

Using the SoM Approach

When Designing Your Next Embedded Solution



EQUIPMENT MONITOR AND CONTROL

What is a System on Module (SoM)?

144 PIN SoM



200 PIN SoM



314 PIN SoM



A SoM is a module that contains a processor with CPU bus accessibility, memory, and standard I/O. It is usually an Off-the-Shelf component. The module does not have any connectorization and is designed to be plugged into a Carrier Board.

System On Module Details:

Contains the Processor Core

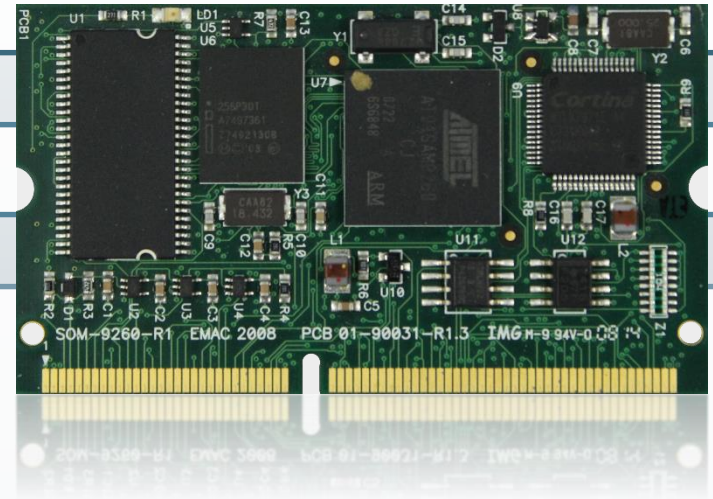
Contains Flash & RAM

Contains Standard I/O

- Serial Ports
- Ethernet
- Real Time Clock

Additional I/O (based on module type)

- GPIO & A/D
- USB Host & Device
- Video & Touch Screen Controller
- Audio
- Timers/Counters/PWM

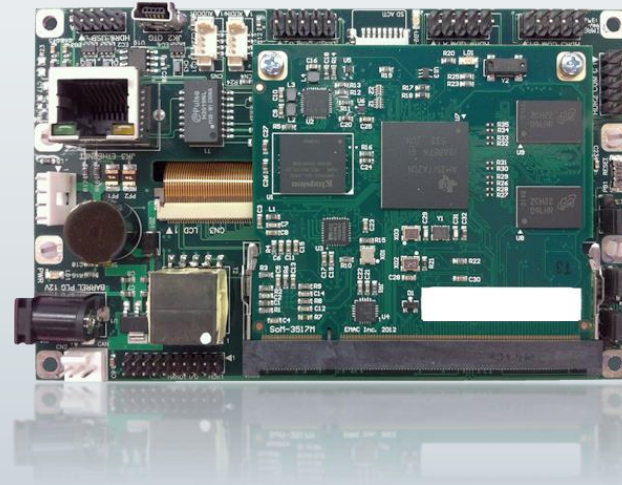


What is a Carrier Board?

Front with Video and Touch



Back of the Carrier Board with Module installed



A Carrier Board (sometimes called a base board, development board or breakout board) contains all the connectors, power supplies as well as any additional I/O requirements.

A Carrier Board can be purchased off the shelf, but is often a custom component based on the application requirements.

Carrier Board Details:

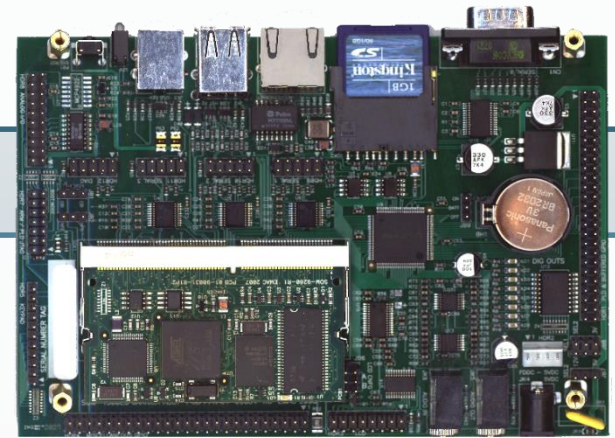
Can be any size or shape required by the application

Contains all the connectors

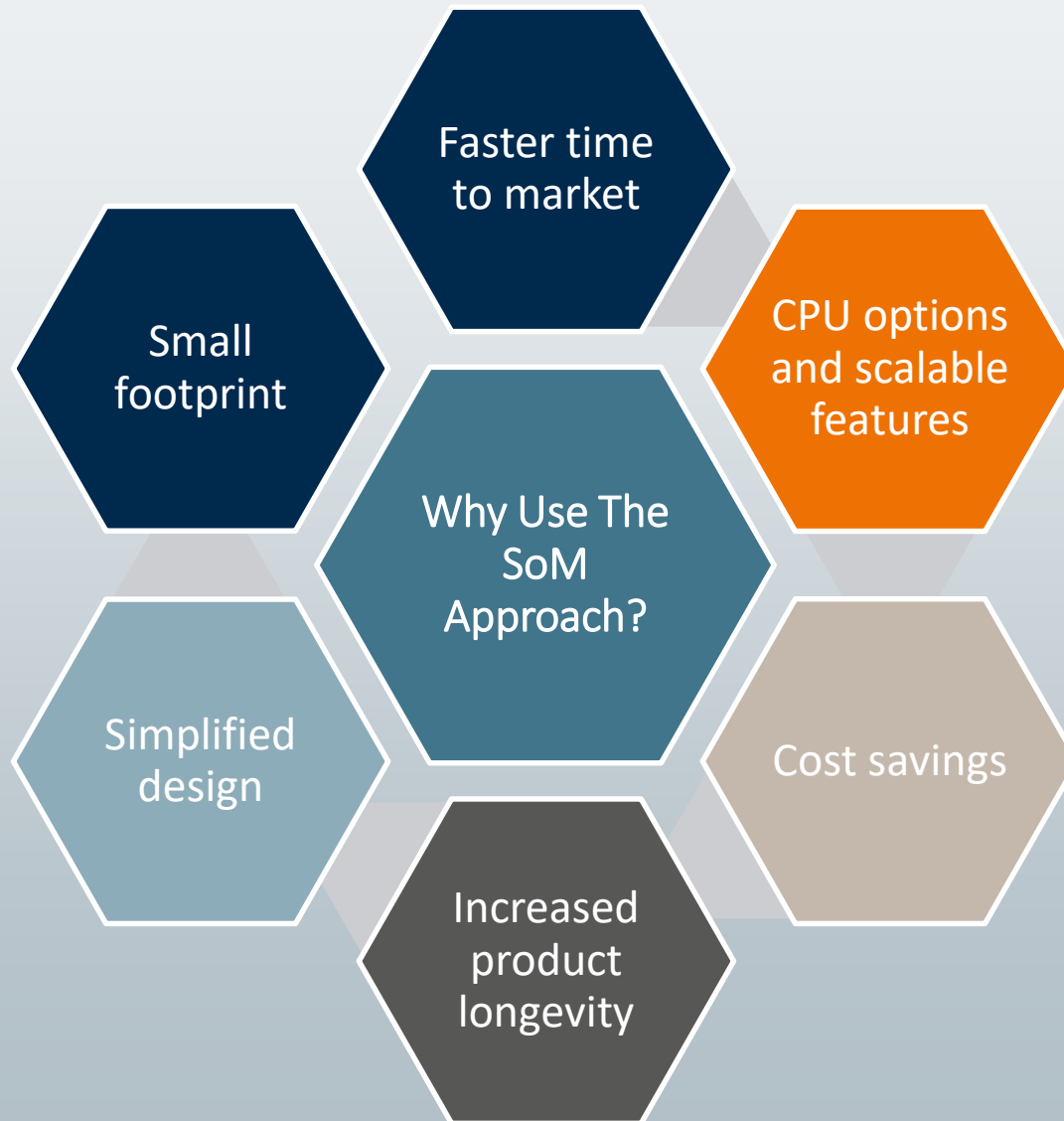
- Complete control over connector location
- Complete control over connector type

Contains any additional I/O required by the application

Off-the-Shelf carriers boards are available for reference and to ease the development process.



