# ATMEL MBC-SAM9G45 Core Board

The MBC-SAM9G45 is a ARM9 module board produced by Embest, built in with powerful ATMEL AT91SAM9G45 embedded microprocessor which is based on the integration of an ARM926EJ-S core with fast SRAM and a wide range of peripherals. It is an ideal processor card easy to integrate in your solution, or a minimum system and/or a reference board for your next design.
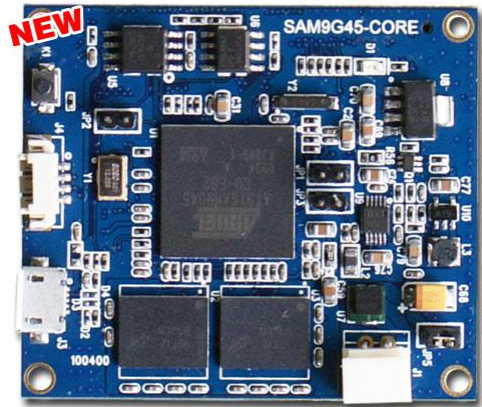
- Atmel AT91SAM9G45, ARM926EJ-S Core, 400MHz, 64KB ROM, 64KB SRAM
- External memory: 4MB DataFlash, 256MB NandFlash, 64KB EEPROM and 128MB DDR2 SDRAM
- Preinstalled Linux2.6 and support WinCE6.0 OS
- Dimensions: 45mm x 52mm

Front

Bottom

Board Dimension

- Board size: 45mm x 52mm x 11mm (Length * Width * Thickness)
- Interface type: QSH-060-01-L-D-A
- Connector gap: 0.5mm
- Pins: 120
- Board layers: 8

- Power supply: 5V DC or powered by base board.
- Weight: 15.2g

Features

CPU: ATMEL AT91SAM9G45, ARM926EJ-S Core, 400MHz

- 32 KBytes Data Cache, 32 KBytes Instruction Cache, with MMU
- Internal memory: one 64KB ROM and one 64KB SRAM

- On board memory: 4MB DataFlash, 256MB NandFlash, 64KB EEPROM and 128MB DDR2 SDRAM
- One Micro USB connector
- One Serial Port (TTL)
- JTAG interface support debugging and downloading
- Crystal: 12MHz for CPU and 32.768KHz for RTC
- Power Supply: 5V, with power on indicated LED
- **OS: Preinstalled Linux2.6, support WinCE6.0 (BSPs Free)**
- Dimension: 52 x 45mm
- Temperature range: -20 to +70 Celsius
- Expansion interface: 120 Pins to carrier board. The module is led out most signals of ATMEL AT91SAM9G45 processor, like UART, Ethernet, LCD, Touch Screen, USB Host, USB Device, ADC, DAC, SPI, SDIO, GPIOs and so on.

Development Reference

General

This core board is an ARM9 minimum system to start learning and developing an ARM9 application, it is also an idea ARM9 card to integrate into your product. It extent most of the signal of AT91SAM9G45 processor to an interface (QSH-060-01-L-D-A). And it can be used to evaluate your application base on one of the mother board (part# MBM-SAM-9G), which is led out most signals of ATMEL AT91SAM9G45, like UART, Ethernet, LCD, Touch Screen, USB Host, USB Device, ADC, DAC, SPI, SDIO, GPIOs and so on.

Jumper

2.0mm Pin Header

2.0 Pin Header	J1	VDDBU Power Supply	
	Close	From +3V	**Default**

	Open	From VDDBU connect to mother board	
	J2	**Chip Select (CS)**	
2.0 Pin Header	Close	Enable the Data Flash CS (U5)	
	Open	Disable the Data Flash CS (U5)	**Default**
	J3	**Chip Select (CS)**	
2.0 Pin Header	Close	Enable the Nand Flash CS (U4)	**Default**
	Open	Disable the Nand Flash CS (U4)	
	J4	**Core Board Power Supply**	
2.0 Pin Header	Close	+5V External Power Adapter	**Default**
	Open	From +5V connect to mother board	

Connector

	J1	**+5V Power Supply**	
2.5 Low Profile Wafer	Pin 1	5V	
	Pin 2	GND	
	J3	**MicroUSB Port, Device or OTG (if R61 mounted)**	
	Pin 1	5V	
MicroUSB	Pin 2	D-	
	Pin 3	D+	
	Pin 4	ID	
	Pin 5	GND	
	J4	**UART Serial Port (TTL)**	
1.25 Pitch 90 Wafer-SMT	Pin 1	3V3	
	Pin 2	DTXD	
	Pin 3	DRXD	

	Pin 4	GND	

Extension Bus Interface

On Main Board Connector (AC-QTH602)

