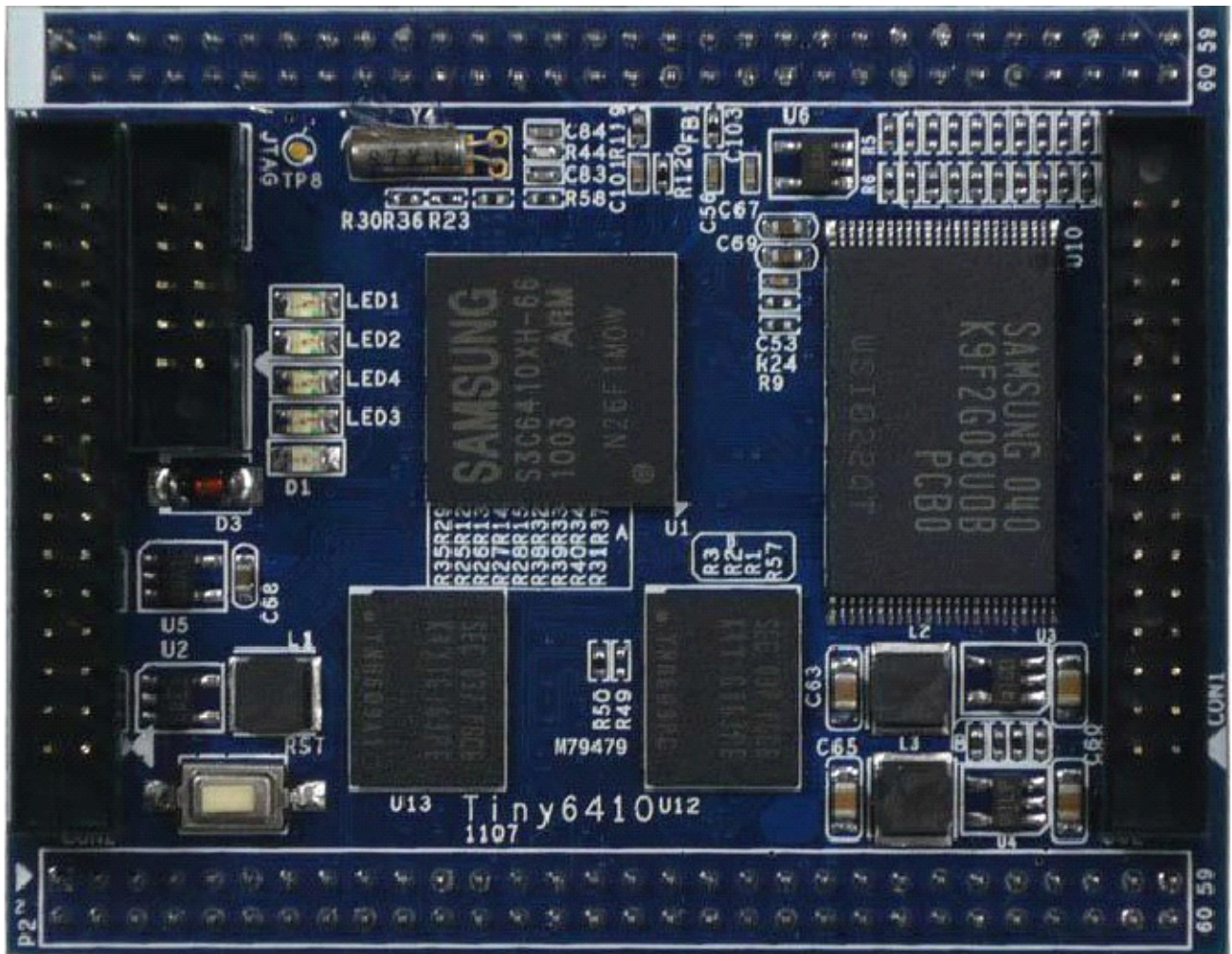


Tiny6410 Hardware Spec



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0.1.0	FriendlyARM Co., Ltd		March 28th, 2011
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This manual is intended to provide the user with an overview of the Tiny6410 board, its benefits, features, specifications, and set up procedures.

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1 Introduction to Tiny6410

The Tiny6410 development board is an excellent ARM11 board offering a comprehensive solution integrating both hardware and software. It is designed, developed and distributed by FriendlyARM. It applies the Samsung S3C6410 microprocessor and inherits all the features and benefits of our most popular Tiny2440 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 Tiny6410 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

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- 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),
- 1 * 10pin JTAG interface,
- 1 * PWM buzzer,
- 1 * I2C-EEPROM,
- 1 * backup battery,
- 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

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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>

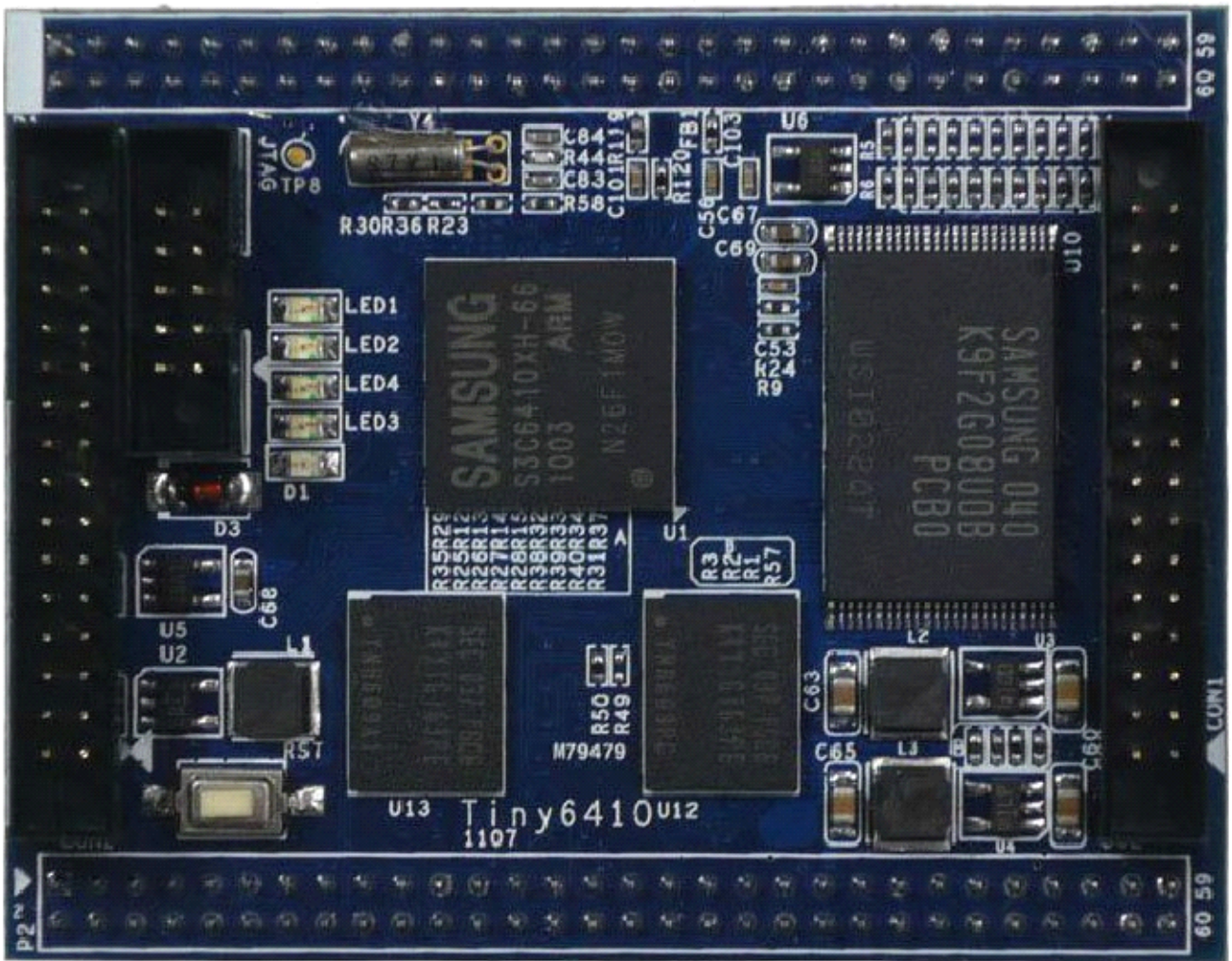
1.1 Tiny6410 Core Board

1.1.1 Tiny6410 Core Board Overview

Below is a diagram of the Tiny6410 core board.