Why Use The SoM Approach?



Faster Time To Market

Since the module is purchased off-the-shelf and most of the complexity is on the module, design time is reduced.



Software board support packages (BSPS) and integrated development environments (IDES) are provided with the module and do not have to be developed.



Commercial off the shelf and reference carrier boards with schematics are available to allow early software development before a custom carrier board is complete.

CPU Options & Scalable Features

32 & 64 Bit
Modules

Blackfin,
Coldfire, ARM,
X86, X64

66, 200, 400,
600 MHz, 1.6,
2.2, 4 GHz+

Serial Ports, SPI,
I2C

Ethernet, CAN &
I2S Audio

Video & Touch
Screen

USB Host,
Device & OTG

SD/MMC &
Compact Flash
Cards

GPIO,
Timer/Counters,
PWM, A/D

Product Longevity

The module contains most of the components with accelerated end-of-life risk (CPU, RAM, Flash)

Modules are pin compatible providing an alternate replacement if a module is no longer available

Faster processors, more memory & additional features can be had by changing modules

Modules are designed to be interchangeable with minimal hardware & software changes

Module BSPS are kept up to date

Simplified Design

Micro Pitch BGAS and other very fine pitch components reside on the module, simplifying carrier board PCB layout.



Reference carrier boards with schematics are available simplifying carrier design.



The module BSP & IDE are provided and do not have to be developed.



Since the module is purchased off-the-shelf and most of the complexity is on the module, design requirements are reduced.

Small Footprint

A variety of module mounting options (depending on module type) allow the SoM to stand off the carrier board



Components can be placed under module to reduce carrier board space



Carrier PCB routing is reduced allowing tighter component placement



Different size modules are available depending on the features & processing power required

Advantages of the SoM Approach

A System on Module (SoM) is an alternative to single board computers for embedded systems offering a more flexible and contoured solution.

The SoM approach reduces the time and work involved with designing fully custom solution.

Using a Semi-Custom SoM approach you get the best aspects of buying Off-the-Shelf product and a custom engineered solution.

144-Pin SoMs (Headless)

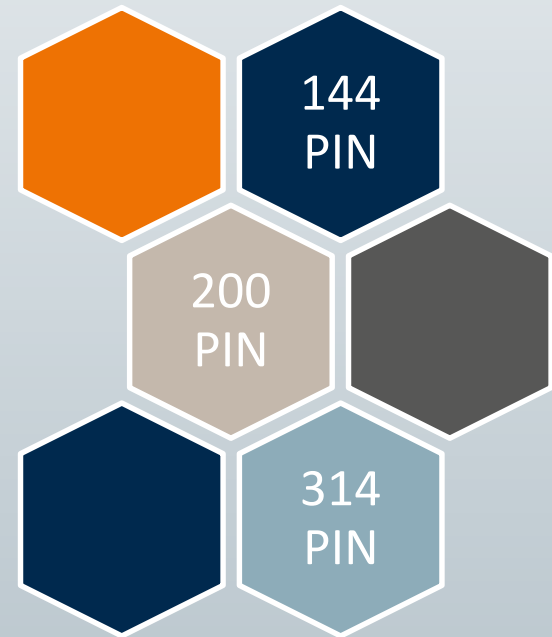
- SoM-iMX6U – Freescale/NXP i.MX6 UltraLite (MCIMX6G1) Cortex A7 528MHz
- SoM-A5D35 – Atmel ARM9 536 MHz
- SoM-9X25 – Atmel ARM9 400 MHz 128
- SoM-9G25 – Atmel ARM9 400 MHz
- SoM-9G20 – Atmel ARM9 Jazelle 400 MHz
- SoM-9260 – Atmel ARM9 Jazelle 200 MHz

200-Pin SoMs (Video & Touch)

- SoM-3354 – TI ARM Cortex A8 1 GHz
- SoM-3517 – TI ARM Cortex-A8 600 MHz
- SoM-A5D36 – Atmel ARM Cortex A5 536 MHz
- SoM-9G45 – Atmel ARM926 Jazelle 400 MHz

314-Pin SoMs (HDMI/LVDS Dual Video & Touch)

- SoM-iMX6M – Solo/Dual/Quad iMX6 ARM Cortex A9 Fanless
800 MHz, 1 GHz, Up to 1.2 GHz (MOQ)



144 Pin SODIMM ARM System on Module



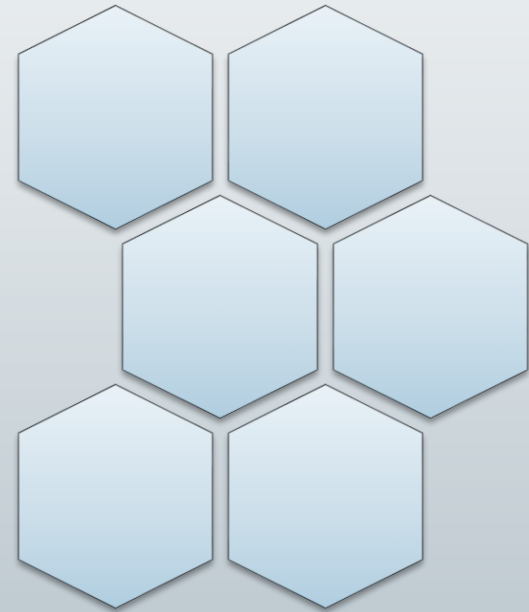
Low Power

Industrial Temperature

Small Size

I/O Rich (Ethernet, USB, CAN, Serial, I2S, I2C, SPI, SDIO, GPIO, A/D, PWM)

Industrial Temperature



144 Pin System on Module – 2.66" x 1.5"

ROADMAP

Accurate

Affordable

Made in
USA

SoM-9G20

Atmel ARM9 Jazelle 400 MHz
32MB SDRAM, 256MB Flash,
64MB SDRAM, 1GB NAND
(Build to Order Option)
8MB Serial Data Flash
32x GPIO, 6x Serial Ports, 3x USB, 10/100,
4x 10-bit A/D, -40° to +85°

NRND

SoM-A5D35

Atmel ARM9 536 MHz
512MB DDR2 RAM, 4GB eMMC,
16MB Serial Data Flash
18x GPIO, 5x Serial Ports, 3x USB
10/100, 4x 12-bit A/D, -40° to +85°

+5 yrs

SoM-9260

Atmel ARM9 Jazelle 200 MHz
32MB SDRAM, 32MB Flash,
64MB SDRAM, 64MB Flash (Option)
128KB Serial Data Flash
32x GPIO, 6x Serial Ports, 3x USB, 10/100,
4x 10-bit A/D, -25° to 75°

NRND

Low
Power

Wide
Temp

Fanless

144 Pin System on Module – 2.66" x 1.5"

ROADMAP

Accurate

Affordable

Made in
USA

2015

SoM-9X25

Atmel ARM9 400 MHz
128 DDR RAM, 4GB eMMC,
8MB Serial Data Flash
(16MB Serial Data Flash Option)
32x GPIO, 6x Serial Ports, 3x USB
10/100, 4x 10-bit A/D, -40° to +85°

+5 yrs

2015

SoM-9G25

Atmel ARM9 400 MHz, 64MB DDR RAM
128MB DDR Build to Order Option
256MB NAND, 8MB Serial Data Flash
512MB NAND 32MB Serial Data (MOQ)
18x GPIO, 6x Serial Ports, 3x USB, 10/100,
5x 10-bit A/D, -40° to +85°

+5 yrs

SoM-iMX6U

APM Sleep Mode of 3.5mA
Freescale/NXP i.MX6 UltraLite
(MCIMX6G1) Cortex A7 528MHz
128MB LP DDR2 RAM, 4GB eMMC,
16MB Serial Data Flash
22x GPIO, 5x Serial Ports, 3x USB
10/100, 4x 12-bit A/D, -40° to +85°