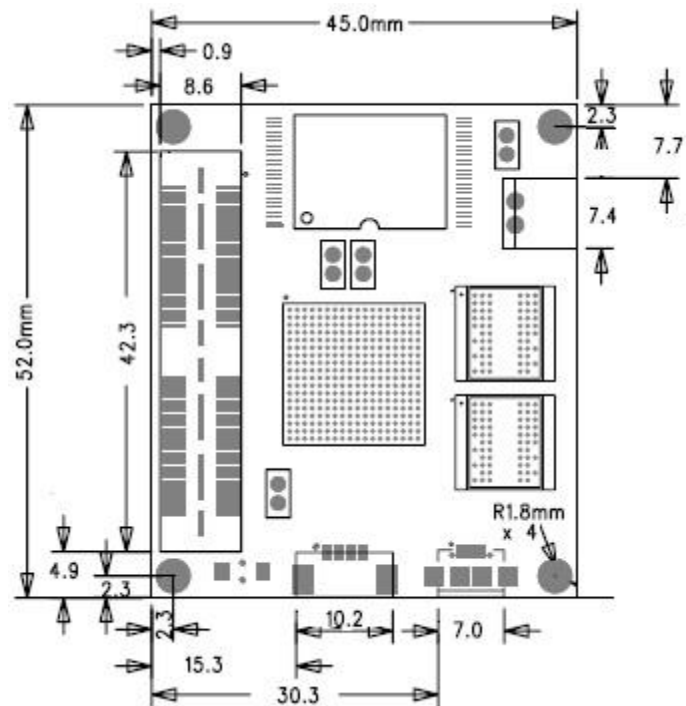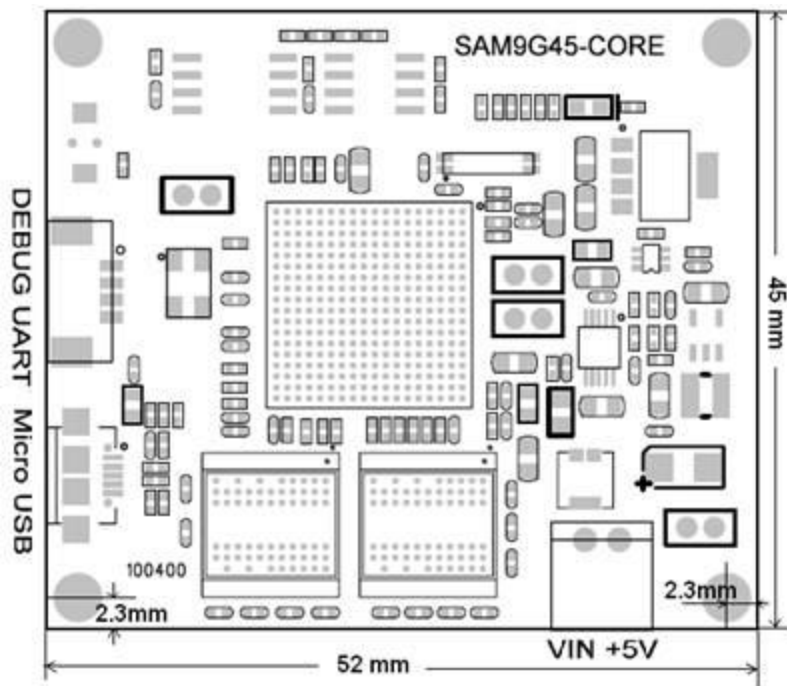On Core Board Connector (AC-QSH602)

Expansion Signal / Interface

Expansion Signal Description (J2)	Nos	Signal Pins
UART (TTL Level)	4	50,52,68,72;54,56;58,60;110,112
Debug UART (TTL Level)	1	25,27
USB Host, Device or OTG	1	6,8,74,76
Ethernet Port (RMII)	1	3,5,7,9,11,13,15,17,19,21
IIC Signal	2	32,34,114,116
SPI	2	18,50,52;66,68,70,72,74
LCD Interface (RGB, max 24bits)	1	31,33,35,37,39,41,43,45,47,49,51,53,55,57,59, 61,63,65,67,69,71,73,75,77,79,81,83,87,89,91,93
SD Card (MCI)	1	107,109,111,113,115,117
Timer Counter -TIOA	5	78,97,99,103,109,115
Timer Counter -TIOB	2	111,117
PWM	2	74,76
AD Input	4	97,99,101,103
SSC (IIS)	1	18,20,22,24,26,28
AC97 Signal	1	78,80,74,76
ISI Image Sensor Interface	1	86,88,90,92,94,96,98,100,102,104,106,108,110,112,114,116
JTAG Signal	1	38,40,42,44,46,48

IO Ports (PA)	18	32,34,3,5,7,9,11,13,15,17,19,21,107,109,111,113,115,117
IO Ports (PB)	28	50,52,54,56,58,60,66,68,70,72,86,88,90,92,94,96, 98,100,102,104,106,108,110,112,114,116,25,27
IO Ports (PD)	16	18,20,22,24,26,28,30,74,76,78,80,23,97,99,101,103
IO Ports (PE)	31	31,33,35,37,39,41,43,45,47,49,51,53,55,57,59,61, 63,65,67,69,71,73,75,77,79,81,83,87,89,91,93
Reset Signal (NRST)	1	36
DC5V	4	1,2,119,120
VDDBU	1	82
GND	9	4,10,16,84,118,29,85,95,105
NC (reserved)	2	12,14
Power Management Status (SHDN and WKUP)	2	62,64

Signal Descriptions in Detail >>More

Mechanical Parameter

○   Dimension: 45mm x 52mm x 11mm (Length x Width x Thickness)

○   Base Board Connector

▪   Interface type: AC-QSH602

▪   Pins gap: 0.5mm

▪   Pins: 120

○   PCB layers: 8

○   Power supply: 5V DC or powered by base board.

○   Weight: 15.4g

SAM9G45-CORE

DEBUG UART   Micro USB

100400

2.3mm

VIN +5V

2.3mm

52 mm

45 mm

45.0mm

0.9

8.6

2.3

7.7

7.4

52.0mm

42.3

R1.8mm
x 4

4.9

2.3

2.3

10.2

7.0

15.3

30.3

Block Diagram