



## IP Security Microcontroller

DS5230

### General Description

The DS5230 is a highly secure, four clocks-per-machine cycle, 100% 8051-instruction-set-compatible microprocessor in the secure microcontroller family from Maxim Integrated Products. It is a feature-reduced and cost-reduced version of the popular DS5250 high-speed secure microcontroller. Its proven architecture protects embedded application software and data against reverse engineering or cloning. A key feature of the device is that it encrypts its program memory with a hardware-based single- or triple-DES (data encryption standard) algorithm and provides optional data memory encryption, making it almost impossible to extract information. It also implements block cipher encoding that uses block addresses to modify the encrypted data, further strengthening security. This makes the device ideal for storage and transmission of passwords, personal identification numbers, encryption keys, and other highly confidential information.

### Applications

- PIN Pads
- Gaming Machines
- Software-Protection Applications

### Ordering Information

PART	TEMP RANGE	MAX CLOCK SPEED (MHz)	PIN-PACKAGE
DS5230F+825	0°C to +70°C	25	80 MQFP
DS5230F+8N5	-40°C to +85°C	25	80 MQFP

+Denotes a lead-free/RoHS-compliant package.

Pin Configuration appears at end of data sheet.

### Features

- ◆ **Feature-Rich, 8051-Compatible Microprocessor**  
 Accesses Up to 64KB Program and 64KB Data Memory (All Nonvolatile)  
 In-System Programmable Through Serial Port  
 Three 16-Bit Timer/Counters  
 256 Bytes of Scratchpad RAM
- ◆ **Advanced Features**  
 CRC-16/32 Generator  
 2KB Battery-Backed (Nonvolatile) Internal SRAM  
 Dedicated Single DES or 3DES Engine for Automatic Program Memory Encryption
- ◆ **High-Speed Architecture**  
 Four Clocks-per-Machine Cycle  
 DC-to-25MHz Operation  
 Single-Cycle Instruction in 160ns  
 Dual Data Pointers Can Increment or Decrement Independently  
 Automatic Data Pointer (DPTR) Selection Available  
 Programmable Speed MOVX Instructions  
 1KB On-Chip Instruction Cache
- ◆ **High-Reliability Operation**  
 Power-Fail/Overvoltage Reset  
 Early Warning Power-Fail Interrupt  
 Watchdog Timer
- ◆ **Security Features**  
 Executes Single/3DES-Encrypted Programs to Prevent Observation  
 One Self-Destruct Input  
 Tamper-Sensing Mesh Detects Probe Attacks  
 Programmable Attack Countermeasures  
 True Random-Number Generator (RNG)  
 Program Memory Integrity Checking
- ◆ DS5230 Evaluation Kit Available (DS5230-KIT)

**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, e-mail [microcontroller.support@maxim-ic.com](mailto:microcontroller.support@maxim-ic.com).



**For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim's website at [www.maxim-ic.com](http://www.maxim-ic.com).**

# ABRIDGED DATA SHEET

## IP Security Microcontroller

DS5230

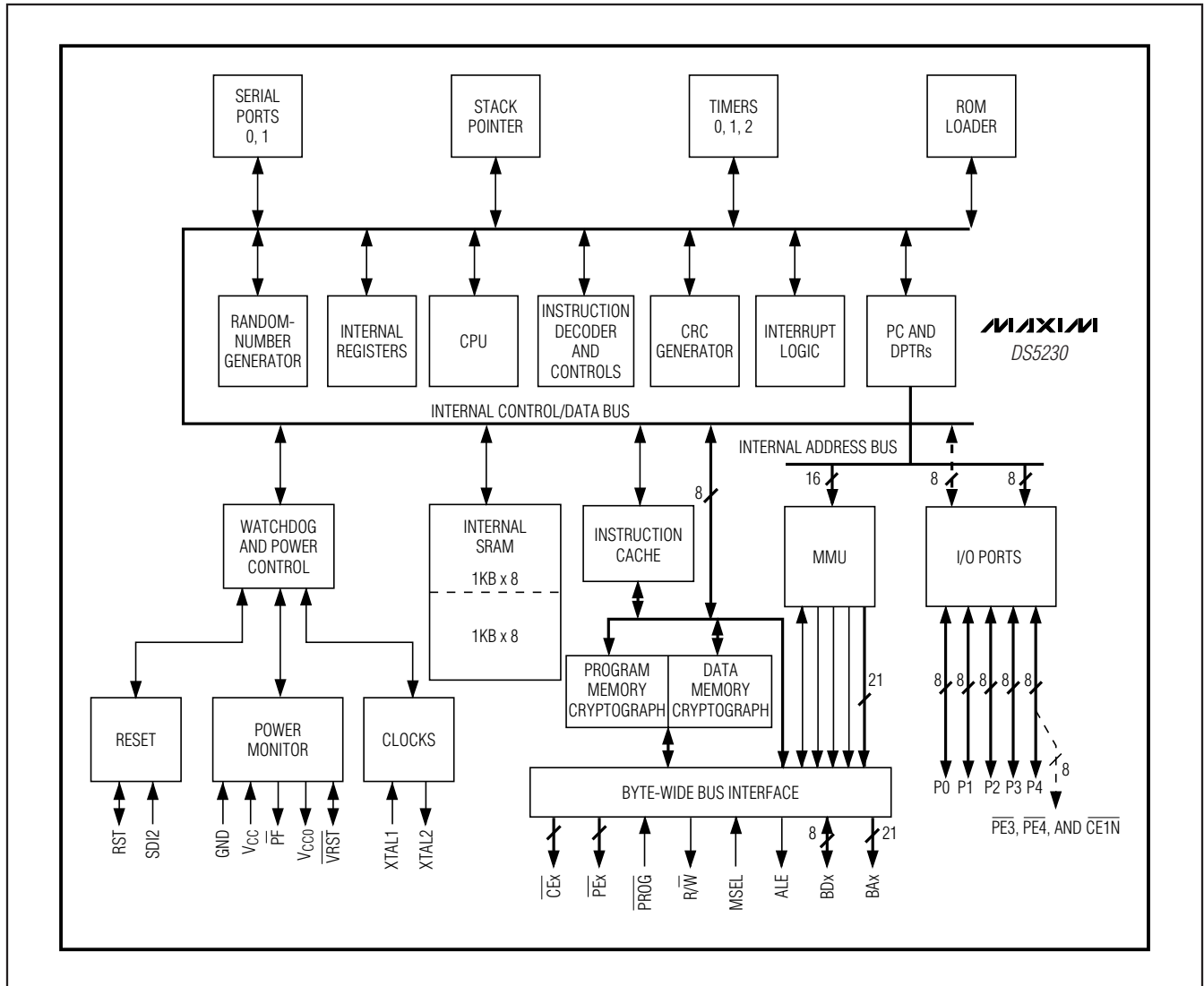


Figure 4. Block Diagram

Note to readers: This document is an abridged version of the full data sheet. To request the full data sheet, go to [www.maxim-ic.com/DS5230](http://www.maxim-ic.com/DS5230).