

# XC167CI

High Performance 16-bit Microcontroller  
with Embedded Flash for  
Industrial Applications



THE XC167CI is a new derivative of the popular C166 microcontroller family that is based on the enhanced C166S V2 architecture it outperforms existing 16-bit solutions. Impressive DSP performance and advanced interrupt handling combined with an integrated powerful peripheral set and a high performance on-chip flash makes the XC167CI the instrument of choice for demanding industrial and automotive applications. Additionally to the well-known C167 peripheral set the XC167CI has a flexible on-chip PWM unit for all kinds of motor control applications as well as an I<sup>2</sup>C-module.

THE ARCHITECTURE of XC167CI has been optimized for high instruction throughput and minimum response time to external interrupts. Integrated intelligent peripheral systems reduce the need for CPU intervention. The high flexibility of this architecture perfectly supports the diverse and varying needs of different application areas such as industrial drives and control, or automotive body. All this combined in a small PG-TQFP-144 package enables very high levels of system integration.

## Applications

- Industrial drives
- Industrial controls
- Electrical power steering
- Body control modules

## Features

- High performance 16-bit C166S V2 CPU with 5-stage pipeline
- Single clock cycle instruction execution with 25 ns instruction time at 40 MHz CPU clock
- 25 ns multiplication (16 x 16-bit) time at 40 MHz CPU clock
- DSP support with built-in advanced MAC unit
- 16 Mbytes total linear address space for code and data
- Flexible synchronous external bus interface
- 16-priority-level interrupt system on 8 group levels

- On-chip debug controller and related interface to JTAG controller
- Gated clock concept (function related) for reduced power consumption and improved EMC
- 8/12 Kbytes on-chip RAM
- 128/256 Kbytes advanced program Flash memory
- Flexible system control and power management
- Real time clock with alarm interrupt
- 16-channel 10-bit A/D converter, conversion time < 3 μs
- Two 16-channel capture/compare units with 2 independent time bases each
- CAPCOM6E module with two independent timers dedicated to PWM generation for AC and DC motor control
- I<sup>2</sup>C bus module with 10-bit addressing and 400 kbit/s data rate
- Two multifunctional general purpose timer units
- Two asynchronous/synchronous serial channels (USART)
- Two high speed synchronous serial channels (SPI)
- TwinCAN module, two full-CAN nodes with 32 message buffers and gateway function and FIFO
- Up to 103 I/O lines with individual bit addressability
- Package: PG-TQFP-144 (pb-free) Plastic Green Thin Quad Flat Package
- Temperature range: -40°C to +125°C
- Supply Voltage:
  - Core Supply: 2.5 V
  - Ports: 5.0 V

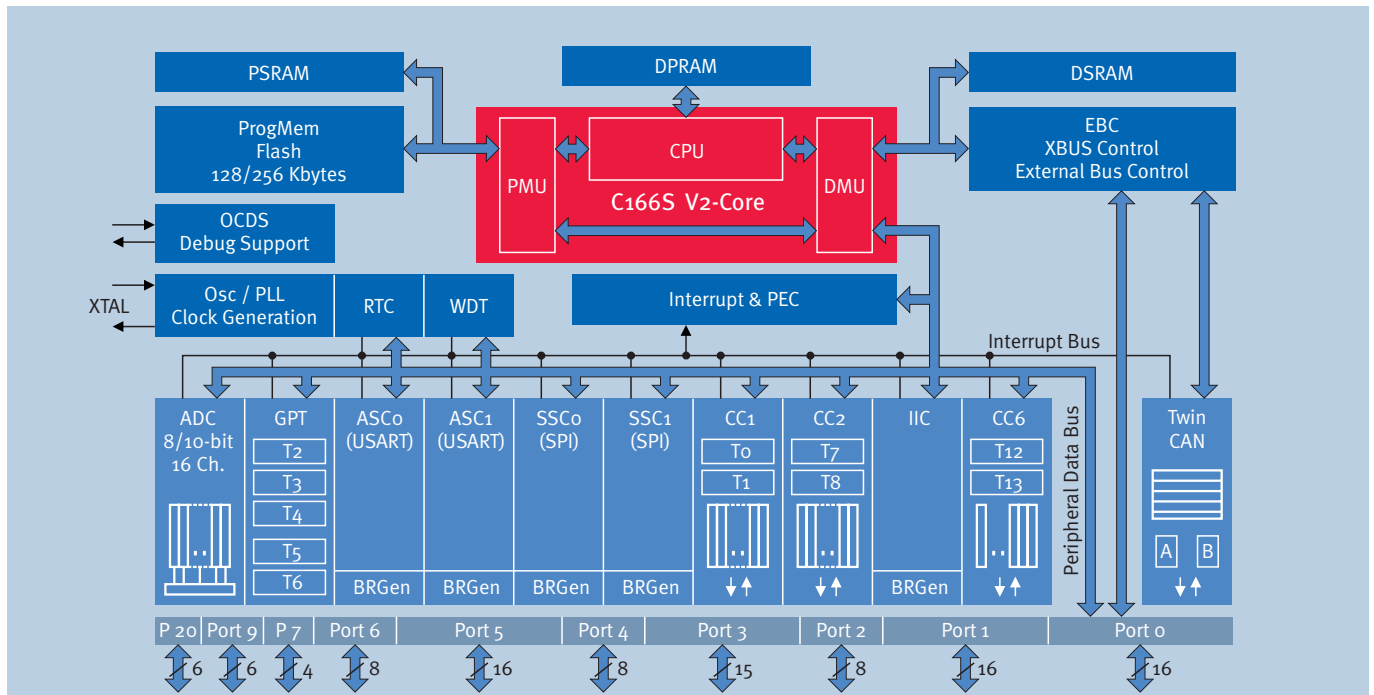
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Microcontrollers



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## XC167CI Block Diagram



## Product Summary

Type	Package
SAF-XC167CI-16F40F	PG-TQFP-144
SAK-XC167CI-16F40F	PG-TQFP-144
SAF-XC167CI-32F40F	PG-TQFP-144
SAK-XC167CI-32F40F	PG-TQFP-144



## XC167CI

### Application Example

- Industrial controls
- Robotic controls
- Industrial networking
- Electrical power steering
- Body control modules
- Distributed control

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