High Fidelity 175W Class-D Audio Amplifier with Digital Inputs and Processing Reference Design

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(ACTIVE) TIDA-00874

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Key Document

- TIDA-00874 Test Results (PDF 196 KB)
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TIDA-00874 High Fidelity 175W Class-D Audio Amplifier with Digital Inputs and Processing Reference Design Top of Board Image

Fully assembled board (shown above) developed for testing and performance validation only, not available for sale.

Description

This design turns the extremely high performance analog input TPA3251D2 Class-D amplifier into a digital input system with audio processing using the highly versatile PCM5242 differential output DAC. Now the full performance of TPA3251D2 amplifier can be realized with a variety of digital input sources. The analog differential output and high SNR of the PCM5242 DAC is a perfect match to the fully differential analog input of the TPA3251D2 amplifier achieving outstanding noise performance and extremely low distortion. With the miniDSP on the PCM5242, audio processing and filtering can be added to further enhance audio performance in the end equipment.

Features

- High performance and audio fidelity from the TPA3251D2 with digital sources
- Accepts USB, Optical, SPDIF and I2S format digital inputs
- 175W @ 10% THD + N from digital sources
- Less than 0.004% THD + N 10W into 4ohms
- miniDSP processing flexibility with PCM5242 DAC
- Fully differential analog path for noise rejection

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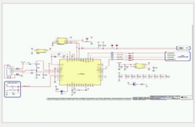
Schematic/Block Diagram

Quickly understand overall system functionality.



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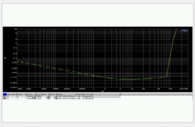
Design Guide

Get results faster with test and simulation data that's been verified.



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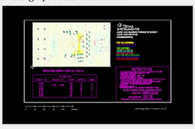
Design Files

Download ready-to-use system files to speed your design process. Get Viewer.



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Bill of Materials (BOM)

Find the complete list of components in this reference design.

Download BOM

TI Devices (7)

Order samples, get tools and find more information on the TI products in this reference design.

Part Number	Name	Product Family	Sample & Buy	Design Kits & Evaluation Modules
LM2940-N	1A Low Dropout Regulator	Linear Regulator (LDO)	Sample & Buy	Not Available
LM5010A	6-75V Wide Vin, 1A Constant On-Time Non-Synchronous Buck Regulator	Converter (Integrated Switch)	Sample & Buy	View Design Kits & Evaluation Modules
PCM5242	4.2-VRMS DirectPath™, 114-dB Audio Stereo Differential-Output DAC with 32-bit, 384-kHz PCM Interface	Audio Converters	Sample & Buy	View Design Kits & Evaluation Modules

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CAD/CAE symbols

Part #	Package | Pins	CAD File (.bxl)	STEP Model (.stp)
LM2940-N	TO-263 (KTT) | 3	Download	Download
	TO-220 (NDE) | 3	Download	-
	SOT (DCY) | 4	Download	Download
	WSON (NGN) | 8	Download	Download
LM5010A	WSON (DPR) | 10	Download	Download
	HTSSOP (PWP) | 14	Download	Download
SRC4392	TQFP (PFB) | 48	Download	Download
TPA3251D2	HTSSOP (DDV) | 44	Download	-
TPS736	SOT (DBV) | 5	Download	Download
	SOT (DCQ) | 6	Download	-
	VSON (DRB) | 8	Download	-

Texas Instruments and Accelerated Designs Inc. have collaborated together to provide TI customers with schematic symbols and PCB layout footprints for TI products.

Step 1: Download and install the Ultra Librarian software ZIP: 62MB

Step 2: Download the Symbol and Footprint .bxl file.

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Technical Documents

User guides (1)

Title	Abstract	Type	Size (KB)	Date	Views	TI Recommends
TIDA-00874 Test Results		PDF	196	18 Dec 2015	201	✓

Design files (6)

Title	Abstract	Type	Size (KB)	Date	Views
TIDA-00874 Gerber		ZIP	1764	18 Dec 2015	51
TIDA-00874 CAD Files		ZIP	2132	18 Dec 2015	76
TIDA-00874 PCB		PDF	867	18 Dec 2015	88
TIDA-00874 Assembly Drawing		PDF	595	18 Dec 2015	63
TIDA-00874 BOM		PDF	317	18 Dec 2015	68
TIDA-00874 Schematic		PDF	1223	18 Dec 2015	251

Applications

- Audio Dock: Performance

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