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Obeverse View

Item	Description
CPU	Samsung S3C6410A, 533Mhz, ARM1176JZF-S, up to 667Mhz
RAM	256 DDR RAM (128M is optional)
Flash	128M/256M/512M/1G/2G Nand Flash, 256M by default
Interface	4 * User Led

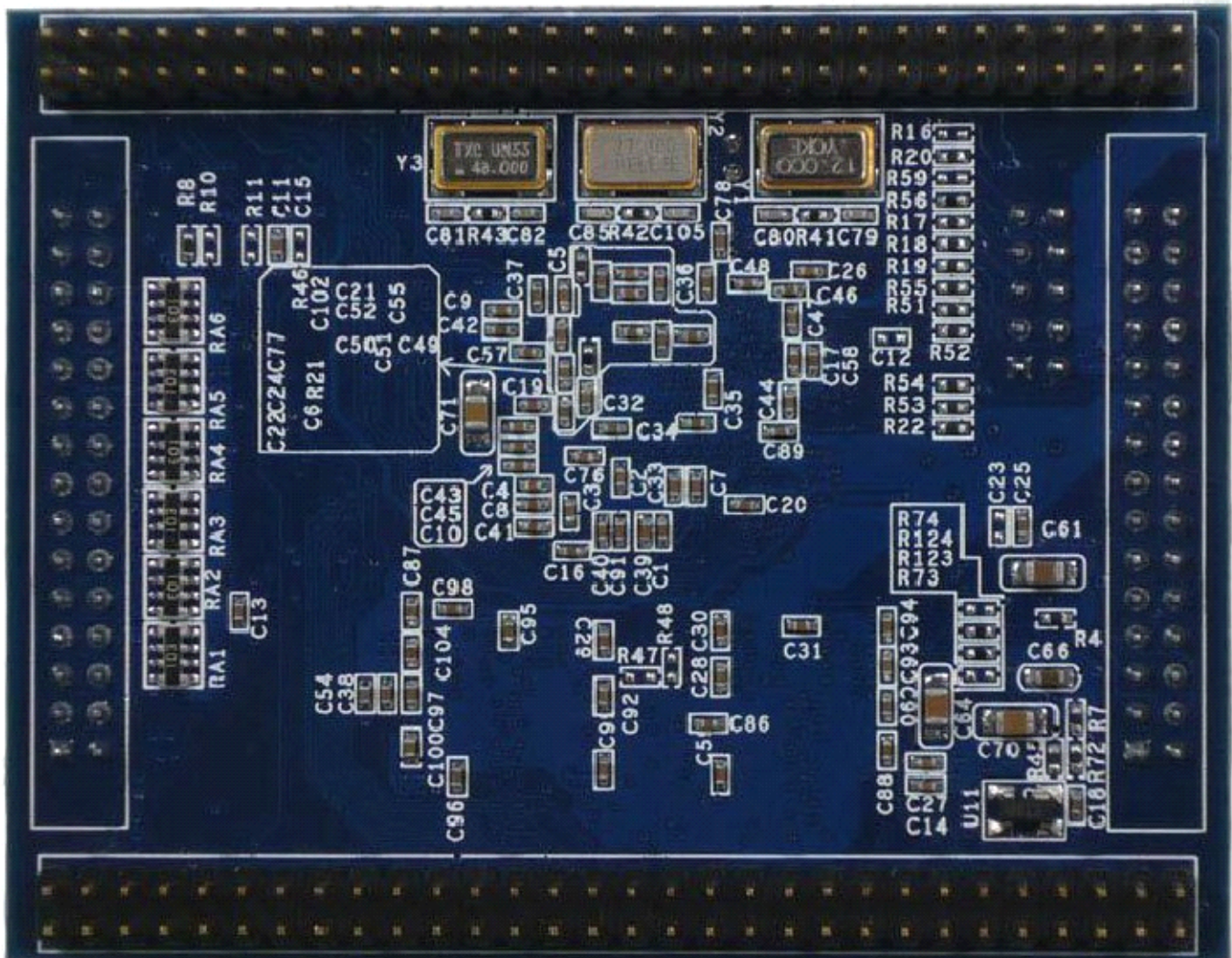
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	1 * 10 pin 2.0mm spaced Jtag connector 1 * Reset button on board
Connector	2 * 60 pin 2.0 mm spaced DIP connector 2 * 30 pin 2.0 mm spaced GPIO connector
Power Supply	2.0V to 6V
Size	64 * 50 * 12mm (L * W * H)

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Reverse View

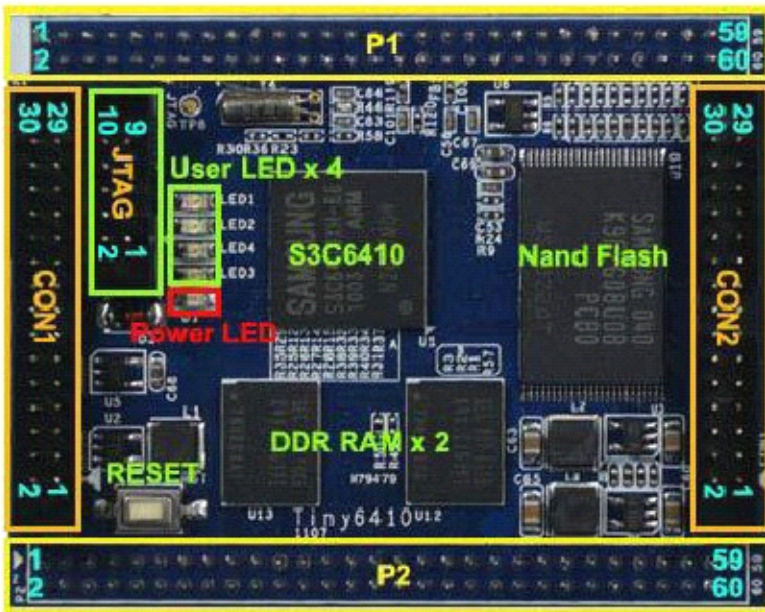
1.1.2 Tiny6410 Core Board Pin Specifications

The Tiny6410 system has four groups of 2.0 mm spaced double line pins: P1, P2, CON1 and CON2. P1 and P2 each have 60 pins. CON1 and CON2 each have 30 pins. There are total 180 pins. The board also has a 10 pin JTAG interface. Blow is table that lists their

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information



Pin	Description
P1	It includes LCD, AD, SDIO2, interrupts, USB and TVOUT0.
P2	It includes serial ports, SPI1, I2C, SD Card, AC97(I2S) and system bus. It includes GPIO, AD, SPI0,
CON1	TAVOUT1. It is compatible with Mini6410's CON6 It includes CMOS and GPIO. The CMOS interface is
CON2	compatible with Mini6410/Mini2440 It includes complete JTAG signals and can be connected to J-Link for single step debugging
JTAG	It includes four 4 LEDs(green), power indicator(red) and reset button
Others	

Here is a table that has more details

P1	Pin Specification	Comments	P1	Pin Specification	Comments
P1.1	VDD_5V	DC-5V Power, Input	P1.2	GND	Ground
P1.3	VD23	LCD_R5/GPJ7	P1.4	VD22	LCD_R4/GPJ6

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P1.5	VD21	LCD_R3/GPJ5	P1.6	VD20	LCD_R2/GPJ4
P1.7	VD19	LCD_R1/GPJ3	P1.8	VD18	LCD_R0/GPJ2
P1.9	VD15	LCD_G5/GPI15	P1.10	VD14	LCD_G4/GPI14
P1.11	VD13	LCD_G3/GPI13	P1.12	VD12	LCD_G2/GPI12
P1.13	VD11	LCD_G1/GPI11	P1.14	VD10	LCD_G0/GPI10
P1.15	VD7	LCD_B5/GPI7	P1.16	VD6	LCD_B4/GPI6
P1.17	VD5	LCD_B3/GPI5	P1.18	VD4	LCD_B2/GPI4
P1.19	VD3	LCD_B1/GPI3	P1.20	VD2	LCD_B0/GPI2
P1.21	VDEN	VDEN/GPJ10	P1.22	PWM1	PWM1/GPF15
P1.23	VSYNC	LCD Sweeping/GPJ9	Field P1.24	HSYNC	LCD Line Sweeping/GPJ8
P1.25	VCLK	LCD Clock/GPJ11	P1.26	GPE0	GPE0
P1.27	VBUS	VBUS	P1.28	OTGDRV_VBUS	OTGDRV_VBUS
P1.29	OTGID	OTGID	P1.30	XEINT8	EINT8/GPN8
P1.31	OTGDM	USB Slave D-	P1.32	USBDN	USB Host D-
P1.33	OTGDP	USB Slave D+	P1.34	USBDP	USB Host D+
P1.35	TSXP	TSXP/AIN7	P1.36	TSXM	TSXM/AIN6
P1.37	TSYP	TSYP/AIN5	P1.38	TSYM	TSYM/AIN4

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P1.39	AIN0	AIN0	P1.40	AIN1	AIN1
P1.41	WiFi_IO	WiFi_IO/GPP10	P1.42	WiFi_PD	WiFi_PD/GPP11
P1.43	SD1_CLK	SD1_CLK/GPH0	P1.44	SD1_CMD	SD1_CMD/GPH1
P1.45	SD1_nCD	SD1_nCD/GPN10	P1.46	SD1_nWP	SD1_nWP/GPL14
P1.47	SD_DAT0	SD1_DAT0/GPH2	P1.48	SD1_DAT1	SD1_DAT1/GPH3
P1.49	SD1_DAT2	SD1_DAT2/GPH4	P1.50	SD1_DAT3	SD1_DAT3/GPH5
P1.51	DACOUT0	TV Output	P1.52	PWM0	PWM0/GPF14
P1.53	XEINT0	XEINT0/GPN0	P1.54	XEINT1	XEINT1/GPN1
P1.55	XEINT2	XEINT2/GPN2	P1.56	XEINT3	XEINT3/GPN3
P1.57	XEINT4	XEINT4/GPN4	P1.58	XEINT5	XEINT5/GPN5
P1.59	XEINT19	XEINT19/GPL11	P1.60	XEINT20	XEINT20/GPL12
P2	Pin Specification	Comments	P2	Pin Specification	Comments
P2.1	OM3	SD/NAND, Boot	P2.2	OM4	SD/NAND, Boot

