



# SiI9185A 3:1 HDMI Switch

## Data Brief

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## General Description

The SiI9185A 3:1 HDMI Switch is the first generation of TMDS™ switching devices that supports the features of revision 1.3 of the HDMI® Specification and integrates the latest generation of TMDS core technology. With three HDMI inputs and a single output, the switch provides a low-cost method of retransmitting protected digital audio and video and adding additional HDMI ports to the latest digital TVs (DTVs), giving consumers a truly all-digital experience. New DTVs can easily connect to the many HDMI sources coming to market, including DVDs, Set Top Boxes (STBs), game consoles, PCs, camcorders, and digital still cameras.

Unlike some other HDMI switching devices, which use high-speed analog switches that can degrade TMDS signals, the SiI9185A switch uses TMDS cores to recover and retransmit the HDMI signal.

Backward compatibility with DVI 1.0 allows HDMI systems to connect to any DVI 1.0 source.

The SiI9185A switch is the first generation of devices from Silicon Image that integrates Extended Display Identification Data (EDID). The EDID is stored in on-board RAM downloaded from the system microcontroller during power-up or initialization. The EDID is reflected on each of the three HDMI ports through the DDC bus. The device also allows using EDID stored on an external ROM, and either location can be selected for each port. Having the flexibility to provide EDID content from on-board RAM can eliminate up to three EDID ROMs and save board space.

This device provides additional features that eliminate external components, lower system cost, and provide enhanced features to the end-user. The switch provides a complete solution for switching sink-side HDMI signals, such as DDC switching and Hot Plug Detect (HPD) control for each port, and 5-volt sense to speed audio mute when changing HDMI cables. For source-side applications, DDC switching can be bypassed

with an external 4-channel I<sup>2</sup>C bus switch to allow clock stretching.

## TMDS

- The TMDS cores are capable of receiving and transmitting at 2.25 Gbps.
- Video resolutions up to 1080p, 60 Hz, 12-bit or 720p/1080i, 120 Hz, 12-bit are supported.
- An adaptive equalizer provides long cable support, even at Deep Color resolutions.
- The transmitter includes pre-emphasis.

## CEC Support

- An integrated HDMI-compliant CEC I/O and the Silicon Image CEC API eliminate the need for additional external components.
- The API manages all CEC signaling using the CEC protocol and makes CEC information available to the system microcontroller, eliminating the microcontroller overhead needed to manage the CEC bus and thus simplifying design.

## Control Capability

- The device can be controlled by the local I<sup>2</sup>C bus.
- An optional stand-alone mode (for which I<sup>2</sup>C control is not required) is available for speeds up to 165 MHz and allows the device to act as a simple switcher.
- The CEC and EDID are still functional during the very-low-power standby mode when the DTV is off, which meets Energy Star and other power-saving requirements.

## Package

- 80-pin, 12 mm by 12 mm, 0.5 mm pitch, TQFP package

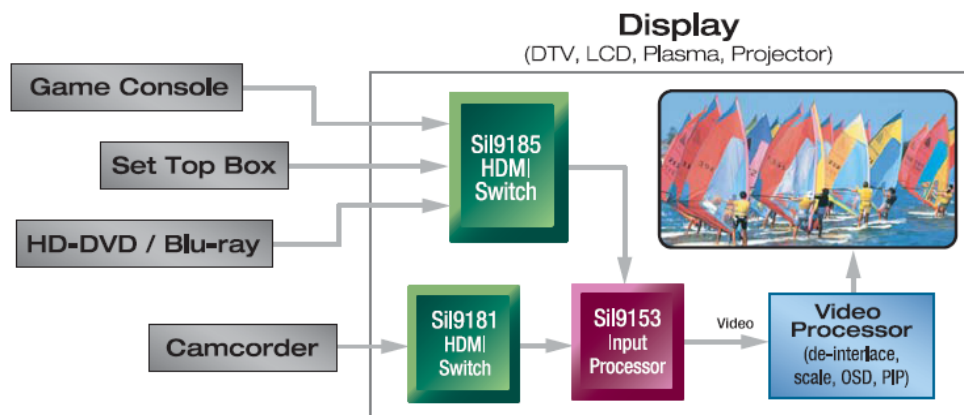


Figure 1. Typical Application

## SiI9185A Pin Mapping

Figure 2 shows the pin diagram for the SiI9185A switch in the 80 pin, 12 mm by 12 mm, 0.5 mm pitch, TQFP package. Pin names are generalized by type for this document. The list below the diagram describes the purpose of each type.

