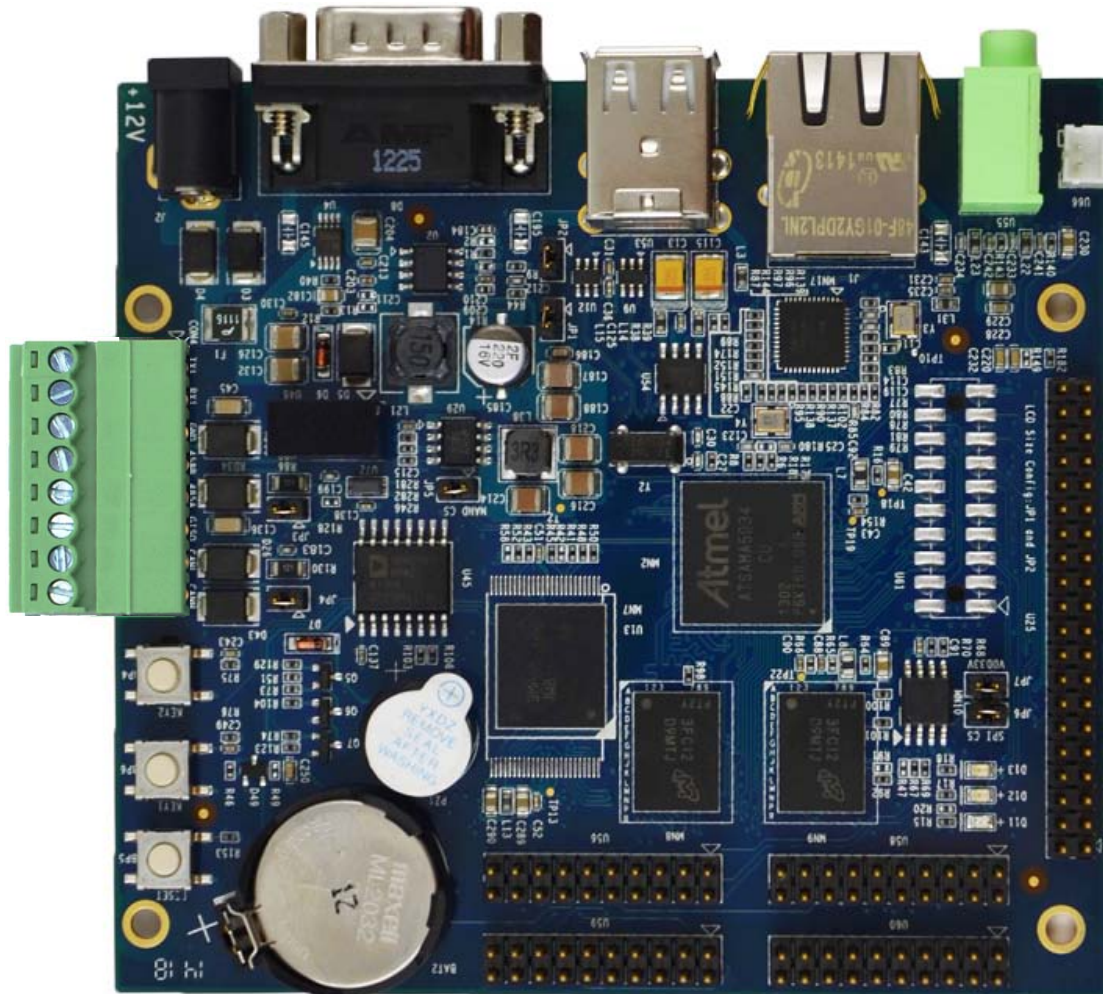


Brief Introduction to SBC60A5 Single Board Computer



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Product Overview

1. About SBC60A5

SBC60A5 is an ARM-based embedded single board computer designed by Embest for industrial control applications. It is built on Atmel Cortex-A5 ATSAMA5D34 – an industrial processor and featured with small size and low cost.

