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StrongARM® SA-1100 Multimedia Development Board with Companion SA-1101 Development Board

Brief Datasheet

Product Features

StrongARM® SA-1100 Multimedia Development Board – The SA-1100 microprocessor provides a true convergence for the appliance, telephony, and embedded computer market segments. With an SA-1100 microprocessor at the heart of this motherboard, this design is an example integration of video, audio, POTS communication, flash, and a DSP co-processor on board. Benefiting from programmable CPLDs, the circuit routing is extremely flexible and probe points provide access to key signals. Two connectors are provided for mounting daughter cards, including one for the optional SA-1101 daughter board.

StrongARM SA-1101 Development Board – The optional SA-1101 companion device provides additional I/O connections for devices and peripherals, including VGA graphics. With an SA-1101 at the heart of this daughter card, this board provides expanded I/O connections for video, PCMCIA card connector, USB, DSUB and 1284/Parallel ports, and PS/2 connections. It also provides a hardware and software development environment for PCMCIA interfaces, IEEE 1284, and matrix keyboards. Like the SA-1100 multimedia development board, this design also benefits from programmable CPLDs and probe points that provide access to key signals.

■ The SA-1100 multimedia development motherboard provides:

— Circuit routing that is extremely flexible through the use of programmable CPLDs. Sample routing for common multimedia functions are provided.

— Memory that is tightly coupled to the SA-1100 to demonstrate maximum memory bandwidth of over 100 Mbytes/sec.

— Two connectors for mounting daughter cards, including one for the SA-1101 daughter board.

— Programmable CPU clock speeds up to 220 MHz.

— Bulkhead serial interface connector on the board provides debug communications to the SA-1100. Ethernet interface optionally available through the use of PCMCIA Ethernet card on the SA-1101 daughter board PCMCIA slot.

— Sample source code including I/O drivers such as the software video-processing engine drivers and the SCB library available through Intel's developer's web site.

— An example integration of video, audio, POTS communication, flash, and DSP co-processor on board.

— Many probe points for access to key signals.

■ The optional SA-1101 development daughter board provides:

— Many probe points that are provided for access to key signals.

— Provides a hardware and software development environment for PCMCIA interfaces, IEEE 1284, and matrix keyboards.

— Expanded I/O connections for video, PCMCIA card connector, USB, DSUB and 1284/Parallel ports, PS/2 connections.

— Circuit routing that is extremely flexible through the use of programmable CPLDs. Sample routing for common functions are provided.

Development Platform Purpose

The SA-1100 multimedia development board and the optional SA-1101 daughter board work together as a platform to serve two purposes:

- A general-purpose hardware and software development platform for the SA-1100 family.

- A multimedia convergence reference design.

Applications

Possible applications enabled by the SA-1100 multimedia reference design include, but are not limited to:

■ Wireless gateway	■ Video phone with optional web and E-mail access	■ Standard digital television (SDTV) engine with capabilities such as PIP, OSD, video phone, and web access
■ Speech recognition	■ Electronic camera	■ Voice-over-IP
	■ Security monitoring/remote security	■ Tapeless recorder

SA-1100 Multimedia Development Board Software

The following source and executable files are available from the StrongARM section in the developer's area on the Intel website.

- SCB driver application—Industry-standard protocols for configuring multimedia components

- Video pass through application—Captures video input and moves it to the video output buffer

- Keyboard driver—Reads data from keyboard to make available to programs

- Video out application—Program that displays application-generated data

- Diagnostics—Test program that analyzes the functions of the SA-1100 multimedia development board and the SA-1101 development board

- Angel boot loader—Software component of ARM that loads an application from a remote host computer or from the application flash

- Set of microHAL libraries (to be used with Angel)—Set of drivers for communicating with the SA-1100 multimedia development board

SA-1100 Multimedia Development Board Kit Contents

The SA-1100 multimedia development kit is shipped with the following items:

