

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

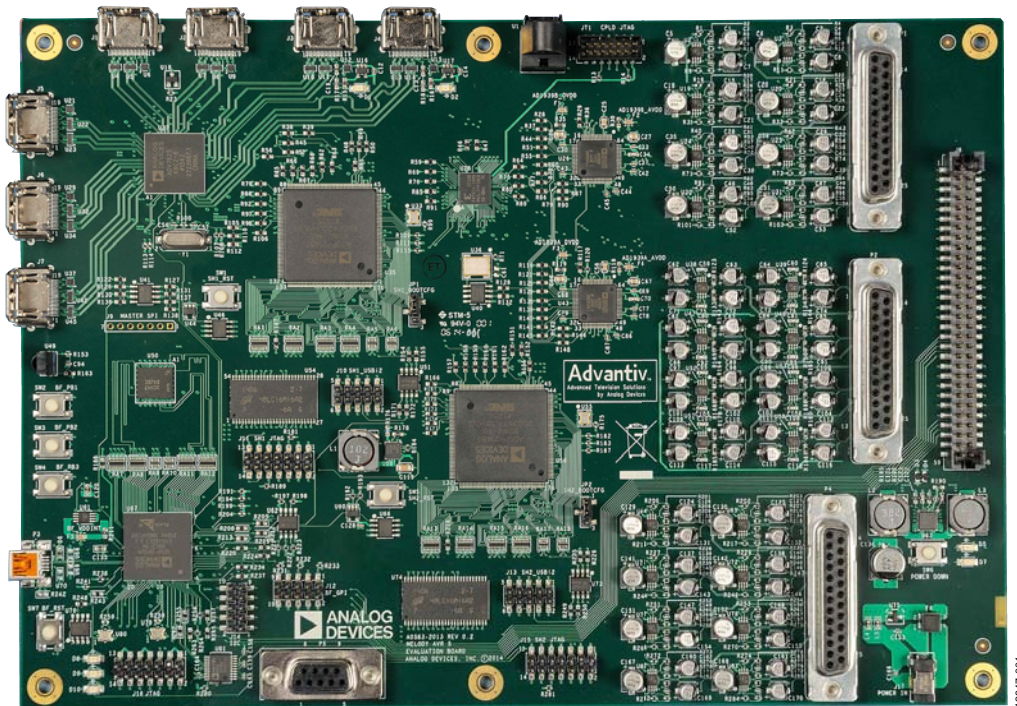


Figure 1.

TABLE OF CONTENTS

Features 1
 Hardware Needed 1
 Software Needed 1
 General Description 1
 EVAL-MELODY-5 Evaluation Board Photograph..... 1

Revision History2
 Evaluation Board Hardware.....3
 Evaluation Board Software6
 Related Links.....6

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 Section3
 Changes to Evaluation Board Hardware Section.....3
 Changes to Figure 3 Caption.....4
 Changes to Table 15
 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.