+5 yrs

2016

Low
Power

Wide
Temp

APM
Sleep
Mode

ARM 144 Pin System on Module – APM Sleep Mode

SoM-iMX6U

Freescall/NXP i.MX6 UltraLite (MCIMX6G1) Cortex A7 528 MHz Processor Speed

512MB of LP DDR2 RAM
4GB of eMMC Flash
16MB of Serial Data Flash

Ethernet, A/D, SPI, I2C, I2S, PWM, GPIO, CAN

Wide Temperature -40° to +85° C

APM Sleep Mode of 3.5mA



Product Features

Processor	• Freescall/NXP i.MX6 UltraLite (MCIMX6G1) Cortex A7
Memory	• 512MB of LP DDR2 RAM • 4 GB eMMC Flash • 16MB Serial Data Flash
I/O	• 12x GPIO (3.3V) Lines • 1x SDIO SD Port • 1x I2S Audio Port with line in/out • 1x CAN 2.0Bb Port • 1x 10/100 BaseT Ethernet • 1x USB 2.0 High Speed Host Port • 1x USB 2.0 High Speed Host/Device Port • 5x Serial Ports • 1x SPI Port • 2x Timer/Counters/PWM • 1x I2C Port
Analog	• 4x A/D Channels with 12-bit A/D Resolution (0-3.3v)
Environment	• -40° to +85° C Industrial Wide Temperature • 90% Upper Operating Humidity
OS	• EMAC OE Embedded Linux



ARM 144 Pin System on Module – Ultra Low Power

SoM-A5D35

Atmel ARM Cortex A5 ATSAMA5D35 536 MHz

512MB of LP DDR2 RAM
4GB of eMMC Flash
16MB of Serial Data Flash

Ethernet, A/D, SPI, I2C, I2S, PWM, GPIO, CAN

Wide Temperature -40° to +85° C

APM Sleep Mode



Product Features

Processor

- Atmel ARM Cortex A5 ATSAMA5D35 536 MHz

Memory

- 512MB of LP DDR2 RAM
- 4 GB eMMC Flash
- 16MB Serial Data Flash

I/O

- 18x GPIO (3.3V) Lines
- 1x SDIO SD port
- 1x I2S Audio Port
- 2x CAN 2.0Bb Ports
- 1x 10/100 BaseT Ethernet
- 2x USB 2.0 High Speed Host Ports
- 1x USB 2.0 High Speed Host/Device Port
- 5x Serial Ports
- 2x SPI Ports
- 2x Timer/Counters, 2x Programmable Clocks, 8x PWM
- 2x I2C Ports

Analog

- 4x A/D Channels with 12-bit A/D Converter

Environment

- -40° to +85° C Industrial Wide Temperature
- 90% Upper Operating Humidity

OS

- EMAC OE Embedded Linux

ARM 144 Pin System on Module

SoM-9G20

Atmel Jazelle ARM9 AT91SAM9G20 400 MHz

Up to 64 MB SDRAM, 133 MHz SDRAM
Up to 1 GB NAND Flash
Up to 8 MB Serial Data Flash
SD/MMC Flash Card Interface

Ethernet, A/D, SPI, I2C, I2S PWM, GPIO

3x USB, 6x Serial Ports & 1x SDIO Port

Wide Temperature -40° to +85° C



Product Features

Processor

- Atmel Jazelle ARM9 AT91SAM9G20 400 MHz

Memory

- Up to 64 MB of SDRAM, 133 MHz SDRAM
- Up to 1 GB of NAND Flash
- Up to 8 MB of Serial Data Flash
- SD/MMC Flash Card Interface

I/O

- 32x GPIO
- 1x SDIO
- 1x I2S Audio Port
- 1x 10/100 BaseT Ethernet with on-board PHY
- 2x USB 2.0 Full Speed Host Ports
- 1x USB 2.0 Full Speed Device Port
- 6x Serial ports (4x w/Handshake; 7x Optional)
- 2x SPI Ports
- 5x Timer/Counters, 3x Programmable Clock, 4x PWM
- Battery backed Real Time Clock
- 1x I2C Port

Analog

- 4x A/D Channels with 10-bit

Environment

- -40° to +85° C Industrial Wide Temperature
- 90% Upper Operating Humidity

OS

- EMAC OE Embedded Linux

ARM 144 Pin System on Module

SoM-9X25

Atmel ARM9 AT91SAM9X25 400 MHz

128 MB of DDR2 RAM,
4 GB of eMMC Flash, 8 MB Serial Data Flash
16 MB of Serial Data Flash (Optional)
Resident Flash Bootloader

Ethernet, A/D, SPI, I2C, I2S, PWM, GPIO, CAN

6x Serial Ports, 3x USB Ports, 1x SDIO Ports

Wide Temperature -40° to +85° C



Product Features

Processor

- Embedded Atmel ARM9 AT91SAM9x25 400 MHz

Memory

- 128 MB of DDR2 RAM
- 4 GB of eMMC Flash
- 8 MB Serial Data Flash
- 16 MB of Serial Data Flash (Optional)
- Resident Flash Bootloader

I/O

- 32x GPIO with 16 ma. drive when used as an output
- 1x SDIO 4-bit Parallel SDHC Interface
- 1x I2S Audio Port, 2x CAN 2.0B Ports
- 1x 10/100 BaseT Ethernet: On-board PHY (2nd Optional)
- 1x USB 2.0 High Speed Host Port
- 1x USB 2.0 Full Speed Host Port
- 1x USB 2.0 High Speed OTG
- 6x Serial Ports
- 2x SPI High-Speed Ports with Chip Selects
- Timer/Counters/PWM
- 2x I2C Ports

Analog

- 4x A/D Channels with 10-bit A/D Converter

Environment

- -40° to +85° C Industrial Wide Temperature
- 90% Upper Operating Humidity

OS

- EMAC OE Embedded Linux

ARM 144 Pin System on Module – Industrial IoT

SoM-9G25

Atmel ARM9 AT91SAM9G25 400 MHz

Up to 128 MB DDR2, 256 MB NAND Flash
Up to 512 MB NAND Flash (MQA applies)
Up to 32 MB Serial Data Flash
SDHC SD/MMC Flash Card/Interface (on Carrier)

Ethernet, A/D, SPI, I2C, I2S PWM, GPIO

3x USB, 6x Serial Ports & 1x SDIO Port

Wide Temperature -40° to +85° C



Product Features

Processor

- Atmel ARM9 AT91SAM9G25 Low Power 400 MHz

Memory

- Up to 128 MB DDR2
- 256 MB NAND Flash
- Up to 512 MB NAND Flash (MOQ)
- Up to 32 MB Serial Data Flash
- SDHC SD/MMC Flash Card Port/Interface (on Carrier)

I/O

- 18x GPIO
- 1x SDIO Port
- 1 I2S Audio Port
- 1x 10/100 BaseT Ethernet with on-board PHY
- 1x USB 2.0 High Speed Host Port
- 1x USB 2.0 High Speed Device Port
- 1x USB 2.0 Full Speed Host Port
- 6x Serial ports, 3 with handshake
- 2x SPI Ports
- 4x Timer/Counters/PWM
- 2x I2C Ports

Analog

- 5x A/D Channels with 10-bit A/D Converter

Environment

- -40° to +85° C Industrial Wide Temperature
- 90% Upper Operating Humidity

OS

- EMAC OE Embedded Linux

ARM 144 Pin System on Module – Ultra Low Power

SoM-9260

Atmel ARM9 Jazelle AT91SAM9260 200Mhz

Up to 64 MB SDRAM
Up to 64MB Flash
128KB Serial Data Flash

Ethernet, A/D, SPI, I2C, I2S PWM, GPIO

3x USB, 6x Serial Ports

APM Sleep Mode



Product Features

Processor

- Atmel ARM9 Jazelle AT91SAM9260 200Mhz

Memory

- Up to 64MB SDRAM
- Up to 64MB Flash
- 128KB Serial Data Flash
- SD/MMC Flash Card Interface

