

## CCS CM4F9 – Microcontroller and FPGA System-on-Module family

### General Description

The CCS CM4F9 is a cost-efficient, highly integrated, low-power system-on-module which efficiently combines a high-performance Cortex®-M4 CPU and a low-power FPGA. It is suitable for control, monitoring, and low complexity computing applications for new designs or existing products as a replacement part. It combines the CPU with an FPGA to implement a wide range of peripherals (GPIO, SPI, I2C, UART, ADC, CAN, USB) and custom programmable logic to accelerate user specific tasks.

The SOM is designed to be pin-compatible with mainstream, commercially available MCUs and act as a cost-effective drop-in replacement without the need of HW redesign.

The CPU supports the ARM® Common Microcontroller Software Interface Standard (CMSIS) for software portability.

### Key features

- High-Efficiency Microcontroller:
  - ARM® Cortex®-M4 processor with FPU
  - Operation up to 120 MHz
  - Up to 3 MB Flash Memory
  - Up to 1 MB SRAM
  - Memory Protection Unit (MPU)
- Communication Interfaces:
  - USB High-Speed or Full-Speed interface
  - CAN 2.0 interface
  - Serial communication interfaces: UART, SPI/QuadSPI, I2C\*
- Up to 183 fast I/Os\*
- Up to 6 ADC (12-bit resolution, 1 Msp/s conversion rate)
- Optional user defined logic or peripheral, e.g. parallel communication interface\*
- Up to six 32-bit timers
- 32 kHz oscillator support for RTC

- Single Wire Debug (SWD) interface
- 24-Bit Color TFT Controller
- External memory interfaces: DDR, Flash, eMMC, microSD interface
- Various low-power modes
- Dedicated security module
- Operation from Single Supply: 1.71V to 3.465V
- Wide Operating Temperature: -40°C to +105°C

\*: the number of interfaces, I/Os or custom logic depends on the system configuration

### Application areas (both new and existing product designs)

- Monitoring
- Control functions
- Low complexity computing
- IoT - Edge computing
- Communication gateway

### Configuration options

- Pin compatible MCU families:
  - STMicroelectronics STM32® family
  - Microchip SAM® family
  - NXP General Purpose MCU family
- Pin compatible packages:
  - LQFP packages with minimum dimensions of 9x9 mm

### Simplified Diagram

