

USB4640/USB4640i

High-Speed Inter-Chip (HSIC) USB 2.0 Hub and Flash Media Controller

PRODUCT FEATURES

Data Brief

General Description

The SMSC USB4640/USB4640i is a Hi-Speed HSIC USB hub and card reader combo solution with an upstream port that is compliant to HSIC 1.0 (supplement to the *USB 2.0 Specification*). The two downstream ports are compliant with the *USB 2.0 Specification*.

High-Speed Inter-Chip (HSIC) is a digital interconnect bus that enables the use of USB technology as a low-power chip-to-chip interconnect at speeds up to 480 Mb/s. The HSIC interface is an industry standard 2-pin digital interface which uses standard USB software. The USB4640/USB4640i provides an ultra fast interface between an HSIC enabled host and several popular flash media formats. The controller allows read/write capability to flash media from the following families:

- Secure Digital™ (SD)
- MultiMediaCard™ (MMC)
- Memory Stick® (MS)
- xD-Picture Card™ (xD)¹

The USB4640/USB4640i combo solution leverages SMSC's innovative technology that delivers industry-leading data throughput in mixed-speed USB environments. Average sustained transfer rates exceeding 35 MB/s are possible².

Highlights

- Upstream HSIC port and 2 exposed Hi-Speed USB 2.0 downstream ports for external peripheral expansion
- Dedicated flash media reader internally attached to a 3rd downstream port of the hub as a USB compound device
 - single or multiplexed flash media reader interface
- **PortMap**
 - Flexible port mapping and disable sequencing
- **PortSwap**
 - Programmable USB differential-pair pin locations ease PCB design by aligning USB signal lines directly to connectors
- **PHYBoost**
 - Programmable USB signal drive strength for recovering signal integrity using 4-level driving strength resolution

Features

- Compliance with the following flash media card specifications SD 2.0; MMC 4.2; MS 1.43; MS-Pro 1.02; MS-Pro-HG 1.01; MS-Duo 1.10; and xD 1.2
- Low-power digital HSIC interface offers a replacement for onboard host and device connection for analog USB bus cable
- HSIC interface enables printers, mobile PCs, ultra-mobile PCs, and cell phone products to reduce the total power budget
- HSIC interface provides use of USB connectivity and compatibility with existing USB drivers and software
- External 1.2 V reference allows upstream/downstream HSIC links to use the same voltage reference
- Supports a single external 3.3 V supply source; internal regulators provide 1.8 V internal core voltage for additional bill of materials and power savings
- The hub transaction translator (TT) supports Full-Speed and Low-Speed peripheral operation
- 9 KB RAM | 64 KB on-chip ROM
- Enhanced EMI rejection and ESD protection performance
- Hub and flash media reader/writer configuration from a single source:
 - Configures internal code using an external I²C EEPROM
 - Supports external code using an SPI Flash EEPROM
 - Customizable vendor ID, product ID, and language ID if using an external EEPROM
- Up to 9 configurable GPIOs for special functions
- The USB4640 supports the commercial temperature range of 0°C to +70°C
- The USB4640i supports the industrial temperature range of -40°C to +85°C
- 48-pin QFN (7 x 7 mm) lead-free, RoHS compliant package

Applications

- 3G/4G handsets, smartphones, cell phones, and other mobile devices
- Desktop and mobile PCs
- Printers
- GPS navigation systems
- Media players/viewers
- Consumer A/V
- Set-top boxes
- Industrial products

1. Obtain user license from the xD-Picture Card License Office.
2. Host and media dependent.

Order Numbers:

USB4640/USB4640i-HZH-xx for 48-pin, QFN lead-free RoHS compliant package

USB4640/USB4640i-HZH-TR-xx for 48-pin, QFN lead-free RoHS compliant tape and reel package

“XX” in the order number indicates the internal ROM firmware revision level. Please contact SMSC for more information.