I/O

- 32x GPIO
- 2x I2C Ports
- 1x 10/100/BaseT Ethernet with on-board PHY
- 2x USB 2.0 Full Speed Host Ports
- 1x USB 2.0 Full Speed Device Port
- 6x Serial Ports (3 with handshake)
- 5x Timer/Counters/PWM
- Battery Backed Real Time Clock
- 1x I2S Audio Port
- 2x SPI Ports

Analog

- 4x A/D Channels with 10-bit A/D Converter

Environment

- -40° to +85° C Operating Temperature
- 90% Upper Operating Humidity

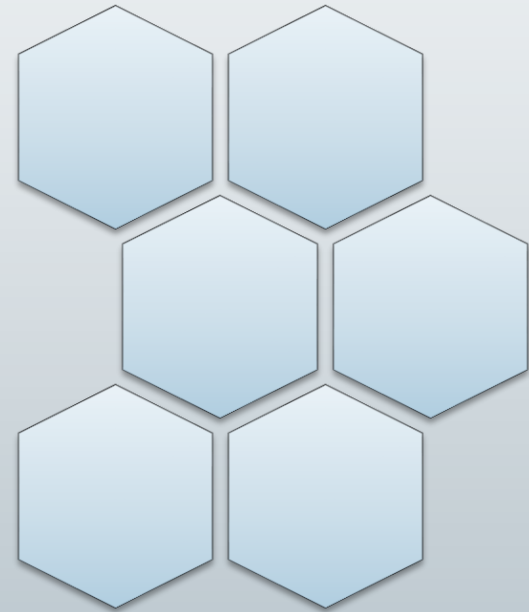
OS

- EMAC OE Embedded Linux

200 Pin SODIMM ARM System on Module



Low Power
Industrial Temperature
Video & Touch Controller



200 Pin System on Module – 2.66" x 2.375"

ROADMAP



SoM-3517 NRND

TI ARM Cortex-A8 600 MHz
256MB DDR2 RAM, 2GB eMMC,
512MB Serial Data Flash
**512MB DDR2, 4GB eMMC,
1GB NAND (Build to Order)**
16x GPIO, 4x Serial Ports, 3x USB, 10/100,
LCD Touch, 0° to 70° **-40° to +85° (MOQ)**

SoM-3354 +5 yrs

TI ARM Cortex A8 1 GHz
512MB DDR3, 4GB eMMC,
16MB Serial Data Flash
22x GPIO, 4x Serial Ports, 3x USB
10/100, LCD Touch, -40° to +85°

2016

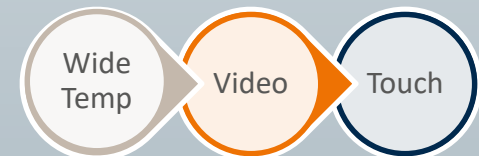
SoM-9G45 NRND

Atmel ARM926 Jazelle 400 MHz
128MB DDR RAM, 256MB NAND
256MB DDR2, 1GB NAND (Option)
8MB Serial Data Flash
32x GPIO, 5x Serial Ports, 2x USB,
10/100, LCD Touch, -40° to +85° C

SoM-A5D36 +5 yrs

Atmel ARM Cortex A5 536 MHz
512 MB LP DDR2, 4 GB eMMC Flash,
16MB Serial Data Flash, 21x GPIO, 5x
Serial Ports, 3x USB, 10/100/1000,
LCD Touch, -40° to +85°

2016



ARM 200 Pin System on Module

SoM-3354

TI AM3354 ARM Cortex-A8 Processor
with Neon Math Coprocessor 1 GHz

512 DDR3 SDRAM, 4 GB of eMMC Flash
Up to 16 GB eMMC Flash Upgrade (MOQ)
16 MB Serial Data Flash

Ethernet, 4x Serial Ports, A/D, SPI, I2C, I2S & CAN

3x USB 2.0 High Speed Ports & 1x SDIO Port

LCD & Resistive Touch Interface

Wide Temperature -40° to +85° C

Product Features

Processor

- TI AM3354 ARM Cortex-A8 1 GHz

Memory

- 512 DDR3 SDRAM
- 4 GB of eMMC Flash
- Up to 16 GB eMMC Flash Upgrade (MOQ)
- 16 MB Serial Data Flash

I/O

- 22x GPIO (3.3V) Lines
- 1x SDIO Port, 1x I2S Audio Port, 1x CAN Port
- 1x 10/100 BaseT Ethernet
- 2x USB 2.0 High Speed Hosts Ports
- 1x USB 2.0 High Speed OTG (Host or Device)
- 4x Serial Ports with RTS/CTS Handshake
- 2x SPI Ports with 4 Slave Selects
- 2x Timer/Counters/PWM, 1x I2C hardware Port

Video

- 2D/3D Accelerated Video up to 2048x2048
- 4-Wire Resistive Touch Controller

Analog

- 4x A/D Channels with 12-bit A/D Resolution

Environment

- -40° to +85° C Industrial Wide Temperature
- 90% Upper Operating Humidity

OS

- EMAC OE Embedded Linux



ARM 200 Pin System on Module

SoM-3517

Embedded TI AM3517 ARM Cortex-A8
with Neon Math Co-processor 600 MHz

Up to 512 MB of DDR2 RAM
Up to 4GB of eMMC Flash
Up to 1GB NAND Flash

Ethernet, A/D, SPI, I2C, I2S, PWM, GPIO, CAN

4x Serial Ports, 2x SPI ports with chip selects

2D/3D Accelerated Video with Resistive Touch



Product Features

Processor	Embedded TI AM3517 ARM Cortex-A8 600 MHz
Memory	- Up to 512 MB of DDR2 RAM - Up to 4GB of eMMC Flash - Up to 1GB NAND Flash
I/O	16x GPIO (3.3V) Lines 1x I2S Audio Port 1x CAN 2.0b Port 1x 10/100 BaseT Ethernet 2x USB 1.1/2.0 High Speed Host Ports 1x USB 2.0 High Speed OTG (Host/Device) Port 4x Serial Ports 2x SPI Ports - Timer/Counters/PWM (11x General Purpose Timers) 2x I2C Hardware Ports
Video	2D/3D Accelerated HD Video up to 2048 x 2048 12-bit 4-Wire Analog Resistive Touch Screen Interface
Analog	2x A/D Channels with 12-bit A/D Converter
Environment	0° to 70° C - Wide Temperature -40° to +85° C (MOQ) 90% Upper Operating Humidity
OS	EMAC OE Embedded Linux

ARM 200 Pin System on Module

SoM-A5D36

Atmel ARM Cortex A5 ATSAMA5D36 536MHz

Up to 512 MB of LP DDR2 RAM
Up to 4 GB of eMMC Flash
16MB of Serial Data Flash

Ethernet, A/D, SPI, I2C, I2S, PWM, GPIO, CAN

3x USB, 5x Serial Ports & 2x SDIO Port

LCD & Resistive Touch Interfaces

Wide Temperature -40° to +85° C

APM Sleep Mode



Product Features

Processor

- Atmel ARM Cortex A5 ATSAMA5D36 536MHz

Memory

- Up to 512 MB of LP DDR2 RAM
- Up to 4 GB of eMMC Flash
- 16MB of Serial Data Flash

I/O

- 21x GPIO (3.3V) Lines
- 2x SDIO SD Port, 1x I2S Audio Port
- 2x CAN 2.0b Ports
- 1x 10/100/1000 BaseT Ethernet with 2nd MAC Available
- 2x USB 2.0 High Speed Host Ports
- 1x USB 2.0 High Speed OTG (Host/Device)
- 5x Serial Ports, 2x SPI Ports
- 5x Timer/Counters, 2x Programmable Clocks, 4x PWM
- 2x I2C Ports