SBC60A5 has 512MB DDR2 SDRAM, 4GB eMMC and 4MB DataFlash, as well as a variety of expansion interfaces such as 4 USARTs (1 RS232, 1 RS485 and 2 TTL levels), 1 CAN bus, 1 gigabit Ethernet, 2 high-speed USB host, 1 SD/MMC, 1 audio input and 1 audio output.

SBC60A5 complies with industrial standards and is available in two models, general model and custom model. The former model works in $-25^{\circ}\text{C} \sim 85^{\circ}\text{C}$ temperature range, while the latter can operate in a wider range from -45°C to 85°C . SBC60A5 is designed to satisfy the requirements of different industrial products used in a wide range of areas including industrial control, field communications, data acquisition & analysis, and instruments and meters.

2. On-Board Interfaces

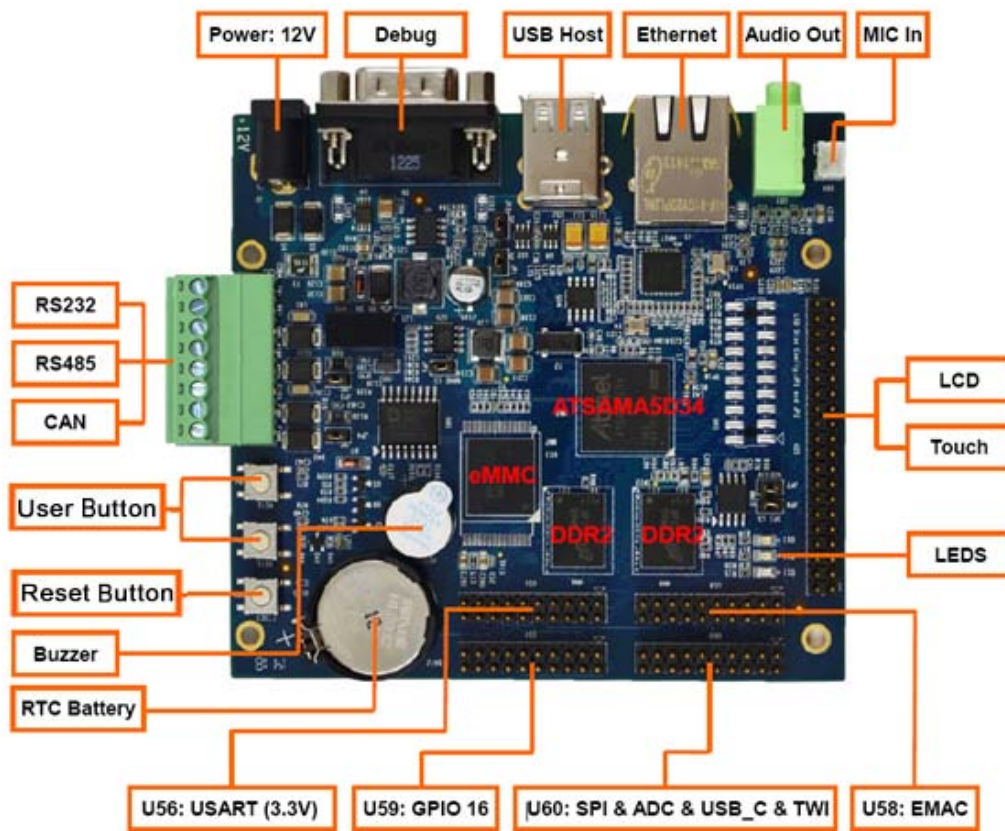


Figure 1 Interfaces on top side of SBC60A5

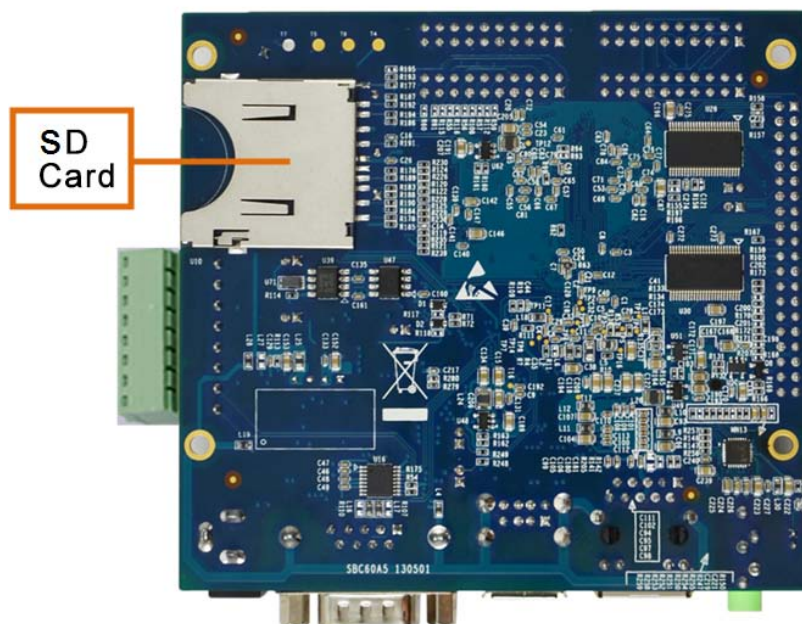


Figure 2 Interfaces on bottom side of SBC60A5

3. System Block Diagram

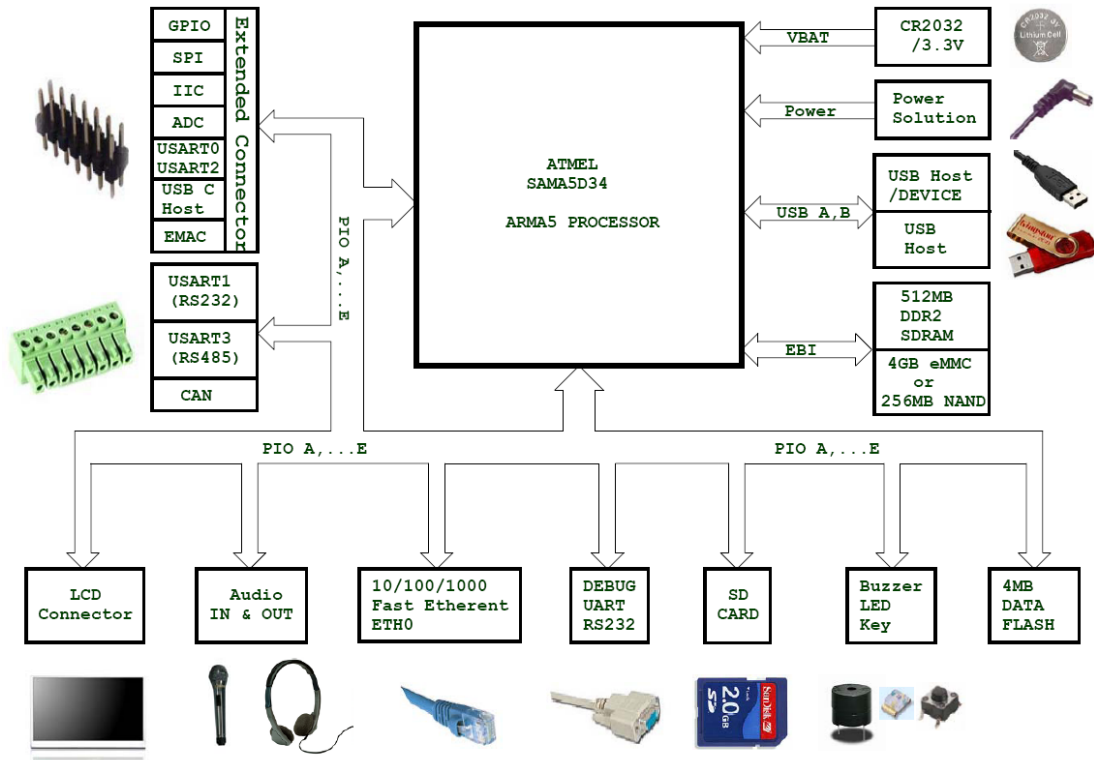


Figure 3 Block diagram of SBC60A5

4. Product Dimensions

