

73S1121F Smart Card Terminal Development Toolkit

Overview

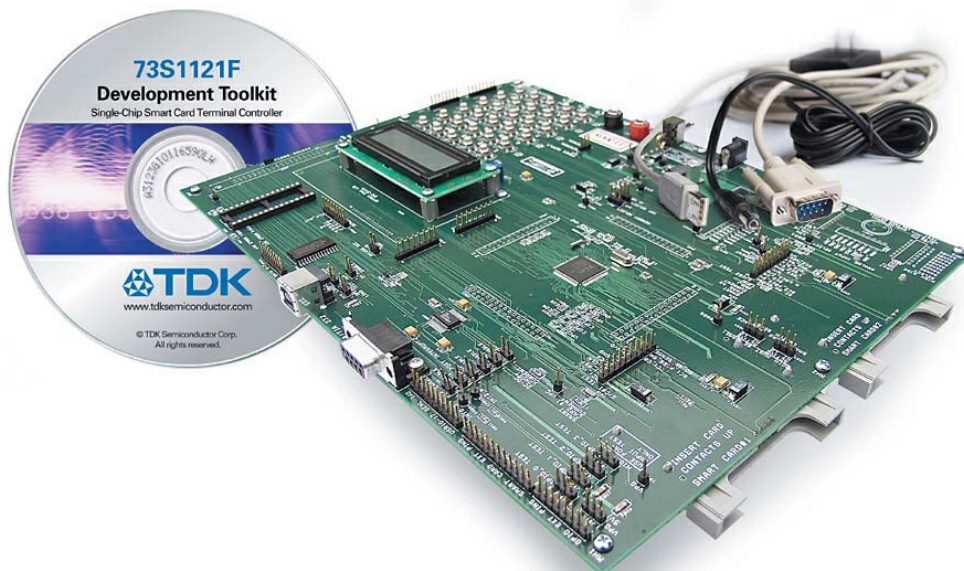
The 73S1121F development toolkit is a complete platform that allows development of 73S1121F embedded applications. The hardware platform is a 73S1121F Evaluation Board that provides access to all built-in interfaces of the 73S1121F. It includes 2 smart card interfaces, 1 keyboard, 1 LCD module, 1 USB and 1 RS232 communication interface. The RS232 interface can be easily modified into a serial interface to be hooked up to any other controller or serial peripheral. The board features a 73S1121F chip that carries out the real time emulation of the application under development. All the signals, including the power supply, the clocks and the analog signals are managed by the 73S1121F.

Benefits

- Immediate prototyping, with the ready-to-use 73S1121F Evaluation Board
- Easy software development using the powerful Application Programming Interface (API functions written in ANSI 'C')
- High-level API library includes protocol layers for ISO-7816-3 and EMV-2000, USB, LCD display and PIN management
- Immediate evaluation of the 73S1121F features, using Windows™ Hyper Terminal with the Low-Level API Exerciser (LAPIE)

Development Toolkit Includes:

- 73S1121F Evaluation Board
- USB and RS232 cables for connection to a PC
- CD-ROM that includes:
 - A sample application using the 73S1121F as a USB or RS232 enabled smart card reader with PC/SC USB drivers
 - Smart Flash tool for downloading of 73S1121F embedded applications
 - EMV Test Application to carry out testing against EMV specification
 - Smart ATR tool for quick interpretation and validation of smart card's Answer To Reset



73S1121F Development Toolkit

The 73S1121F has a DMA (Direct Memory Access) that allows it to run on external program and data memories. This allows either an external In-Circuit-Emulator (ICE) or an external program memory to respectively emulate or contain the application program under development. This external memory could be an inexpensive ROM emulator. For in-circuit-emulation, the 73S1121F Development Toolkit is designed to operate with a SIGNUM® 8052 In-Circuit-Emulator (USP-51A-TDK - 60 MHz base with its POD51-ASIC-TDK). This is available separately and is not included in the standard toolkit package.

