



# C505L

## First 8051 Microcontroller with On-Chip LCD

The C505L enhances the C500 family of 8-bit Microcontrollers by a new member which provides on-chip LCD.

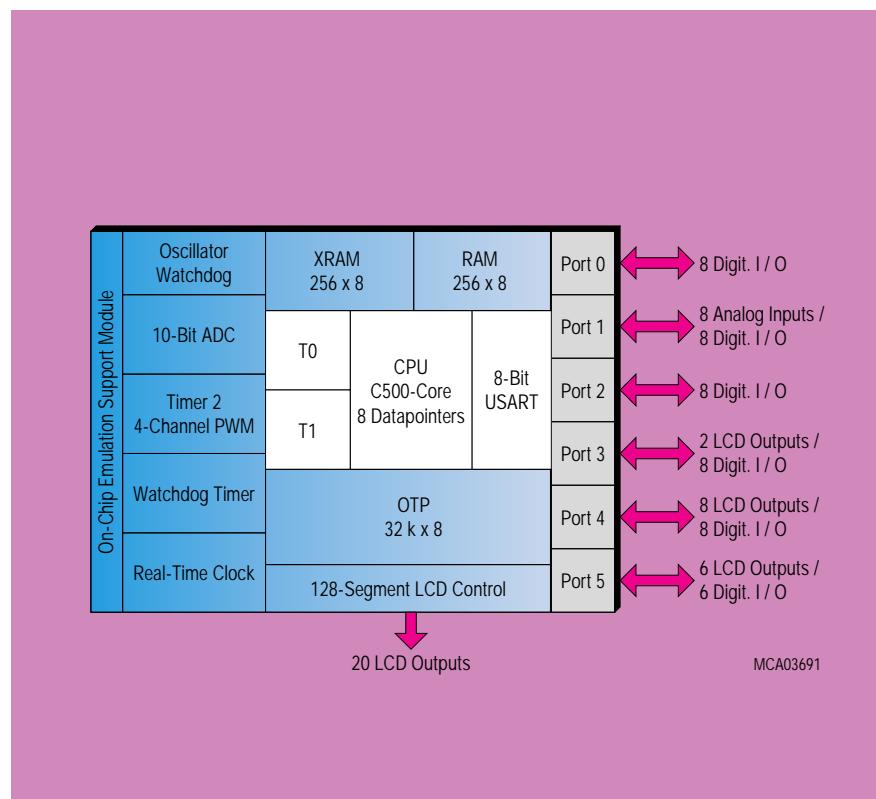
The device provides 32 KByte of OTP, 512 Bytes of RAM, LCD, an asynchronous/synchronous serial interface and a highly accurate 10-bit ADC with a 6 µs conversion time integrated on-chip.

Typical applications for the C505L are electricity meters, utility meters, intelligent terminals and controllers. This device has several power saving modes, including one in which the on-chip RTC is functioning with a typical power consumption of 50 µA at 3 V.

- Enhanced 8-Bit C500-CPU – fully software/toolset compatible to standard 80C51/80C52 Microcontrollers
- 300 ns instruction cycle time at 20 MHz CPU clock without clock prescaler
- Eight 16 Bit datapointers for indirect addressing of program and data memory
- Supports external address range up to 64 KByte program and data memory
- Full duplex serial interface with asynchronous and synchronous modes and programmable baudrate generator
- 32 KByte On-chip OTP memory (C505L-4E only)
- 256 Byte On-chip RAM
- 256 Byte On-chip XRAM

- Five 8-bit and one 6-bit digital I/O ports (Port 5 with 6 bits only)
- Three 16-bit timers/counters
- 128-segment LCD controller
  - 1/4 duty cycle drive
  - 4 row and 32 column outputs
  - On-chip programmable reference voltage generation
  - 20 dedicated LCD output lines (4 rows + 16 columns)
  - Option to switch 16 LCD output lines for digital I/O (2 sets of 8 lines each)
- Real-time clock
  - 47-bit digital clock counter (40 bits readable)
  - External crystal oscillator of frequency 32.768 KHz required
- Full duplex serial interface with programmable baudrate generator (USART)
- 10-bit A/D converter with 8 multiplexed inputs
- 6 µs conversion time
- Twelve interrupt sources with four priority levels
- On-chip emulation support logic (Enhanced Hooks)
- Programmable 15-bit watchdog timer
- Oscillator watchdog
- Fast power on reset
- Power saving modes
- P-MQFP-80 package
- Temperature ranges:  
SAB-C505L  $T_A = 0$  to  $70^\circ\text{C}$   
SAF-C505L  $T_A = -40$  to  $85^\circ\text{C}$

# C505L Block Diagram



# C505L Pin Configuration

