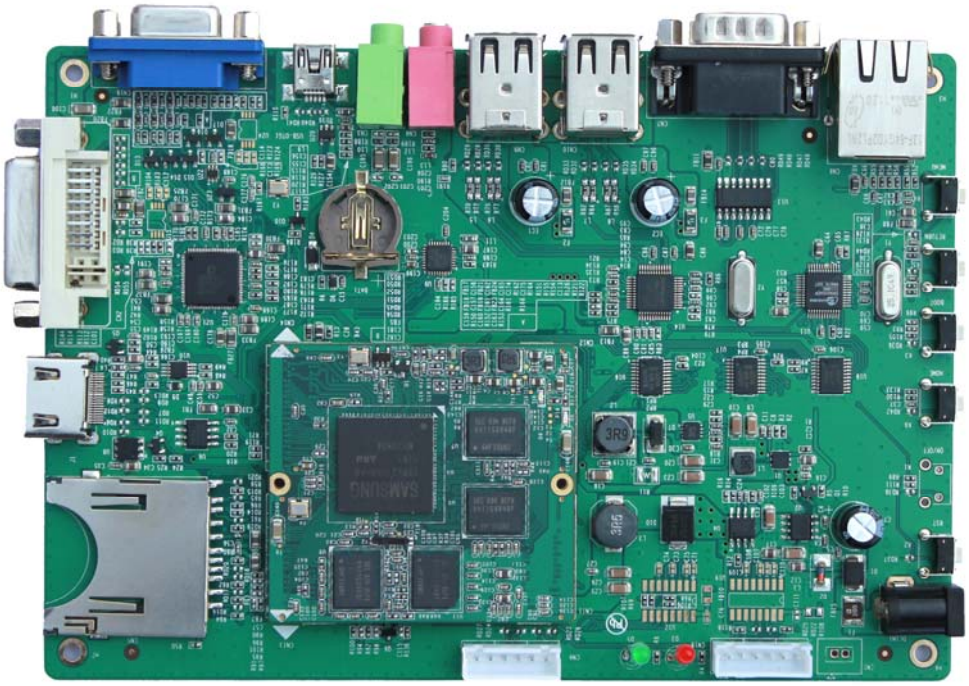
SBC2100 Single Board Computer

- *1GHz Samsung S5PV210 ARM Cortex-A8 Application Microprocessor*
- *1GBytes Mobile DDR2 and 1GBytes NAND Flash*
- *UART, USB Host/OTG, Ethernet, HDMI, DVI-D/VGA, Audio, SD,...*
- *Optional WiFi and 3G Modules*
- *Ready-to-Run Android 2.2 and WinCE 6.0 OS*



SBC2100 Single Board Computer

Overview

Embest SBC2100 Single Board Computer is designed based on Mini2100 processor card which is using Samsung's S5PV210 ARM Cortex-A8 processor to provide cost-effective, low power, and high performance microprocessor solution for mobile phones and general applications.

The Mini2100 processor card mounts directly on top of the expansion board, connecting via four high-quality 0.5mm space 2*40-pin board-to-board connectors. It has the S5PV210 processor, 1Gbytes mobile DDR2 and 1Gbytes Nand Flash on board. Up to 237 multi-functional input/ output ports are brought out through the pins of expansion connectors.

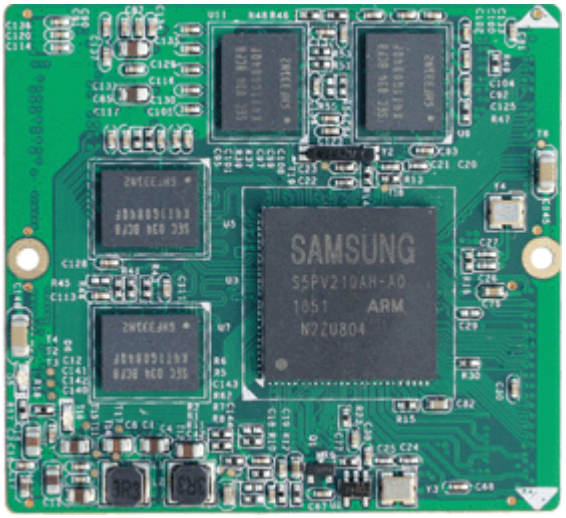
The SBC2100 expansion board has extended rich hardware peripherals interfaces including HDMI, DVI-D/VGA, Serial port, Ethernet, USB Host, SD, Audio and Buttons to demonstrate powerful performance of the S5PV210. It features HDMI and VGA/DVI-D video output which can implement large size monitor and TV display. It has four USB Host ports via Hub chip which allows you to connect to various USB devices. Currently Embest offers optional USB WiFi, USB Digital Camera and USB 3G function modules for using under Windows CE OS on this board.

