EVAL-MELODY-5 User Guide
UG-784

One Technology Way • P.O. Box 9106 • Norwood, MA 02062-9106, U.S.A. • Tel: 781.329.4700 • Fax: 781.461.3113 • www.analog.com

EVAL-MELODY-5 Evaluation Board

FEATURES

HDMI input and output with HDCP 1.4 technology support
Audio decoding using 1 or 2 ADSP-21489 devices
Differential line level analog audio output

HARDWARE NEEDED

Analog Devices, Inc., ICE-1000 or ICE-2000 USB to JTAG adapter (required for updating the firmware on Blackfin/SHARC)
1 to 2 DB25 to RCA cables, such as the CS-2436-06 from Infinite Cables
Straight through serial cable: DB9 (required for updating the ADSP-BF524 firmware)

SOFTWARE NEEDED

PC with a licensed copy of CrossCore Embedded Studio Rev. 1.1.0 for Windows® (required for updating the firmware on Blackfin/SHARC)
Xilinx® platform cable USB and associated software needed to program the Xilinx XC2C256 (CPLD)

GENERAL DESCRIPTION

The EVAL-MELODY-5 evaluation board is a platform that allows users to evaluate Analog Devices products intended for decoding high quality digital audio signals.

The EVAL-MELODY-5 evaluation board provides a Blackfin® ADSP-BF524 processor for system control and two SHARC® ADSP-21489KSWZ-4B processors for audio decoding. This evaluation board also includes High-bandwidth Digital Content Protection (HDCP) 1.4 technology. To order this evaluation board, the user must be licensed for the HDCP 1.4 technology.

Full specifications for the ADSP-21489 and the ADSP-BF524 are listed in the ADSP-21489 data sheet and the ADSP-BF524 data sheet available from Analog Devices and must be consulted in conjunction with this user guide when using the evaluation board.

EVAL-MELODY-5 EVALUATION BOARD PHOTOGRAPH

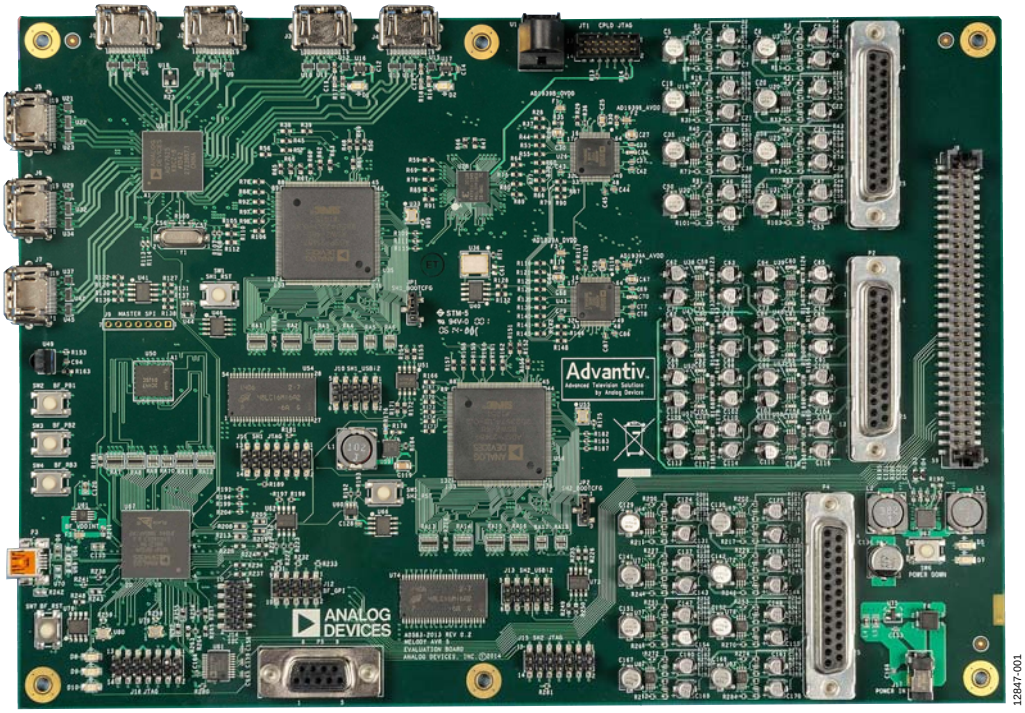

Figure 1.

TABLE OF CONTENTS

REVISION HISTORY

4/2017—Rev. 0 to Rev. A

Reorganized Layout ..... Universal
Changed Equipment/Software Needed Section to Hardware Needed Section and Software Needed Section 1
Changes to Features Section, Hardware Needed Section, Software Needed Section, and General Description Section 1
Changed EVAL-MELODY-5 Audio/Video Evaluation Board Photograph Section to EVAL-MELODY-5 Evaluation Board Photograph Section 1
Deleted Terminology Section 3
Changes to Evaluation Board Hardware Section 3
Changes to Figure 3 Caption 4
Changes to Table 1 5
Changes to Evaluation Board Software Section and Related Links Section 6

6/2015—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

A block diagram of the EVAL-MELODY-5 platform is shown in Figure 2. The ADV7625 provides the digital audio input and the AD1939 handles the digital audio output. The evaluation board hardware components are described in Table 1.

