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DS3645

DeepCover Security Manager with 4KB Secure Memory and Tamper Protection

Single-Chip Solution Integrates Advanced Physical Security with On-Chip Encryption Key Memory

 [NDA Required. Request Full Data Sheet](#)  [Subscribe](#)  Active: In Production.

OVERVIEW

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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 Security Manager (DS3645) is a secure supervisor with 4096 bytes of SRAM for applications requiring the secure storage of sensitive data and the physical tamper-sensing response functions required in cryptographic processors and data security equipment.

One of the DS3645's primary features is the on-chip encryption key memory, consisting of 32 128-byte banks incorporating a high-speed, direct-clearing function. The 4KB key memory is constantly complemented in the background to prevent memory imprinting. In the event of a qualified tamper event, the key memory is rapidly cleared and a negative bias is applied to clear SRAM external to the DS3645.

The device includes a real-time seconds counter, watchdog timer, CPU supervisor, nonvolatile (NV) SRAM controller, and on-chip temperature sensor. In the event of a primary power failure, an external battery source is automatically switched in to keep the key memory, seconds counter, and tamper-detection circuitry active. The DS3645 provides low-leakage tamper-detection inputs for interface to external sensors, interlocks, and antitamper meshes. The DS3645 also invokes a tamper event if the backup battery drops below a specified threshold or absolute temperature, if the temperature rate-of-change exceeds programmed limits, or if the crystal oscillator frequency falls outside a specified window. The tamper event is latched and timestamped for future debugging purposes.

Access to the seconds counter, tamper monitoring, key memory, and device configuration is conducted through an I²C-compatible interface. The DS3645 is assembled in a CSBGA package, which enhances key security because the leads are not exposed to the outer edges of the package.

Key Features

- 4096-Byte Nonimprinting Key Memory with High-Speed Erase
- Optional External SRAM Clear Upon Qualified Tamper Event
- 64-Byte General-Purpose RAM (Not Cleared)
- 32-Bit Seconds Counter
- Watchdog Timer
- CPU Supervisor
- Four General-Purpose Tamper-Detect Comparators
- Four Window Comparators with On-Chip Reference Voltages
- Two Tamper-Detect Logic Inputs
- On-Chip, Programmable Temperature Sensing with Proprietary Rate-of-Change Detector
- On-Chip Random-Number Generator (RNG)
- Latching and Timestamping of Tamper Events
- Crystal Oscillator Tamper Monitoring
- Low-Power Consumption
- Wide Temperature Range: -55°C to +95°C
- CSBGA Package (7mm x 7mm x 0.8mm) with No Horizontally Exposed Leads
- I²C-Compatible Interface

Applications/Uses

- Alarm Systems
- Gaming
- IT Security
- Point-of-Sale Terminals
- Routers/Switches

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OVERVIEW	KEY SPECS	DESIGN RESOURCES	ORDER			
Part Number	Free Sample	Buy	Status 	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR [*]	Temp	RoHS/Lead-Free? Materials Analysis
DS3645B	Sample	Buy	Active	CSBGA,,49 pin;49 mm ² Package Details	-40°C to +85°C	RoHS/Lead-Free: No Materials Analysis
DS3645B+	Sample	Buy	Active	CSBGA,,49 pin;49 mm ² Package Details	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS3645B+TRL		Buy	Active	CSBGA,,49 pin;49 mm ² Package Details	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS3645B-TRL		Buy	Active	CSBGA,,49 pin;49 mm ² Package Details	-40°C to +85°C	RoHS/Lead-Free: No Materials Analysis
DS3645B-W+		Buy	Active	CSBGA,,49 pin;49 mm ² Package Details	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS3645K		Buy	Active	KIT;	-40°C to +85°C	See data sheet

Notes:

- Other options and links for purchasing parts are listed at: <http://www.maximintegrated.com/en/sales>.
- [Didn't Find What You Need?](#) Ask our applications engineers. Expert assistance in finding parts, usually within one business day.
- Part number suffixes: T or T&R = tape and reel; + = RoHS/lead-free; # = RoHS/lead-exempt; -D = drypack; -U/+U on DS parts = cut tape. More: See [Full Data Sheet](#) or [Maxim Product Naming Conventions](#).
- ^{*} Some packages have variations, listed on the drawing. "PkgCode/Variation" tells which variation the product uses. Note that "+", "#", "-" in the part number suffix describes RoHS status. Package drawings may show a different suffix character.

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