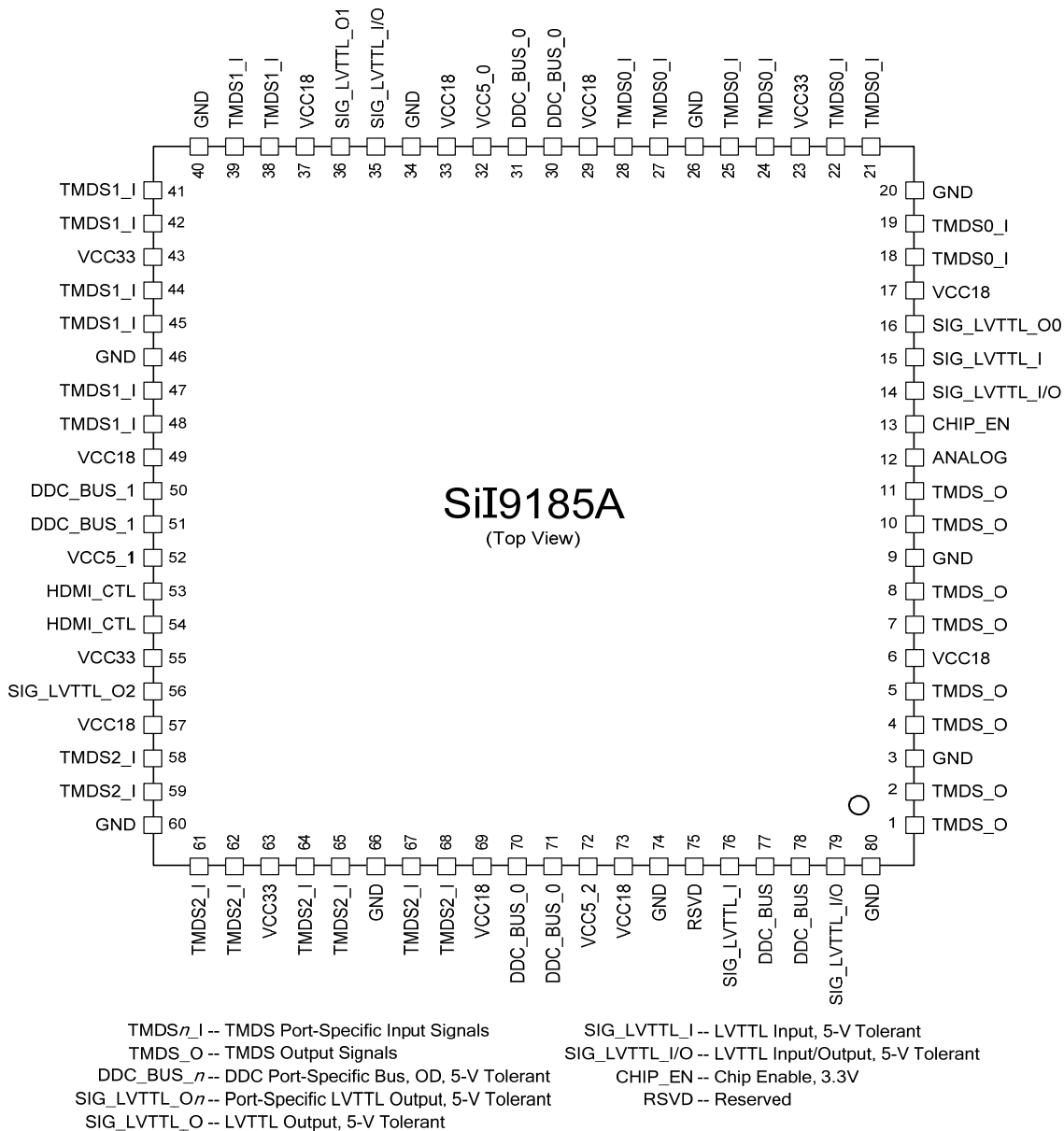
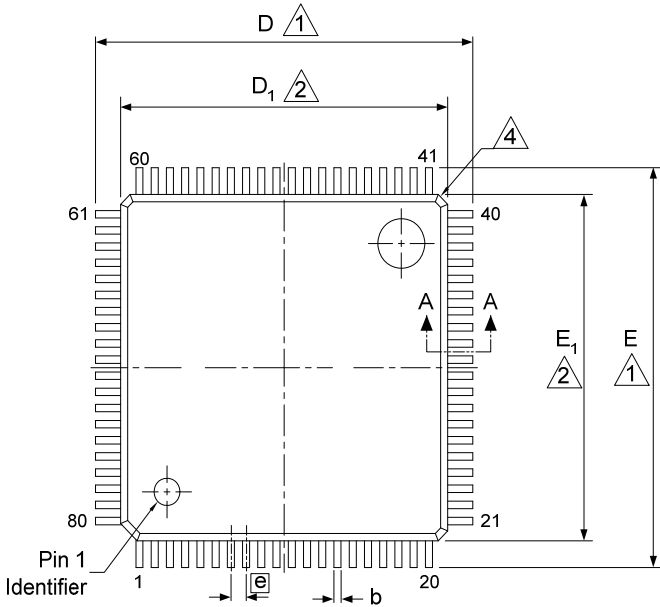


Figure 2. Pin Mapping

# Package Information

These drawings are not to scale.