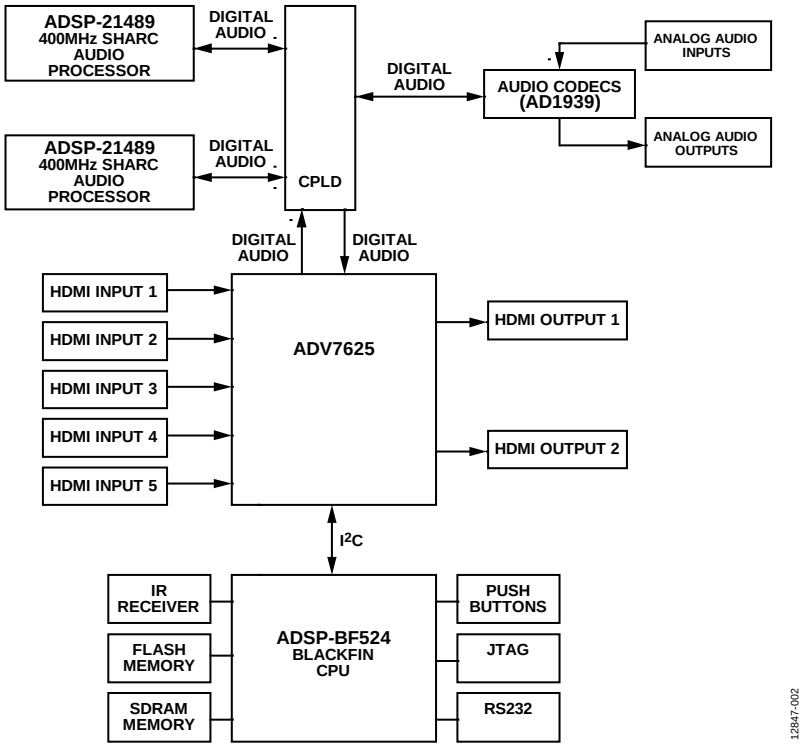

Figure 2. EVAL-MELODY-5 Block Diagram

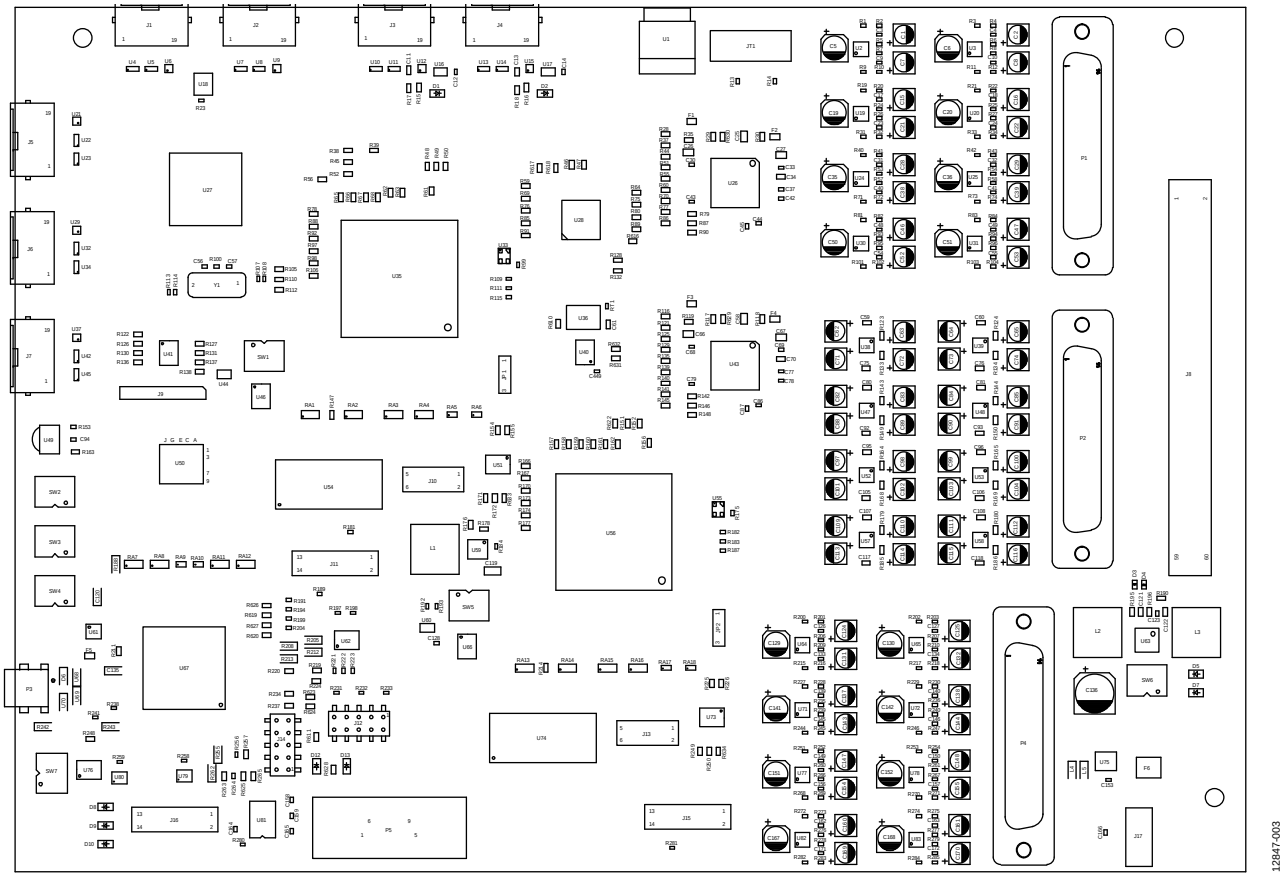

Figure 3. Assembly Drawing (Top Side) of the EVAL-MELODY-5 Printed Circuit Board (PCB)

Table 1. Evaluation Board Hardware Components

Reference Designator	Function	Description
J17	Power connector	The 5 V at 3.6 A power supply is connected at J17.
SW7	ADSP-BF524 reset	This push-button switch resets the ADSP-BF524 processor.
SW1	SHARC1 reset	This push-button switch resets the SHARC1 processor.
SW5	SHARC2 reset	This push-button switch resets the SHARC2 processor.
P5	RS-232 port	RS-232 interface for ADSP-BF524. A straight through serial cable must be connected between a PC and this port to update the firmware for the ADSP-BF524.
P3	ADSP-BF524 USB port	Unused.
J16	ADSP-BF524 JTAG	An ICE-1000 or ICE-2000 JTAG emulator can be connected here to restore the ADSP-BF524 universal bootloader (u-boot) or to step through the ADSP-BF524 source code.
J11	SHARC1 JTAG	An ICE-1000 or ICE-2000 JTAG emulator can be connected here to program the SHARC1 flash or to step through SHARC1 source code.
J15	SHARC2 JTAG	An ICE-1000 or ICE-2000 JTAG emulator can be connected here to program the SHARC2 flash or to step through SHARC2 source code.
J7	HDMI Input 1 (RXA)	HDMI connector for receiving audio and video over HDMI (from a Blu-ray player, for example).
J6	HDMI Input 2 (RXB)	Unused.
J5	HDMI Input 3 (RXC)	Unused.
J1	HDMI Input 4 (RXD)	Unused.
J2	HDMI Input 5 (RXE)	Unused.
J4	HDMI Output 1 (TXA)	HDMI connector for transmitting audio and video over HDMI (to a TV, for example).
J3	HDMI Output 2 (TXB)	Unused.
D10	ADSP-BF524 LED	Indicates status of ADSP-BF524 (flashes when firmware is running).
D12	SHARC1 LED	SHARC1 status LED (functionality depends on software).
