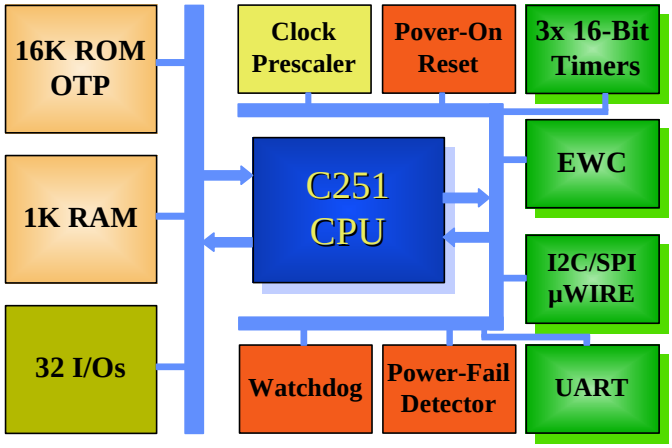
TSC80251G1
Extended 8-bit Microcontroller with Serial Communication Interfaces

The TSC80251G1 is tailored to high-end 8-bit microcontroller applications in communication, consumer and similar market segments, requiring extensive C-code handling combined with a low stand-by current consumption and low EMC.



Product Description

- New “extended 8-bit” CPU
- Compatible with Intel 80C251-SB
- Serial interfaces
- 16 Kbytes of internal ROM or OTP
- 1 Kbytes of internal RAM
- Hardware watchdog
- Three 16-bit Timers
- 44 pin PLCC or TQFP
- 16 MHz at 5 Volts

Key Features

- Serial communication interfaces
  - One of the following protocols is selectable
    - Master I2C protocol
    - µWire protocol
    - SPI protocol (Serial Peripheral Interface)
  - UART with fast internal Baudrate-generator
- Keyboard feature on Port 1
- EWC - Event & Waveform Controller
  - 5 modules / Capture - Compare
  - Signal decoding and generation (Capture / PWM)
  - High speed outputs
- Power Management Unit
  - Powerfail detector, programmable internal clock frequency
  - Power-down mode (20µA) / 3 and 5 Volt operation
- 256 Kbytes of externally addressable memory for code and data

Typical Application	Main Benefits
• ISDN Terminals and Adapters	• 256 Kbytes of external addressing space for code and data • Low EMC & communication interfaces
• Mobile Phones	• High instruction throughput and high C-compiler efficiency (GSM proven) • Power management Unit
• High-end Feature phones	• Powerful instructions usable for software DSP functions (e.g. DTMF) • Event & Waveform Controller (PWM) • Low standby current