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		Mode			Mode
P2.3	M_nRESET	Manual Reset	P2.4	VDD_RTC	RTC Power Supply
P2.5	RTSn1	RTSn1/GPA7	P2.6	CTSn1	CTSn1/GPA6
P2.7	TXD0	TXD0/GPA1	P2.8	RXD0	RXD0/GPA0
P2.9	TXD1	TXD1/GPA5	P2.10	RXD1	RXD1/GPA4
P2.11	TXD2	TXD2/GPB1	P2.12	RXD2	RXD2/GPB0
P2.13	TXD3	TXD3/GPB3	P2.14	RXD3	RXD3/GPB2
P2.15	SPIMOSI	SPIMOSI/GPC6	P2.16	SPIMISO	SPIMISO/GPC4
P2.17	SPICLK	SPICLK/GPC5	P2.18	SPICS	SPICS/GPC7
P2.19	I2CSCL	I2CSCL/GPB5	P2.20	I2CSDA	I2CSDA/GPB6
P2.21	SD0_CLK	SD0_CLK/GPG0	P2.22	SD0_CMD	SD0_CMD/GPG1
P2.23	SD0_nCD	SD0_nCD/GPG6	P2.24	SD0_nWP	SD0_nWP/GPL13
P2.25	SD0_DAT0	SD0_DAT0/GPG2	P2.26	SD0_DAT1	SD0_DAT1/GPG3
P2.27	SD0_DAT2	SD0_DAT2/GPG4	P2.28	SD0_DAT3	SD0_DAT3/GPG5

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P2.29	AC97_BITC LK	AC97_BITCLK/G PD0	P2.30	AC97_RSTn	AC97_RSTn/GP D1
P2.31	AC97_SYNC	AC97_SYNC/GPD 2	P2.32	AC97_SDO	AC97_SDO/GP D4
P2.33	AC97_SDI	AC97_SDI/GPD3	P2.34	XEINT12	XEINT12/GPN1 2
P2.35	ADDR0	ADDR0	P2.36	ADDR1	ADDR1
P2.37	ADDR2	ADDR2	P2.38	ADDR3	ADDR3
P2.39	nCS1	nCS1	P2.40	XEINT7	XEINT7/GPN7
P2.41	nWAIT	nWAIT	P2.42	nESET	Reset
P2.43	LnWE	LnWE	P2.44	LnOE	LnOE
P2.45	DATA0	DATA0	P2.46	DATA1	DATA1
P2.47	DATA2	DATA2	P2.48	DATA3	DATA3
P2.49	DATA4	DATA4	P2.50	DATA5	DATA5
P2.51	DATA6	DATA6	P2.52	DATA7	DATA7
P2.53	DATA8	DATA8	P2.54	DATA9	DATA9
P2.55	DATA10	DATA10	P2.56	DATA11	DATA11
P2.57	DATA12	DATA12	P2.58	DATA13	DATA13
P2.59	DATA14	DATA14	P2.60	DATA15	DATA15

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CON1	Pin Specification	Comments	CON1	Pin Specification	Comments
CON1. 1	VDD_IO(3.3 V)	Output	CON1. 2	GND	
CON1. 3	GPE1		CON1. 4	GPE2	
CON1. 5	GPE3		CON1. 6	GPE4	
CON1. 7	GPM0		CON1. 8	GPM1	
CON1. 9	GPM2		CON1. 10	GPM3	
CON1.1 1	GPM4		CON1. 12	GPM5	
CON1. 13	GPQ1		CON1. 14	GPQ2	
CON1. 15	GPQ3		CON1. 16	GPQ4	
CON1.	GPQ5		CON1.	GPQ6	

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17			18		
CON1. 19	SPICLK0		CON1. 20	SPIMISO0	
CON1. 21	SPICS0		CON1. 22	SPIMOSI0	
CON1. 23	EINT6		CON1. 24	EINT9	
CON1. 25	EINT11		CON1. 26	EINT16	
CON1. 27	EINT17	This is different from MINI6410's CON6.27	CON1. 28	AIN2	
CON1. 29	AIN3		CON1. 30	DACOUT1	
CON2	Pin Specification	Comments	CON2	Pin Specification	Comments
CON2. 1	CAMSDA	Connected I2CSDA	to CON2. 2	CAMSCL	Connected to I2CSCL
CON2.	GPK2		CON2.	CAMRSTn	

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3			4		
CON2. 5	CAMCLK		CON2. 6	CAMHREF	
CON2. 7	CAMVSYN C		CON2. 8	CAMPCLK	
CON2. 9	CAMDATA7		CON2. 10	CAMDATA6	
CON2.1 1	CAMDATA5		CON2. 12	CAMDATA4	
CON2. 13	CAMDATA3		CON2. 14	CAMDATA2	
CON2. 15	CAMDATA1		CON2. 16	CAMDATA0	
CON2. 17	VDD_IO(3.3 V)	Output	CON2. 18	VDDCAM	2.4-2.8V , for CMOS only
CON2. 19	1.8V	Output for CMOS only	CON2. 20	GND	
CON2. 21	GPK8		CON2. 22	GPK12	

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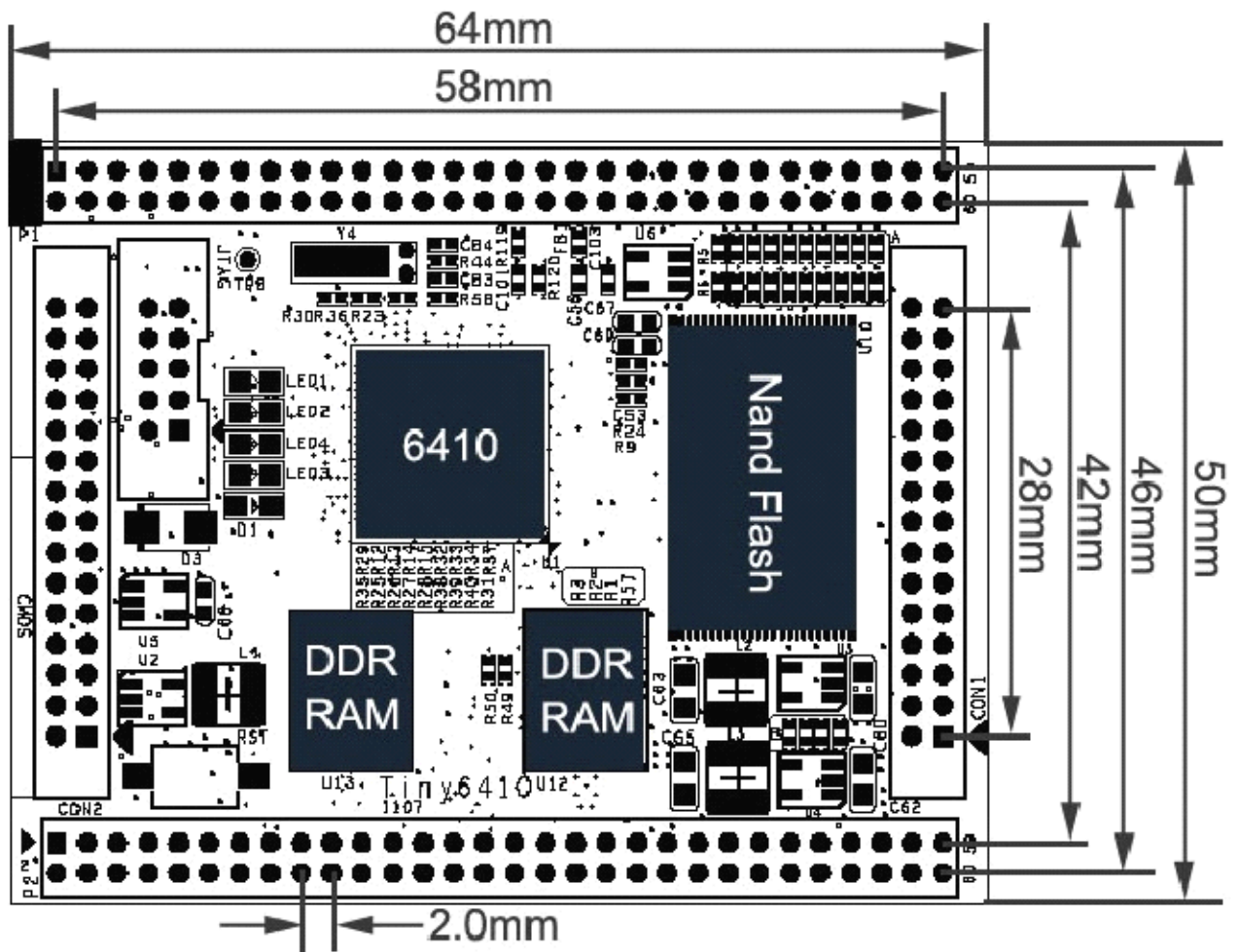
CON2. 23	GPK13		CON2. 24	EINT18	
CON2. 25	VD0	To work in conjunction with LCD signals from P1 for LCD output	CON2. 26	VD1	To work in conjunction with LCD signals from P1 for LCD output
CON2. 27	VD8		CON2. 28	VD9	
CON2. 29	VD16		CON2. 30	VD17	
JTAG	Pin Specification	Comments	JTAG	Pin Specification	Comments
1	VDD_IO	Power Supply 3.3V (Input)	2	VDD_IO	Power Supply 3.3V (Input)
3	TRSTn	TRSTn	4	nRESET	nRESET
5	TDI	TDI	6	TDO	TDO
7	TMS	TMS	8	GND	Ground
9	TCK	TCK	10	GND	Ground

