New "extended 8-bit" Architecture
A new Family of Application Specific Microcontrollers for High-end Applications

| Core Performance | Application Specific Family | TSC 80251A1 | TSC 80251G1 | Development Tools |
The Core Performance (1/5)

New Requirements for the 90’s and Beyond

- Higher performance to support sophistication of equipment
- Re-use of existing code due to big development investments and software qualification
- Complex Software (memory space)
- Easier and efficient programming with "C" language
- Time to market with ASSP approach
- Less power consumption and noise
- System cost reduction
The Core Performance (2/5)

Features / Benefits

- Core fully licenced from INTEL
- Binary Code compatible with the 80C51 on its lowest perf. level
- 5 times faster than the 80C51 by using the same code at same frequency
- High instruction throughput with a new 3-stage pipeline architecture (2 clocks per basic instruction)
- 15 times faster than the 80C51 by using the 189 new 16/32 bit instructions
- Register based compared to 80C51 accumulator based

- C-Language optimized product
  - 64KB stack space
  - Fully "C"-oriented instructions
  - Low overhead with C-language
  - Up to factor 3 of code size savings
  - Increased up to 16MByte addressable code and data memory
The Core Performance (3/5)

Block Diagram

- Register based Architecture
- Internal 16-bit Databus
- ALU
- Register file
- Program Counter
- Instruction Sequencer
- Data & Peripherals Interfaces
- External Stack Space 64 Kbytes
- External 8-bit Databus
- Extended Memory Space 16 Mbytes
- 3-stage Instruction Pipeline
  1 Machine cycle per basic instruction
- C-Language Optimized
  Code size reduction factor 3
- 16/32-bit instructions
The Core Performance (4/5)

System Advantage

Use higher performance to reach new applications
  • High-end 8-bit and 16-bit applications
  • All applications with a high demand of controlling, computing or dataprocessing performance:
    Automotive: Airbag, Car-Navigation, Climate Control
    Communication: Mobile phones, ISDN-phones, high speed Modems, Network Termination
    Computer: CD-ROM, high-end Monitors, Disk Drives

Reduce Operating frequency while maintaining high level of CPU-power
  • Decrease Power Consumption
  • Limit the EMC problems
  • Reduce Systemcosts (Crystal, Memory..)

Use CPU for additional tasks (DSP, DTMF, ..)
The Core Performance (5/5)
CPU Performance

Clock / MHz

CPU-performance / Mips

2 4 6 8 10 12 14 16 18 20

0 0,5 1 1,5 2 2,5 3 3,5 4 4,5 5
Application Specific Family (1/2)

Peripherals

- CAN-Controller
- J1850-Controller
- USB-Controller
- SPI / I2C-Interface
- UART
- PCA / PWM
- Watchdog/Timers
- Interrupt Handler
- Power Management
- A/D Converter
- ALU
- Reg. file
- Bus interf.
- Data & Periph. Interface
- Instruction Sequencer
- Internal RAM
- Internal ROM/OTP
- Watchdog/Timers
A full range of derivatives will be designed around the C251 core.
TSC80251A1 Extended 8-bit µC with analog interfaces

Specification (1/2)

- A/D converter 8-Bit (4 channels)
- PMU - 3 interface units for smart analog sensors
- EWC - 5 programmable counters for PWM and capture/compare functions
- Full duplex UART
- Two 16-bit Timers
- 24 Kbyte of internal ROM or EPROM (OTP)
- 1 Kbyte of internal RAM
- External memory space 256 Kbytes
- 16 MHz max at 5V all ranges
- PLCC and TQFP 44 package

Available Now!
The TSC80251A1 was tailored to embedded microcontroller applications requiring analog interface structures.

Applications (2/2)
TSC80251G1 Extended 8-bit μC with communication interfaces

**Specification (1/2)**

- Pin & functional compatible to Intel C251-SB
- Synchronous serial interfaces (I2C, SPI, µWire)
- EWC - 5 programmable counters for PWM and compare/capture functions
- Keyboard feature on Port1
- Hardware watchdog
- Full duplex UART
- Three 16-bit Timers
- 16 Kbyte of internal ROM or EPROM (OTP)
- 1 Kbyte of internal RAM
- External memory space 256 Kbytes
- 16 MHz max at 5V all ranges / 44 PLCC & TQFP
The TSC80251G1 is a general purpose microcontroller with communication interface for high-end 8-bit applications in telecommunication, computer and industrial segments.
TEMIC and its Tool-partners provide a full set of development tools dedicated to each derivative product:

**Compiler, Assembler**

Two ANSI C Compilers are available:
- Keil C251 C-compiler & Assembler
- Tasking C251 C-compiler & Assembler

**Instruction Simulator & ROM Monitor**

Two Instruction debugger are available:
- Keil dScope-251 source level debugger
- Tasking Cross View-251 debugger

dScope-251 includes simulation models for all derivative products

Evaluation boards available controlled by ROM Monitor
Development Tools (2/2)

IN - Circuit Emulators

Three Emulators support the TSC80251 derivatives:

- Hitex ICE-251
- Nohau EMUL-251
- Metalink iceMaster-251

For each derivative a dedicated ICE-probecard is available

TEMIC TSC80251 Starter Kit

TEMIC offers a starter kit containing the following:

- C-Compiler (2k of code limit)  Keil or Tasking version
- Assembler /Linker
- Instruction Simulator
- Optionally Evaluation board per derivative (connected to simulator)
- Documentation