The board is supports for running Android and WindowsCE operating systems. Embest offers Android 2.2 and WindowsCE 6.0 BSP along with documents for this board, the software drivers are mostly in source code. The device would be a solid reference board for developers who will use the S5PV210 processor for evaluation and development. It can also be used directly for multi-media applications.

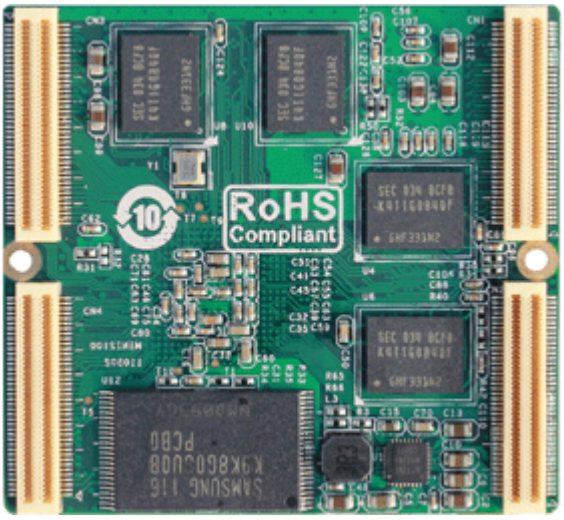
Hardware Features

The SBC2100 Single Board Computer has the Mini2100 as CPU core board and an expansion board to extend many hardware peripherals through four 0.5mm space 2*40-pin board-to-board connectors. The hardware is characterized as following:

CPU Board Mini2100



Top-View



Bottom-View

Mechanical Parameters

- Dimensions: 55.2 mm x 50.5 mm
- Working temperature: 0~70 Celsius
- Humidity Range: 20% ~ 90%
- Power Consumption: 200mA @ 5V

Processor

- Samsung S5PV210 Mobile Application Processor
  - Up to 1-GHz ARM® Cortex™-A8 Core with NEON, also supports 800-MHz operation
  - 32KB I-Cache; 32KB D-Cache; 512KB L2 Cache
  - Onchip 64KB ROM and 96KB SRAM
  - Built-in the programmable PowerVR SGX540 core
  - 2D/3D Graphics Acceleration
  - Multi Format Codec provides encoding and decoding of MPEG-4/H.263/H.264 up to 1080p@30fps and decoding of MPEG-2/VC1 video up to 1080p@30 fps

Memory

- 1GBytes Mobile DDR2, 8-bit
- 1GBytes NAND Flash, 8-bit

Expansion Interfaces and Signals Routed to Pins

- Four 0.5mm space 2*40-pin board-to-board female expansion connectors
  - TFT LCD Interface (support 24/ 18/ 16-bpp parallel RGB Interface LCD)
  - Analog TV interface (support NTSC / PAL)
  - HDMI Digital TV Interface (Supports 480p, 576p, 720p, 1080i, 1080p)
  - 3-channel Camera Interfaces (Supports ITU-R BT 601/656 YCbCr 8-bit, MIPI mode)
  - PCM Audio Interface (Supports three port PCM interface)