- Two identical adapter cables fitted with a male RCA jack and a two-pin header receiver
- A 16-pad keypad
- A fully-populated SA-1100 multimedia development board with pre-programmed CPLDs
- A SODIMM double-sided module containing 16 MB or 32 MB of DRAM memory, already pre-installed
- Null-modem cable (9 pin D-Sub female to 9 pin D-Sub female)
- *StrongARM™ SA-1100 Multimedia Development Board with Companion SA-1101 Development Board User's Guide (*this document)
- *StrongARM® SA-1100 Microprocessor Specification Update*
- *SA-1100 Microprocessor Technical Reference Manual*
- *README.TXT*

SA-1101 Development Board Kit Contents

The optional SA-1100 multimedia development board is shipped with the following items:

- A 64-key keyboard
- A fully-populated SA-1101 development board with pre-programmed CPLDs
- *StrongARM™ SA-1101 Microprocessor Technical Reference Manual*

The schematics, parts list, software (including CPLD source code), and copies of the documentation are available from the developer's area on the Intel website.

The SA-1100 multimedia development board is a highly flexible platform for hardware and software development of videophones, Internet TVs, Internet cameras, as well as a general-purpose operating system and application porting platform. With the addition of the SA-1101 development daughter board, the SA-1100 and SA-1101 reference design combination contains all the system components necessary for a Windows CE sub-notebook system development platform with two independent video heads.

The SA-1100 multimedia development board block diagram illustrates the flexibility and extendibility of this design. All device interfacing has been implemented with in-system programmable CPLDs and all system interface points are available on connectors suitable for daughter boards or cables. Although not intended as a ready to manufacture product design, the SA-1100 multimedia development board provides the basis for low-cost derivative designs such as the Internet TV videophone.

Physical Description

Figure 1 shows the physical layout of the SA-1100 multimedia development board. It is a single-board computer with the form factor of a PCI add-in card. Figure 2 show the physical layout of the optional SA-1101 development board. It is a single-board I/O expander for the SA-1100 with the form factor of a daughter card.

This board contains processor, system controller, memory and input/output devices. Switch block S1 is used for configuring the card for ROM selection and disabling interrupts.

The bulkhead mounting bracket of the board holds a 9F D-Sub connector and an IrDA header block. The D-sub connector provides an RS232 terminal connection to a host system.

The CPLDs, which can be programmed to provide a variety of hardware functions, are pre-programmed to support sample designs. The CPLDs are also capable of being programmed at run-time to support a variety of hardware needs. The in circuit programmability feature of these devices allows SA-1100 system developers to tailor the SA-1100 multimedia design to their specific application. The ability to quickly port a new hardware application to an existing and supported platform allows rapid deployment of software development platforms for the customer application. (Typically software schedules are more critical to time to market than hardware schedules, so the early deployment of functional software development platforms can reduce product delivery schedules.)