This product meets the halogen maximum concentration values per IEC61249-2-21

For RoHS compliance and environmental information, please visit www.smssc.com/rohs

Please contact your SMSC sales representative for additional documentation related to this product such as application notes, anomaly sheets, and design guidelines.

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Block Diagram

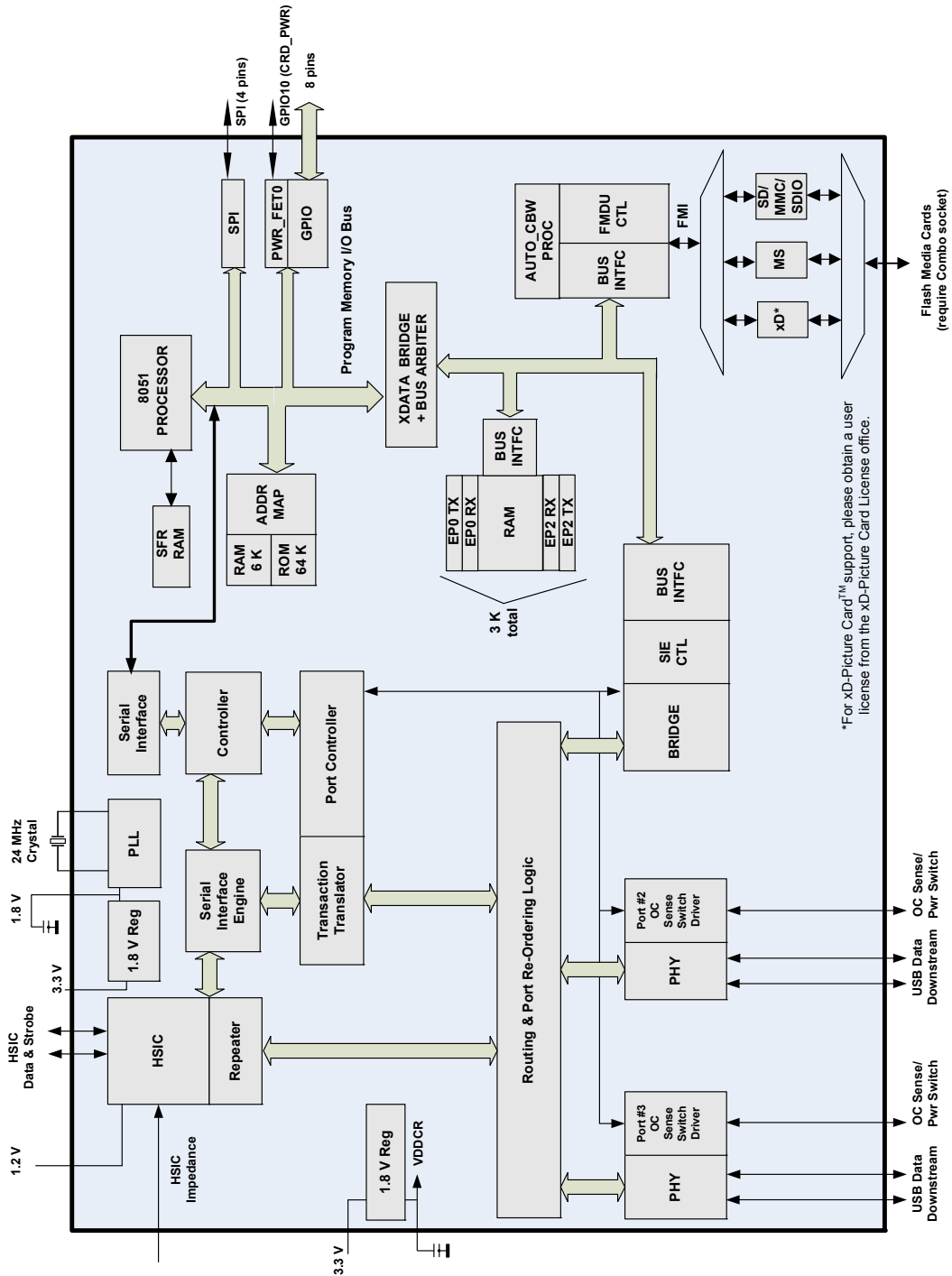
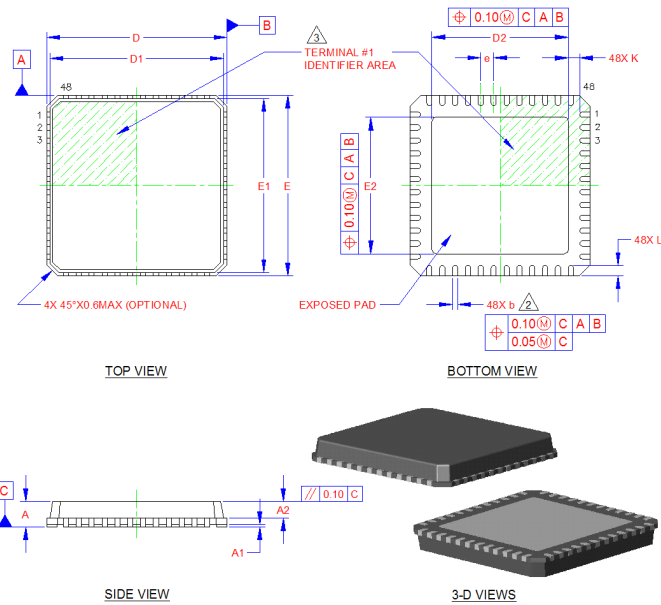