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1.1.3 Core Board Dimension

Below is a detailed Tiny6410 core board drawing:



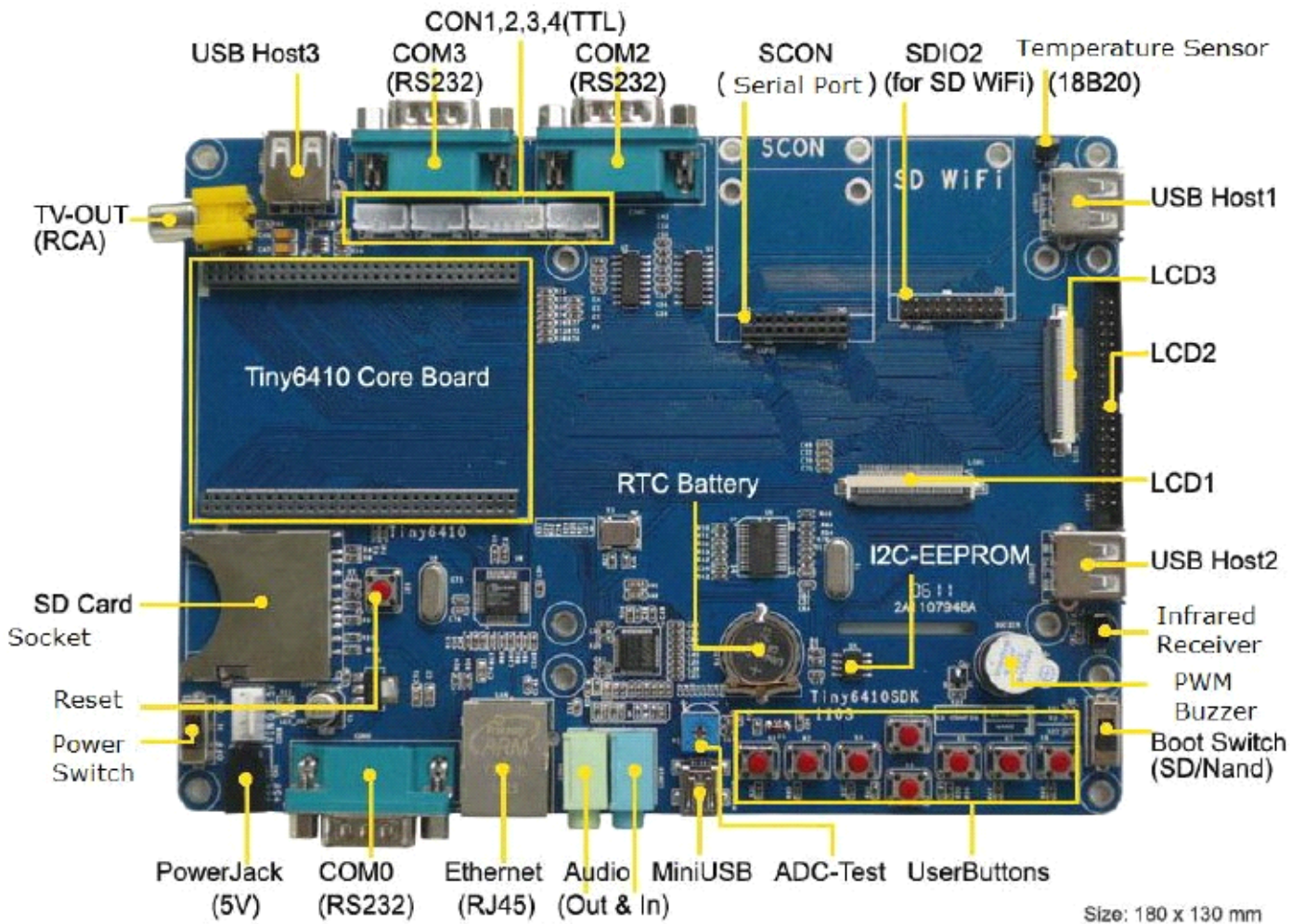
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1.2 Tiny6410 Base Board SDK

1.2.1 Tiny6410SDK Base Board Overview

The Tiny6410SDK base board's layout, interfaces and ports are presented as below:



The following table lists all the hardware features of the Tiny6410SDK base board

Item	Description
------	-------------

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CPU	Samsung S3C6410A(ARM1176JZF-S)
Frequency	533Mhz, Maximum 667Mhz
RAM	128M DDR RAM, 256M optional
Nand Flash	128M/256M/512M/1GB, 256M by default
Multi-media	Support Mpeg4, H.264, H.263, VC1 Hardware Encoding/Decoding up to 30fps@SD
3D	Support 3D hardware accelerator
2D	Support screen zoom in/out and rotation
Debug Interface	COM0 + JTAG + USB Slave
PCB Dimension	180 x 130 mm
Power Supply	5V
LED	4 x User LED(core board), 1 x Power LED
User Button	8 x User Buttons, Interrupt Button
USB Slave	1 x mini USB (Base board doesn't support OTG)
USB Host	4 USB host ports
Network Interface	10/100M MB ethernet, RJ-45 Interface

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1.2.2 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	
0x2000_0000	0x27FF_FFFF	128MB	
0x2800_0000	0x2FFF_FFFF	128MB	DM9000AEP
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	
0x6000_0000	0x6FFF_FFFF	256MB	
			128M DDR RAM

1.2.3 Base Board Interface Specifications

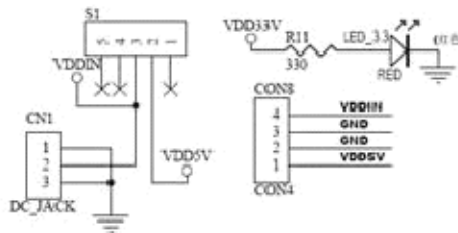
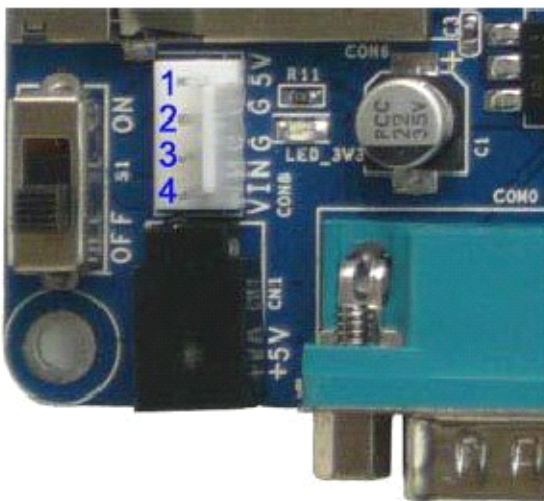
This section describes in detail each interface/port on the board. For more details users can refer to the complete schematics (in PDF and Protel99SE) in the CDs shipped together with this product.

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1.2.3.1 Power

The Tiny6410 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.



1.2.3.2 Serial Port

The Tiny6410 core board has 4 serial ports: UART0, 1, 2 and 3. UART1 is a 5 wire serial port and the other two are 3 wire serial ports.

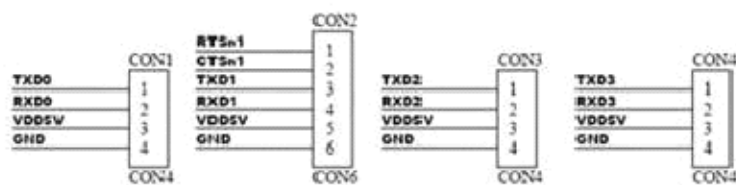
On this board, UART0, 1 and 2 are converted via RS232 to COM0, 1 and 2 can communicate with a PC via a serial port cable.

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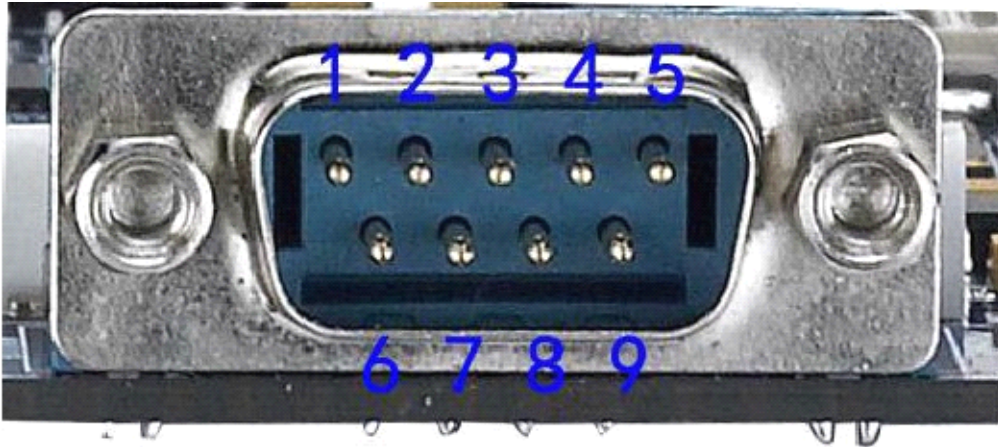