Video

- 12-bit 4-wire Analog Resistive Touch Screen
- 24-bit LCD Controller

Analog

- 6x A/D Channels with 12-bit (0 to 3.3V)n

Environment

- Wide Temperature -40° to +85° C
- 90% Upper Operating Humidity

OS

- EMAC OE Embedded Linux

ARM 200 PIN SYSTEM ON MODULE

SoM-9G45

Atmel ARM9 Jazelle AT91SAM9G45 400 MHz

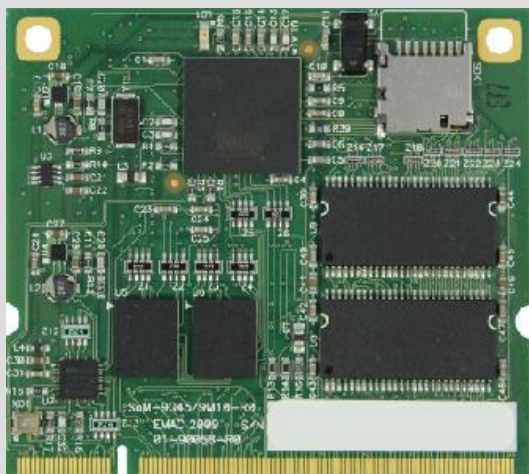
Up to 256 MB of DDR2 RAM, 133 MHz SDRAM
Up to 1 GB of NAND Flash
Up to 8 MB of Serial Data Flash
SD/MMC Flash Card Interface

Ethernet, A/D, SPI, I2C, I2S PWM, GPIO

2x USB, 5x Serial Ports 3 with Handshake

LCD & Resistive Touch Interfaces

Wide Temperature -40° to +85° C



Product Features

Processor

Atmel ARM9 Jazelle AT91SAM9G45 400 MHz

Memory

- Up to 256 MB of DDR2 RAM, 133 MHz SDRAM
- Up to 1 GB of NAND Flash
- Up to 8 MB of Serial Data Flash
- SD/MMC Flash Card Interface

I/O

- 32x GPIO
- 1x I2S Audio Ports
- 1x 10/100 BaseT Ethernet with on-board PHY
- 1x USB 2.0 High Speed Host Port
- 1x USB 2.0 High Speed OTG (Host/Device)
- 5x Serial Ports, 4 with Handshake (UARTS)
- 2x SPI Ports, 1x I2C Port
- 2x Timer/Counters/PWM,
- Battery backed Real Time Clock

Video

- LCD Video Interface with up 1280 x 860 resolution
- 4-wire Touch Screen Interface

Analog

- 4x A/D Channels with 10-bit Resolution

Environment

- Wide Temperature -40° to +85° C
- 90% Upper Operating Humidity

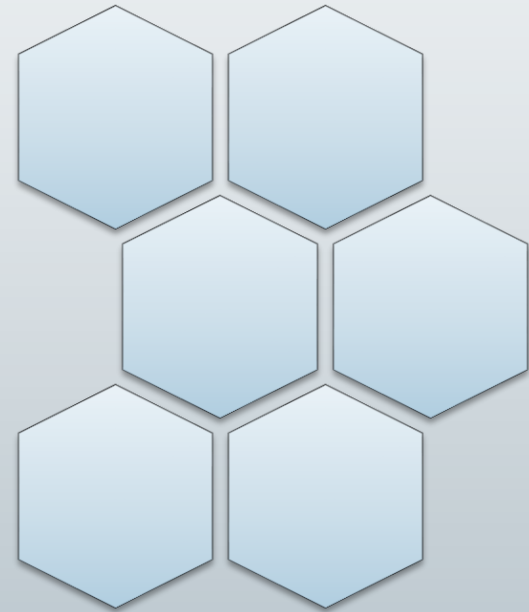
OS

- EMAC OE Embedded Linux

314 Pin SODIMM ARM System on Module

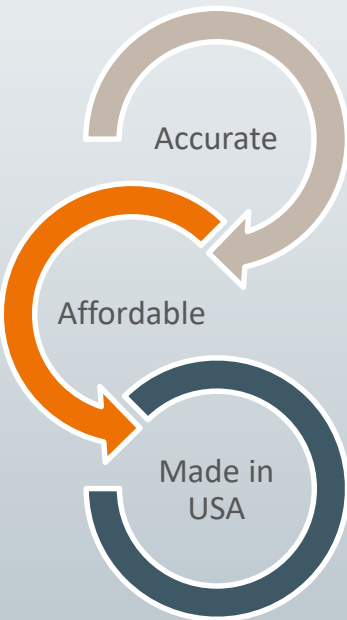


HDMI /LVDS Dual Video
with Touch Controller
PCIe Bus Expansion
SATA Support
Industrial Temperature -40° - +85°



314 Pin System on Module – 3.23" x 2.6"

ROADMAP



+5 yrs

2016

SoM-iMX6M (Quad)
 Quad ARM Cortex A9 Fanless 1 GHz
 2GB DDR3, 4GB eMMC,
 16MB Serial Data Flash
 16x GPIO, 4x Serial Ports, 4x USB, 1
 Gigabit Ethernet, HDMI/LVDS Touch
 -40° to +85°

2016

SoM-iMX6M (Dual)
 Dual ARM Cortex A9 Fanless 1 GHz
 1GB DDR3, 4GB eMMC,
 16MB Serial Data Flash
 16x GPIO, 4x Serial Ports, 4x USB, 1
 Gigabit Ethernet, HDMI/LVDS Touch
 -40° to +85°

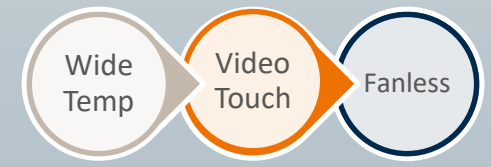
2016

SoM-iMX6M (Solo)
 Solo ARM Cortex A9 Fanless 800 MHz
 512MB DDR3 RAM, 4GB eMMC
 16MB Serial Data Flash
 16x GPIO, 4x Serial Ports, 4x USB, 1
 Gigabit Ethernet, HDMI/LVDS Touch
 -40° to +85°

Under Development

NXP IMX8

2017



ARM 314 Pin System on Module

SoM-iMX6M

Solo/Dual/Quad iMX6 ARM Cortex A9 Fanless
800 MHz, 1 GHz, Up to 1.2 GHz (MOQ)

Up to 2 GB DDR3 RAM
4 GB of eMMC Flash, 16 MB of Serial Data Flash
Micro SD Card interface with Status LED

Ethernet, SATA, A/D, SPI, I2C, I2S & CAN

4x USB, 4x Serial Ports, 2x SDIO

HDMI /LVDS Dual Video with Touch Controller

Wide Temperature -40° to +85° C



Product Features

Processor

- Solo/Dual/Quad iMX6 ARM Cortex A9 Fanless
- 800 MHz, 1 GHz, Up to 1.2 GHz Processor Speed

Memory

- Up to 2 GB DDR3 RAM
- 4 GB of eMMC Flash, 16 MB of Serial Data Flash
- Micro SD Card interface with Status LED

I/O

- 16x GPIO
- 2x SDIO, 1x SATA, 2x I2S, 1x SPDIF, 2x CAN Ports
- 1x Gigabit BaseT Ethernet with Status LEDs
- 3x USB 2.0 High Speed Host Ports
- 1x USB 2.0 High OTG (Host/Device)
- 4x Serial Ports with Handshake
- 2x Timer/Counters/4x PWMs, Programmable LED
- 4x I2C Ports, 2x SPI Ports

Video

- 24-bit LVDS / HDMI
- 1x Serial Video Capture (CSI) Port
- 4-wire Analog Resistive Touch Screen

Analog

- 4x A/D Channels with 12-bit A/D Resolution

Environment

- Wide Temperature -40° to +85° C
- 90% Upper Operating Humidity

OS

- EMAC OE Embedded Linux

(COTS) Development/Carrier Boards

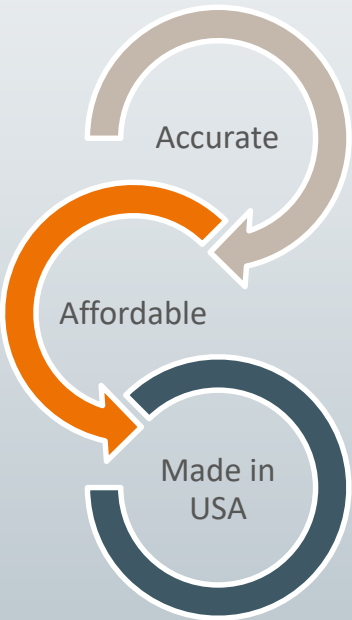


Commercial Off The Shelf
144 Pin Carrier Board
200 Pin Carrier Boards
314 Pin Carrier Board



