Click here to ask an associate for production status of specific part numbers.

1Kb Protected 1-Wire EEPROM with SHA-1 Engine
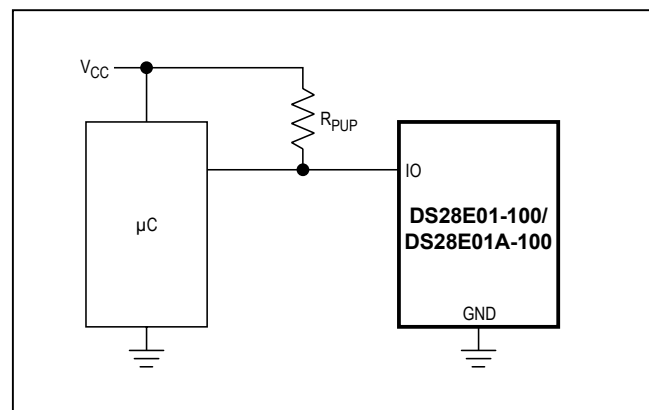
DS28E01-100/DS28E01A-100

General Description

The DS28E01-100/DS28E01A-100 combine 1024 bits of EEPROM with challenge-and-response authentication security implemented with the ISO/IEC 10118-3 Secure Hash Algorithm (SHA-1). The device can process SHA-1 input block secrets of 64 bits and 320 bits in conjunction with a 40-bit random challenge and additional device data to provide a high degree of authentication security between a host system and peripheral accessories. The 1024-bit EEPROM array is configured as four pages of 256 bits with a 64-bit scratchpad to perform write operations. All memory pages can be write protected, and one page can be put in EPROM-emulation mode, where bits can only be changed from a 1 to a 0 state. Each DS28E01-100/DS28E01A-100 has its own guaranteed unique 64-bit ROM registration number that is factory-programmed into the chip. The DS28E01-100/DS28E01A-100 communicate over the single-contact 1-Wire® bus. The communication follows the standard 1-Wire protocol with the registration number acting as the node address in the case of a multi-device 1-Wire network.

Applications

- Printer Cartridge Configuration and Monitoring
- Medical Sensor Authentication and Calibration
- System Intellectual Property Protection

Features

- 1024 Bits of EEPROM Memory Partitioned into Four Pages of 256 Bits
- On-Chip 512-Bit SHA-1 Engine to Compute 160-Bit Message Authentication Codes (MACs) and to Generate Secrets
- Dedicated 64-Bit Write-Only Secret with a Feature to Extend the Secret Size to 320 Bits by Setting a 256-Bit Page as Both Read and Write Protected
- 5-Byte Challenge Size for Read Authenticated Page with Optional "Anonymous" Mode
- Write Access Requires Knowledge of the Secret and the Capability of Computing and Transmitting a 160-Bit MAC as Authorization
- User-Programmable Page Write Protection for Page 0, Page 3, or All Four Pages Together
- User-Programmable OTP EPROM Emulation Mode for Page 1 ("Write to 0")
- Communicates to Host with a Single Digital Signal at 15.3kbps or 90.9kbps Using 1-Wire Protocol
- Switchpoint Hysteresis and Filtering to Optimize Performance in the Presence of Noise
- Reads and Writes over 2.8V to 5.25V Voltage Range from -40°C to +85°C
- 6-Lead TSOC and TDFN or 2-Lead TO-92 Packages

Typical Operating Circuit

Pin Configurations *appear at end of data sheet.*

Ordering Information

PART	TEMP RANGE	PIN-PACKAGE
DS28E01-100+	-40°C to +85°C	2 TO-92
DS28E01P-100+	-40°C to +85°C	6 TSOC
DS28E01AP-100+	-40°C to +85°C	6 TSOC
DS28E01P-100+T	-40°C to +85°C	6 TSOC
DS28E01AP-100+T	-40°C to +85°C	6 TSOC
DS28E01Q-100+T&R	-40°C to +85°C	6 TDFN-EP* (2.5k pcs)

+Denotes a lead(Pb)-free/RoHS-compliant package.
T and T&R = Tape and reel.
*EP = Exposed pad.

1-Wire is a registered trademark of Maxim Integrated Products, Inc.

Visit Web Support to complete the nondisclosure agreement (NDA) required to receive additional product information.

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