Smart Card Interface IC

General Purpose, Low Power ISO-7816/EMVco Electrical Interface with High-Efficiency DC-DC Converter

>Replacement for Industry-Standard TDA8002

The 73S8023C is a single smart card interface IC, compliant to the electrical requirements of ISO-7816-3 and EMV 4.0 (EMV2000) electrical specifications. It can be used in conjunction with any micro-controller that can support the smart card protocol layer.

The 73S8023C interfaces with the host through a dedicated digital control bus, compatible with the industry-standard devices TDA8004 and TDA8002.

Interface signals coming from the host are internally latched, and latches are controlled by a Chip-Select host input. This allows the host to control multiple TDK 73S8023C devices through the same control bus.

The smart card clock source can be supplied by the system, or be generated by a built-in oscillator (an external crystal is required). A clock output is available to other 73S8023C ICs when implementing multiple card architectures.

Additionally, a separate synchronous clock input is provided and the card activation sequence can be modified from the host in synchronous mode that makes the TDK 73S8023C compatible with all kind of synchronous cards.

A key feature of the 73S8023C is its high-efficiency inductor-based DC-DC converter, that generates the smart card voltage (3V or 5V) from a low-voltage source (2.7V to 3.6V), capable of supplying an ICC card current up to 100mA.

The circuit also features a power-down mode that can be activated through a digital input. When entering this mode (allowed when no card is activated), the card interface typically draws less than 2µA.

The circuit is available in a 32-pin QFN package (5 x 5 x 0.8mm), making it the smallest solution available today in the market.

High efficiency and power down mode are ideal features for battery-operated applications. In addition, easy interfacing of multiple ICs in parallel, and support for synchronous card make the TDK 73S8023C ideal for Point-of-Sales terminals and payphone applications. It can also be used everywhere a general purpose, high performance, low-power smart card interface is needed, in particular in applications that do not have a 5V power supply available.

[1]NDS Approval Pending

Key Applications

- *Point-of-Sales terminals, ATM and payment systems*
- *Conditional Access: In Set-Top-Boxes, DVD or HDD recorders (Personal Video Recorders) and Digital TVs*
- *Payphones*
- *General purpose smart card readers*

Key Advantages

- *Replacement for the TDA8002/TDA8004*
- *The 5V system power supply can be removed!*
  - *Dramatic cost reduction of the BOM in consumer electronics applications*
- *Power down mode: Sub 2µA typical*
- *The inductor-based DC-DC converter provides higher current and efficiency (85% typ.) than usual charge-pump capacitor-based converters*
  - *Very Low-power dissipation*
  - *Ideal for battery-powered applications*
  - *Suitable for high current cards and SAMs: (up to 100mA supplied to the card!)*

ISO/IEC 7816-3

EMVCo

TDK SEMICONDUCTOR CORP.

Features

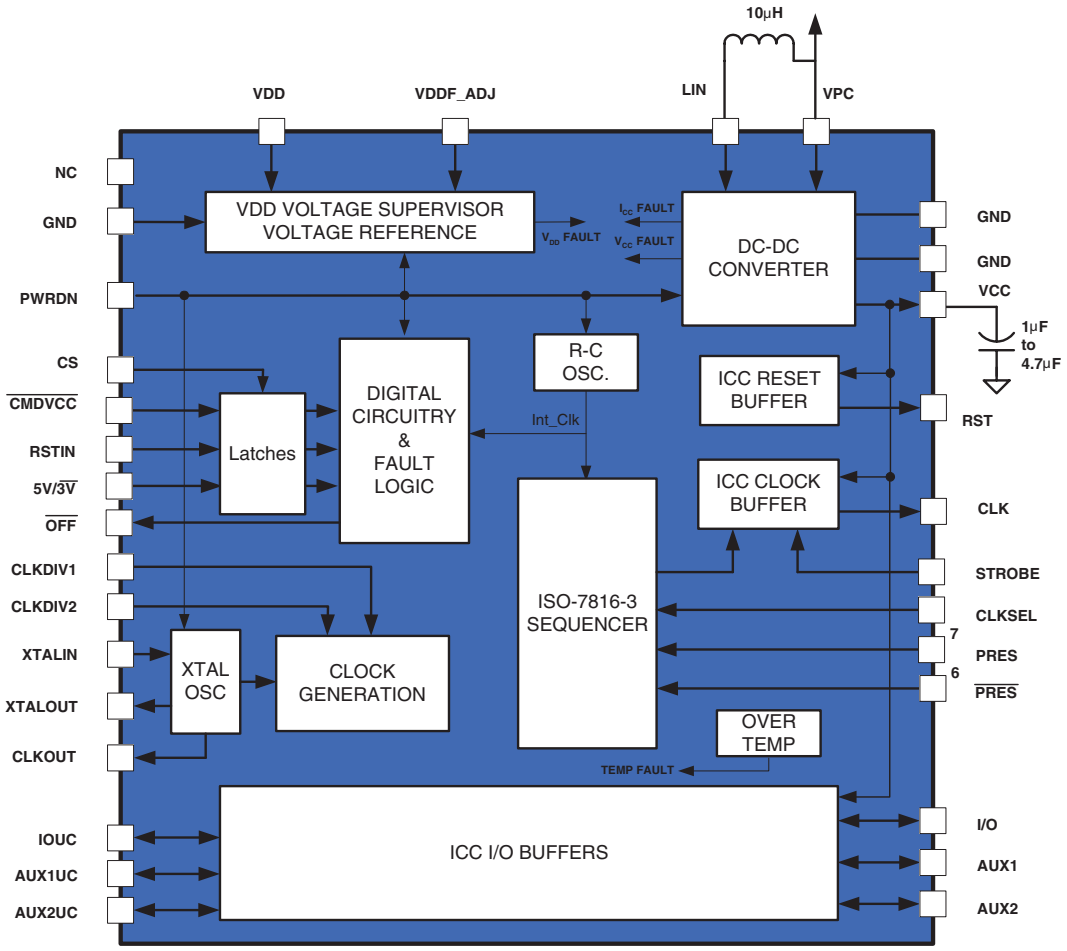
Card Interface

- Complies with ISO-7816-3 and EMV 4.0
- Provides at least 100mA to the card
- DC-DC Converter provides 3V / 5V to the card from an external power supply input
- ISO-7816-3 Activation / Deactivation sequencer
- Emergency card deactivation upon hardware fault:
  - *Card removal*
  - *Voltage supervision faults: Detection of voltage drops on VCC (card) and VPC power supply*
  - *Adjustable power supply (VDD) fault detection (2 resistors needed)*
  - *Card over-current (true current detection)*
  - *Die over-heating fault*
- 2 card detection inputs, 1 for each possible user polarity
- Auxiliary I/O lines, for C4 / C8 contact signals

System Controller Interface

- 4 Digital inputs control the card activation / deactivation, card reset, card voltage and power down mode
- 1 Strobe digital input is a secondary, synchronous card clock input
- 3 Digital inputs control the card clock (division rate and clock selection)
- 1 Chip Select digital input allows the host to drive several 73S8023C in parallel (controls internal latches)
- 1 Digital output (Interrupt output to the host for fault detection), allows the system controller to monitor the card presence

73S8023C Block Diagram



Power Supply

- 2.7V to 5.5V

6KV ESD Protection on the card interface

Package: QFN32

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