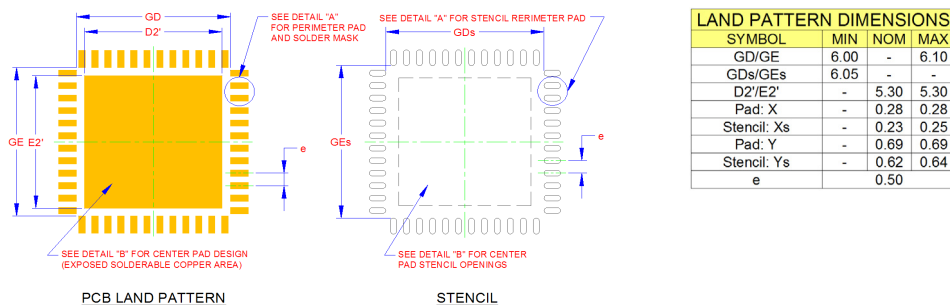
Figure 1 USB4640/USB4640i Block Diagram

Package Outline



COMMON DIMENSIONS					
SYMBOL	MIN	NOM	MAX	NOTE	REMARK
A	0.70	0.85	1.00	-	OVERALL PACKAGE HEIGHT
A1	0	0.02	0.05	-	STANDOFF
A2	-	-	0.90	-	MOLD CAP THICKNESS
D/E	6.85	7.00	7.15	-	X/Y BODY SIZE
D1/E1	6.55	6.75	6.95	-	X/Y MOLD CAP SIZE
D2/E2	5.20	5.30	5.40	-	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	0.35	-	-	-	CENTER PAD TO PIN CLEARANCE
e	-	0.50 BSC	-	-	TERMINAL PITCH

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



LAND PATTERN DIMENSIONS			
SYMBOL	MIN	NOM	MAX
GD/GE	6.00	-	6.10
GDs/GEs	6.05	-	-
D2'/E2'	-	5.30	5.30
Pad: X	-	0.28	0.28
Stencil: Xs	-	0.23	0.25
Pad: Y	-	0.69	0.69
Stencil: Ys	-	0.62	0.64
e	-	0.50	-

Figure 2 USB4640/USB4640i 48-Pin QFN

Mouser Electronics

Authorized Distributor

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[USB4640I-HZH-03-TR](#)