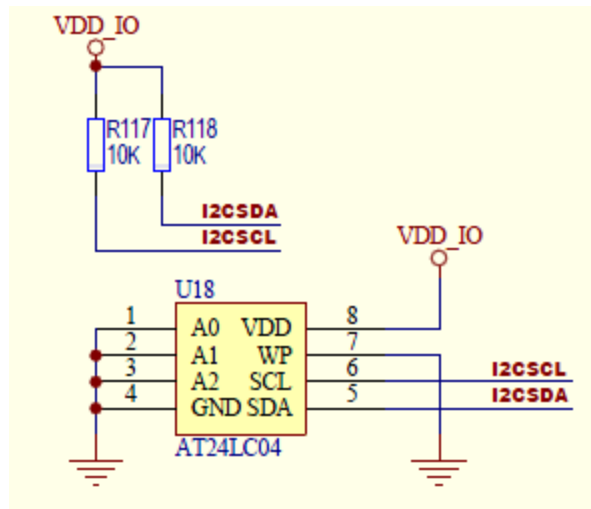
3.14 Infrared Receiver

The Mini6410 has an infrared receiver. Its type is IRM3638 (or others compatible). It connects to EINT12.



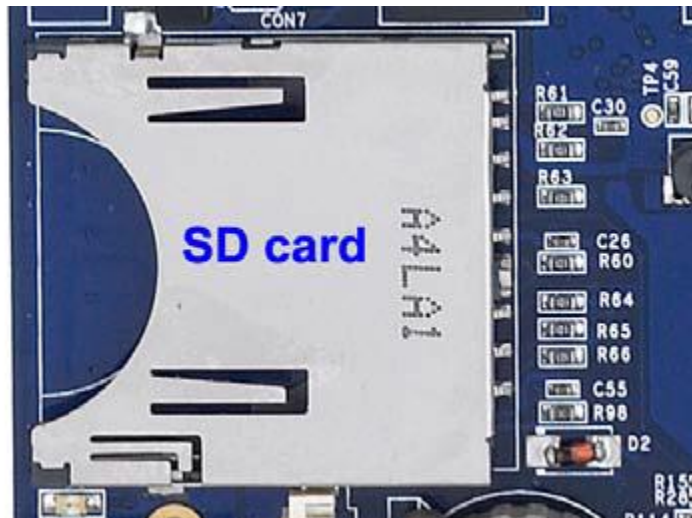
3.15 I2C-EEPROM

The Mini6410 has an EEPROM AT24C08 connected to CPU's I2C. It has 256 bytes memory and is mainly for testing I2C bus.