Carrier Board – 144 Pin SODIMM

ROADMAP



SoM-150ES

4x Serial Ports (3x RS232, 1x RS232/485)
Up to 48x Digital General Purpose I/O Lines
10/100 BaseT Ethernet with RJ45
Audio & CAN 2.0B Port
2x USB Host Jack & 1x USB Device Jack

SoM-112ES

4x Serial Ports (2x RS232, 2x RS232/485)
Up to 48x Digital General Purpose I/O Lines
1x 10/100 BaseT Ethernet
1x12S Audio & CAN 2.0B Port
3x USB 2.0 & 1x USB Device



144 Pin Carrier Board (ACTUAL I/O AVAILABILITY IS SOM DEPENDENT)

SoM-150ES

4x Serial Ports (3x RS232, 1x RS232/485)

Up to 48x Digital General Purpose I/O lines

10/100 BaseT Ethernet with RJ45

Audio & CAN 2.0B Port

2x USB Host Jack & 1x USB Device Jack

144 Pin SODIMM Socket



Product Features

Compatibility

- EMAC 144 Pin SODIMM socket

I/O

- 30x PLD Controlled General Purpose digital I/O lines in addition to SoM I/O lines
- 24x General Purpose digital (PLD) I/O lines
- 8x GPIO Lines are High Drive Digital Output Lines with Status LEDs (500 ma. sink)
- 1x CAN 2.0B Port
- 1x 10/100 BaseT Ethernet/onboard Magnetics RJ45
- 4x Serial Ports (3x RS232, 1x RS232/485)
- 2x USB Host Jack, 1x USB Device Jack
- Battery for nonvolatile RAM & Real Time Clock
- MMC/SD Flash Card Socket
- Power and MMC/SD status LEDs
- System Reset button

Video

- Character LCD interface

Analog

- 8 channel 12-bit A/D single ended
- 2 channel 12-bit D/A (0 - 2.5V output)
- I2S Audio Stereo CODEC with Line In/Out Jacks

Environment

- 0-70° C Operating Temperature [Opt. -40° to +85° C]
- 90% Upper Operating Humidity

144 Pin Carrier Board (ACTUAL I/O AVAILABILITY IS SOM DEPENDENT)

SoM-112ES

4x Serial Ports (2x RS232, 1x USB to Serial, 1x RS232/485)

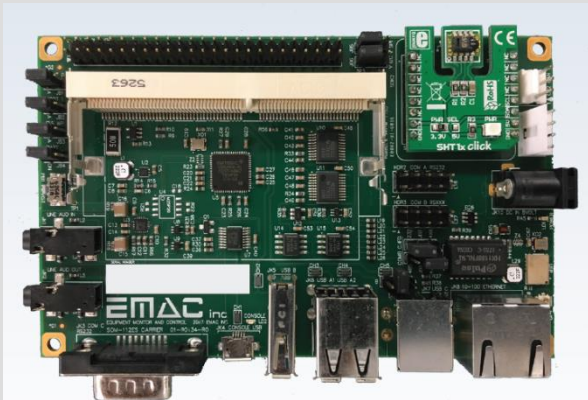
General I/O: GPIOs, SPI, A/D, D/A, PWM, I2C, I2S

10/100 BaseT Ethernet with RJ45

1x CAN 2.0B Port

3x USB 2.0 & 1x USB Device

144 Pin SODIMM Socket



*MikroBus Daughter board not included



Product Features

Compatibility

- EMAC 144 Pin SODIMM socket

I/O

- 14x Processor General Purpose I/O (GPIO) Lines; Up to 8x more GPIO's optional
- 4x Serial Ports (2xRS232, 1xRS232/422/485, 1x USB Device to Serial Console)
- 3x USB 2.0 Hosts, 1 USB Device, 1x USB Device to Serial Console
- 1x CAN 2.0B Port
- 1x 10/100 BaseT Ethernet/onboard Magnetics RJ45
- 4x Serial Ports (3x RS232, 1x RS232/485)
- 2x USB Host Jack, 1x USB Device Jack
- Wifi (802.11 b/g/n) & Bluetooth (v4.0)
- MMC/SD Flash Card Socket
- Power and MMC/SD status LEDs
- System Reset button

Video

- Character LCD interface

Analog

- 4x Channels of A/D (from SoM)
- Multi-I/O up to 8x more, 12-bit A/D and/or 8x, 12-bit D/A (Optional)
- 1x 12S Audio Port with Line In/Out

Environment

- 0-60° C Operating Temperature [Opt. -40° to +85° C]

Carrier Boards – 200 Pin SODIMM ROADMAP

Accurate

Affordable

Made in
USA

NRND

SoM-200ES

4x Serial Ports (3x RS232 & 1x RS232/422/485), Up to 56x GPIO, 10/100 Ethernet, I2S Audio, 1x I2C, 1x SPI, 1x CAN, SD Flash Socket, 2x USB 2.0 Host & 1x USB Device

SoM-200GS

4x Serial Ports (3x RS232 & 1x 232/422/485) Gig Ethernet, 2x USB 2.0 Host & 1x USB OTG I2S Audio Line In/Out Port, SD Card Slot WiFi 802.11 b/g/n [optional] Bluetooth 3.0 + High Speed [optional] 4.3" LCD with Touch Screen

NRND

SoM-210ES

3x Serial Ports (2x RS232 & 1x RS232/485) 10/100 Ethernet, 3x USB 2.0 Host Ports MicroSD Flash Card Interface 26x SoM Specific I/O lines & JTAG 4.3" Graphic LCD with WQVGA TTL

SoM-212ES

3x Serial Ports (2x RS232 & 1x RS232/485) 10/100 Ethernet, 3x USB 2.0 Host Ports MicroSD Flash Card Interface 26x SoM Specific I/O lines & JTAG 4.3" Graphic LCD with WQVGA TTL

EOL

SoM-250ES

4x Serial Ports (3x RS232 & 1x RS232/422/485) 10/100 BaseT Ethernet, 2x USB Host Ports & 1x USB OTG Port, 22x SoM Specific I/O Lines 7" WVGA 800 x 480 Graphic LCD with Touch 10" WSVGA 1024 X 600 Graphic LCD Touch

SoM-250GS

4x Serial Ports (3x RS232 & 1x RS232/422/485) Gig BaseT Ethernet, 2x USB Host Ports & 1x USB OTG Port, 22x SoM Specific I/O Lines 7" WVGA 800 x 480 Graphic LCD with Touch 10" WSVGA 1024 X 600 Graphic LCD Touch

2017

200 PIN CARRIER BOARD (ACTUAL I/O AVAILABILITY IS SOM DEPENDENT)

SoM-200ES

4x Serial Ports (3x RS232 & 1x RS232/422/485)