The rest 4 ports are connected to CPU via CON1-4. They are presented as below:



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COM0	PIN Spec	COM1	PIN Spec	COM2	PIN Spec	COM3	PIN Spec	
1	NC	1	NC	1	NC	1	NC	
2	RSRXD0	2	RSRXD1	2	RSRXD2	2	RSRXD3	
3	RSTXD0	3	RSTXD1	3	RSTXD2	3	RSTXD3	
4	NC	4	NC	4	NC	4	NC	
5	GND	5	NC	5	GND	5	GND	
6	NC	6	NC	6	NC	6	NC	
7	NC	7	RSRST1	7	NC	7	NC	
8	NC	8	RSRST1	8	NC	8	NC	
9	NC	9	NC	9	NC	9	NC	
Note: NC means floating								

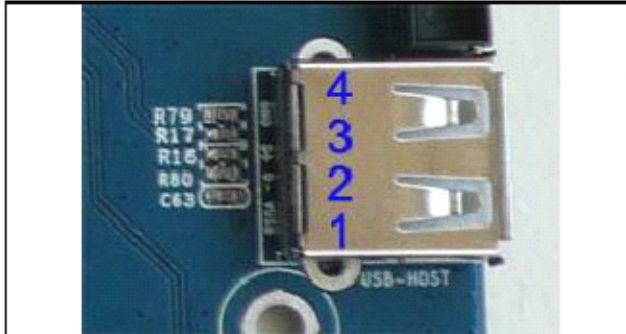
1.2.3.3 USB Host Interface

The Tiny6410 board has four A type USB Host 1.1 interfaces. They are the same as the USB interface on a PC and can connect to a USB camera, keyboard, mouse, flash drive and other USB devices.

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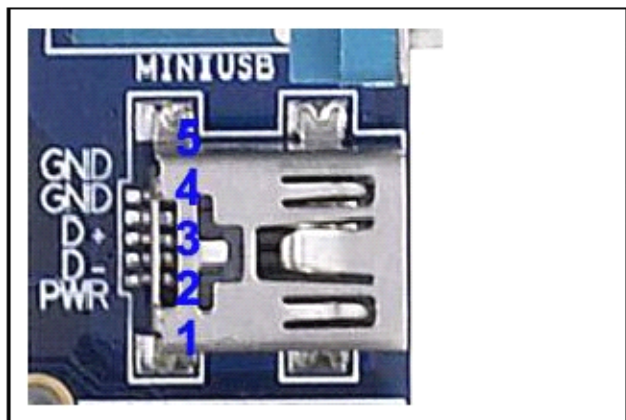
USB Host:

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

1.2.3.4 USB Slave Interface

This board has another 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:

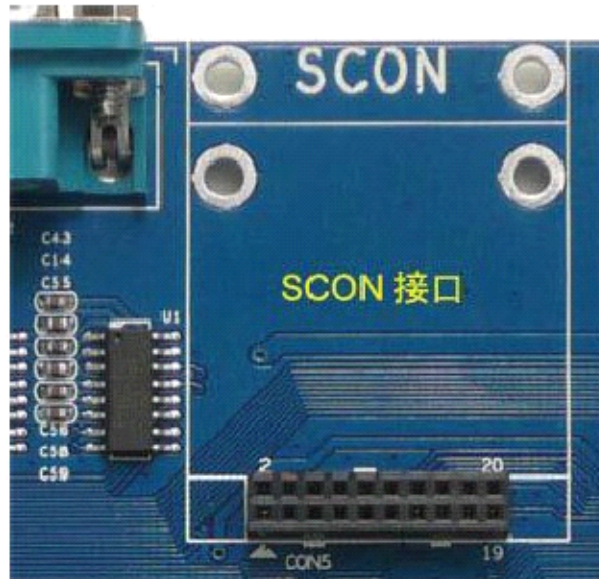
	Mini USB	PIN Spec
	5	GND
	4	OTGID
	3	D+
	2	D-
	1	Vbus

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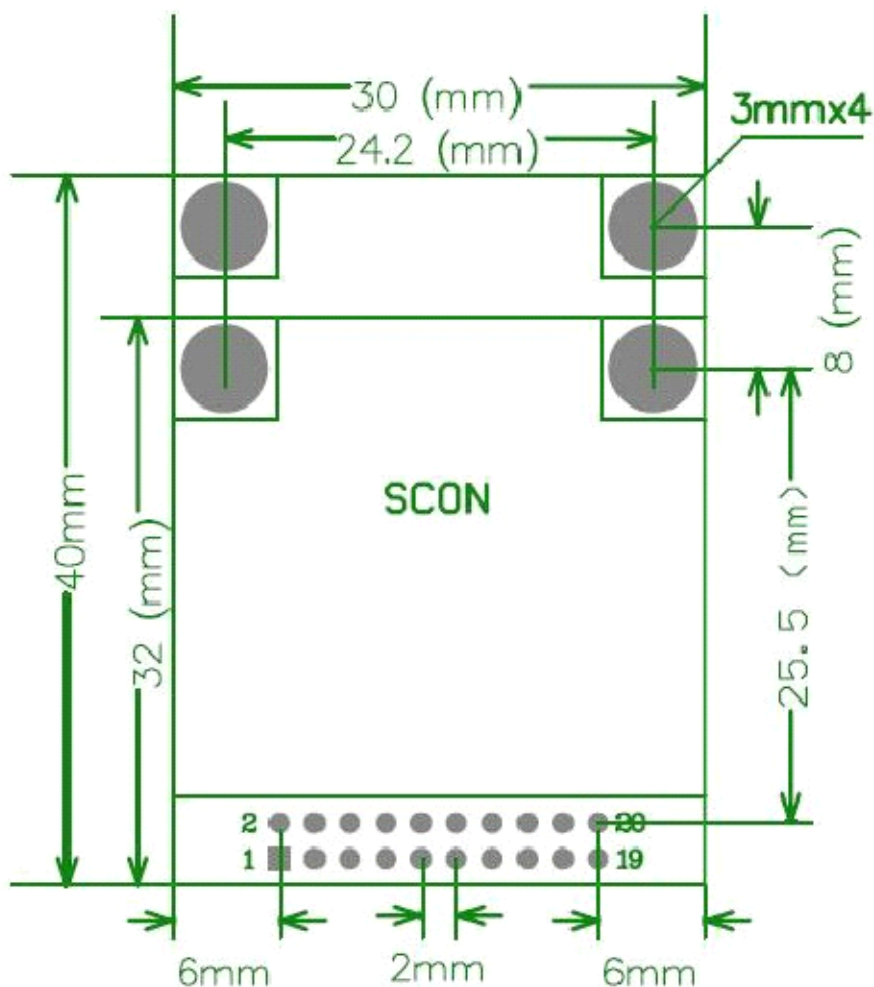
1.2.3.5 SCON Interface

In order for users to develop their own serial port devices we especially developed a SCON interface called “Serial Port Integrator” which includes two serial ports, one I2C, one USB host, one GPIO, one 5V power output and one 3.3V power output.



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SCON Interface Pin Specification	Comments	SCON1	Pin Specification	Comments
1GND		2	5V Output	
3USB_D		4	USB_D+	
5I2CSCL		6	I2CSDA	
7TXD1		8	RXD1	
9CTSn1	TTL	10	RTSn1	TTL
11TXD2	TTL	12	RXD2	TTL
13SPIMOSI	TTL	14	SPIMISO	TTL
15SPICS	6410 SPI1	16	SPICLK	6410 SPI1
17nRESET	6410 SPI1	18	EINT8	6410 SPI1
	Reset			When this pin is utilized U10 needs to be

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					disconnected
19	GND		20	3.3V Output	

1.2.3.6 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 tiny6410.

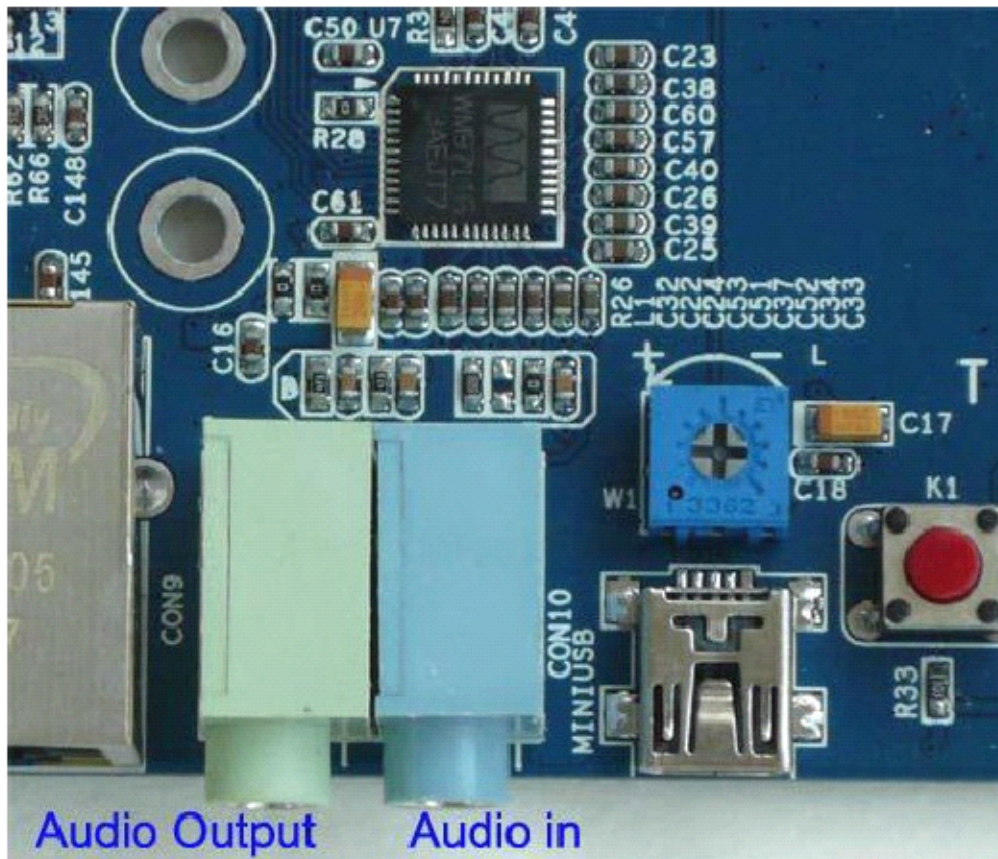
1.2.3.7 Audio Interface

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.