D13	SHARC2 LED	SHARC2 status LED (functionality depends on software).
P4	Output 1 to Output 8	DB25 female connector containing differential line level analog audio outputs (P4 Channel 1 to Channel 8).
P1	Output 9 to Output 16	DB25 female connector containing differential line level analog audio outputs (P1 Channel 1 to Channel 8).
P2	Analog Audio Inputs	Unused.

EVALUATION BOARD SOFTWARE

The software on the EVAL-MELODY-5 evaluation board consists of firmware and a configuration code running on three or four devices (depending on whether the evaluation board is running in 1-SHARC mode or 2-SHARC mode):

- ADSP-BF524 application processor, U67
- ADSP-21489 (SHARC1) audio processor, U35
- ADSP-21489 (SHARC2) audio processor, U56
- Xilinx XC2C256 complex programmable logic device (CPLD), U28

For the evaluation board to work correctly, all three or four devices must be configured for the desired application (1-SHARC mode or 2-SHARC mode). The software for configuring this evaluation board and the full documentation package must be requested through the software request form (SRF) process on the Analog Devices website. For additional options, contact a local Analog Devices sales or distribution representative.

The software passes video from the RXA input to the TXA output, processes the extracted audio in either SHARC1 only (for 1-SHARC mode) or in SHARC1 and SHARC2 (for 2-SHARC mode), and the line level analog audio output is available on Connector P4 Channel 1 to Channel 8 and on Connector P1 Channel 1 to Channel 8. It is recommended to purchase the CS-2436-06 from Infinite Cables because its RCA cables are labeled with the channel number.

RELATED LINKS

Resource	Description
ADSP-21489	SHARC Processor, High Performance Fourth Generation DSP
ADSP-BF524	Blackfin Embedded Processor