XC886/888LM

High Performance 8-bit Microcontroller with On-Chip Flash Memory for Enhanced Motor Control

THE XC886/888LM enhances the XC800 family of 8-bit µCs with a new member providing advanced motor drive capability by combining up to 32 KByte of embedded Flash with a powerful capture compare unit (CCU6) for flexible PWM generation and the new Multiplication/Division Unit (MDU) for fast mathematical computations.

ADDITIONAL KEY FEATURES include support for LIN, a highly accurate 10-bit ADC with fast conversion speed and a CORDIC unit.

THE FLEXIBILITY offered by the XC886/888LM embedded Flash products is also expanded to include a family of compatible ROM versions for further cost saving potential in high volume production.

THE XC886/888LM family offers an optimized fit to a wide range of motor control applications including automotive body, industrial motor control and consumer drive.

Key Features

- High performance XC800 core, based on industry standard 8051 architecture
- 83 – 166 ns instruction cycle time @ 24 MHz CPU clock
- 24 KByte or 32 KByte of Flash memory
  - Built-in error correction (ECC)
  - Increased Flash performance through caching
  - Up to 8 KByte of the 24/32 KByte Flash ideal for data Flash and EEPROM emulation
- 256 Byte RAM, 1536 Byte XRAM
- 2 UART (one for LIN support)
- High speed SPI compatible synchronous serial interface (SSC)
- Capture/Compare Unit (CCU6) with two independent 16-bit timers dedicated for PWM generation for AC and DC motor control
  - 4 compare channels with 7 outputs and 6 capture inputs
  - Support for dead time generation
- 10-bit ADC with high accuracy (8 channels)
  - Fast conversion time of less than 1.5 µs
  - TUE less than ±2 LSB
  - Auto scan, injection and comparator modes to offload CPU