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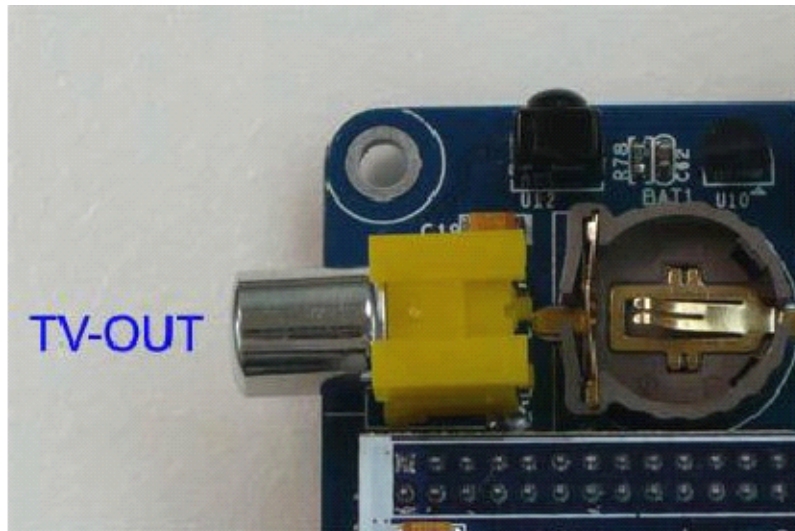
1.2.3.8 TV Output

The S3C6410 has two TV outputs. The Tiny6410 system magnifies the output of DACOUT0, users can connect the board to a TV via an AV cable.

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

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1.2.3.9 JTAG Interface

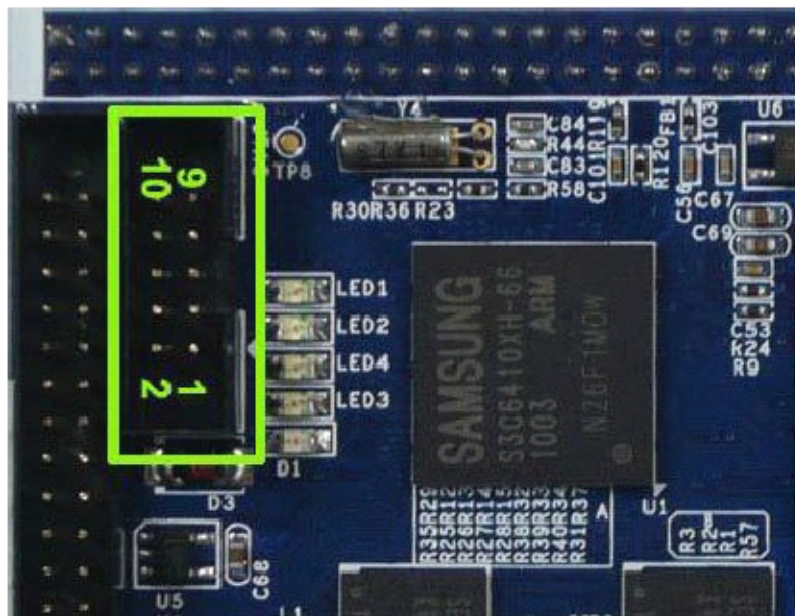
When a board just comes off from production lines it is just a bare board without any data and we usually have to burn the first program to it through the JTAG interface. However since the S3C6410 supports booting from SD card the JTAG is not significant to users any more. Now the JTAG is more often 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

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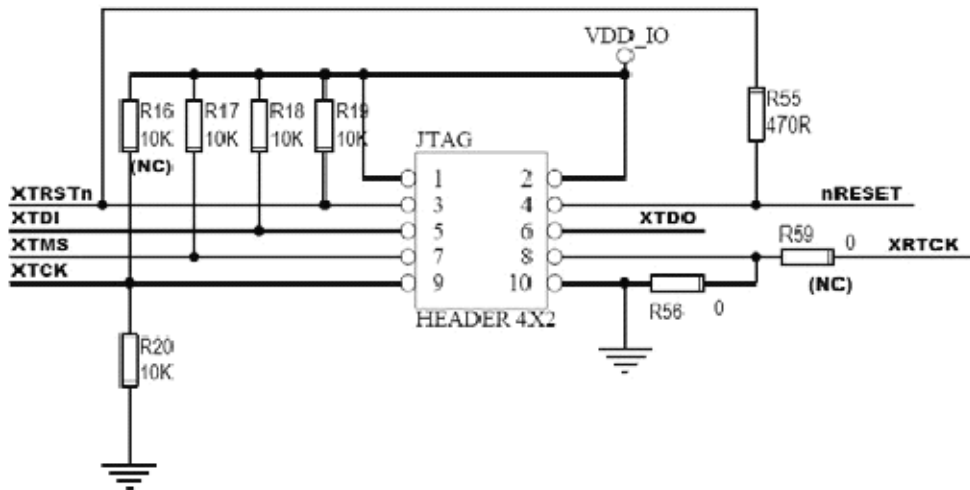
JTAG interface. The mini6410 has a 10Pin JTAG interface which has complete standard JTAG signals.

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.



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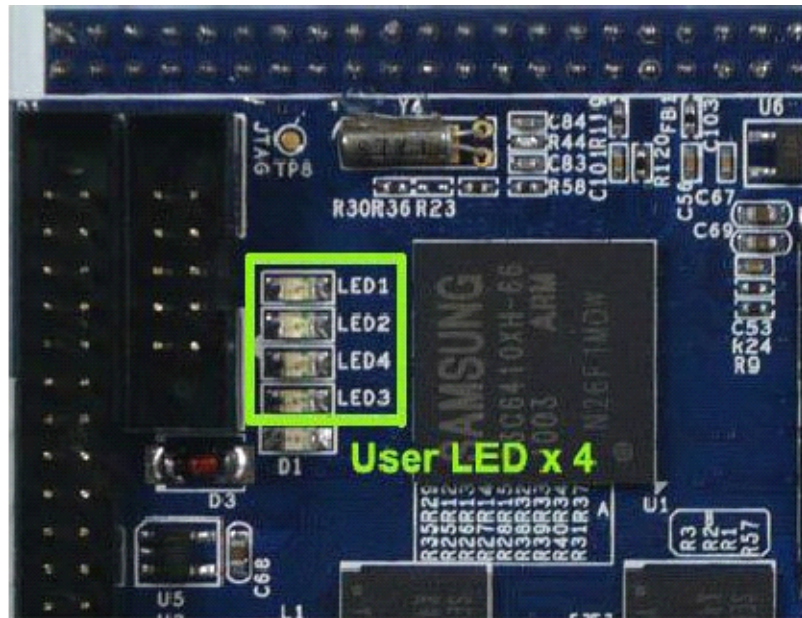
1.2.3.10 LED

A LED is commonly used as a status indicator. The Tiny6410 has 4 user programmable LEDs which are directly connected to GPIO. The LEDs will be on at a low level voltage.

