<u>Product Brief</u>



TC1796

Highly Integrated 32-bit TriCoreTM-based Next Generation Microcontroller for Automotive Applications

The TC1796 - member of the AUDO-NG family - is optimized for highly demanding applications where embedded real-time performance and DSP capabilities combined with an extremely fast interrupt response time and highest level of fault tolerance are needed. AUDO-NG is based on the award-winning unified 32-bit TriCoreTM architecture combining RISC, CISC and DSP functionality in a single chip. New innovative peripherals like the Micro Second bus, fast analog-to-digital converter unit or the Micro Link Interface as well as the advanced triple bus structure boosting the overall system performance turn the TC1796 into the most powerful 32-bit microcontroller in the automotive arena.

Applications

- Automotive engine and transmission control
- Automotive by-wire control systems
- Industrial robotic control

Features

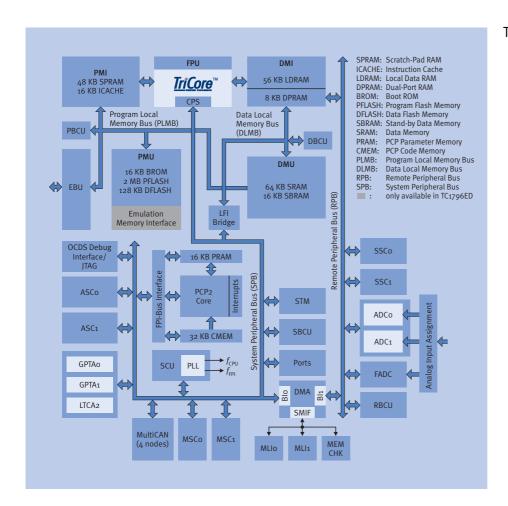
- High performance 32-bit super-scalar TriCoreTM V1.3 CPU with 4 stage pipeline
 - Superior real-time performance
 - Strong bit handling
 - Fully integrated DSP capabilities
 - Single precision floating point unit (FPU)
 - 150 MHz at full automotive temperature range
- 32-bit Peripheral Control Processor with single cycle instruction (PCP2)
- Memories
 - 2 MByte embedded program flash with ECC
 - 128 KByte data flash for scalable 16 KByte EEPROM emulation
 - 192 KByte on-chip SRAM
 - 16 KByte instruction cache
- 16-channel DMA controller
- 32-bit external bus interface unit with synchronous burst flash access capability
- Sophisticated interrupt system with 2 x 255 hardware priority arbitration levels serviced by CPU and PCP2
- High performing triple bus structure
 - 64-bit local memory buses to internal flash and data memory
 - 32-bit system peripheral bus for interconnections of on-chip peripherals and further functional units
 - 32-bit remote peripheral bus serving the requirements of high speed peripherals

- Two Micro Second bus interfaces (MSC) for port expansion to external Power ASICs
- Two general purpose timer array modules plus separate LTC array with a digital signal filtering and timer functionality to realize autonomous and complex I/O management (GPTA4)
- Two asynchronous/synchronous serial channels with baud rate generator, parity, framing and overrun error detection (ASC)
- Two high speed synchronous serial channels with programmable data length and shift direction (SSC)
- Two high-speed Micro Link Interfaces for serial inter-processor communication (MLI)
- MultiCAN module with four CAN nodes and 128 free assignable message objects for high efficiency data handling via FIFO buffering and gateway data transfer; one CAN node with TTCAN functionality
- 4-channel fast analog-to-digital converter unit (FADC) with concatenated comb filters for hardware data reduction;
 10-bit resolution/min. conversion time 280 ns
- Two 16-channel analog-to-digital converter units (ADC) with 8-bit, 10-bit or 12-bit resolution
- 44 analog input lines for ADC and FADC
- 123 digital general purpose I/O lines,
 4 input lines
- Digital I/O ports with 3.3 V capability
- On-chip debug support OCDS level 1+2 (CPU, PCP, DMA)
- Dedicated emulation device chip for multicore debugging, tracing and calibration via USB 1.1 interface (TC1796ED)
- Power management system
- Clock generation unit with PLL
- Supply Voltage 1.5 V
- I/O Voltage 3.3 V
- Full automotive temperature range -40° to +125°C
- P-BGA-416 package

www.infineon.com/microcontrollers

Microcontrollers





TC1796 Block Diagram



TC1796 The Most Innovative Solution for High-end Engine and Transmission Control

Diesel & Gasoline Engine Control

- Reduced emission levels
- Better engine behavior
- Less fuel consumption

Automated Transmission Control

- Better acceleration
- More comfort
- Less fuel consumption

How to reach us: http://www.infineon.com

Published by Infineon Technologies AG, St.-Martin-Strasse 53, D-81669 München

© Infineon Technologies AG 2004. All Rights Reserved.

Template: pb_tmplt.fm/4/2004-01-01

Attention please!

The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics.

Terms of delivery and rights to technical change reserved.

We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office.

Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.

Infineon Technologies Components may only be used in lifesupport devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.