

Complete ISO7816/EMV2000 Level 1 Smart Card Reader



The third member of the TDK Semiconductor 73S11xx family of smart card terminal controllers, the 73S112F, is a stripped down version of the full-featured 73S1121F.

It shares the same digital platform (80C52 core with 64kB of Flash program memory and 4kB of user XRAM data memory, ISO7816 UART). It features a single built-in ISO7816 / EMV smart card interface and a serial interface for communicating with the external world. Additionally, it has a total of 11 digital user I/Os.

The 73S112F is especially suitable for applications where a ready-to-use smart card reader capability must be incorporated into more complex designs such as payment systems, controlled access and identification terminals. Its embedded hardware ISO7816 UART is dedicated to communicating with asynchronous cards under T=0, T=1 protocols. This UART can be bypassed to allow any other firmware-enabled protocol, for synchronous cards. The large amount of built-in memory allows developers to implement various protocols without having to worry about code size.

Embedded applications can be developed using the same 73S1121F Development Kit and tools. The TDK Semiconductor Application Programming Interface (API) is fully compatible with the 73S112F. Ready-to-use EMV test application and API commands can be immediately incorporated into custom projects, to allow immediate EMV certification in accredited labs. Like the other members of the 73S11xxF family, the embedded flash memory can be downloaded through the serial interface, either initiated from the external word by hardware (In-System-Programming mode, or ISP, controlled by a dedicated input), or from the embedded application (In-Application-Programming, or IAP). ISP mode can be used at production level to download the first application, and can be permanently disabled by blowing a built-in fuse. This will guarantee the integrity of the embedded application, and only the application itself will then be able to update the content of the flash memory.

The API can be used to control the features of the entire chip, including serial interface, user I/Os and CPU resources (clock management, interrupts and power modes).

Key Applications

- *Payment Systems*
- *Single Smart Card Readers*
- *Identification and Controlled Access*

Key Advantages

- *A complete hardware and software solution for EMV Level 1*
- *Ready-to-use EMV level 1 application to assist certification*
- *Easy integration into new or existing systems*
- *Largest memory size (program and data) among 8-bit smart card reader ICs in the industry*

Features

Microcontroller

- 80C52 Core
- 64KB internal Flash (Program Memory)
- 1KB IRAM + 4KB internal XRAM (user data memory)
- ROM Boot-loader enabling In-System-Programming (ISP) and In-Application-Programming (IAP) of the internal Flash
- 128 Bytes Flash IFB (Information Block for serial #, firmware version...)
- Single low cost 12MHz crystal is required

Smart Card Interfaces

- (1) ISO-7816 / EMV2000 smart card interfaces w/ embedded Step-up converter for 3V/5V smart-cards
- ISO-7816 UART (9600Kbps to 115Kbps with 12MHz crystal) for protocols T=0, T=1 with a dedicated 2-Byte FIFOs
- Auxiliary I/O lines for C4/C8 signals and UART bypass for synchronous card support
- Card clock stop high and low
- Card clock up to 7.2MHz

Peripherals

- (11) User I/Os

Communication

- (1) Serial interface 1200Kbps to 115Kbps

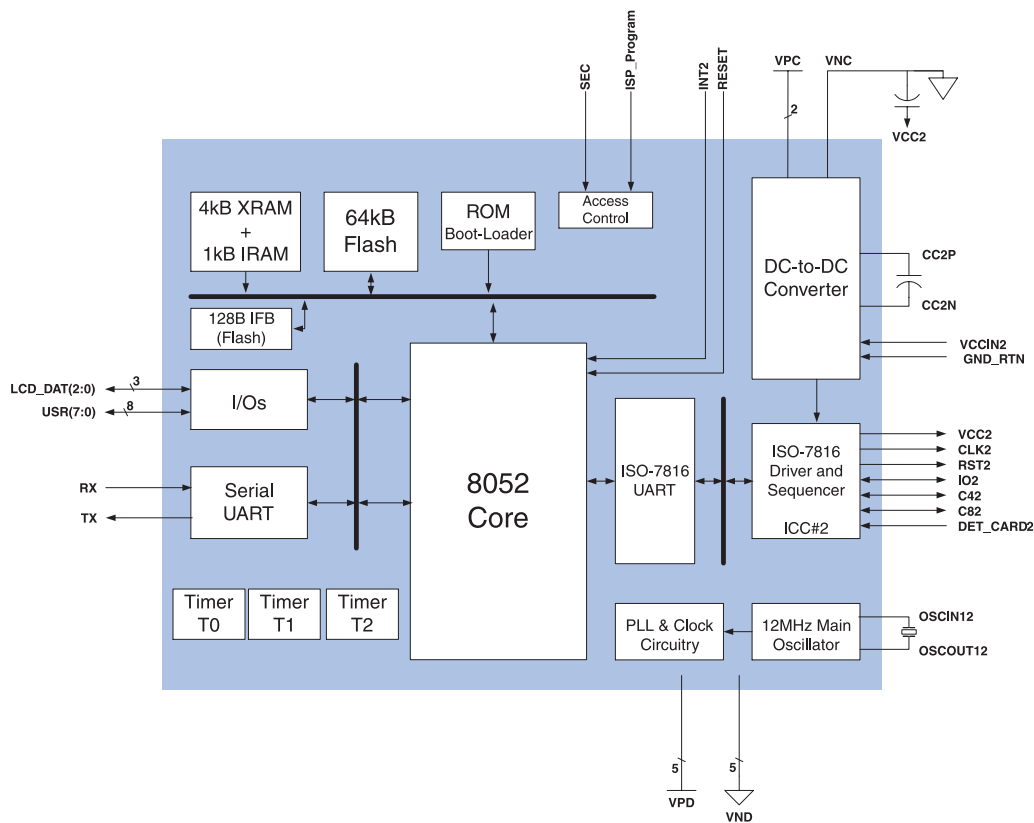
Security

- Embedded security fuses to permanently disable the In-System-Programming mode.

Power Supply: Single 2.7V to 3.6V

Package: 44 LQFP

73S1112F Block Diagram



Software

- Two-level API (C-language libraries) for fast application development
- Demo smart-card reader application, with a sample of USB driver compatible with PC/SC and Microsoft® Windows™ Hardware Quality Laboratory test suite
- TDK "EMV-Ready" optional application: a ready-to-use smart card reader with PC/SC Command Interpreter and serial protocol



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