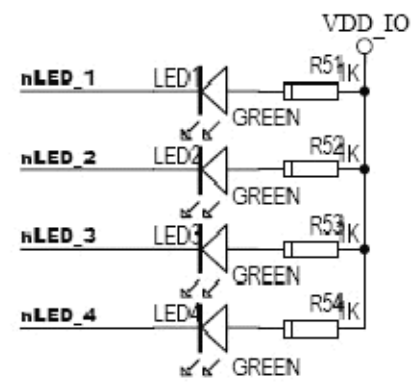
Detailed information is as follows

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A12/GPK12	N25	KP_ROW4	
A11/GPK11	P18	KP_ROW3	
A10/GPK10	P23	KP_ROW2	
A9/GPK9	P19	KP_ROW1	
A8/GPK8	P25	KP_ROW0	
A7/GPK7	R25	nLED_4	
A6/GPK6	R24	nLED_3	
A5/GPK5	R22	nLED_2	
A4/GPK4	R23	nLED_1	
A3/GPK3	T23	GPK3	(NC)
A2/GPK2	T24	GPK2	
A1/GPK1	T22	GPK1	
A0/GPK0	T25	GPK0	



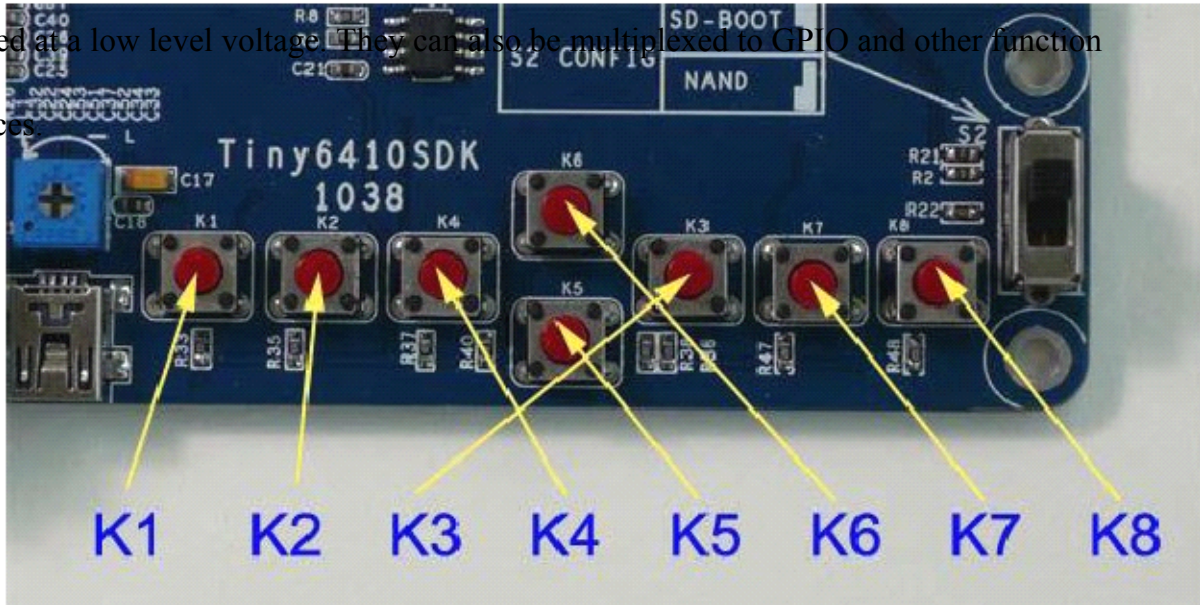
	LED4	LED3	LED2	LED1
GPIO	GPK7	GPK6	GPK5	GPK4

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1.2.3.11 User Key

The Tiny6410 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.



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

1.2.3.12 LCD Interface

For users' convenience we incorporate three LCD interfaces on the board: LCD1, LCD2 and LCD3. LCD1 and LCD2 are 0.5mm spaced 40 pin connectors, and LCD3 is a 2.0mm spaced 40 pin connector.

The LCD connectors have most of the commonly used control signals (line sweeping,

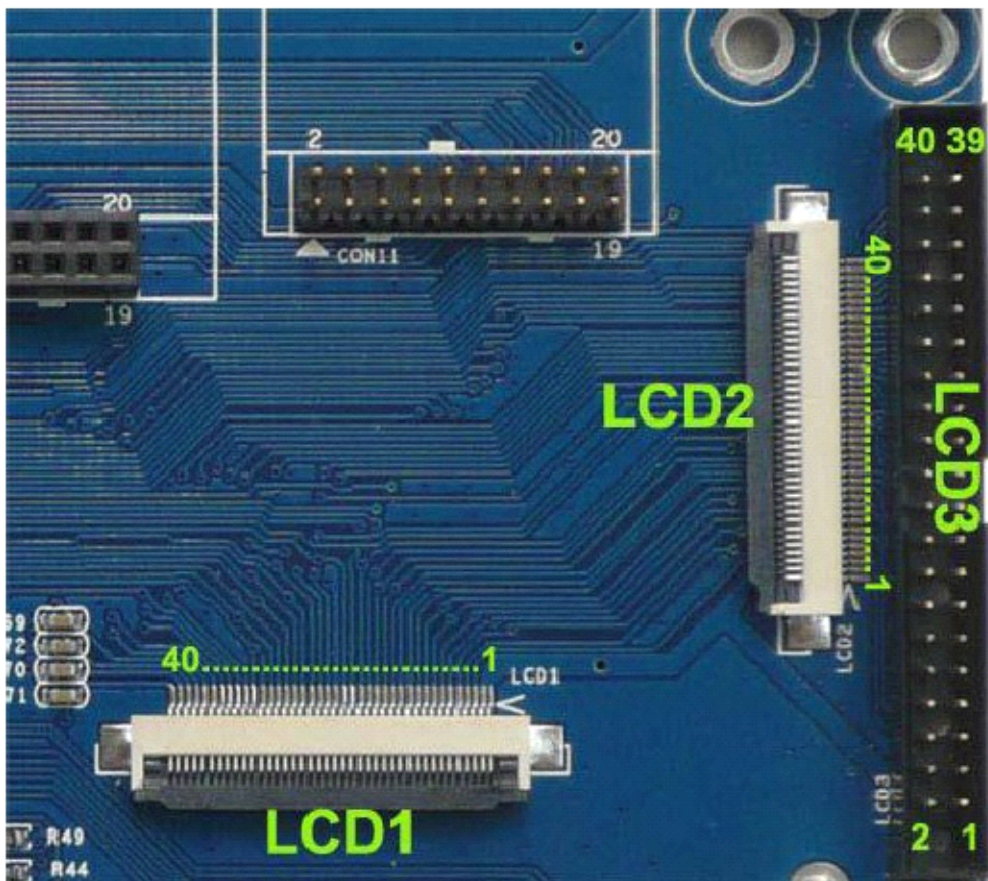
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field sweeping, clock, enable/disable) and 6:6:6 RGB data signals.

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

Note: if you need 8:8:8 LCD signals, you need to extend from the board's CON2 (please refer to the core board's pin specifications), which corresponds to the words marked in red in the following table



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LCD1, LCD2 & LCD3	PIN Spec	LCD1, LCD2 & LCD3	PIN Spec
1	5V	2	5V
3	NC	4	NC
5	VD2	6	VD3
7	VD4	8	VD5
9	VD6	10	VD7
11	GND	12	NC
13	NC	14	VD10
15	VD11	16	VD12
17	VD13	18	VD14
19	VD15	20	GND
21	NC	22	NC
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	VSYN
35	HSYN	36	VCLK
37	TSXM	38	TSXP
39	TSYM	40	TSYP
		41	GND

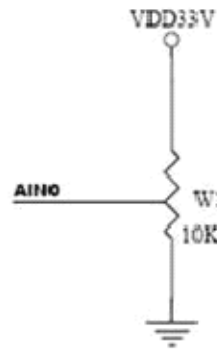
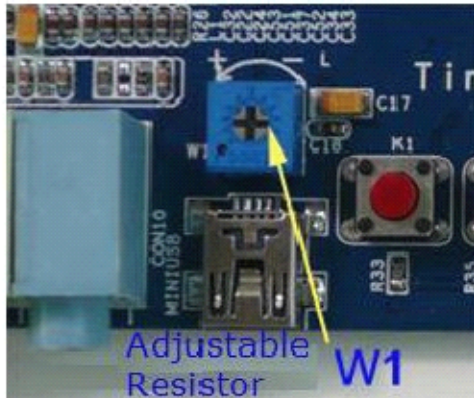
1.2.3.13 ADC Input

The Tiny6410 has 2 A/D conversion channels. AIN0 is connected to the adjustable resistor W1. 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.

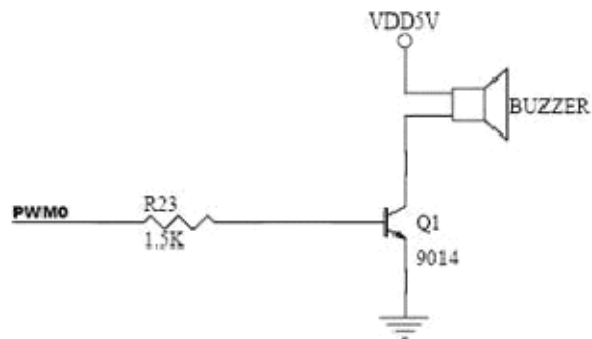
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1.2.3.14 PWM Buzzer

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.

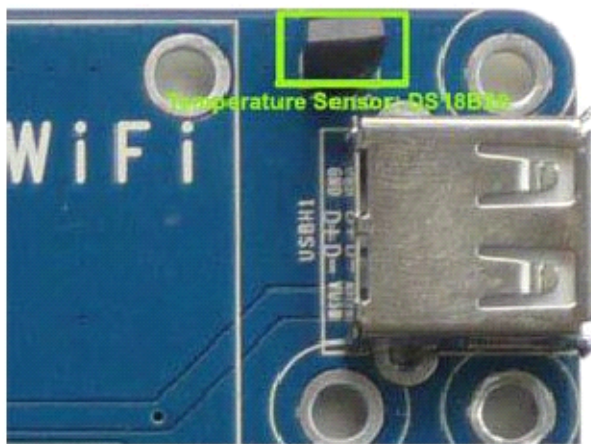


1.2.3.15 Temperature Sensor

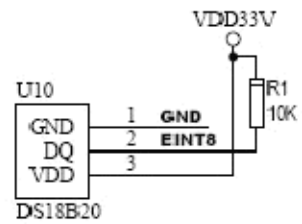
The Tiny6410 board has a DS18B20 temperature sensor. It is connected to a CPU interrupt pin.

