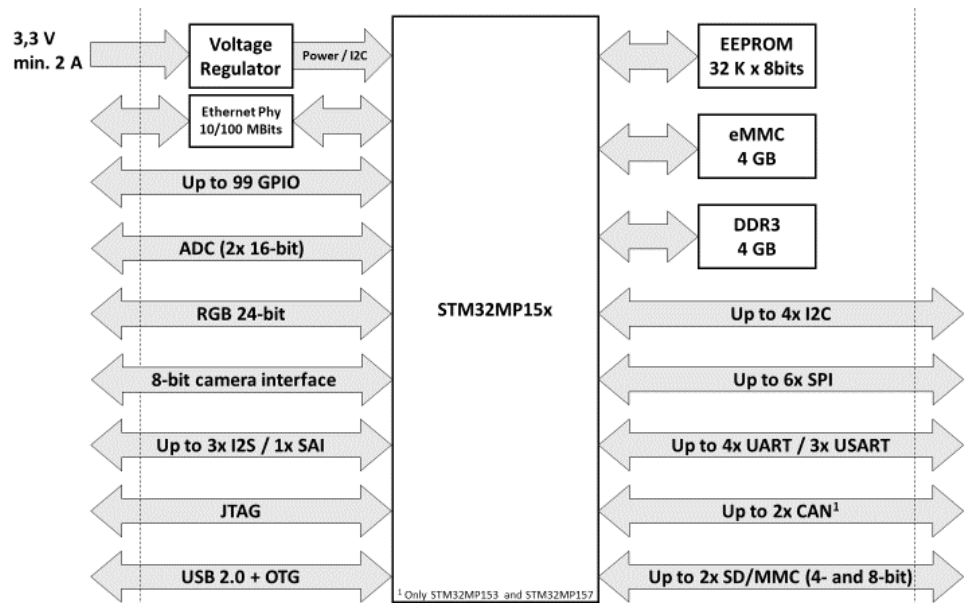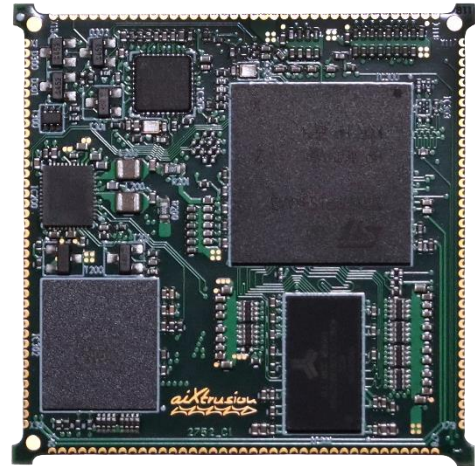# STM32MP15x

The aiXcore offers a wide range of functions.

The processor comes from STmicroelectronics STM32MP15x family. It has a high-performance (dual-core[Note1]) Arm® Cortex®-A7 32-bit RISC core operating at up to 800 MHz. The Cortex-A7 processor includes a 32-Kbyte L1 instruction cache, a 32-Kbyte L1 data cache and a 256-Kbyte level2 cache. The STM32MP15x also embed a Cortex® -M4 32-bit RISC core operating at up to 209 MHz frequency. Cortex-M4 core features a floating point unit (FPU) single precision which supports Arm® single-precision data-processing instructions and data types. The Cortex® -M4 supports a full set of DSP instructions and a memory protection unit (MPU) which enhances application security.

Included are memory units in the form of an EEPROM with 32 kB, a DDR3 with 1 GB and an eMMC with 4 GB.
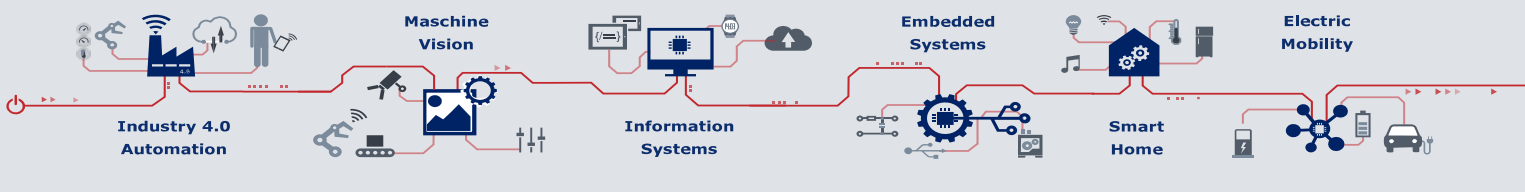
An Ethernet Phy is also used and offers a transmission speed of 10/100 MBits.

The aiXcore has various interfaces for communication and data transfer. Standard transmissions such as SPI, I2C and UART/USART are implemented several times. USB 2.0, CAN, SDMMC, audio or display signals can also be transmitted.

Typical applications include gateway solutions, security-based high-performance embedded systems or display and touchscreen systems.

Note 1: Only on STM32MP153 / STM32MP157

Block diagram:

Input	STM32MP15x	Output
3,3 V min. 2 A → Voltage Regulator (Power / I2C)		EEPROM 32 K x 8bits
Ethernet Phy 10/100 MBits		eMMC 4 GB
Up to 99 GPIO		DDR3 4 GB
ADC (2x 16-bit)		Up to 4x I2C
RGB 24-bit		Up to 6x SPI
8-bit camera interface		Up to 4x UART / 3x USART
Up to 3x I2S / 1x SAI		Up to 2x CAN[1]
JTAG		Up to 2x SD/MMC (4- and 8-bit)
USB 2.0 + OTG		

[1] Only STM32MP153 and STM32MP157

SOC	
Processor	STM32MP15x
Core	32-bit single/dual-core[1] Arm® Cortex®-A7 32-bit Arm® Cortex®-M4 with FPU/MPU
Clock frequency	Till to 800 MHz
Cache	L1: 32 kB I 32 kB D L2: 256 kB
Intern RAM	708 kB SRAM
Extern memory	
Flash	4 GB eMMC
DDR3	4 GB
EEPROM	32 kB
Physical Properties	
Dimension	46.5 x 46.5 x 2.5 mm
Weight	8.3 g
Operating temperature	
Power supply	+3.3 V
Power consumption	
Contacting	156-pin 1.012 mm-pitch solder connection
Software	
Operating system	Linux
Real-time operating system	

Maximum interfaces	
Ethernet	10/100M or Gigabit
USB 2.0	2x high-speed host / 1x OTG
UART / USART	3x (up to 4x) / 1x (up to 3x)
SPI	3x (up to 6x)
I²C	4x (1x used internal)
CAN[2]	2x (up to 2x)
MMC/SD	1x 4-bit (up to 1x 4-bit + 1x 8-bit)
A/D	2x16-bit
Display	24-bit RGB
Audio	4x - SAI up to 1x, - I2S 1x [up to 3x]
GPIO	15x (up to 99x)
Debugging	JTAG

Note 2: Just for STM32MP153 and STM32MP157

Product Example