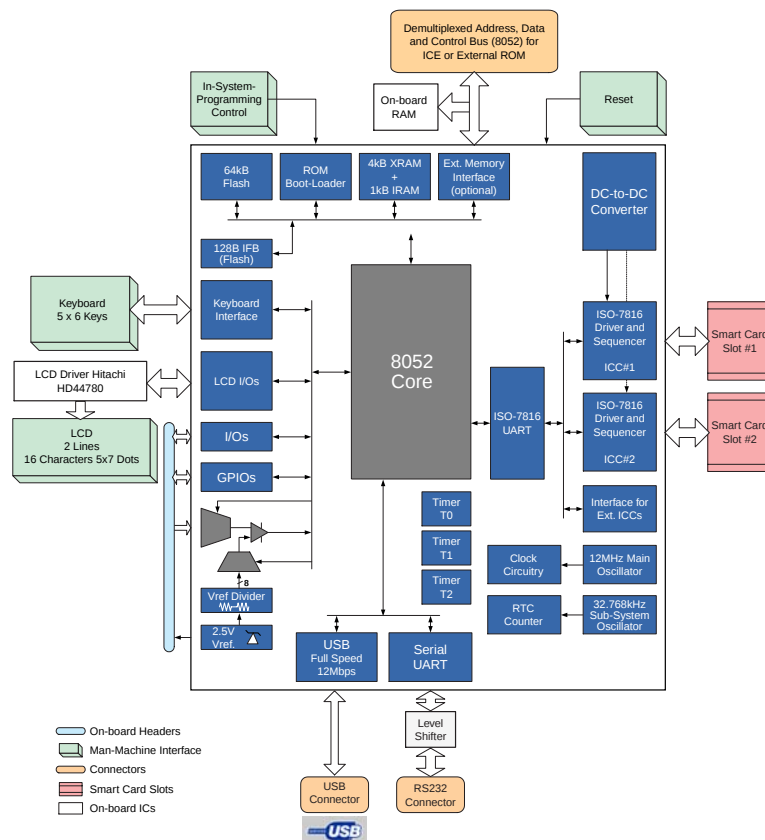
TDK Semiconductor Corp. has developed the 73S1121F together with a comprehensive software layer stack (library software in ANSI-C) based on a two-level Application Programming Interface (API). The low-level API functions control the entire 73S1121F capabilities and low-level parameters (register settings, clock settings and power modes, sharing of the resources such as interrupts and timers, configuration of the interfaces). The high-level API functions include protocol layers to communicate with asynchronous cards (protocols T=0 and T=1, compliant with ISO-7816-3 or EMV-2000) and with the USB interface. It also provides services for PIN management, memory management and display. TDK Semiconductor Corp. recommends the 8051 development environment from Keil®, including C-compiler, version C51V6.21 or higher.

Additional Software Tools and Utilities:

- Smart Flash is a Windows™ application that programs the 73S1121F embedded flash memory through the RS232 link of the Evaluation board.
- The LAPIE (Low-level API Exerciser) evaluation tool, is downloaded into the flash memory of the 73S1121F Evaluation Board, enabling simple commands to be exchanged between a PC and the Evaluation Board using Microsoft® Hyper Terminal. It consists of a simple Command Interpreter controlling the low-level peripherals and features of the 73S1121F for immediate evaluation.
- An application program is provided that implements a single USB enabled smart-card reader, connectable to a PC. The embedded 73S1121F application is based on the use of the API. A sample USB driver, compliant with Microsoft® Windows™ Hardware Quality Laboratory test suite is also provided. The application sample must be downloaded into the 73S1121F flash memory.
- An EMV testing application is part of the software package. It implements, based on the high-level API, a “loopback” application that exchanges APDU commands with the card interface under test, in accordance with the Europay testing procedure. The source-code is available to allow developers to incorporate it into their own application.

73S1121F Evaluation Board Features:

- 2 Smart Card slots
- 1 USB port
- 1 RS232 serial port
- Keyboard: 5 x 6 key matrix
- LCD module: 2 x 16 characters, dot matrix 5x7 dots, controlled by a Hitachi HD44780 LCD driver
- On-board 73S1121F, with DMA (Direct Memory Access) providing access to connect either a ROM-emulator or SIGNUM® 8052 In-Circuit-Emulator
- On-board 12MHz and 32kHz crystals
- Easy-to-use headers providing access to User I/O, General Purpose I/O and Analog Inputs
- In System Programming using the serial port
- On-board regulator allowing use of either the DC PSU block or a standard bench PSU



73S1121F Development Toolkit Block Diagram

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