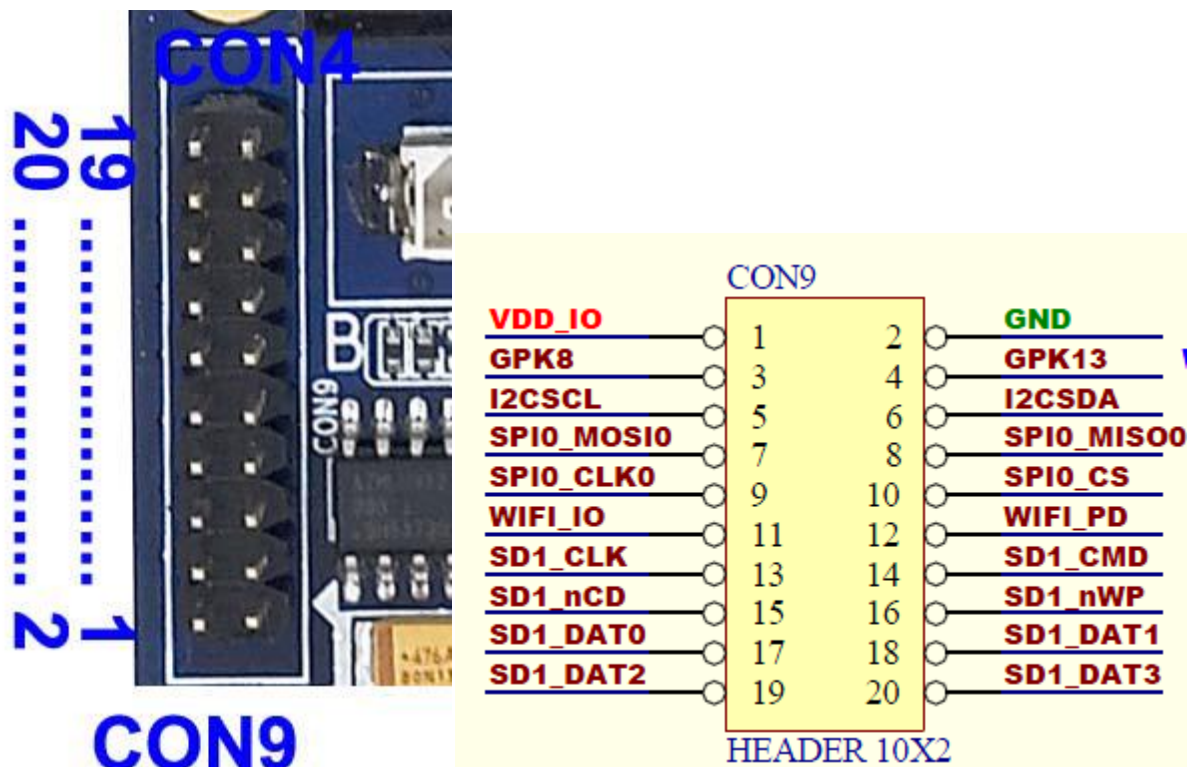
3.16 SD Card

The S3C6410 has two SDIO interfaces. SDIO0 is commonly used for SD cards. The Mini6410 makes a standard SD card slot by extending SDIO0 via CON7. It supports SDHC i.e. high speed large memory SD cards.



3.17 SDIO-II//SD-WiFi

The other SDIO of the S3C6410 is extended via CON9. It is a 2.0 mm spaced 20 pin connector and includes an SPI, an I2C and 4 GPIOs.



CON9	PIN Spec	CON9	PIN Spec
1	VDD/3.3V	2	GND
3	GPK8	4	GPK13
5	I2CSCL	6	I2CSDA
7	SPI0_MOSIO	8	SPI0_MISO0
9	SPI0_CLK0	10	SPI0_CS
11	GPP10/WiFi_IO	12	GPP11/WiFi_PD
13	SD1_CLK	14	SD1_CMD
15	SD1_nCD	16	SD1_nWP
17	SD1_DAT0	18	SD1_DAT1
19	SD1_DAT2	20	SD1_DAT3

3.18 CMOS Camera Interface

The S3C6410 has a CMOS camera interface. It is extended via CON10. It is a 20 pin 2.0mm connector, users can directly use the CAM130 module we provide. The CAM130

module does not have any circuits. It is basically just a converter and directly connects to a ZT130G2 camera module.

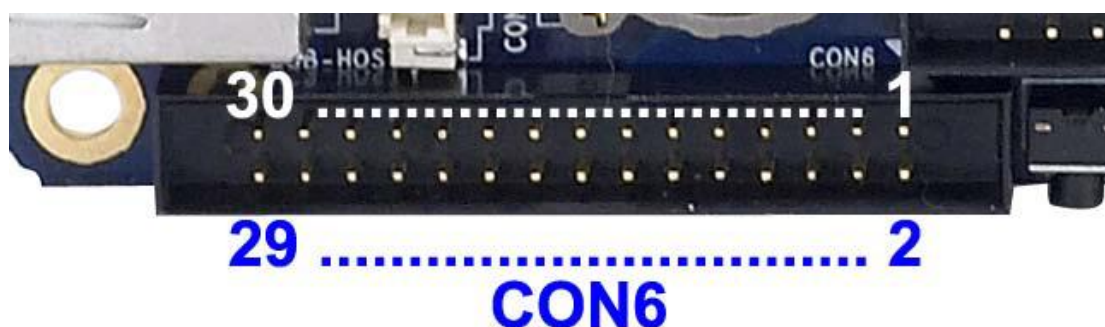
Notes: the camera interface is a multiplexed port. It can be used as GPIO by setting corresponding registers. The schematic below presents its pin details.



CON10	PIN Spec	CON10	PIN Spec
1	CAMSDA(实接 I2CSDA)	2	CAMSCL(实接 I2CSCL)
3	GPK2	4	CAMRSTn
5	CAMCLK	6	CAMHREF
7	CAMVSYNC	8	CAMPCLK
9	CAMDATA7	10	CAMDATA6
11	CAMDATA5	12	CAMDATA4
13	CAMDATA3	14	CAMDATA2
15	CAMDATA1	16	CAMDATA0
17	3.3V	18	2.45-2.8V
19	1.8V	20	GND

3.19 GPIO

GPIO is the abbreviated form of General Purpose Input Output. The Mini6410 has a 30 Pin 2.0mm spaced GPIO interface, i.e. CON6. In fact, CON6 has not only quite a few GPIO pins but also some CPU pins such as AD input, DAC and so on. The SPI interface, I2C interface, interrupts and some others are all GPIOs, but they are marked as special function interfaces. They can be configured for other purposes too by setting related CPU registers.