- LIN bootstrap loader (BSL) support (Flash programming through LIN possible)
- Multiplication/Division Unit (MDU) for high-speed 16- and 32-bit multiplication, division and shift operations
- CORDIC (COordinate Rotation DIgital Computer) unit for high-speed computation of trigonometric, linear or hyperbolic functions
- Brown-out detection for core logic supply
- On-chip OSC (9.6 MHz) and PLL for clock generation
- 4 general purpose 16-bit timers
- Programmable 16-bit watchdog timer (WDT)
- Interrupts
  - 14 interrupt vectors with 4 priority levels
  - Non-maskable interrupt (NMI)
- On-chip debug support (JTAG)
- Port- and core-voltage watchdog circuit with RESET generation
- Power saving modes
  - Slow-down mode
  - Idle mode
  - Power-down mode with fast wake-up capability via RxD (LIN) or EXINT0
  - Clock gating control to each peripheral
- Flexible single voltage supply of 3.3 V or 5.0 V
- 34/48 general purpose I/O ports (incl. 8 analog ports)
- Packages:
  PG-TQFP-48 (green),
  PG-TQFP-64 (green)
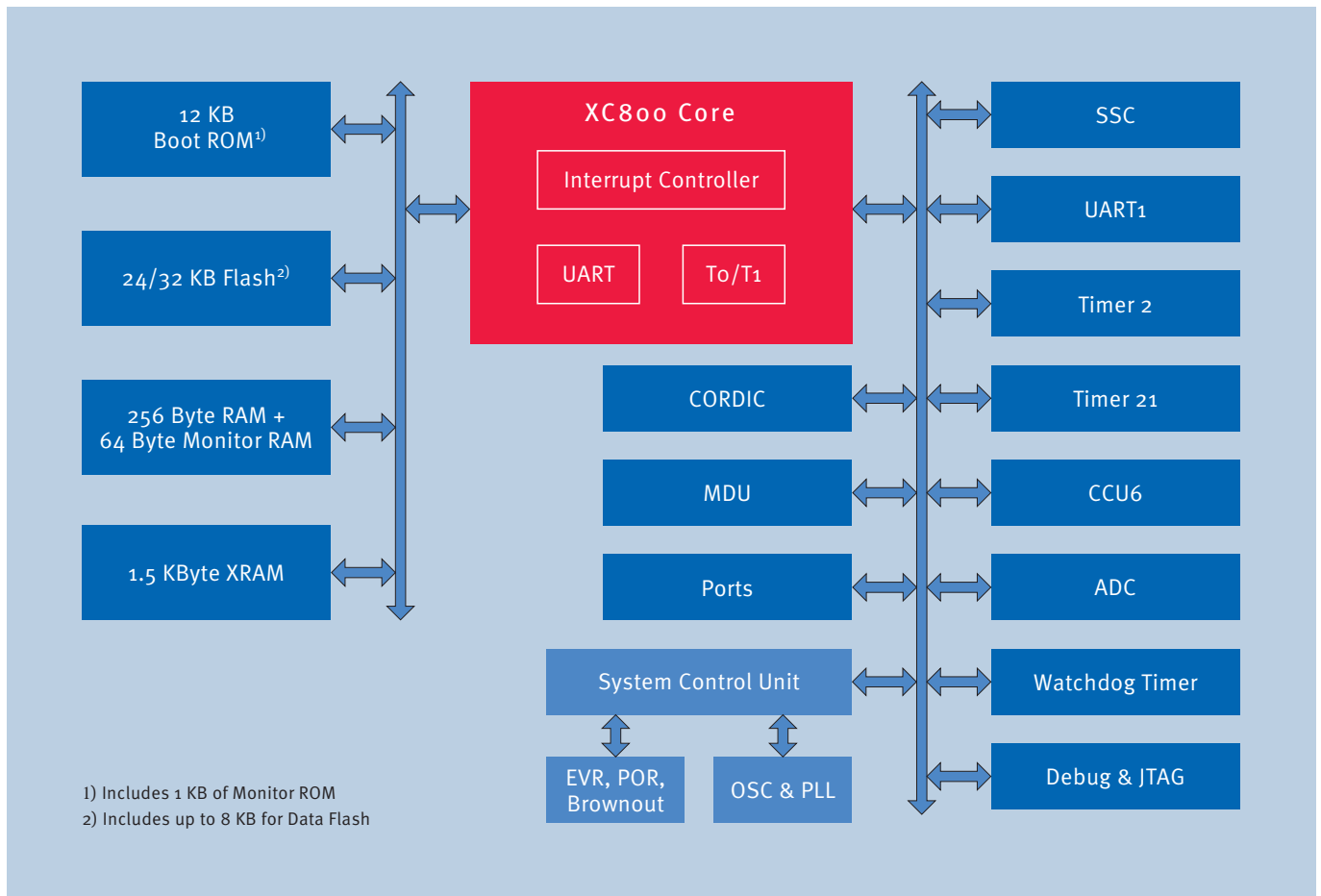- Temperature range
  - SAF (-40°C to 85°C)
  - SAK (-40°C to 125°C)

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XC886/888LM Block Diagram

12 KB Boot ROM[1]		XC8oo Core		SSC
24/32 KB Flash[2]		Interrupt Controller		UART1
256 Byte RAM + 64 Byte Monitor RAM		UART / To/T1		Timer 2

Blocks shown: 12 KB Boot ROM[1], 24/32 KB Flash[2], 256 Byte RAM + 64 Byte Monitor RAM, 1.5 KByte XRAM, XC8oo Core (Interrupt Controller, UART, To/T1), CORDIC, MDU, Ports, System Control Unit, EVR, POR, Brownout, OSC & PLL, SSC, UART1, Timer 2, Timer 21, CCU6, ADC, Watchdog Timer, Debug & JTAG

1) Includes 1 KB of Monitor ROM
2) Includes up to 8 KB for Data Flash

Derivatives

Type	eFlash [KByte]	RAM [Byte]	MDU	LIN BSL Support	Package
XC886-6FF	24	1792	–	–	PG-TQFP-48
XC886-8FF	32	1792	–	–	PG-TQFP-48
XC888-6FF	24	1792	–	–	PG-TQFP-64
XC888-8FF	32	1792	–	–	PG-TQFP-64
XC886LM-6FF	24	1792	✓	✓	PG-TQFP-48
XC886LM-8FF	32	1792	✓	✓	PG-TQFP-48
XC888LM-6FF	24	1792	✓	✓	PG-TQFP-64
XC888LM-8FF	32	1792	✓	✓	PG-TQFP-64