

SEC2410/SEC4410



HS Endpoint Processor with USB 2.0, Smart Card, & FMC for Secure Token & Storage

PRODUCT FEATURES

Data Brief

General Description

The SMSC SEC2410/SEC4410 are USB 2.0 compliant, hi-speed bulk-only mass storage class peripheral controllers. They are intended to be used to read and write to popular flash media, including Secure Digital (SD), and MultiMediaCard™ (MMC) families.

The SMSC SEC2410/SEC4410 are fully integrated, single-chip solutions capable of ultra-high performance operation. Average sustained transfer rates exceeding 35 MB/s are possible if the media and host can support those rates. The SMSC SEC2410/SEC4410 includes provisions to read/write to secure media formats, as well as support AES encryption, without performance impact.

General Features

- The SEC2410/SEC4410 is available in two lead-free RoHS compliant packages:
 - 64-pin QFN (9x9 mm) package
 - 72-pin QFN (10x10 mm) package that includes debug pins to interface to standard ARM debug tools
- Hardware-controlled data flow architecture for all self-mapped media
- Pipelined hardware support for access to non-self-mapped media
- Order number (see next page) with *i* denote the products that support the industrial temperature range of -40°C to 85°C
- Support included for secure media format on a licensed, customized basis
 - SD Secure

Hardware Features

- Single-chip flash media controller containing:
 - A multiplexed interface for use with combo card sockets
 - SD/MMC flash media reader/writer
- SDIO and MMC streaming mode support
- Extended configuration options
- Media Activity LED
- GPIO configuration and polarity
 - Up to 32 GPIOs for special function use
 - One GPIO with up to 200 mA drive

- On board 24 MHz crystal driver circuit
- Optional external 24 MHz clock input
- Internal card power FET
 - 200 mA
 - "Fold-back" short circuit protection
- ARM M3 32-bit microprocessor
 - 60 MHz execution speed at 1 cycle per instruction (minimum)
 - 32 KBytes of internal SRAM for a general purpose scratchpad
 - 96 KByte SRAM available for code execution
 - 32 KByte internal code ROM
 - JTAG interface
- Supports a single external 3.3 V supply source; internal regulators provide 1.2 V internal core voltage for additional bill of materials and power savings
- Optimized pinout improves signal routing, easing implementation for improved signal integrity
- 1.2 V reference voltage for HSIC (SEC4410 only)

Flash Media Specification Compliance

- Secure Digital 2.0
 - HS-SD, SDHC, SDXC
 - TransFlash™ and reduced form factor media
- MultiMediaCard
 - MMC version 4.2: 1/4/8-bit
 - eMMC version 4.4

Software Features

- Customizable vendor-specific data
- Reduced memory footprint

Applications

- Secure dongles and storage
- Flash media card reader/writers
- Desktop and mobile PCs
- Consumer A/V and media players/viewers
- Compatible with
 - Microsoft® Vista™ and Vista ReadyBoost™
 - Windows® 7, XP, ME, 2K SP4
 - Apple Mac OSx®
 - Linux Mass Storage Class Drivers

Order Numbers:

ORDER NUMBERS	LEAD-FREE ROHS COMPLIANT PACKAGE	PACKAGE SIZE (mm)	TEMPERATURE RANGE
SEC2410/SEC2410-JZX	64QFN	9x9	0°C to 85°C
SEC4410/SEC4410i-JZX			-40°C to 85°C
SEC2410/SEC2410-AKZE	72QFN	10x10	0°C to 85°C
SEC4410/SEC4410i-AKZE			-40°C to 85°C

**This product meets the halogen maximum concentration values per IEC61249-2-21.
For RoHS compliance and environmental information, please visit www.smssc.com/rohs**

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General Description

SEC2410/SEC4410 is a flash media card reader solution intended to provide a flexible means of providing embedded Audio/video systems (TVs, DVD players, STBs, Portable Media Copiers or Players, etc.) access to Media files stored on Flash Media Cards such as Secure Digital/MultiMediaCard (SD/MMC), and NAND Flash.

