

## Extended 8-bit Microcontroller with Analog Interfaces

### General Presentation

The TSC80251A1 products are derivatives of the TEMIC Application Specific Microcontroller family based on the extended 8-bit C251 Architecture described below.

This family of products are tailored to Microcontroller applications requiring analog interface structures.

Three major peripheral blocks have been implemented to provide this facility to the designer:

- Analog to Digital Converter: 4 inputs at 8-bit resolution.
- Pulse Measurement Unit (PMU): 3 modules used to interface to smart analog sensors.
- Event and Waveform Controller (EWC): 5 programmable Counters e.g. for Pulse Width Modulation (PWM) or Compare/Capture functions.

### Application focus

Typical applications for these products are CD-ROM, Card or Barcode readers, Monitors, Car Navigation Systems, Airbag and Brake Systems, as well as all kinds of Industrial Control and Measurement Equipment. With the high instruction throughput, the TSC80251A1

products are focussing on all high-end 8-bit to 16-bit applications. They are also well suited to systems where a lower operating frequency is needed to reduce power consumption or Radio Frequency Interference (RFI), while maintaining a high level of CPU-power.

### C251 Architecture

The C251 Architecture at its lowest performance level, is Binary Code compatible with the 80C51 Architecture. Due to a 3-stage Instruction Pipeline, the CPU-Performance is increased by up to 5 times, using existing 80C51 code without any modification.

Using the new C251 Instruction Set, the performance will be increased by up to 15 times, at the same clock rate.

This performance enhancement is based on the 16-bit instruction bus and additional internal 8 and 16-bit data

busses. The 24-bit address bus will allow an extension of the address space up to 16 Mbytes for future derivatives.

Programming flexibility and C-code efficiency are both increased by the Register-based Architecture, the 64-Kbyte extended stack space, combined with the new Instruction Set.

Combining the above features of the C251 core, the final code size could be reduced by a factor of 3, compared to an 80C51 implementation.

### TSC80251A1 Products

The TSC80251A1 is available as a ROMless version (TSC80251A1) or with on-chip Mask Programmable ROM (TSC83251A1). The TSC87251A1 is an EPROM version or OTPROM (One Time Programmable) compatible with the Mask ROM version.

The standard production packages are 44 pins PLCC or TQFP.

The products can be delivered as 12 or 16 MHz versions at 5 Volts and in all major temperature ranges.