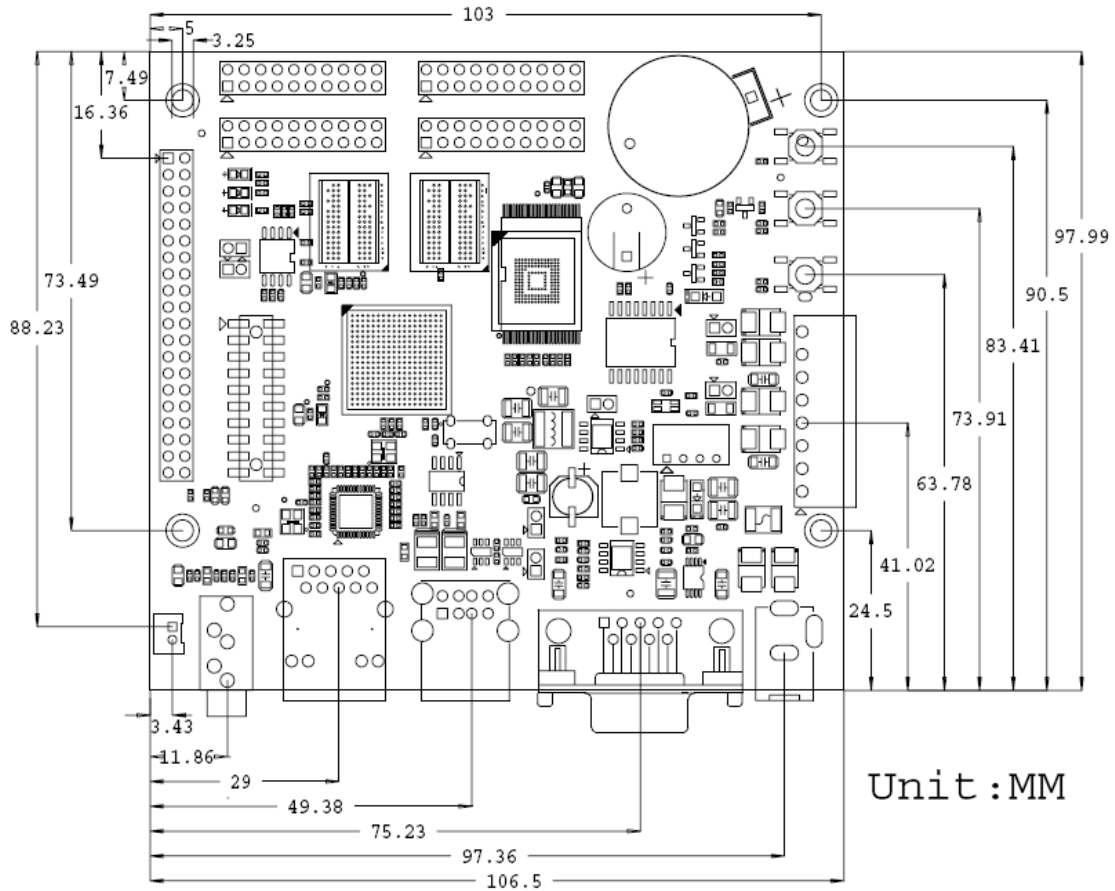


Figure 4 Dimensions of SBC60A5

5. Packing List

- SBC60A5 PCBA×1
- 12V 2A power adapter×1
- DB9 cross-over serial cable×1
- Cross-over Ethernet cable×1
- Type A-to-type A USB cable×1
- Hex brass tube nut×4
- CD-ROM×1

Hardware Features

1. General Features

- Operating Temperature: -25 °C ~ 85 °C (-45 °C ~ 85 °C for custom model)
- Storage Temperature: -45 °C ~ 85 °C
- Operating Humidity: 0% ~ 90% (Non-condensing)
- Power Supply: 12V/2A
- Electric Standards: CE, FCC, CCC
- Product Dimensions: 106.5mm x 97.99mm

