

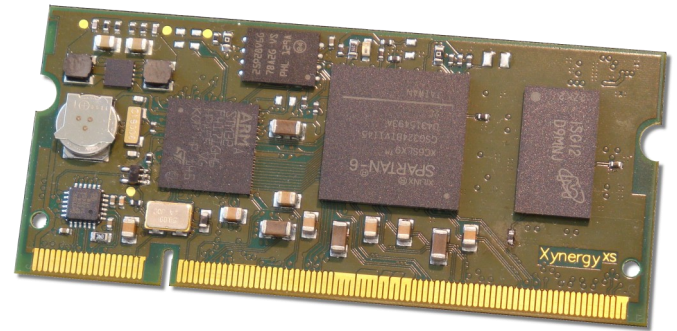
# Xynergy<sup>XS</sup>

**Versatile Controller module with STM32 Cortex-M4  
Spartan-6 FPGA, 128MB DDR3 RAM & 10/100LAN  
CAN, UART, USB-OTG, SDIO, I<sup>2</sup>C, ADC/DAC**



**Xynergy<sup>XS</sup>** combines STMicroelectronics' STM32F417 controller, based on ARM® Cortex™-M4, with a Xilinx Spartan-6 low-cost FPGA XC6SLX9. The controller's FSMC interface is used for parallel 16-bit connection to the FPGA ensuring high-speed data transfer between the two devices. The STM32F417 core can be clocked at up to 168 MHz and has up to 1 MB flash memory and 192 KB SRAM on chip. In addition, the 128MB (64M x 16) DDR-3 memory, which is connected to the FPGA, can be made transparent via the FSMC bus, enabling the controller to use it like external memory.

The micro-controller of the **Xynergy<sup>XS</sup>** provides numerous communications interfaces, including 10/100 Ethernet with PHY, USB-OTG, CAN (two channels), one SPI, one COM-Port (RX/TX only), I<sup>2</sup>C (two channels), an SDIO port, seven ADC channels, two DAC channels and up to 21 general purpose I/O lines. All interface signals are available at the 200-pin edge connector.



## Specifications:

**Power consumption:** 3 Watts\* @ 3.3V (alternate V<sub>IO</sub> for the FPGA is 2.5V (Bank 0 & 2))

**Micro-Controller:** STM32F417 in BGA176

**FPGA:** Spartan-6 (XC6SLX9 in BGA324, LX45 optional)

**External Memory:** 128 MBytes DDR3, 64 Mbit SPI flash

**I/O:** Up to 130 general purpose I/O pins, supporting different I/O standards and protocols (see text)

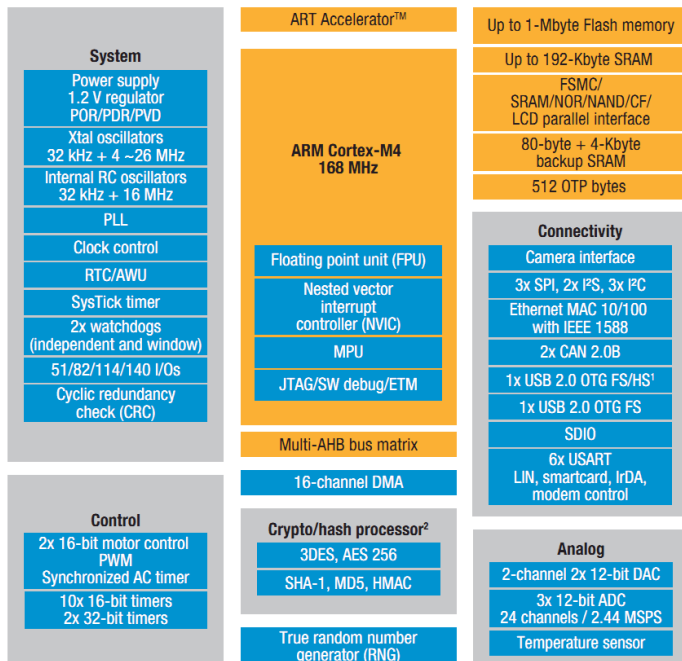
**Physical Dimensions:** 67.6 x 30.0 x 6mm (SO-DIMM200)

**Weight:** approx. 6grams

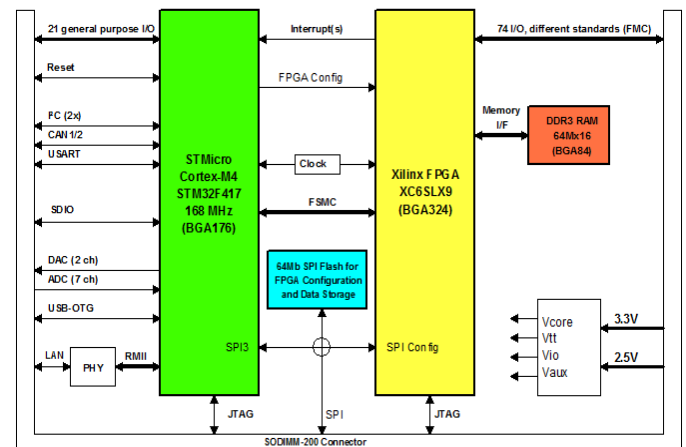
**Matching Socket:** e.g., TE Connectivity 1473005-4

**Bottom/Top Component Height:** 2.0/2.0mm (max.)

*\*) depending on the application*



STM32F417 Block Diagram



Simplified Xynergy<sup>XS</sup> Block Diagram

The FPGA expands I/O capabilities of the **Xynergy<sup>XS</sup>** by delivering up to 35 differential (LVDS) I/O lines useful for connecting FMC based expansion boards and four single-ended general purpose I/O lines.

For the pinout of the SO-DIMM connector, please refer to: [downloads.dsp-sys.de/XynergyXS/PinoutXynergyXS.pdf](http://downloads.dsp-sys.de/XynergyXS/PinoutXynergyXS.pdf)

Also available is a motherboard with all pins accessible at 100mil header plus JTAG headers for easy evaluation.

Silica's Xynergy board may be used as a development platform for our **Xynergy<sup>XS</sup>** module. More information on this product can be found at [www.silica.com/Xynergy](http://www.silica.com/Xynergy).

## Typical applications:

Point of Sale (PoS), Industrial Control, Industrial Imaging, Motion Control, M2M Communication etc.



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