

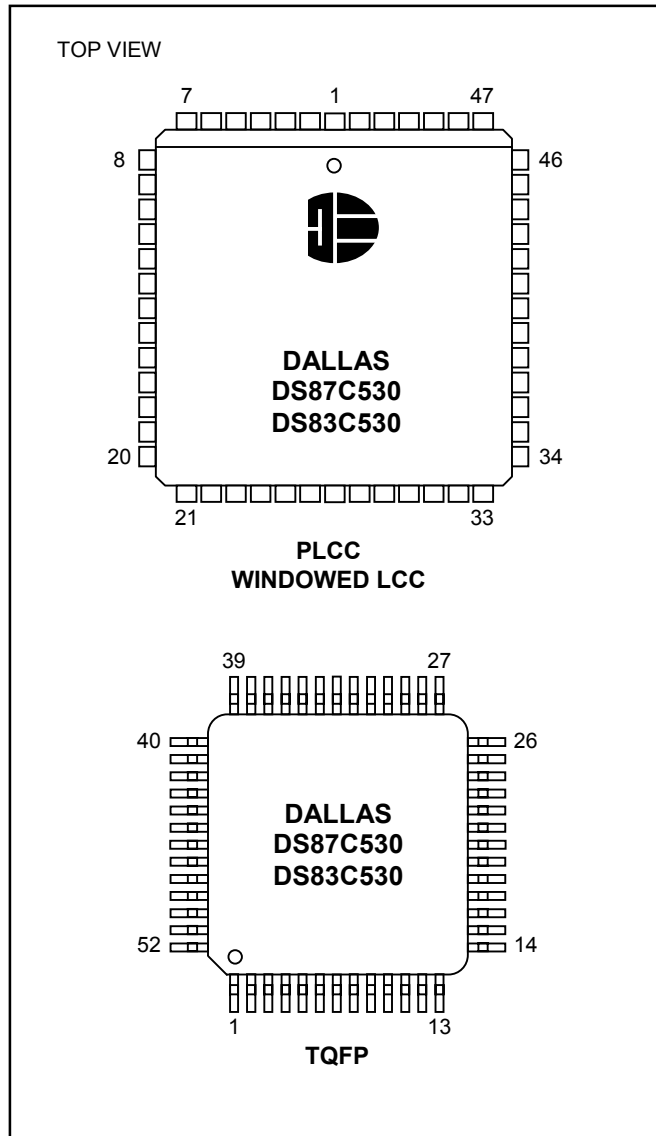
DS87C530/DS83C530 EPROM/ROM Microcontrollers with Real-Time Clock

www.maxim-ic.com

FEATURES

- **80C52 Compatible**
8051 Instruction-Set Compatible
Four 8-Bit I/O Ports
Three 16-Bit Timer/Counters
256 Bytes Scratchpad RAM
- **Large On-Chip Memory**
16kB EPROM (OTP)
1kB Extra On-Chip SRAM for MOVX
- **ROMSIZE Features**
Selects Effective On-Chip ROM Size from 0 to 16kB
Allows Access to Entire External Memory Map Dynamically Adjustable by Software
Useful as Boot Block for External Flash
- **Nonvolatile Functions**
On-Chip Real-Time Clock with Alarm Interrupt
Battery Backup Support of 1kB SRAM
- **High-Speed Architecture**
4 Clocks/Machine Cycle (8051 = 12)
Runs DC to 33MHz Clock Rates
Single-Cycle Instruction in 121ns
Dual Data Pointer
Optional Variable Length MOVX to Access Fast/Slow RAM /Peripherals
- **Power Management Mode**
Programmable Clock Source Saves Power
Runs from (Crystal/64) or (Crystal/1024)
Provides Automatic Hardware and Software Exit
- **EMI Reduction Mode Disables ALE**
- **Two Full-Duplex Hardware Serial Ports**
- **High Integration Controller Includes:**
Power-Fail Reset
Early-Warning Power-Fail Interrupt
Programmable Watchdog Timer
- **14 Total Interrupt Sources with Six External**

PIN CONFIGURATIONS



The *High-Speed Microcontroller User's Guide* must be used in conjunction with this data sheet. Download it at: www.maxim-ic.com/microcontrollers.

DALLAS is a registered trademark of Dallas Semiconductor Corp.
MAXIM is a registered trademark of Maxim Integrated Products, Inc.

Note: Some revisions of this device may incorporate deviations from published specifications known as errata. Multiple revisions of any device may be simultaneously available through various sales channels. For information about device errata, click here: www.maxim-ic.com/errata.

ORDERING INFORMATION

PART	TEMP RANGE	MAX CLOCK SPEED (MHz)	PIN-PACKAGE
DS87C530-QCL	0°C to +70°C	33	52 PLCC
DS87C530-QNL	-40°C to +85°C	33	52 PLCC
DS87C530-KCL	0°C to +70°C	33	52 Windowed LCC
DS87C530-ECL	0°C to +70°C	33	52 TQFP
DS87C530-ENL	-40°C to +85°C	33	52 TQFP
DS83C530-QCL	0°C to +70°C	33	52 PLCC
DS83C530-QNL	-40°C to +85°C	33	52 PLCC
DS83C530-ECL	0°C to +70°C	33	52 TQFP
DS83C530-ENL	-40°C to +85°C	33	52 TQFP

DETAILED DESCRIPTION

The DS87C530/DS83C530 EPROM/ROM microcontrollers with a real-time clock (RTC) are 8051-compatible microcontrollers based on the Dallas high-speed core. They use 4 clocks per instruction cycle instead of the 12 used by the standard 8051. They also provide a unique mix of peripherals not widely available on other processors. They include an on-chip RTC and battery backup support for an on-chip 1k x 8 SRAM. The new Power Management Mode allows software to select reduced power operation while still processing.

A combination of high-performance microcontroller core, RTC, battery-backed SRAM, and power management makes the DS87C530/DS83C530 ideal for instruments and portable applications. They also provide several peripherals found on other Dallas high-speed microcontrollers. These include two independent serial ports, two data pointers, on-chip power monitor with brownout detection and a watchdog timer.

Power Management Mode (PMM) allows software to select a slower CPU clock. While default operation uses four clocks per machine cycle, the PMM runs the processor at 64 or 1024 clocks per cycle. There is a corresponding drop in power consumption when the processor slows.

The EMI reduction feature allows software to select a reduced emission mode. This disables the ALE signal when it is unneeded.

The DS83C530 is a factory mask ROM version of the DS87C530 designed for high-volume, cost-sensitive applications. It is identical in all respects to the DS87C530, except that the 16kB of EPROM is replaced by a user-supplied application program. All references to features of the DS87C530 will apply to the DS83C530, with the exception of EPROM-specific features where noted. Please contact your local Dallas Semiconductor sales representative for ordering information.

Note: The DS87C530/DS83C530 are monolithic devices. A user must supply an external battery or super cap and a 32.768kHz timekeeping crystal to have permanently powered timekeeping or nonvolatile RAM. The DS87C530/DS83C530 provide all the support and switching circuitry needed to manage these resources.