SEC2410/SEC4410 is fully compliant with the *USB 2.0 Specification*. All required transivers and resistors of the USB ports are integrated into the device. This includes all series termination resistors on D+ and D- pins and all required pull-down and pull-up resistors. The over-current sense inputs for the downstream facing ports have internal pull-up resistors. One Control, One interrupt Pair, and Two Bulk Pair Endpoints are provided with reconfigurable Endpoint Buffers.

SEC2410/SEC4410 incorporates a powerfull ARM M3 32-bit microprocessor with 60 MHz execution speed at 1 cycles per instruction (minimum).

Following memories are embedded:

- 32 KBytes of internal SRAM for general purpose scratchpad
- 96 KByte SRAM available for code execution
- 32 KByte Internal Code ROM
- 10 KBytes of reconfigurable Endpoint Buffers
- 2 KByte OTP

It also supports optional 4 MByte External Code Space using SPI Flash memory.

SEC2410/SEC4410 has on-chip SD/MMC Controller. It supports:

- High-Speed MMC version 4.2: 1/4/8 bit MMC
- eMMC version 4.4
- High-Speed SD card, SDHC
- SDXC in SDR25 Mode (no support for SD card UHS25, SDR50, or SDR100).
- TransFlash™ and reduced form factor media.
- Hardware support for Secure Digital(SD) Pass-Through
- Hardware support for SD Security Command Extensions
- Hardware support for SDIO (SD Input/Output)

It has on-chip power FET's for supplying flash media card power with minimum board components.

SEC2410/SEC4410 supports SmartCard interface, ISO/IEC 7816 compliant and has Integrated 3/1.8 Volt regulator.

Integrated cryptographical module offers AES encryption with AES 128, AES 192, AES 256 key sizes and ECB, CBC or CTR implementation.

SEC2410/SEC4410 offers up to 32 GPIOs with diverse configuration and polarity options for special function such as LED indicators, button inputs, and power control to memory devices. The number of actual GPIOs depends on the implemented configuration. One GPIO available with up to 200 mA drive and "fold-back" short circuit protection

SEC2410/SEC4410 has a 24 MHz Crystal Driver Circuit and internal PLL for 480 MHz USB 2.0 Sampling on board.

It supports a single external 3.3 V supply source. Internal regulators provide 1.2 V internal core voltage for additional bill of materials and power savings.

SEC2410/SEC4410 is offered as a single chip flash media controller in 64-pin and 72-pin QFN, lead-free RoHS compliant packages in either SEC2410/SEC4410 commercial temperature range from 0°C to +70°C or industrial from -40°C to +85°C.

It supports USB Mass Storage Compliant Bootable BIOS, firmware upgrade via USB bus for SPI Flash and SD/MMC cards ("boot block flash" not required).

Compatible with Microsoft Vista; Windows 7, XP, and 2K SP3&4; Mac OS X 10; and Linux Multi-LUN Mass Storage Class Drivers