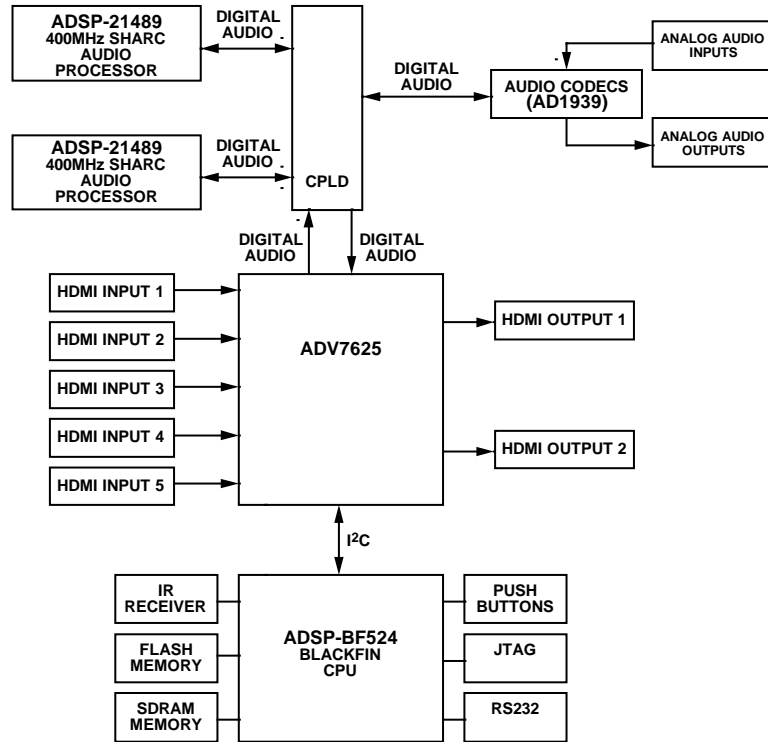


Figure 2. EVAL-MELODY-5 Block Diagram

12847-002

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



ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

Legal Terms and Conditions

By using the evaluation board discussed herein (together with any tools, components documentation or support materials, the "Evaluation Board"), you are agreeing to be bound by the terms and conditions set forth below ("Agreement") unless you have purchased the Evaluation Board, in which case the Analog Devices Standard Terms and Conditions of Sale shall govern. Do not use the Evaluation Board until you have read and agreed to the Agreement. Your use of the Evaluation Board shall signify your acceptance of the Agreement. This Agreement is made by and between you ("Customer") and Analog Devices, Inc. ("ADI"), with its principal place of business at One Technology Way, Norwood, MA 02062, USA. Subject to the terms and conditions of the Agreement, ADI hereby grants to Customer a free, limited, personal, temporary, non-exclusive, non-sublicensable, non-transferable license to use the Evaluation Board FOR EVALUATION PURPOSES ONLY. Customer understands and agrees that the Evaluation Board is provided for the sole and exclusive purpose referenced above, and agrees not to use the Evaluation Board for any other purpose. Furthermore, the license granted is expressly made subject to the following additional limitations: Customer shall not (i) rent, lease, display, sell, transfer, assign, sublicense, or distribute the Evaluation Board; and (ii) permit any Third Party to access the Evaluation Board. As used herein, the term "Third Party" includes any entity other than ADI, Customer, their employees, affiliates and in-house consultants. The Evaluation Board is NOT sold to Customer; all rights not expressly granted herein, including ownership of the Evaluation Board, are reserved by ADI. CONFIDENTIALITY. This Agreement and the Evaluation Board shall all be considered the confidential and proprietary information of ADI. Customer may not disclose or transfer any portion of the Evaluation Board to any other party for any reason. Upon discontinuation of use of the Evaluation Board or termination of this Agreement, Customer agrees to promptly return the Evaluation Board to ADI. ADDITIONAL RESTRICTIONS. Customer may not disassemble, decompile or reverse engineer chips on the Evaluation Board. Customer shall inform ADI of any occurred damages or any modifications or alterations it makes to the Evaluation Board, including but not limited to soldering or any other activity that affects the material content of the Evaluation Board. Modifications to the Evaluation Board must comply with applicable law, including but not limited to the RoHS Directive. TERMINATION. ADI may terminate this Agreement at any time upon giving written notice to Customer. Customer agrees to return to ADI the Evaluation Board at that time. LIMITATION OF LIABILITY. THE EVALUATION BOARD PROVIDED HEREUNDER IS PROVIDED "AS IS" AND ADI MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND WITH RESPECT TO IT. ADI SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, ENDORSEMENTS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, RELATED TO THE EVALUATION BOARD INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT WILL ADI AND ITS LICENSORS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES RESULTING FROM CUSTOMER'S POSSESSION OR USE OF THE EVALUATION BOARD, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DELAY COSTS, LABOR COSTS OR LOSS OF GOODWILL. ADI'S TOTAL LIABILITY FROM ANY AND ALL CAUSES SHALL BE LIMITED TO THE AMOUNT OF ONE HUNDRED US DOLLARS (\$100.00). EXPORT. Customer agrees that it will not directly or indirectly export the Evaluation Board to another country, and that it will comply with all applicable United States federal laws and regulations relating to exports. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Massachusetts (excluding conflict of law rules). Any legal action regarding this Agreement will be heard in the state or federal courts having jurisdiction in Suffolk County, Massachusetts, and Customer hereby submits to the personal jurisdiction and venue of such courts. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement and is expressly disclaimed.