2. Devices/Interfaces

Table 1 Devices/interfaces of SBC60A5

Categories	Names	Descriptions
Processor	CPU	Atmel ATSAMA5D34 Cortex-A5 536Mhz
Memory	DDR2	512MB
	eMMC	4GB
	DataFlash	4MB
	SD card	High-speed SD interface supports hot plugging
Comm. Interface	Serial Interface	DEBUG: 3-wire RS232
		USART0: 5-wire TTL
		USART1: 3-wire RS232
		USART2: 5-wire TTL
	USART3: RS485 (isolated)	
	Ethernet	10/100/1000Mbps with LED indicator
USB HOST	CAN	2 USB2.0 Host interfaces support USB keypad/mouse, and hot plugging. One of the interfaces can be set to USB Device mode.
		1 CAN Bus 2.0 with isolation
Display Interface	LCD	Supports TFT LCD under 16-bit RGB mode. CPU supports up to 2048X2048. Linux driver supports 4.3-inch (480x272), 5.6-inch (640x480), 7-inch (800x480) and 10.4-inch (800x600) LCDs
Input/Output	Touch Screen	4-wire resistive touch screen
	Buzzer	1 buzzer
	Audio Out	Supports MP3 playback

Categories	Names	Descriptions
Interface	Audio In	Supports MIC recording
	GPIO	16 GPIOs
General Interface	LED Indicators	1 power supply indicator, 2 working status indicator
	Reset Button	RESET
	IO Buttons	2 IO buttons
Expansion Interface	SPI	1 SPI bus for users' function expansion
	TWI	1 TWI bus for users' function expansion
	USB Host	Can be extended for function of USB Host
	ADC	2 12-bit ADCs
	EMAC	Can implement 10/100Mbps Ethernet by working together with an external physical-layer transceiver
Others	Real-Time Clock (RTC)	Independent real-time clock module with backup battery holder (battery is not provided by default)
	WatchDog	Controller is integrated in CPU
	System Power	DC-in 12V

Software Features

1. Linux BSP

The following table lists all the contents of the BSP included in the CD-ROM provided along with SBC60A5.

Table 2 SBC60A5 Linux BSP

Contents		Descriptions
Bootloader	Bootstrap	DATA FLASH
	U-boot	DATA FLASH Supports SAM-BA/SD/USB/Internet, kernel and filesystem update
Kernel	Linux-3.10.0	Supports INITRD/EXT2/EXT3/EXT4/FAT/NFS/JFFS2/UBIFS filesystems
Device Drivers	Serial	1 DEBUG and 4 serial interfaces
	RTC	Built-in RTC driver
	Net	1000Mbps Ethernet driver
	Flash	NANDFLASH driver/DATAFLASH driver
	LCD	LCD driver supports 480x272, 640x480, 800x480 and 800x600
	Touch Screen	Built-in 4-wire resistive touch-screen controller
	USB Host	3 USB Host, one of them can work as OTG
	USB Device	1 USB Device (OTG)
	Watchdog	Built-in Watchdog driver
	SD Card	EMMC / SD card driver
	CAN Bus	1 CAN bus
	RS485	1 RS485 bus
	LED	2 LED indicators
	Buzzer	1 buzzer driver
	Sound	WM8904 Codec audio driver
	Button	Driver for 2 user buttons
GPIO	Driver for 16 GPIOs	
ADC	Driver for 2 12-bit ADCs	
Root Filesystem	UBIFS	Readable/writeable filesystem supports compressed data storage
Graphic Interface	Qt	Version 4.8.5

2. Linux Qt Demo

After installing an image file that contains QtDemo onto SBC60A5 and booting up the system, QtDemo will be running automatically and its interface will be displayed as shown below.

Note:

📖 Please do screen calibration and reboot the system if the touch screen cannot respond to tapping accurately.



Figure 5 QtDemo interface

By tapping the blocks on the QtDemo interface, different applications can be launched accordingly. The following figures are the screenshots of example application interfaces for lighting control and air conditioning.