Block Diagrams

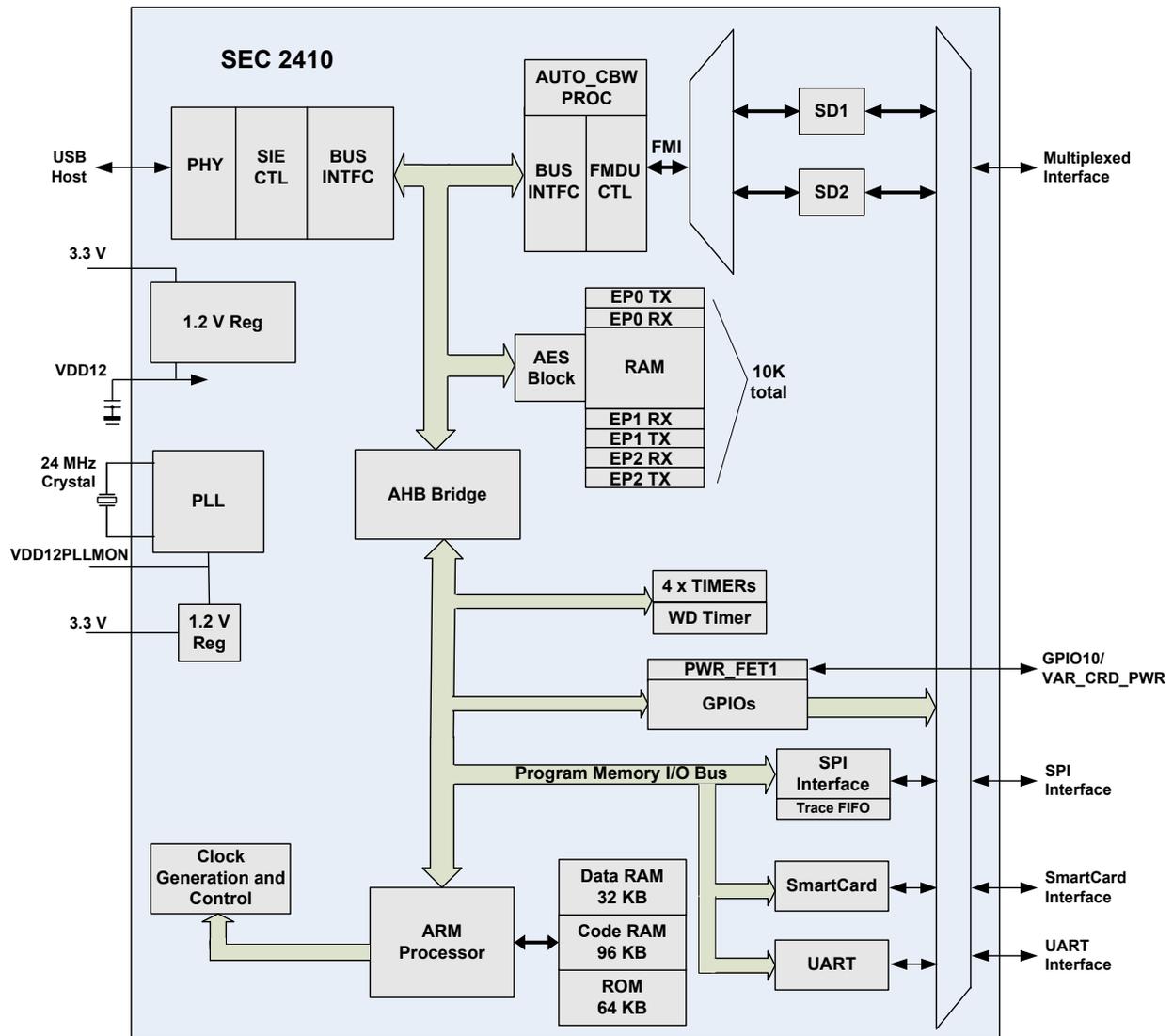


Figure 1 SEC2410 Block Diagram