Intel MCS®251 CPU Core Compatible

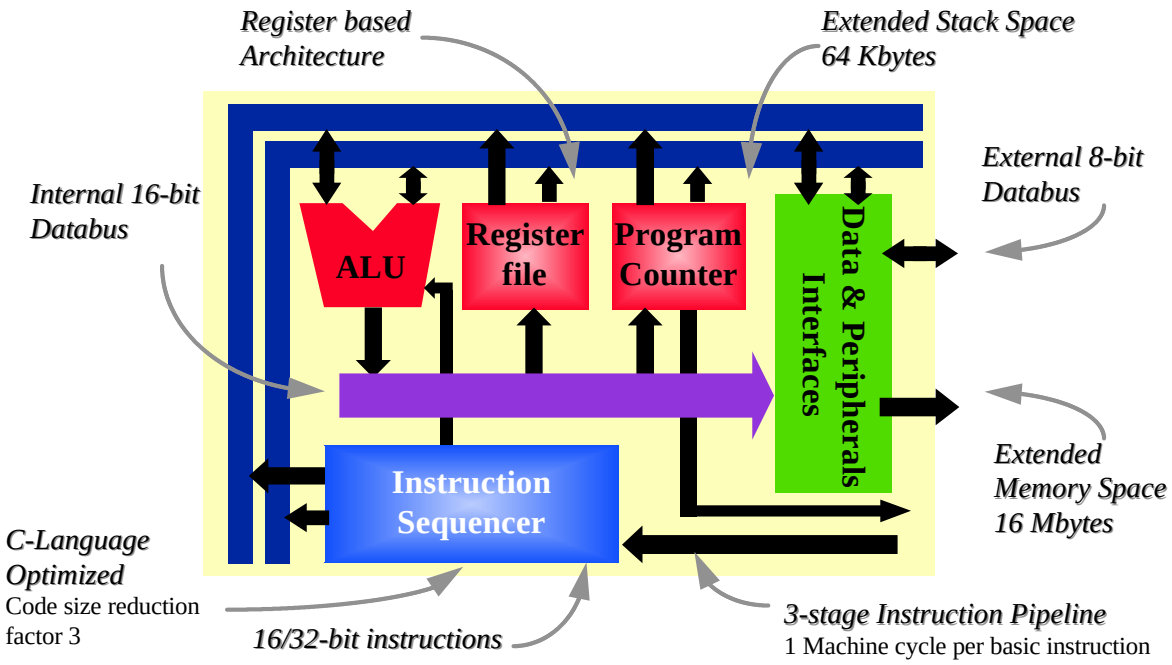
TEMIC
Semiconductors

About the “extended 8-bit” Architecture

The new TSC80251 architecture at its lowest performance level , is binary code compatible with the 80C51 family, hence, attaining an increase in performance has never been easier. Due to its 3-stage pipeline, the CPU performance is increased by a factor 5 compared to existing 80C51. Using the new C251 instruction set, performance will increase up to 15 times at the same clock rate.

This performance enhancement is based on the internal 16-bit instruction bus, allowing for more powerful instructions such as 16x16 multiplication and 16/16 division, as well as on some additional internal 8 and 16 bit data-busses. The 24-bit address-bus will allow for an extension of linear addressable memory space to a maximum of 16 Mbytes. Programming flexibility and C-code efficiency are both increased through the register based architecture, the 64 Kbytes extended stack space combining with the new instruction set.

The TSC80251 Ansi C-Compilers are some of the most efficient available, coupled with the final codesize, which could be a factor of three down, when compared to an 80C51 implementation.



Application Fields

Due to the high instruction throughput, this microcontroller family is focusing on high-end 8-bit to 16-bit applications, such as Mobile phones, ISDN-Terminals, High-end feature phones, Network Terminators, Subscriber Linecards, High-speed Modems or similar systems other segments. It is also well suited to systems, where a lowered operating frequency is needed to reduce the power-consumption or Radio Frequency Interference (RFI), while maintaining a high level of CPU-power.

Design your application around the TSC80251G1

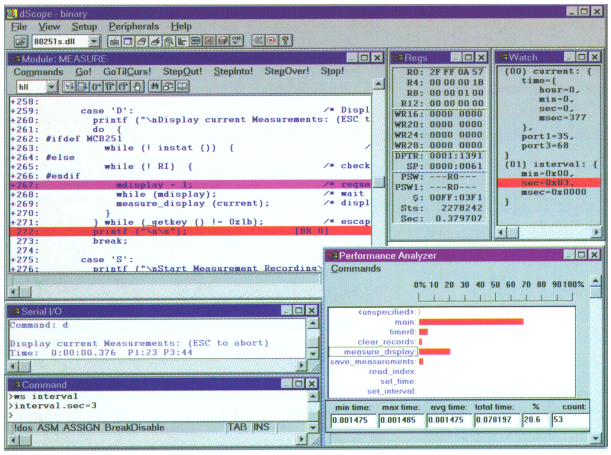
TEMIC offers a complete set of development and debug tools around the TSC80251G1, designed to get allow applications to be realized in the shortest possible time and in the most efficient way.
Working with leading tool vendors, the designer will migrate with ease and cost effectively to the new TSC80251 architecture

Optimized Compiler

As the TSC80251 in binary mode is fully code compatible with the 80C51 and an existing code can be transferred without any risk.
An optimized compiler is needed to take the architecture benefits and to get advantage of the new powerful instruction set of the TSC80251 (189 new instructions).