Figure 6 Lighting control application

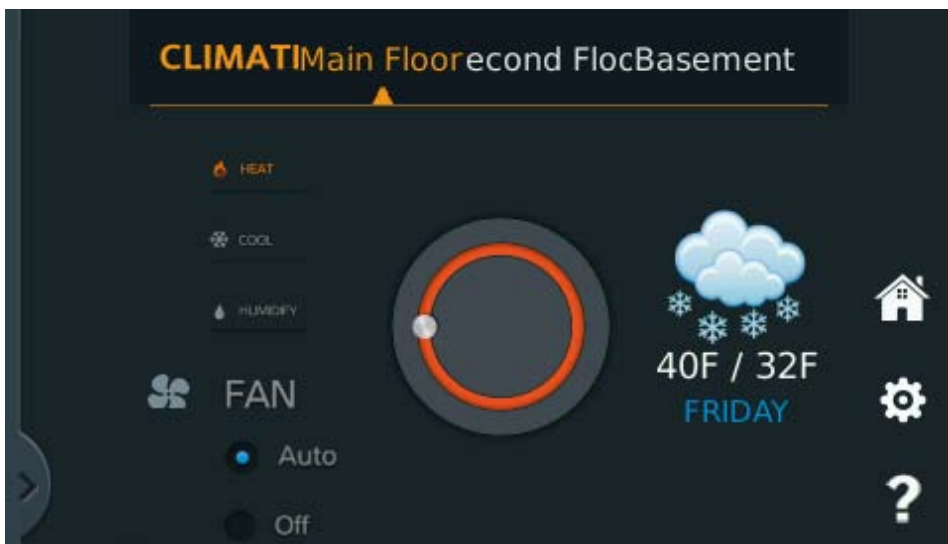


Figure 7 Air conditioning application

Technical Support and Warranty

Technical Support



Embest Technology provides its product with one-year free technical support including:

- Providing software and hardware resources related to the embedded products of Embest Technology;
- Helping customers properly compile and run the source code provided by Embest Technology;
- Providing technical support service if the embedded hardware products do not function properly under the circumstances that customers operate according to the instructions in the documents provided by Embest Technology;
- Helping customers troubleshoot the products.



The following conditions will not be covered by our technical support service. We will take appropriate measures accordingly:


- Customers encounter issues related to software or hardware during their development process;
- Customers encounter issues caused by any unauthorized alter to the embedded operating system;
- Customers encounter issues related to their own applications;
- Customers encounter issues caused by any unauthorized alter to the source code provided by Embest Technology;

Warranty Conditions

- 1) 12-month free warranty on the PCB under normal conditions of use since the sales of the product;

- 2) The following conditions are not covered by free services; Embest Technology will charge accordingly:
- Customers fail to provide valid purchase vouchers or the product identification tag is damaged, unreadable, altered or inconsistent with the products.
 - Products are damaged caused by operations inconsistent with the user manual;
 - Products are damaged in appearance or function caused by natural disasters (flood, fire, earthquake, lightning strike or typhoon) or natural aging of components or other force majeure;
 - Products are damaged in appearance or function caused by power failure, external forces, water, animals or foreign materials;
 - Products malfunction caused by disassembly or alter of components by customers or, products disassembled or repaired by persons or organizations unauthorized by Embest Technology, or altered in factory specifications, or configured or expanded with the components that are not provided or recognized by Embest Technology and the resulted damage in appearance or function;
 - Product failures caused by the software or system installed by customers or inappropriate settings of software or computer viruses;
 - Products purchased from unauthorized sales;
 - Warranty (including verbal and written) that is not made by Embest Technology and not included in the scope of our warranty should be fulfilled by the party who committed. Embest Technology has no any responsibility;
- 3) Within the period of warranty, the freight for sending products from customers to Embest Technology should be paid by customers; the freight from Embest to customers should be paid by us. The freight in any direction occurs after warranty period should be paid by customers.
- 4) Please contact technical support if there is any repair request.

Note:

 Embest Technology will not take any responsibility on the products sent back without the permission of the company.

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