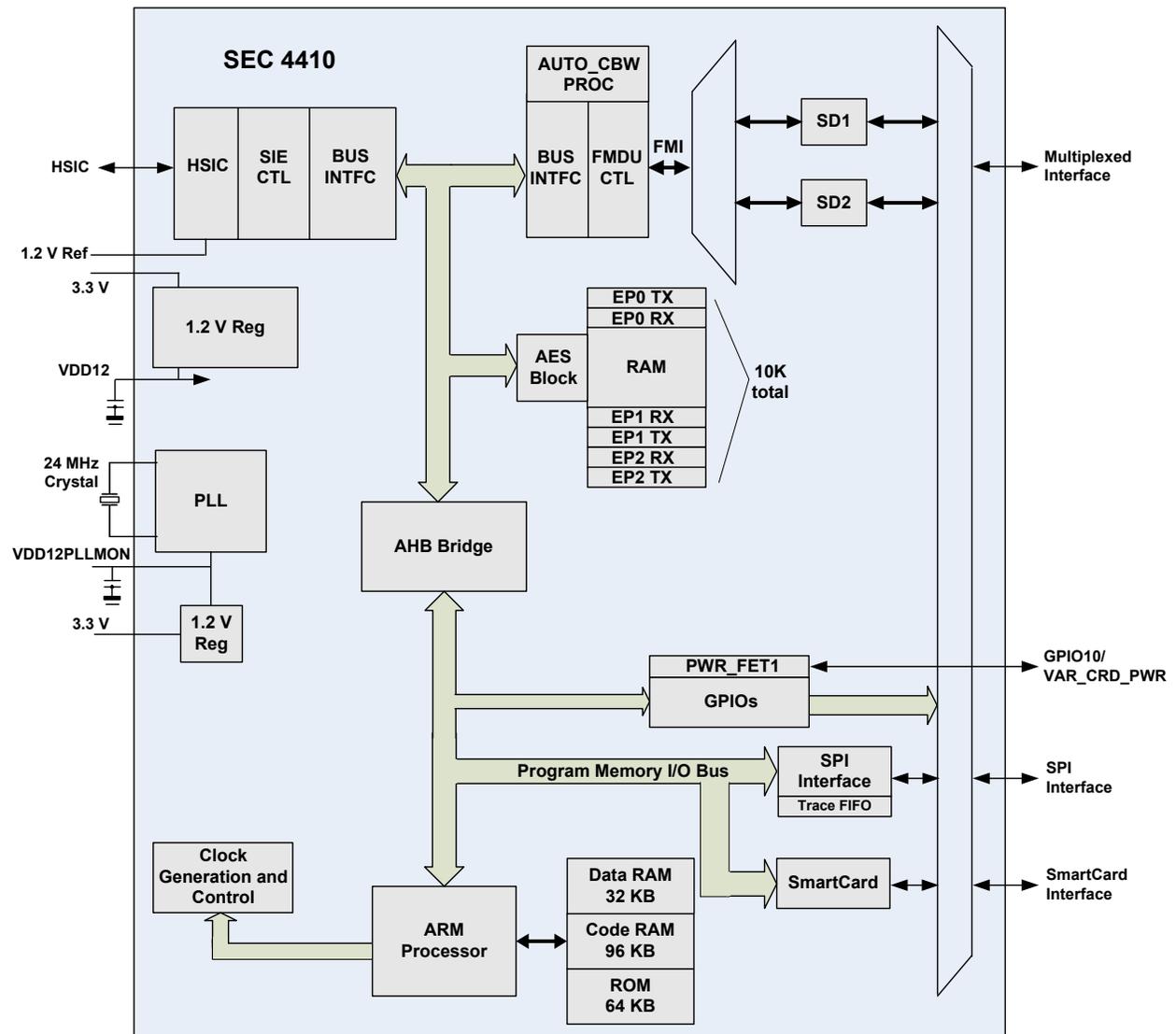
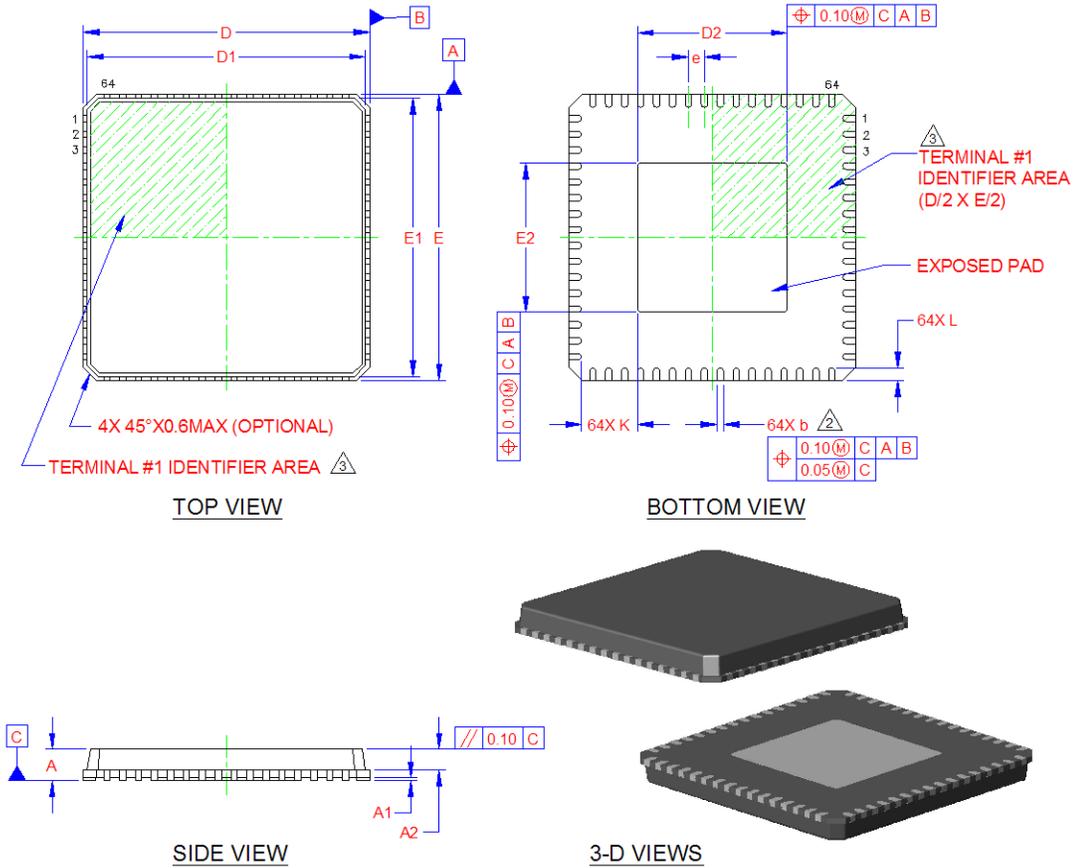