Two new ANSI C-Compiler are available for this family:

- KEIL C251 C-Compiler and Assembler/Linker
- TASKING C251 C-compiler and Assembler/Linker



Simulator

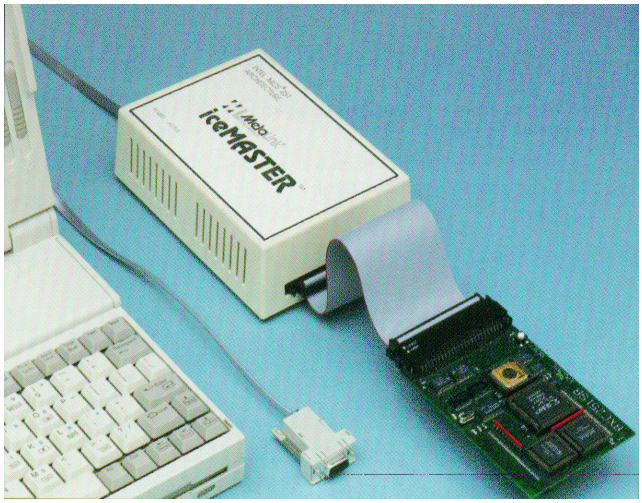
The dScope-251 instruction simulator from KEIL simulates the exact behavior of the TSC80251G1 including all peripherals.
To debug your code in a real hardware environment, a TSC80251G1 evaluation board can be connected to the simulator supported by a ROM monitor.

In- Circuit Emulators

Three in - circuit emulators are available for the TEMIC TSC80251G1 family to support the debugging of your final application:

- **HITEX ICE-251**
- **NOHAU EMUL-251**
- **METALINK iceMASTER**

All emulators support the Microsoft user interface and fully support Keil and Tasking compiler tools (OMF251 format).
For each TEMIC derivative product family, a dedicated probecard is available to be adapted to the master-ICE board.



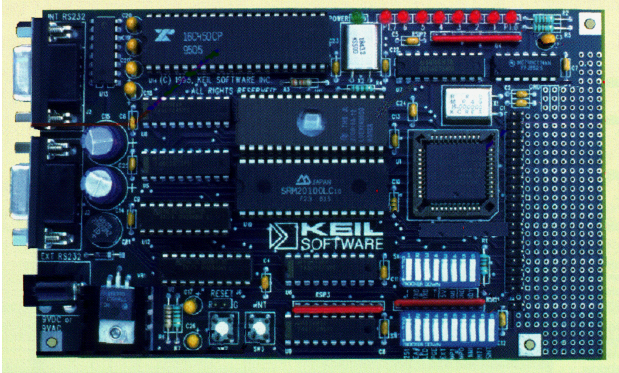
KEIL SOFTWARE TASKING hitex NOHAU MetaLink Corporation

TSC80251G1 Starter Kit

To allow a quick and cost effective first evaluation of the new architecture, TEMIC offers a "Starter Kit" including the following items:

- Ansi C Compiler (limited to 2k of code)
- Assembler / Linker
- Instruction Simulator
- Optionally TSC80251G1 Evaluation Board with ROM Monitor

Please visit TEMIC World Wide Web for updated software package



ORDERING INFORMATION	
Part Number	**Description**
TSC80251G1-A12CB	ROMless, Source Mode, 12MHz, PLCC 44, 0 to 70°C
TSC80251G1-B16IB	ROMless, Binary Mode, 16MHz, PLCC 44, -40 to 85°C
TSC80251G1-A12CD	ROMless, Source Mode, 12MHz, TQFP 44, 0 to 70°C
TSC251G1XXX-A12CB	Mask ROM, Source Mode, 12MHz, PLCC 44, 0 to 70°C
TSC251G1XXX-B12CB	Mask ROM, Binary Mode, 12MHz, PLCC 44, 0 to 70°C
TSC87251A1-A12CB	OTP ROM, 12MHz, PLCC 44, 0 to 70°C
TSC87251A1-A12CC	EPROM, 12MHz, Window UV CQPJ 44, 0 to 70°C

For other requests and pricing information, please contact your sales office.

On-line Support

- TSC80251 E-mail hot-line: C251@temic.fr
- World Wide Web (http://...):

  TEMIC: www.temic.de
  Keil: www.keil.com
  Tasking: www.tasking.com
  Hitex: www.hitex.com
  Nohau: www.nohau.com

Available Documentation

- TSC80251 Brochure
- TSC80251G1 Datasheet (Q4-96)
- TSC80251 Programmers Guide
- TSC80251G1 Starter Kit Package

For more information on our products:
TEMIC Semiconductors Sales offices:
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Korea Tel.: (822) 785 1136 Fax.: (822) 785 1137 / Singapore Tel.: (65) 788 66 68 Fax.: (65) 788 00 31 /
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