The discrete LEDs and the HexLEDs provide status information during power up and self-test. See the README.TXT for interpretation of the LEDs and hexleds.
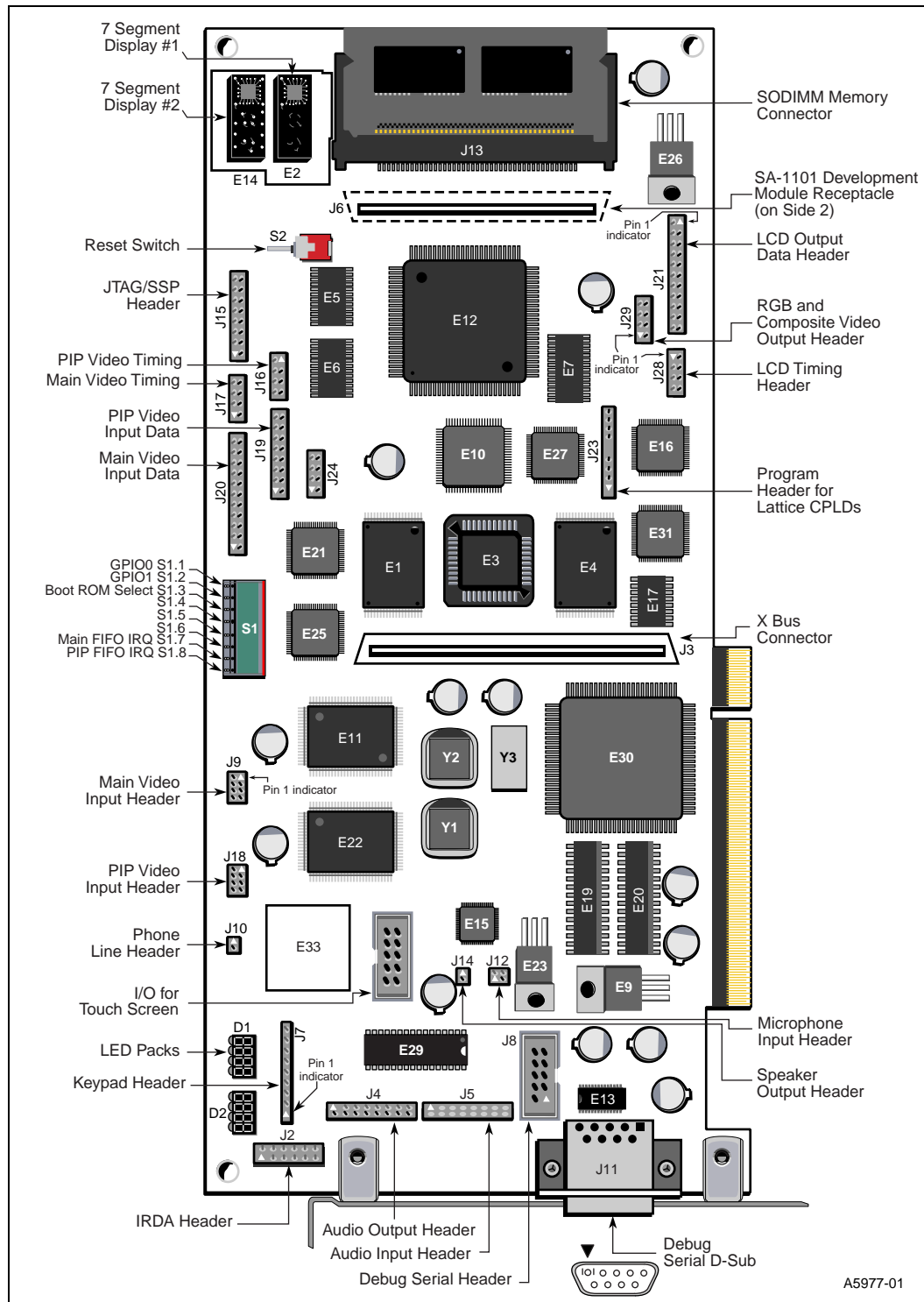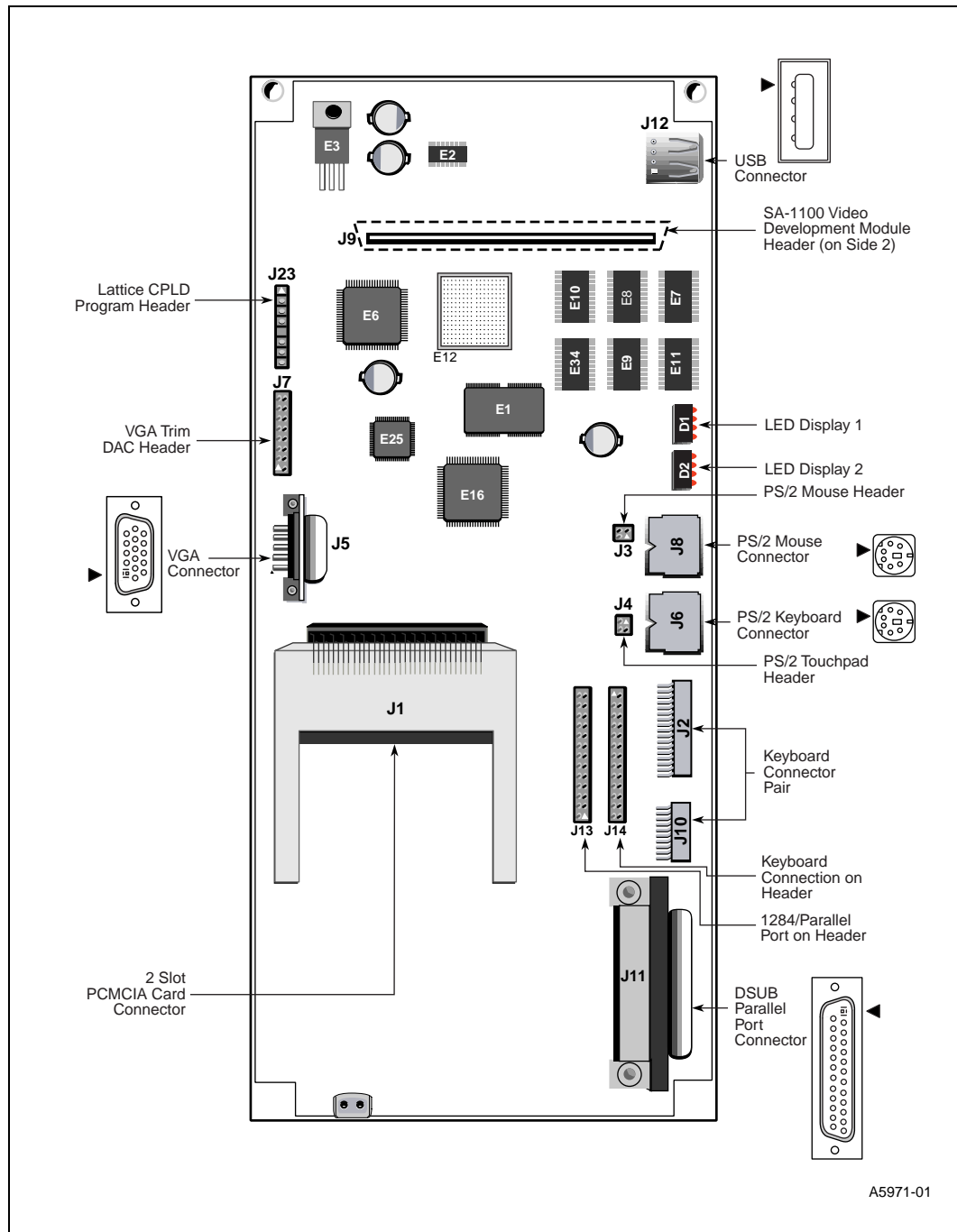
Figure 1. SA-1100 Multimedia Development Board