- AC97 Audio Interface (Supports AC97 Full Specification)
- JTAG Debugger Interface
- USB 2.0 OTG (Supports high-speed up to 480 Mbps)
- USB 2.0 Host (Supports high-speed up to 480 Mbps)
- 14*8 Key Matrix support
- 2-channel SPI Interfaces
- 3-channel IIS bus interfaces
- 3-channel IIC bus interfaces
- 4 channel HS-MMC/SD
- 4-channel UART (Supports 5-bit, 6-bit, 7-bit, or 8-bit serial data transmit/ receive)
- 10-channel multiplexed ADC (support Maximum 500Ksamples/sec and 12-bit resolution)
- GPIO (up to 237 multi-functional input/ output ports)

Expansion Board of SBC2100

Mechanical Parameters

- Dimensions: 165.2 mm * 114.1 mm
- Power Input: +5V
- Power Consumption: 5V@250mA
- Working temperature: 0~70 Celsius
- Humidity Range: 20% ~ 90%

Audio/Video Interfaces

- HDMI input interface (supports 1080p@30fps video encoding and decoding of MPEG-1/2/4, H.263, and H.264, and decoding of VC1)
- DVI high-resolution image display output port (supports 720p, 30fps signal)
- Standard VGA interface (supports resolution up to 1366*768 pixels, uses the same channel to DVI so can not be used with DVI at the same time)
- 3.5mm Audio input jack (Mic In)
- 3.5mm Audio output jack

