TC11IB is Infineon's first TriCore microcontroller targeting general purpose and industrial applications. An advanced set of on chip communication peripherals makes this microcontroller very useful for highly integrated applications such as PLC, slot CPU in a PC or as industrial communication device. The External Bus Unit (EBU), usually the bottleneck of 32 Bit devices, is designed for new performance dimensions and fulfills the PC100 specification. This device takes credit from the strongly increasing demand for high performance interfaces like PCI and Ethernet, which are integrated on the chip. Sophisticated real time operating systems will find enough memory with the 1.5 MB embedded DRAM to enable single chip solutions.



### **Feature Overview**

- Unified 32 Bit MCU-DSP
  - TriCore<sup>™</sup> V1.3
  - 96 MHz CPU clock rate
  - Hardware supported context switch
  - 22 ns interrupt latency @ 96 MHz
  - 1, 8, 16, 32 & 64 data format
  - Powerful integrated DSP capabilities
  - Bit logical operations
  - Concurrent 16/32 Bit instruction set
  - Superscalar RISC design with 3 pipelines
  - Load/Store architecture
  - Dual 16 x 16 MACs
  - 4 Gbyte address range
- On-chip memories
  - 1.5 MB eDRAM
  - 32 kB configurable code memory for scratch-pad and cache
  - 32 kB configurable data memory for scratch-pad and cache
  - 16 kB boot ROM
  - 16 kB PCP code memory
  - 4 kB PCP data memory
- 32 Bit I/O-processor PCP (Peripheral Control Processor)
  - Data move between any memory or I/O location
  - Read-modify-write
  - Arithmetic and logical operations
  - Interrupt driven

- Bus Systems
  - 64 Bit, 96 MHz on chip LMB (Local Memory Bus)
  - 32 Bit, 96 MHz and 48 MHz multi-master on-chip FPI bus (Flexible Peripheral Interconnect Bus)
- PCI V2.2 Interface
  - 32 Bit/33 MHz operation
  - Target/Initiator operation
  - Host functionality
  - Multi function PCI device (up to 2)
  - DMA transfer capability
  - Configurable configuration space
- Power Management V1.1
- External Bus Unit (EBU)
  - PC100 SDRAM multibanking and power-down support
  - Master/Slave operation
  - SRAM, ROM, EPROM support
  - Burst flash
- 7 fully programmable chip-selects
- Fast Ethernet Interface (10/100 Mbit/s)
  - IEEE802.3 standard
  - MII interface (media independent interface)
- 12 Mbaud High Speed Synchronous Serial Interface (SSC) with SCI support

- 1.5 Mbaud Asynchronous/ Synchronous Serial Interface (ASC) with IrDA support
- 3 Mbaud 16x50 Serial Interface
- 2 General Purpose Timer Units (GPTU) Cinden and deaths an arating
- 6 independently operating
  32 Bit timers
  32 Bit timers can be split into
- 8 and 16 Bit sub timers
- 16 MHz MultiMediaCard<sup>™</sup> Interface (MMCI)
- Up to 96 General Purpose software configurable Inputs/Outputs (GPIO)
   Organized into 6 ports of 16 Bits each
- Enhanced boot mechanism
- Watchdog timer
- System timer
- On Chip Debug Support (OCDS)
   JTAG
  - level 2
  - Multicore debugging (PCP, TriCore)
- On Chip Power Management
- Supply voltage 1.8 V
- I/O voltage 3.3 V
- PCI 3.3 V signaling
- 388 pin P-BGA package
- Ambient temperature range 0°C to +85°C

# T C 1 1 I B Highly Integrated 32 Bit Microcontroller



I device (up to 2) bability figuration space

## Block Diagram TC11IB



## **Key Features**

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32 Bit I/O-processor PCP	<ul><li>Intelligent DMA controller</li><li>Logical and arithmetic operation support</li></ul>	<ul> <li>I/O-processor for autonomous peripheral management</li> </ul>
EBU	<ul> <li>PC100 SDRAM support</li> <li>Master/Slave operation</li> <li>7 fully programmable chip selects</li> </ul>	<ul> <li>400 MB/s maximum throughput</li> <li>Highly flexible memory interface with a high choice of memory types</li> </ul>
eDRAM	<ul> <li>512 kB eDRAM on the 96 MHz 64 Bit bus for system operations</li> <li>1 MB eDRAM on the 96 MHz 32 Bit bus for data buffer</li> <li>Universal for code and data</li> </ul>	<ul> <li>High throughput on PCI and Ethernet interfaces</li> <li>Huge on chip memory space for operation systems and applications</li> </ul>
PCI	<ul> <li>32 Bit/33 MHz operation</li> <li>Host functionality</li> <li>Multi functions</li> <li>DMA transfer capable</li> </ul>	Excellent adoption to the PC environment
MMC <sup>™</sup>	<ul><li>16 MHz bus interface</li><li>Stack of up to 30 different cards</li></ul>	Mobility through the memory card itself

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Published by Infineon Technologies AG, Bereich Kommunikation, St.-Martin-Strasse 53, D-81541 München

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> Ordering No. B158-H7768-X-X-7600 Printed in Germany PS 11003. NB

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