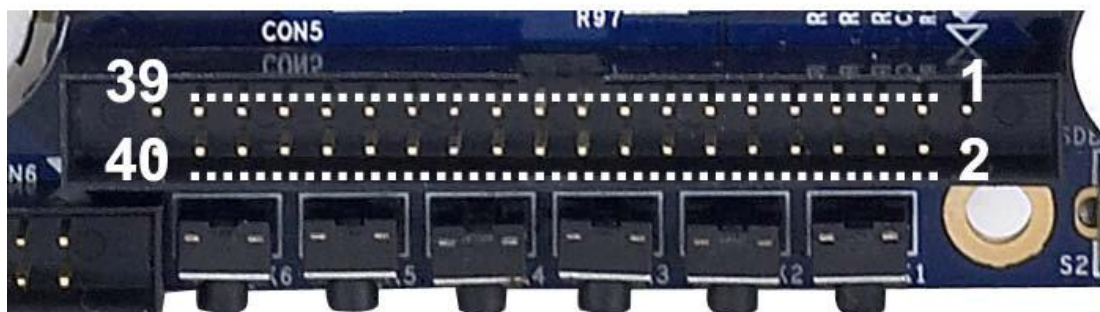
CON6	PIN Spec	Description	CON6	PIN Spec	Description
1	3.3V	Power	2	GND	Ground
3	GPE1	Available, can be used as GPIO	4	GPE2	Available, can be used as GPIO
5	GPE3	Available, can be used as GPIO	6	GPE4	Available, can be used as GPIO
7	GPM0	Available, can be used as GPIO	8	GPM1	Available, can be used as GPIO
9	GPM2	Available, can be used as GPIO	10	GPM3	Available, can be used as GPIO
11	GPM4	Available, can be used as GPIO	12	GPM5	Available, can be used as GPIO
13	GPQ1	Available, can be used as GPIO	14	GPQ2	Available, can be used as GPIO
15	GPQ3	Available, can be used as GPIO	16	GPQ4	Available, can be used as GPIO
17	GPQ5	Available, can be used as	18	GPQ6	Available, can be used as

		GPIO			GPIO
19	SPI1_CLK	Available, can be used as GPIO	20	SPI1_MISO	Available, can be used as GPIO
21	SPI1_CS	Available, can be used as GPIO	22	SPI1_MOSI	Available, can be used as GPIO
23	EINT6	Available, can be used as GPIO	24	EINT9	Available, can be used as GPIO
25	EINT11	Available, can be used as GPIO	26	EINT16	Available, can be used as GPIO
27	AIN1	Analog input1, 0-0.3.3V	28	AIN2	Analog input2, 0-0.3.3V
29	AIN3	Analog input3, 0-0.3.3V	30	DACOUT1	
Note: DACOUT1 is TV output. It needs to be connected to a magnifier for TV output					

3.20 System Bus

The system bus is CON5. It contains 16 data lines (D0-D15), 8 address lines (A0-A6, A24), and some control signal lines (such as chip select, read/write, reset and so on). CON5 can supply 5V output. In fact very few users would extend interfaces through system bus. Below is the detailed information about CON5's pins

CON5





CON5	PIN Spec	CON5	PIN Spec
1	5V	2	GND
3	EINT17	4	EINT18
5	NC	6	NC
7	nCS4	8	nCS5
9	GND	10	GND
11	LnOE	12	LnWE
13	nWAIT	14	nRESET
15	GND	16	GND
17	ADDR0	18	ADDR1
19	ADDR2	20	ADDR3
21	ADDR4	22	ADDR5
23	ADDR6	24	ADDR19
25	DATA0	26	DATA1
27	DATA2	28	DATA3
29	DATA4	30	DATA5
31	DATA6	32	DATA7
33	DATA8	34	DATA9
35	DATA10	36	DATA11
37	DATA12	38	DATA13
39	DATA14	40	DATA15
Note: NC means not used			