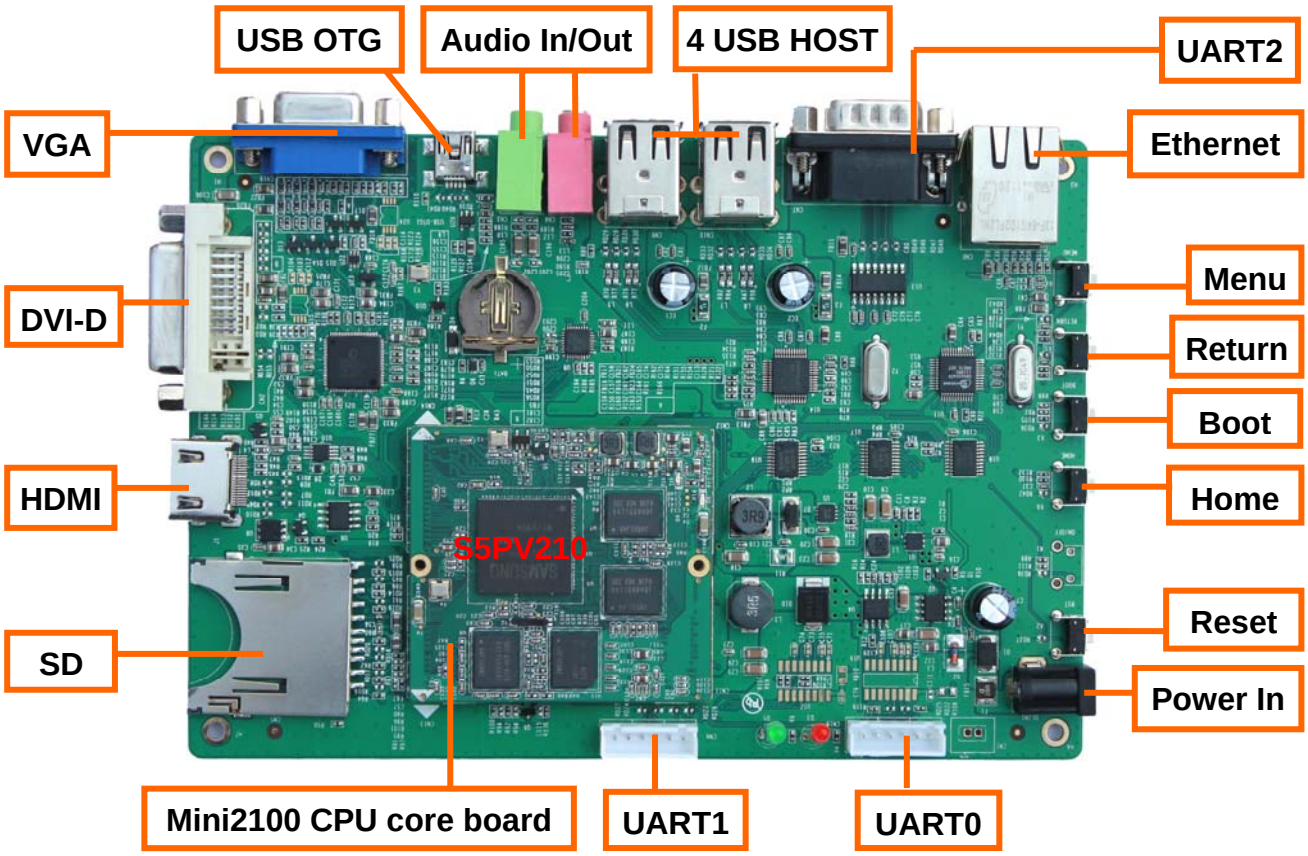
Data Transfer Interface

- Serial port:
  1 x 5 line Debug serial port, RS232 voltage (UART2, brings out by DB9 connector)
  1 x 3 line serial port, TTL voltage (UART0, brings out by one 2.0mm space 6-pin connector)
  1 x 5 line serial port, TTL voltage (UART1, brings out by one 2.0mm space 6-pin connector
- USB port:
  1 x USB2.0 OTG port, High-speed (Mini USB-B type)
  4 x USB2.0 Host ports, High-speed (USB-A type)
- 1 x SD card slot
- 1 x 10/100Mbps Ethernet interface (RJ45 connector)