Figure 2 SEC4410 Block Diagram

Package Outline



COMMON DIMENSIONS					
SYMBOL	MIN	NOM	MAX	NOTE	REMARK
A	0.80	0.85	1.00	-	OVERALL PACKAGE HEIGHT
A1	0	0.02	0.05	-	STANDOFF
A2	-	0.65	0.80	-	MOLD CAP THICKNESS
D/E	8.90	9.00	9.10	-	X/Y BODY SIZE
D1/E1	8.65	8.75	8.85	-	X/Y MOLD CAP SIZE
D2/E2	4.60	4.70	4.80	-	X/Y EXPOSED PAD SIZE
L	0.30	0.40	0.50	-	TERMINAL LENGTH
b	0.18	0.25	0.30	2	TERMINAL WIDTH
K	1.55	-	-	-	CENTER PAD TO PIN CLEARANCE
e	0.50 BSC			-	TERMINAL PITCH

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETER.
 - DIMENSIONS "b" APPLIES TO PLATED TERMINALS AND IT IS MEASURED BETWEEN 0.15 AND 0.30 mm FROM THE TERMINAL TIP.
 - DETAILS OF TERMINAL #1 IDENTIFIER ARE OPTIONAL BUT MUST BE LOCATED WITHIN THE AREA INDICATED. THE TERMINAL #1 IDENTIFIER MAY BE EITHER A MOLD OR MARKED FEATURE.

