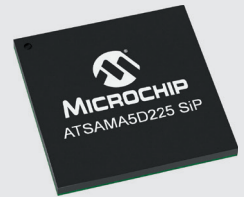


SAMA5D2 System in Package (SiP) Family

Embedded (LP)DDR2 Simplifies PCB Design and Reduces Board Cost

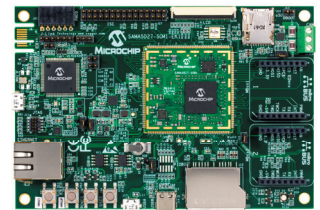
Summary

Microchip's SAMA5D2 System in Package (SiP) family integrates DDR2 or LPDDR2 SDRAM with the SAMA5D2 MPU in a single package, which eliminates the board layout complexity of interfacing high-speed (LP)DDR2 signals and reduces EMI concerns. Besides shrinking board dimensions, SiPs can reduce the number of PCB layers significantly lowering the system cost. Microchip's customer-driven obsolescence policy insulates you from the risk of DRAM obsolescence. The SiP family is fully supported by a mainlined Linux distribution.



Four DDR2 memory sizes (128 Mb, 512 Mb, 1 Gb and 2 Gb) are available for the SAMA5D2 SiP and optimized for bare metal, Real-time Operating System (RTOS) and Linux implementations and rated for -40 to +85°C operation. If you have secure application requirements, you can select a version with Payment Card Industry (PCI) pre-certification.

Part Number	Target Application	Memory Type	Memory Density	Package
ATSAMA5D225C-D1M-CU(R)	RTOS, bare metal	DDR2	128 Mbit/16 Mbytes	BGA196
ATSAMA5D27C-D5M-CU(R)	Linux®	DDR2	512 Mbit/64 Mbytes	BGA289
ATSAMA5D27C-D1G-CU(R)	Linux	DDR2	1 Gbit/128 MBytes	BGA289
ATSAMA5D27C-LD1G-CU(R)	Linux	LPDDR2	1 Gbit/128 MBytes	BGA361
ATSAMA5D27C-LD2G-CU(R)	Linux	LPDDR2	2 Gbit/256 MBytes	BGA361
ATSAMA5D28C-D1G-CU(R)	Linux, PCI compliant	DDR2	1 Gbit/128 MBytes	BGA289
ATSAMA5D28C-LD1G-CU(R)	Linux, PCI compliant	LPDDR2	1 Gbit/128 MBytes	BGA361
ATSAMA5D28C-LD2G-CU(R)	Linux, PCI compliant	LPDDR2	2 Gbit/256 MBytes	BGA361



Support

The ATSAMA5D27-SOM1-EK1 Evaluation Kit provides a convenient hardware development platform for the SAMA5D2 SiP family. Microchip supports the SAMA5D2 family in the mainline Linux OS distribution. Software development support is available on www.linux4sam.org, including demo images and support for AT91Bootstrap, U-Boot and the Buildroot and Yocto project build systems. A SAMA5D2 software package provides driver and demo code example support for RTOS and bare-metal software development. To accelerate hardware design, IBIS models and BSDL files for the SiPs and development board design and manufacturing files (Gerbers, schematics, etc.) can all be downloaded from www.microchip.com/mpu.

Key Applications

- Smart HMI/control panels (white goods, alarm systems, etc.)
- IoT/secure gateways
- Point of Sale (POS) terminals and imaging/cameras
- Wearables/battery-operated applications

Key Highlights

- **Lower system cost** – SiPs reduce the board size and number of layers, significantly reducing PCB cost. The initial design effort is reduced as well as the hidden cost of DRAM obsolescence on design resources.
- **Low-power, high-performance architecture** – The SAMA5D2 series delivers the world's lowest-power consumption of all MPUs in its class. The ATSAMA5D27C-LD1G SiP with 1 Gb LPDDR2 DRAM consumes just 0.4 mW in MPU backup and LPDDR2 self refresh mode with context preserved and has a 15 μ S ultra-fast wake-up.
- **High-grade security** – The SAMA5D2 was designed to provide a comprehensive security environment. Its so secure that we offer PCI pre-certification (used by financial terminal applications) on the ATSAMA5D28 SiPs.
- **Lifetime commitment** – Microchip's customer-driven obsolescence policy allows you to design a SiP without worry.

SAMA5D2 SiP Family Devices

Feature	SAMA5D225C-D1M	SAMA5D27C-D5M	SAMA5D27C-D1G	SAMA5D28C-D1G	SAMA5D27C-LD1G	SAMA5D27C-LD2G	SAMA5D28C-LD1G	SAMA5D28C-LD2G
Package	TFBGA196	TFBGA289			TFBGA361			
(LP)DDR2-SDRAM	128 Mb DDR2	512 Mb DDR2	1 Gb DDR2		1 Gb LPDDR2	2 Gb LPDDR2	1 Gb LPDDR2	2 Gb LPDDR2
SMC	Up to 16-bit							
DDR Memory Bus Width	16-bit				32-bit			
PIOs	90	128						
SRAM	128 Kbytes							
QSPI	2							
LCD	24-bit RGB							
Camera Interface (ISC)	1							
EMAC	1							
PTC	4 X-lines x 8 Y-lines	8 X-lines x 8 Y-lines						
CAN	1	2						
USB	2 (2 Hosts or 1 Host/1 Device)	3 (2 Hosts/1 HSIC or 1 Host/1 Device/1 HSIC)						
UART/SPI/I ² C	9/7/7	10/7/7						
SDIO/SD/MMC	2							
I ² S/SSC/Class D/PDM	2/2/1/1							
ADC Inputs	5	12						
Timers	5	6						
PWM	4 (PWM) + 5 (TC)	4 (PWM) + 6 (TC)						
Tamper Pins	6	8						
AES Accelerator	Yes							
Environmental Monitors, Die Shield	-	-	-	Yes	-	-	Yes	

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