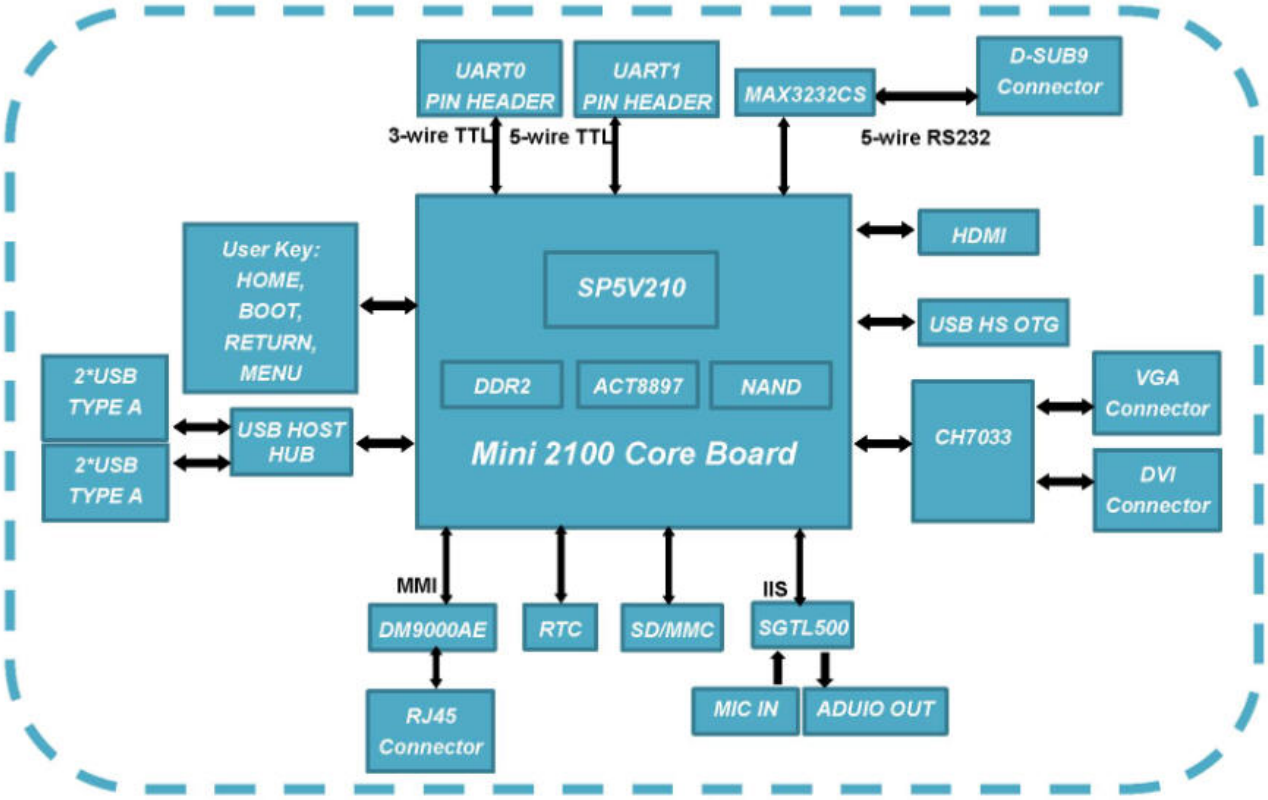
Input Interface and others

- 1 x RESET button
- 4 x User buttons (used as Home, Menu, Return and Boot in Android system)
- 1 x LED power indicator
- 1 x User LED