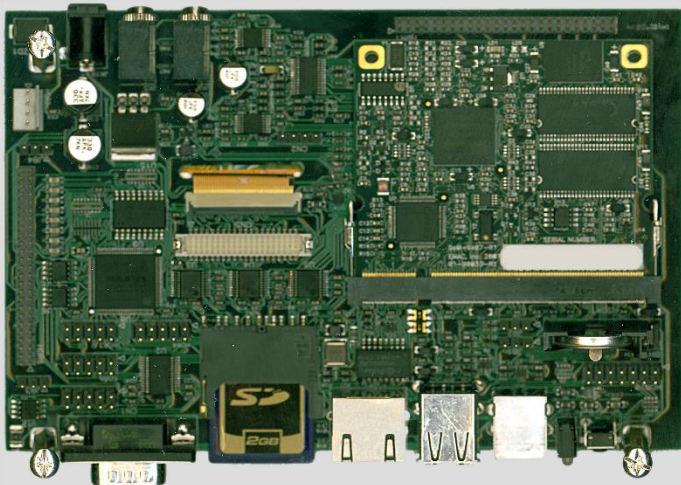
Up to 56x I/O Lines

10/100 Base-T Ethernet

I2S Audio, 1x I2C, 1x SPI, 1x CAN, SD Flash Socket

2x USB 2.0 Host Ports & 1x USB Device Port

EMAC 200 Pin SODIMM socket



Product Features

Compatibility

- EMAC 200 Pin SODIMM socket

I/O

- 24x GPIO Lines, 32 SOM Specific I/O Lines
- 1x I2S Audio Line In/Out Port
- 1x 10/100 Base-T Ethernet with RJ45 Jack
- 2x USB 2.0 Host Ports
- 1x USB 2.0 Device Port
- 4x Serial Ports (3x RS232 & 1x RS232/422/485)
- 1x CAN 2.0 Port
- 1x SPI (3 chip selects)
- Reset Button
- Battery for nonvolatile RAM and Real Time Clock
- Power and MMC/SD card status LEDs
- 1x I2C Port

Video

- 4.3" Graphic LCD interface TFT WQVGA LCD (480x272)
- 1x 4-wire Resistive Touch Screen Interface
- Backlight Brightness Control
- 44 Pin Dual Row 2mm Auxiliary Video/Touch Connector

Analog

- 4x A/D Channels

Environment

- 0°-60° C Operating Temperature [Opt. -40° to +85° C]
- 90% Upper Operating Humidity

200 PIN CARRIER BOARD (ACTUAL I/O AVAILABILITY IS SOM DEPENDENT)

SoM-200GS

4x Serial Ports (3x RS232 & 1x RS232/422/485)

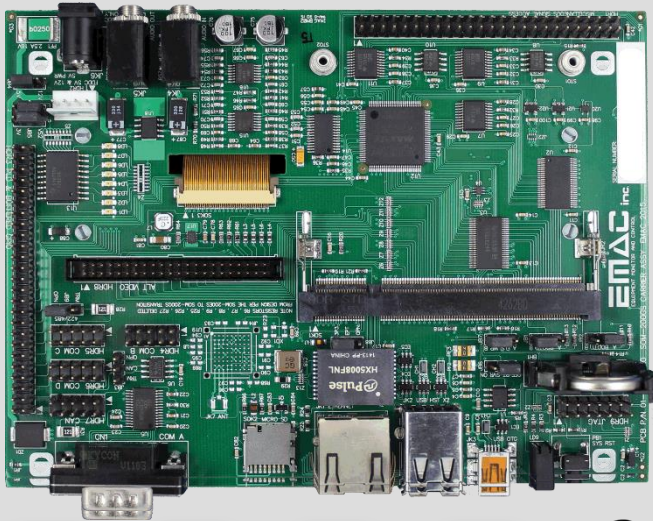
Gigabit Ethernet with Status LEDs

2x USB 2.0 Host & 1x USB OTG Ports

I2S Audio Line In/Out Port & SD Card Slot

Wi-Fi 802.11 b/g/n & Bluetooth 3.0 [optional]

4.3" LCD with Touch Screen



Product Features

Compatibility

- EMAC 200 Pin SODIMM socket

I/O

- 16x General Purpose Digital (PLD) I/O Lines (8x Digital Input Lines & 8x Digital Output lines with 20 ma. drive)
- 32x SOM Specific I/O Lines, 8x High Drive Digital (PLD) Output Lines with Status LEDs (500ma. sink)
- 1x I2S Audio Line In/Out Port
- 4x Serial Ports (3x RS232 & 1x RS232/422/485)
- 1x CAN 2.0 Port, Reset Button
- Power & SD/Wi-Fi Activity Status LEDs
- 2x USB 2.0 Host & 1 USB OTG Ports
- 1x 10/100/1000 BaseT "Gigabit" Ethernet w/Status LEDs
- 1x Wi-Fi 802.11 b/g/n (optional)
- 1x Bluetooth 3.0 + High Speed [optional]
- 1x I2C, 1x SPI (3 chip selects)

Video

- 4.3" Graphic LCD Interface for TFT WQVGA (480x272)
- 44 Pin dual row 2mm auxiliary video/touch connector
- Backlight Brightness Control
- 4-wire Resistive Touch Screen Interface

Analog

- 4x A/D Channels

Environment

- 0°-60° C Operating Temperature [Opt. -40° to +85° C]
- 90% Upper Operating Humidity

200 PIN CARRIER BOARD (ACTUAL I/O AVAILABILITY IS SOM DEPENDENT)

SoM-210ES

3x Serial Ports (2x RS232 & 1x RS232/485)

10/100 BaseT Ethernet with On-Board RJ-45

3x USB 2.0 Host Ports

MicroSD Flash Card Interface

26x SoM Specific I/O lines & JTAG

4.3" Graphic LCD with WQVGA TTL Interface



Product Features

Compatibility

- EMAC 200 Pin SODIMM socket

I/O

- 26x SoM Specific I/O lines & JTAG
- 1x I2S Audio Port
- 3x Serial Ports (2x RS232 & 1x RS232/485)
- 1x 10/100 BaseT Ethernet with On-Board RJ-45
- 2x USB 2.0 Hosts (w/access to an additional Host Port)
- Battery for Real Time Clock
- Reset Button
- 1x Audio Beeper
- 1x SPI Port
- Timer/Counters & Pulse Width Modulation (PWM)
- 1x I2C Hardware Port

Video

- 4.3" Graphic LCD Interface for TFT WQVGA (400 x 272)
- Durability - Over one million touches
- Luminance: 400 (cd/m²)
- Backlight Brightness Control
- 1x 4-wire Resistive Touch Screen Interface

Analog

- 4x A/D Channels

Environment

- 0°-60° C Operating Temperature
- 90% Upper Operating Humidity

200 PIN CARRIER BOARD (ACTUAL I/O AVAILABILITY IS SOM DEPENDENT)

SoM-212ES

4x Serial Ports (3x RS232 & 1x RS232/485)

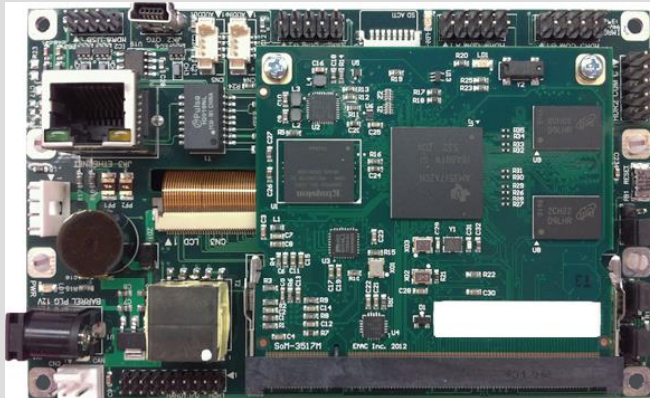
10/100 BaseT Ethernet with On-Board RJ-45

2x USB 2.0 Hosts & 1 USB OTG

1x MicroSD Flash Card Socket

26x SoM Specific I/O lines

4.3" Graphic WQVGA LCD with TTL Interface
Resistive Touch Screen Interface



Product Features

Compatibility

- EMAC 200 Pin SODIMM socket

I/O

- 26x SoM Specific I/O lines
- 1x I2S Audio Line In/Out Port
- 4x Serial Ports (3x serial RS232 & 1x RS232/485)
- 1x CAN 2.0b Port
- 1x 10/100 BaseT Ethernet (POE Type 1 Optional)
- 8-36Vdc Wide Input or Reg. 5 Vdc for SOM, USB & LCD
- 2x USB 2.0 Host Ports, 1x USB OTG (Host/Device)
- Battery for Real Time Clock , Reset Button
- 1x Software Controller Beeper
- 1x SPI Port
- Timer/Counters & Pulse Width Modulation (PWM) Ports
- 1x I2C Hardware Port