7 Segment Display #1
7 Segment Display #2
E14 E2
SODIMM Memory Connector
J13
E26
J6
SA-1101 Development Module Receptacle (on Side 2)
Pin 1 indicator
Reset Switch S2
JTAG/SSP Header J15
E5
E12
Pin 1 indicator
J21
LCD Output Data Header
E6
J29
RGB and Composite Video Output Header
PIP Video Timing J16
Main Video Timing J17
E7
Pin 1 indicator
J28
LCD Timing Header
PIP Video Input Data J19
Main Video Input Data J20
J24
E10 E27 J23 E16
E21 E31
GPIO0 S1.1
GPIO1 S1.2
Boot ROM Select S1.3
S1.4
S1.5
S1.6
Main FIFO IRQ S1.7
PIP FIFO IRQ S1.8
S1
E25
E1 E3 E4
E17
Program Header for Lattice CPLDs
X Bus Connector
J3
E11
Y2 Y3
E30
Main Video Input Header J9
Pin 1 indicator
Y1
PIP Video Input Header J18
E22
Phone Line Header J10
E33
E15
J14 J12 E23
I/O for Touch Screen
J8
Microphone Input Header
LED Packs D1
J7
E29
Speaker Output Header
Keypad Header
Pin 1 indicator
D2
E9
E13
J4 J5
J2
J11
IRDA Header

Audio Output Header
Audio Input Header
Debug Serial Header
Debug Serial D-Sub
A5977-01

Figure 2. Optional SA-1101 Development Board

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Support, Products, and Documentation

If you need general information or support, call **1-800-628-8686** or visit Intel's website at:

http://www.intel.com

Copies of documents that have an ordering number and are referenced in this document, a product catalog, or other Intel literature may be obtained by calling **1-800-548-4725** or by visiting Intel's website for developers at:

http://developer.intel.com