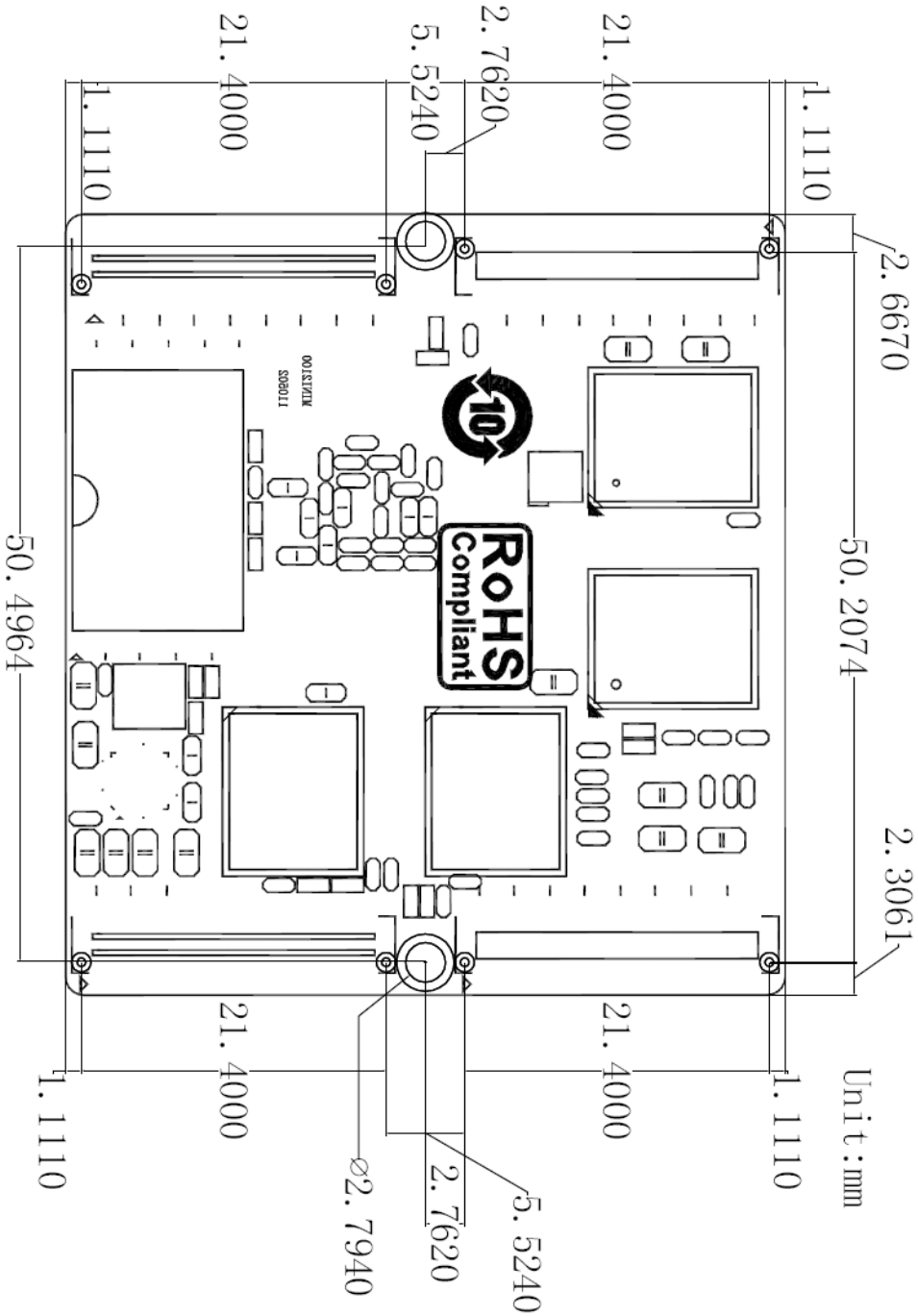
Interface Introduction



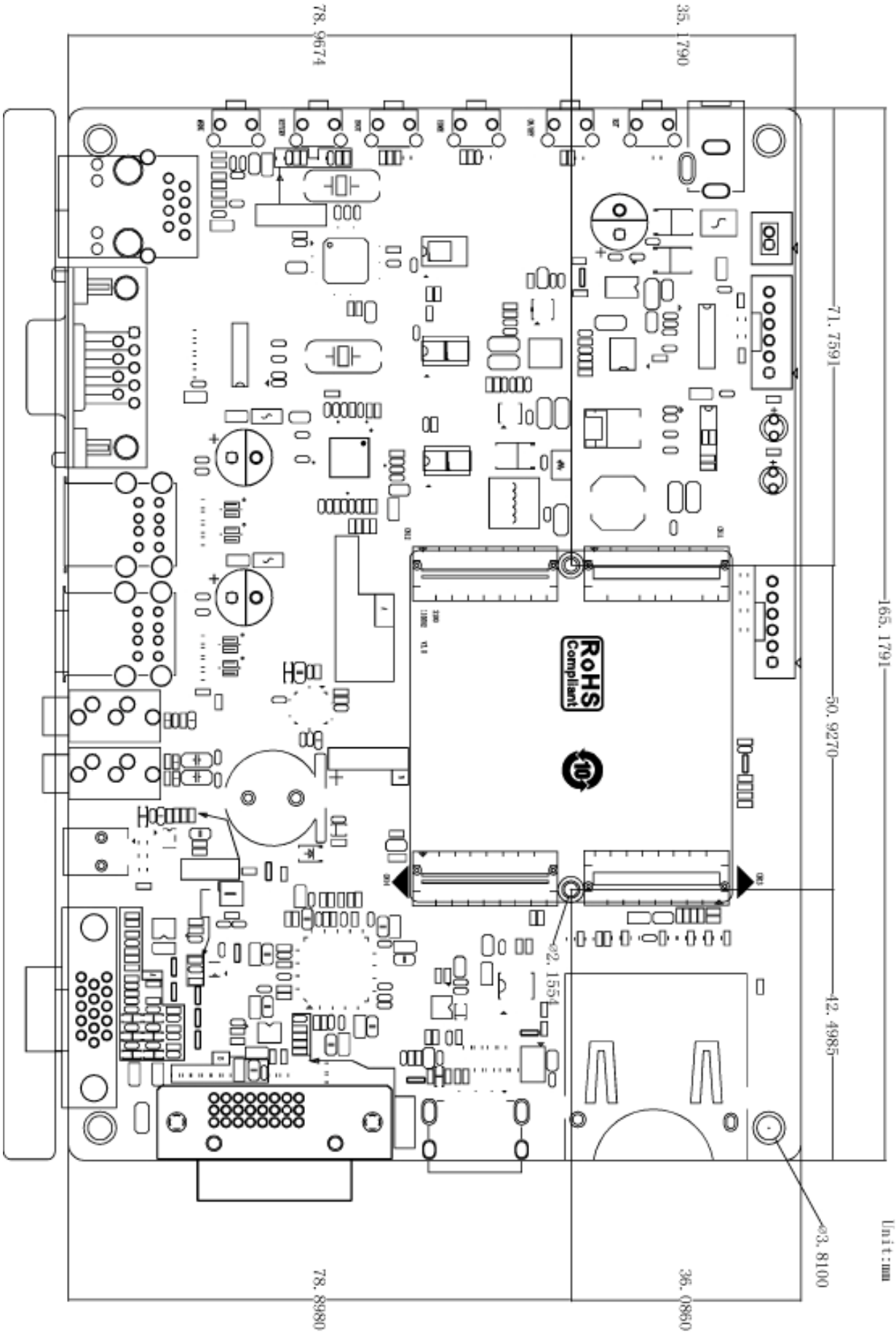
Function Block Diagram



Dimensions



SBC2100 CPU core board (Mini2100) CPU core board Dimension Chart



SBC2100 Expansion Board Dimension Chart

Software

The SBC2100 Single Board Computer is provided with Android 2.2 and WinCE 6.0 BSP, with steady-going drivers, many of which are all in source code. Please refer to below table.

OS	Item		Remark
Android	BIOS	x-loader	NAND / ONENAND
			MMC/SD
			FAT
		u-boot	NAND / ONENAND
			MMC/SD
			FAT
			NET
	Kernel	Android2.2	Supports ROM/CRAM/EXT2/EXT3/FAT/NFS/JFFS2/YAFFS2 file systems
	File system	Ramdisk, EXT3, Yaffs2 File System	
		udev support	
	Driver	Nand Flash, SDRAM, HDMI, DVI-D, VGA, Serial port, Ethernet, USB OTG, USB EHCI, SD card, Audio input/output, Key, LED, RTC (in source code)	
		2D/3D (library file, no source code provided)	
	Application Demo	MP3/MPEG4/H264 DSP hardware decoder (library file, no source code provided)	
	Cross-compile toolchains	arm-eabi-4.4.0+arm-2009q3-67-arm-none-linux-gnueabi-i686-pc-linux-gnu	
WinCE	Steploader	UART	
		NAND	
		MMC/SD	
	Eboot (WinCE6.0)	UART	
		NAND	
		MMC/SD	
	OAL (in source code)	KILT (USB RNDIS & USB serial), Boot parameter, RTC, System timer, Interrupt controller, MMU, Serial Debug Port, Kernel Profiler-use timer2, Library Abstrations (GPIO abstrations), Power management	
