Data Sheet

DS28E15

DeepCover Secure Authenticator with 1-Wire SHA-256 and 512-Bit User EEPROM

General Description

DeepCover™ embedded security solutions cloak sensitive data under multiple layers of advanced physical security to provide the most secure key storage possible.

The DeepCover Secure Authenticator (DS28E15) combines crypto-strong bidirectional secure challenge-and-response authentication functionality with an implementation based on the FIPS 180-3-specified Secure Hash Algorithm (SHA-256). A 512-bit user-programmable EEPROM array provides nonvolatile storage of application data. Additional protected memory holds a read-protected secret for SHA-256 operations and settings for memory protection control. Each device has its own guaranteed unique 64-bit ROM identification number (ROM ID) that is factory programmed into the chip. This unique ROM ID is used as a fundamental input parameter for cryptographic operations and also serves as an electronic serial number within the application. A bidirectional security model enables two-way authentication between a host system and slave-embedded DS28E15. Slave-to-host authentication is used by a host system to securely validate that an attached or embedded DS28E15 is authentic. Host-to-slave authentication is used to protect DS28E15 user memory from being modified by a unauthentic host. The DS28E15 communicates over the single-contact 1-WireM bus at overdrive speed. The communication follows the 1-Wire protocol with the ROM ID acting as node address in the case of a multi-device 1-Wire network.

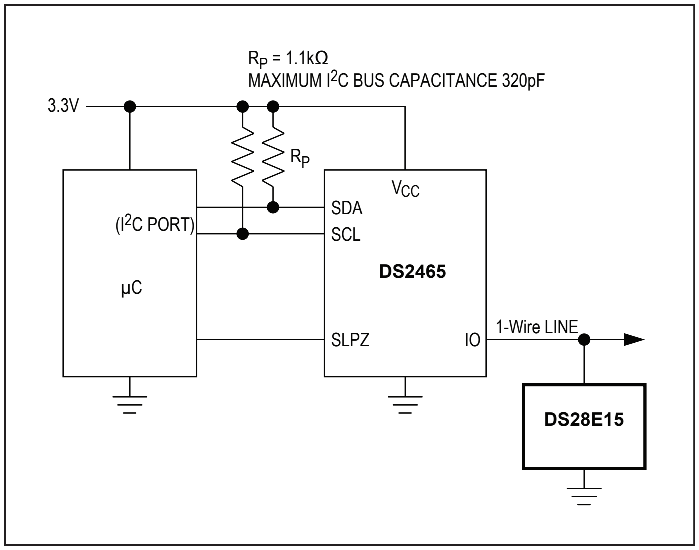
Applications

- Authentication of Consumables
- Secure Feature Control

Benefits and Features

- 512-Bit EEPROM with SHA-256 Authentication for Reads and Writes
  - Symmetric-Key-Based Bidirectional Secure Authentication Model Based on SHA-256
  - Strong Authentication with a High-Bit-Count User-Programmable Secret and Input Challenge
  - 512 Bits of User EEPROM Partitioned Into Two Pages of 256 Bits
  - User-Programmable and Irreversible EEPROM Protection Modes Including Authentication, Write and Read Protect, and OTP/EPROM Emulation
  - Unique Factory-Programmed, 64-Bit Identification Number
- Minimalist 1-Wire Interface Lowers Cost and Interface Complexity
  - Reduces Control, Address, Data, Power, and Programming Signals to a Single Data Pin
  - ±8kV HBM ESD Protection (typ)
  - 2-Pin SFN, 6-Pin TDFN-EP, and 6-Pin TSOC Packages
  - Operating Range: 3.3V ±10%, -40°C to +85°C

Typical Application Circuit



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