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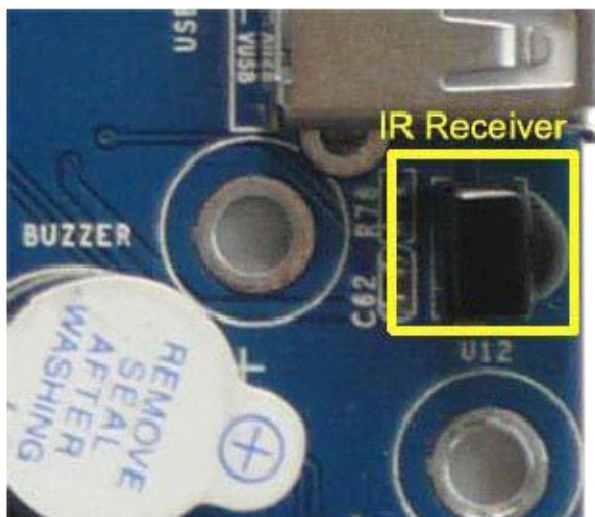


Temperature Sensor

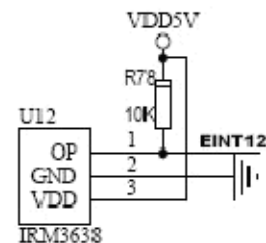


1.2.3.16 Infrared Receiver

The Tiny6410 has an infrared receiver. Its type is IRM3638 (or others compatible). It connects to EINT12.



IR Receiver

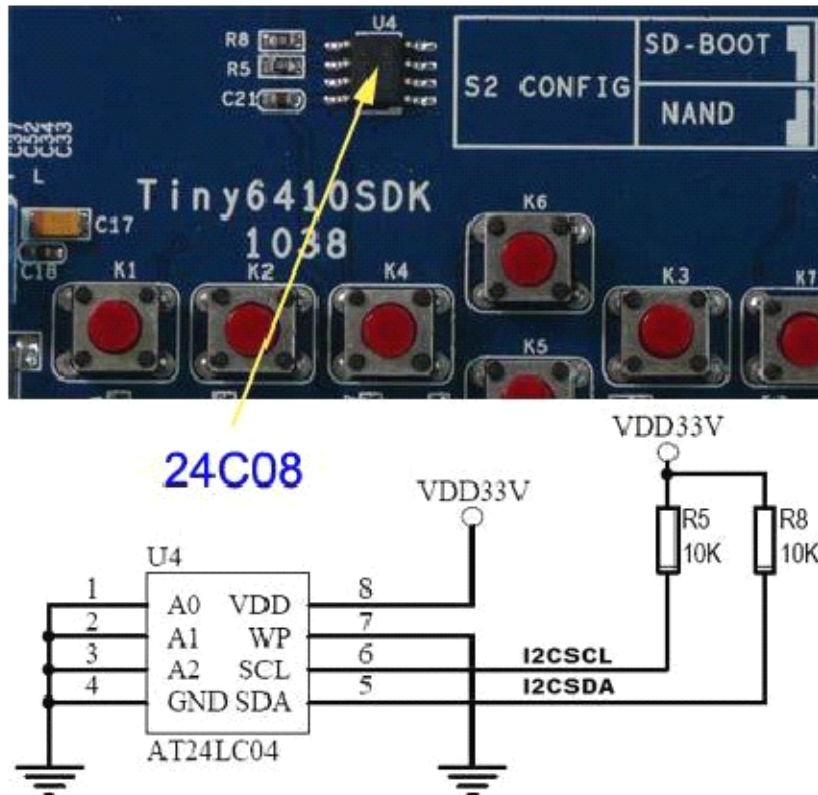


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1.2.3.17 I2C-EEPROM

The mini6410 has an EEPROM AT24C08 connected to CPU's I2C. It has 256 bytes memory and is mainly for testing I2C bus.

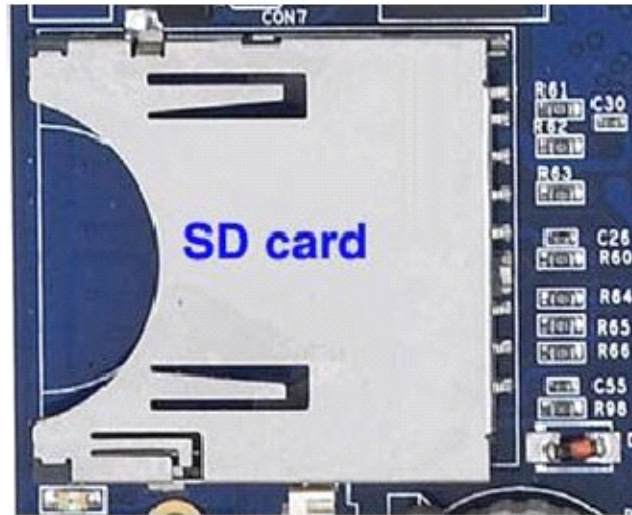


1.2.3.18 SD Card

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 CON6. It supports SDHC i.e. high speed large memory SD cards.

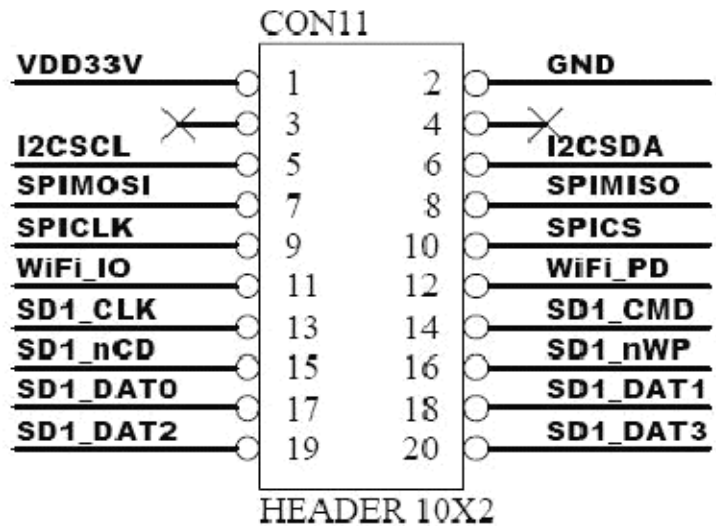
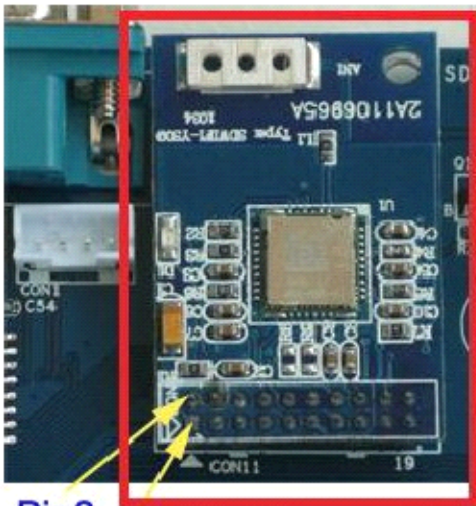
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1.2.3.19 SDIO-II/SD-WiFi

The other SDIO of the S3C6410 is extended via CON11. It is a 2.0 mm spaced 20 pin connector and includes one SPI and 2 GPIOs.

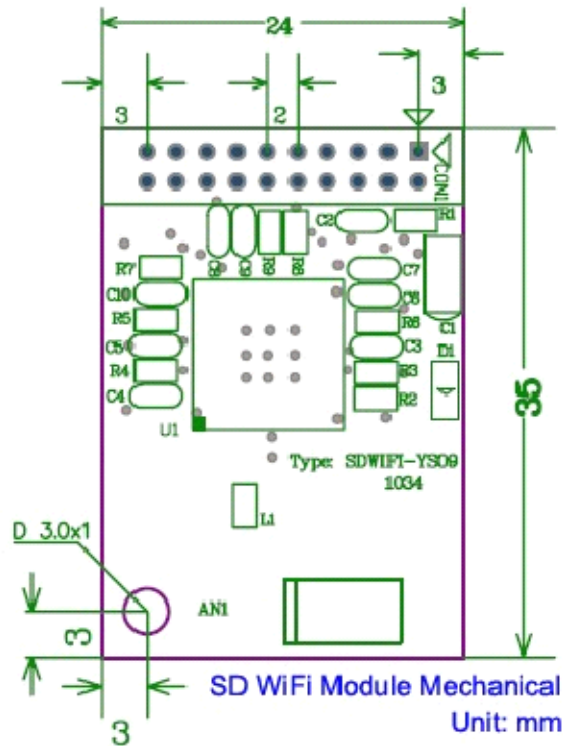


Pin2
Pin1
SD WiFi Module

SD WiFi Module Dimension:

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Note: by default the SD WiFi module is not included in our standard package. Users can contact us for more details

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2 Software Features

2.1 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
 - Driver for 4 serial ports
 - DM9000 driver
 - Audio driver (WM9714)

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- 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

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- 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)
- USB WiFi Kits: USB wireless tool kits
- 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
 - SD auto mounting/unmounting
 - USB mouse can work together with touch screen
 - Touch screen calibration
- 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

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- 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
- Cross Compiler
 - arm-none-linux -4.5.1-v6-vfp: cross compiler

2.2 WinCE 6.0 Features

- Version

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- 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

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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

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2.3 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

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- 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

2.4 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

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