## Package Dimensions



TOP VIEW

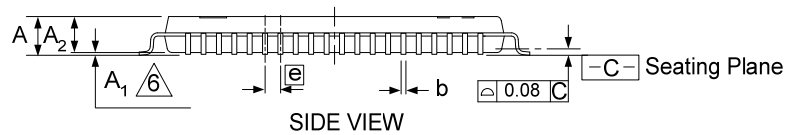
NOTE:

- ① To be determined at seating plane
- ② Dimensions  $D_1$  and  $E_1$  do not include mold protrusion.  $E_1$  and  $E_1$  are maximum plastic body size dimensions including mold mismatch.
- ③ Dimension  $b$  does not include Dambar protrusion. Dambar cannot be located on the lower radius of the foot.
- ④ Exact shape of each corner is optional.
- ⑤ These dimensions apply to the flat section of the lead between 0.10 mm and 0.25 mm from the lead tip.
- ⑥  $A_1$  is defined as the distance from the seating plane to the lowest point of the package body.
- 7 Controlling dimension: millimeter.
- 8 Reference document: JEDEC MS-026-ADE.
- 9 Special characteristics C Class: ccc

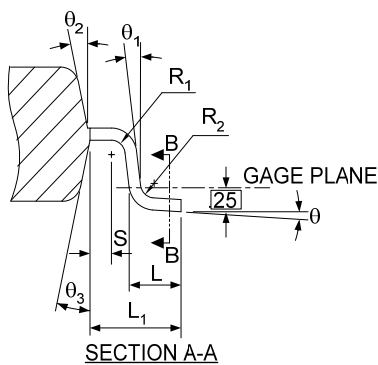
Symbol	Description	Min	Typ	Max
A	Thickness	—	—	1.20
A <sub>1</sub>	Stand-off	0.05	—	0.15
A <sub>2</sub>	Body Thickness	0.95	1.00	1.05
b	Plated Lead Width	0.17	0.20	0.27
b <sub>1</sub>	Metal Lead Width	0.17	0.20	0.23
c	Plated Lead Thickness	0.09	—	0.20
c <sub>1</sub>	Metal Lead Thickness	0.09	—	0.16
D	Footprint	14.00 BSC		
D <sub>1</sub>	Body Size	12.00 BSC		
E	Footprint	14.00 BSC		
E <sub>1</sub>	Body Size	12.00 BSC		
e	Lead Pitch	0.50 BSC		
L	Lead Foot Length	0.45	0.60	0.75
L <sub>1</sub>	Total Lead Length	1.00 REF		
R <sub>1</sub>	Lead Radius, Inside	0.08	0.15	—
R <sub>2</sub>	Lead Radius, Outside	0.15	0.20	0.25
S	Lead Horizontal Run	0.20	—	—
θ	Lead Foot Angle	0°	3.5°	7°
θ <sub>1</sub>	Vertical Lead Angle	0°	—	—
θ <sub>2</sub>	Upper Facet Angle	11°	12°	13°
θ <sub>3</sub>	Lower Facet Angle	11°	12°	13°

Dimensions in millimeters.

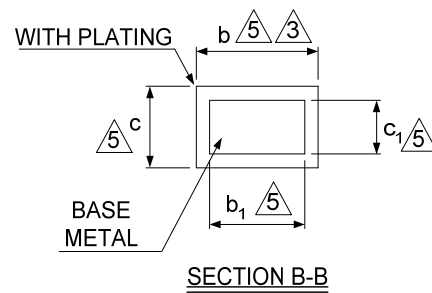
Overall thickness  $A = A_1 + A_2$ .



SIDE VIEW



SECTION A-A

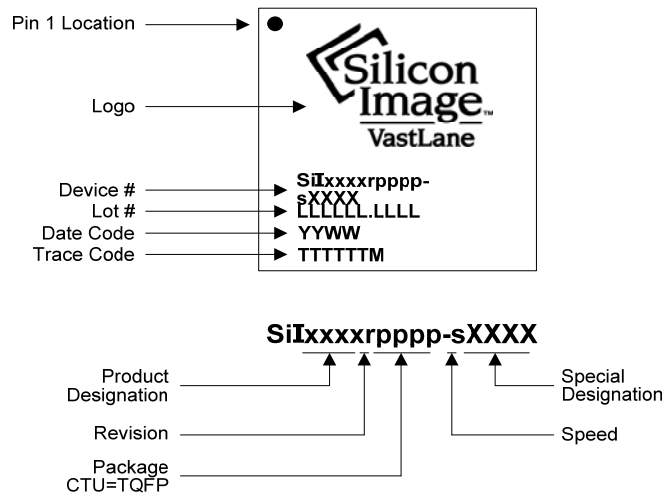


SECTION B-B

Figure 3. 12.0 mm x 12.0 mm TQFP Package Diagram

## Marking Specification

Marking drawing is not to scale.



Legend	Description
LLLLLL.LLLL	Lot number
YY	Year of manufacture
WW	Week of manufacture
TTTTTT	Trace code
M	Maturity code

The universal package can be used in lead-free and ordinary process lines.

**Figure 4. Marking Diagram**

## Ordering Information

Production Part Numbers:

Device	Part Number
Standard	SiI9185ACTU

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