Video

- 4.3" Graphic ICD Interface for TFT WQVGA (400 x 272)
- Durability - Over one million touches
- Luminance: 400 (cd/m²)
- Backlight Brightness Control
- 1x 4-wire Resistive Touch Screen Interface

Analog

- 4x A/D Channels

Environment

- 0°-60° C Operating Temperature
- 90% Upper Operating Humidity

200 PIN CARRIER BOARD (ACTUAL I/O AVAILABILITY IS SOM DEPENDENT)

SoM-250ES

4x Serial Ports (3x RS232 & 1x RS232/422/485)

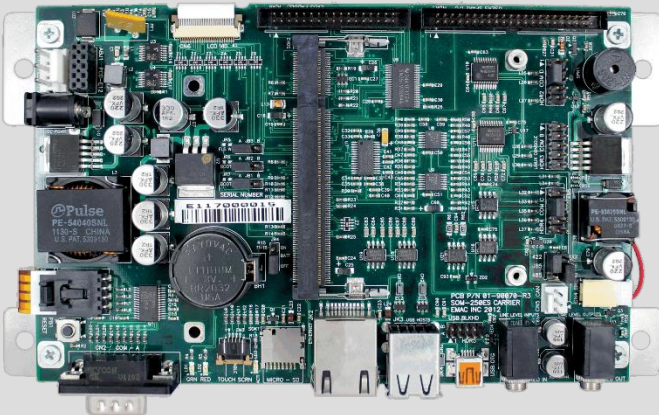
10/100 BaseT Ethernet with Status LEDs

2x USB Host & 1x USB OTG Port

22x SoM Specific I/O Lines

7" WVGA 800 x 480 Graphic LCD with Touch

10" WSVGA 1024 X 600 Graphic LCD with Touch



Product Features

Compatibility

- EMAC 200 Pin SODIMM socket

I/O

- 22x SoM Specific I/O lines (GPIO, A/D, SPI, I2C)
- 4x Serial Ports (3x RS232 & 1x RS232/422/485)
- 1x I2S Audio port with Line-In/Line-Out
- 1x CAN 2.0B Port
- 10/100 BaseT Ethernet with Status LEDs
- 2x USB 2.0 High Speed Host port
- 1x USB 2.0 High Speed OTG port
- Battery for nonvolatile RAM and Real Time Clock
- System Reset button
- 1x Audio Beeper

Video

- 7" TFT Color LCD, 800 x 480 WVGA @ 256K Colors
- 330 (cd/m²), Durability - Over one million touches
- 10" TFT LVDS Color LCD, 1024 x 600 WSVGA @ 256K
- 250 (cd/m²), Durability - Over one million touches
- Backlight Brightness Control
- 4-Wire Analog Resistive Touch Screen

Analog

- 4x Channels A/D

Environment

- 0°-60° C Operating Temperature
- 90% Upper Operating Humidity

200 PIN CARRIER BOARD (ACTUAL I/O AVAILABILITY IS SOM DEPENDENT)

SoM-250GS

4x Serial Ports (3x RS232 & 1x RS232/422/485)

Gig BaseT Ethernet with Status LEDs

2x USB Host Ports & 1x USB OTG Port

22x SoM Specific I/O Lines

7" WVGA 800 x 480 Graphic LCD with Touch

10" WSVGA 1024 X 600 Graphic LCD with Touch



Product Features

Compatibility

- EMAC 200 Pin SODIMM socket

I/O

- 22x SoM Specific I/O lines (GPIO, A/D, SPI, I2C, CAN)
- 4x Serial Ports (3x RS232 & 1x RS232/422/485)
- 1x I2S Audio port with Line-In/Line-Out
- 1x 10/100/1000 BaseT Ethernet with Status LEDs
- 2x USB 2.0 High Speed Host ports
- 1x USB 2.0 High Speed OTG port
- Battery for nonvolatile RAM and Real Time Clock
- System Reset button
- 1x Audio Beeper

Video

- 7" TFT Color LCD, 800 x 480 WVGA @ 256K Colors
- 330 (cd/m²), Durability - Over one million touches
- 10" TFT LVDS Color LCD, 1024 x 600 WSVGA @ 256K
- 250 (cd/m²), Durability - Over one million touches
- Backlight Brightness Control
- 4-Wire Analog Resistive Touch Screen

Analog

- 4x Channels A/D

Wireless

- Wireless 802.11 b/g/n; Bluegiga [WF111-E]Bluetooth

Environment

- 0°-60° C Operating Temperature
- 90% Upper Operating Humidity

Carrier Board – 314 Pin SODIMM

ROADMAP



SoM-350ES

1x mSATA Socket, 1x microSD Flash Card
4x Serial Ports (3x RS232, 1x RS232/422/485)
14x Processor General Purpose I/O Lines
1x Gig BaseT Ethernet with Status LEDs
Graphic LCD/HDMI/LVDS/DSI Interfaces
Resistive Touch Screen Interface
2x USB 2.0 High Speed Host, 1x USB OTG
1x I2S Audio & 1x CAN 2.0B Port
Wi-Fi & Bluetooth (Optional)

2017

Accurate

Affordable

Made in
USA

Wi-Fi

Video

Touch

314 PIN CARRIER BOARD (ACTUAL I/O AVAILABILITY IS SOM DEPENDENT)

SoM-350ES

4x Serial Ports (3x RS232 & 1x RS232/422/485)

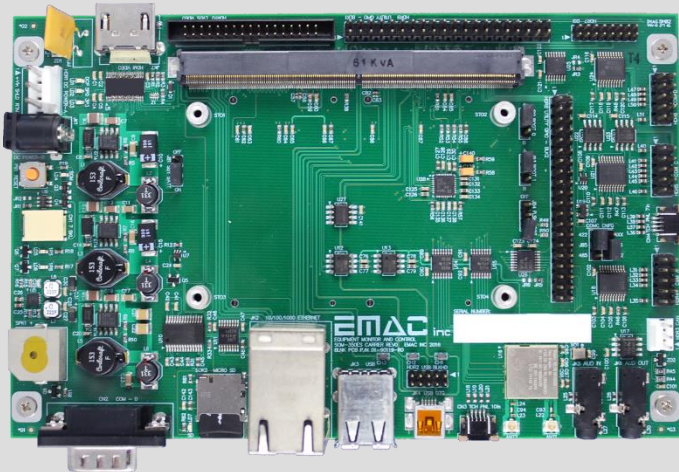
14x GPIO SoM Lines, 31x FPGA GPIO

2x Gig Base-T Ethernet with Status LEDs

Graphic LCD, HDMI, LVDS, & DSI Interfaces
Resistive Touch Screen Interface

I2S Audio Port with Line-In/Line-Out

Wi-Fi & Bluetooth (Optional)



Product Features

Compatibility

- EMAC 314-pin MXM EM4C G2 Spec socket

I/O

- 14x GPIO SoM Lines, 31x FPGA GPIO
- 1x I2S Audio port with Line-In/Line-Out
- 2x 10/100/1000 BaseT (Gig) Ethernet with Status LEDs
- 1x CAN Port
- 4x Serial Ports (3x RS232 & 1x RS232/422/485)
- 2x USB 2.0 or 3.0 Host Ports
- 1x USB 2.0 High Speed OTG port
- 2x Timers/Counters/PWM
- System Reset button, 1x Audio Beeper
- 1x SPI, 1x I2C Hardware Port

Video

- 7" TFT Color LCD opt., 800x480 WVGA @ 256K Colors
- 800 (cd/m²), Durability - Over one million touches
- 10" TFT LVDS Color LCD opt., 1024x600 WSVGA (256K)
- 460 (cd/m²), Durability - Over one million touches
- Graphic LCD, HDMI, LVDS, & DSI Interfaces
- Backlight Brightness Control
- 4-Wire Analog Resistive Touch Screen

Analog

- 4x A/D Channels

Environment

- 0°-60° C Operating Temperature [Opt. -40° to +85° C]
- 90% Upper Operating Humidity

PLEASE CONTACT EMAC, INC. FOR DETAILS ON



Custom Engineering

Integration Services

COTS Boards & Peripherals



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Thank You

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