	Driver (in source code)	Audio (I2S and AC97), Backlight, Battery, Camera, CEC, CMM (codec memory management), Display, I2C, IROM BOOT, JTAG, Keypad, MFC (Mutli-Format Codec, MPEG2,MPEG4, H.263,H.264, VC-1), Nand Flash, NLED, OTG Device, Power Button, Power Control, SD/MMC, Serial port, SPI, Touch Screen, TVOUT(HDMI and Composite Video), USB EHCI, USB OHCI, DM9000 NDIS, CH7033（DVI/VGA）	
	Drivers for Optional Modules	WF8000-U USB WiFi Module CAM8100-U USB Digital Camera Module CDMA8000-U USB 3G Module WCDMA8000-U USB 3G Module (no source code provided)	
	Application Demo	HDMI output example	
	Software features	Supports .NET Compact Framework 3.5 and KITL kernel debug	
		Supports Hive registry and ROM file system	

Order Information

Order No.	T6010161
Item	SBC2100 Single Board Computer
Deliveries	• One SBC2100 Single Board Computer (including the CPU core board Mini2100) • One 5V power adapter • One cross serial cable • One HDMI cable • One 2GB SD card • One Product CD (including user manual, schematic in PDF format, datasheet, Android 2.2 and WinCE6.0 BSP)
Options	• WF8000-U USB WiFi Module • CAM8100-U USB Digital Camera Module • CDMA8000-U USB 3G Module (CDMA2000 Standard) • WCDMA8000-U USB 3G Module (WCDMA Standard) • Mini2100 Processor Card
Price	Please contact us.

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