Figure 3 SEC2410/SEC4410 64-Pin QFN Package Drawing

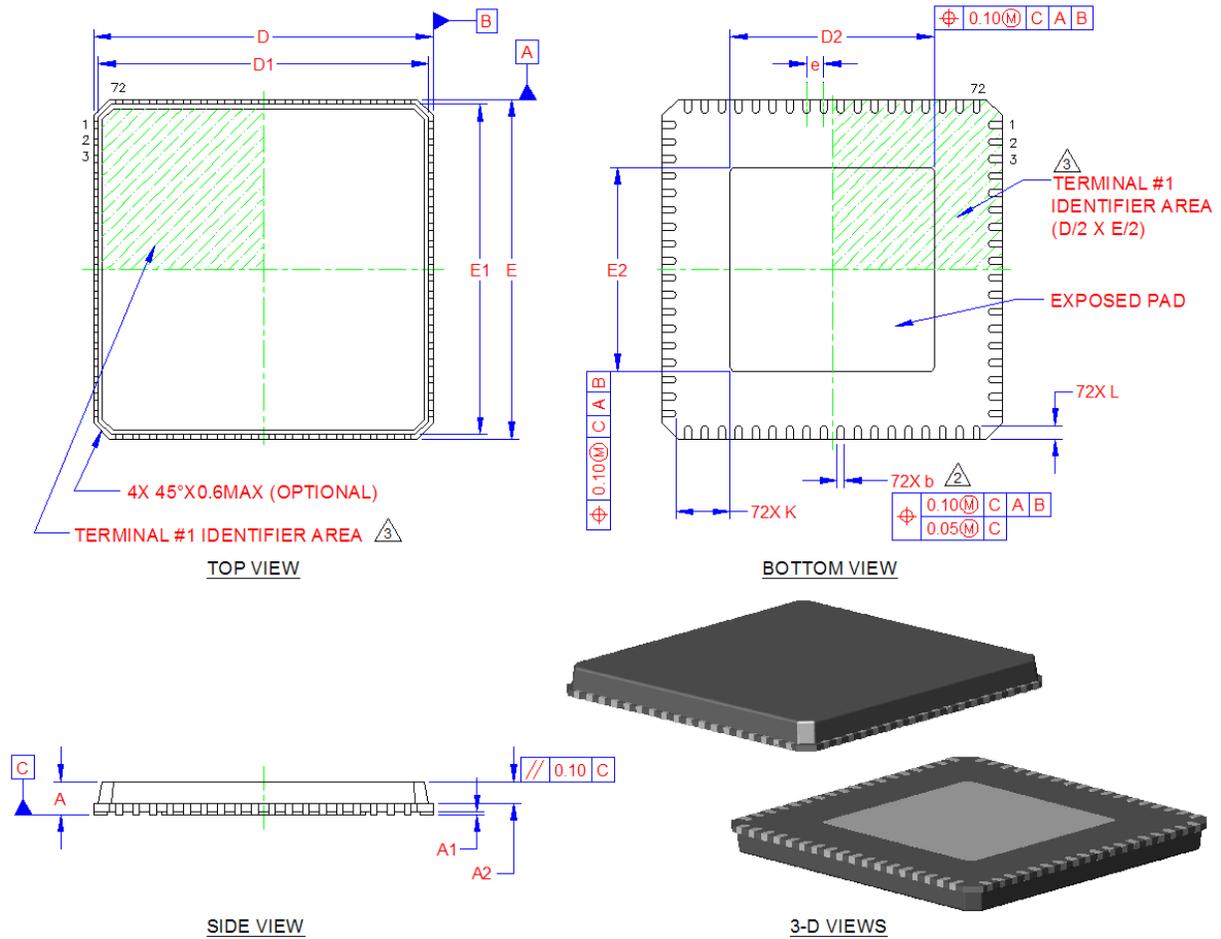


Figure 4 SEC2410/SEC4410 72-Pin QFN Package Drawing