



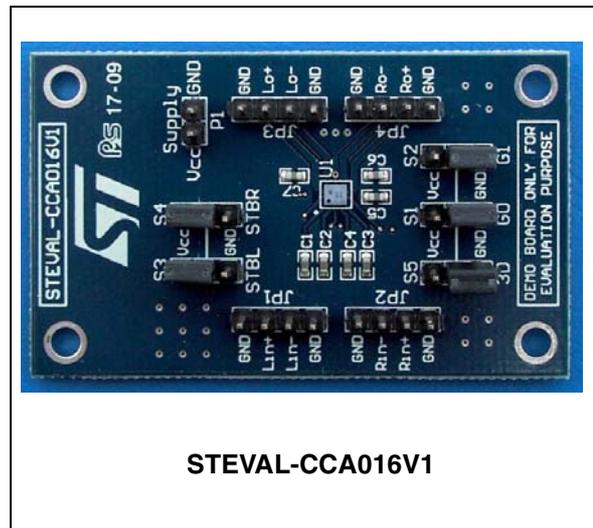
STEVAL-CCA016V1

Filter-free stereo 2.8 W Class-D audio power amplifier demo board with selectable 3D sound effects based on the TS4999

Data brief

Features

- Operating range from $V_{CC} = 2.4\text{ V}$ to 5.5 V
- Dedicated standby mode active low for each channel
- Output power per channel: 2.8 W at 5 V into $4\ \Omega$ with 10% THD+N
- Output power per channel: 0.7 W at 3.6 V into $8\ \Omega$ with 1% THD+N max.
- Selectable 3D sound effect
- Four gain setting steps: 3.5, 6, 9.5 and 12 dB.
- Low current consumption
- PSRR: 63 dB typ @ 217 Hz.
- Fast start-up phase: 7.8 ms
- Output short-circuit and thermal shutdown protection
- RoHS compliant



Description

This demonstration board is designed to evaluate the performances of TS4999, that is a stereo fully differential Class-D power amplifier.

It can drive up to 1.35 W into a $8\ \Omega$ load at 5 V per channel. The device has four different gain settings utilizing two discrete pins, G0 and G1.

Pop and click reduction circuitry provides low on/off switch noise while allowing the device to start within 8 ms.

3D enhancement effects are selected through one digital input pin that allows more amazing stereo audio sound.

Two standby pins (active low) allow each channel to be switched off separately.

The TS4999 is available in a 18 bumps Flip-Chip package.

1 Circuit schematic and BOM list

Figure 1. Schematic diagram

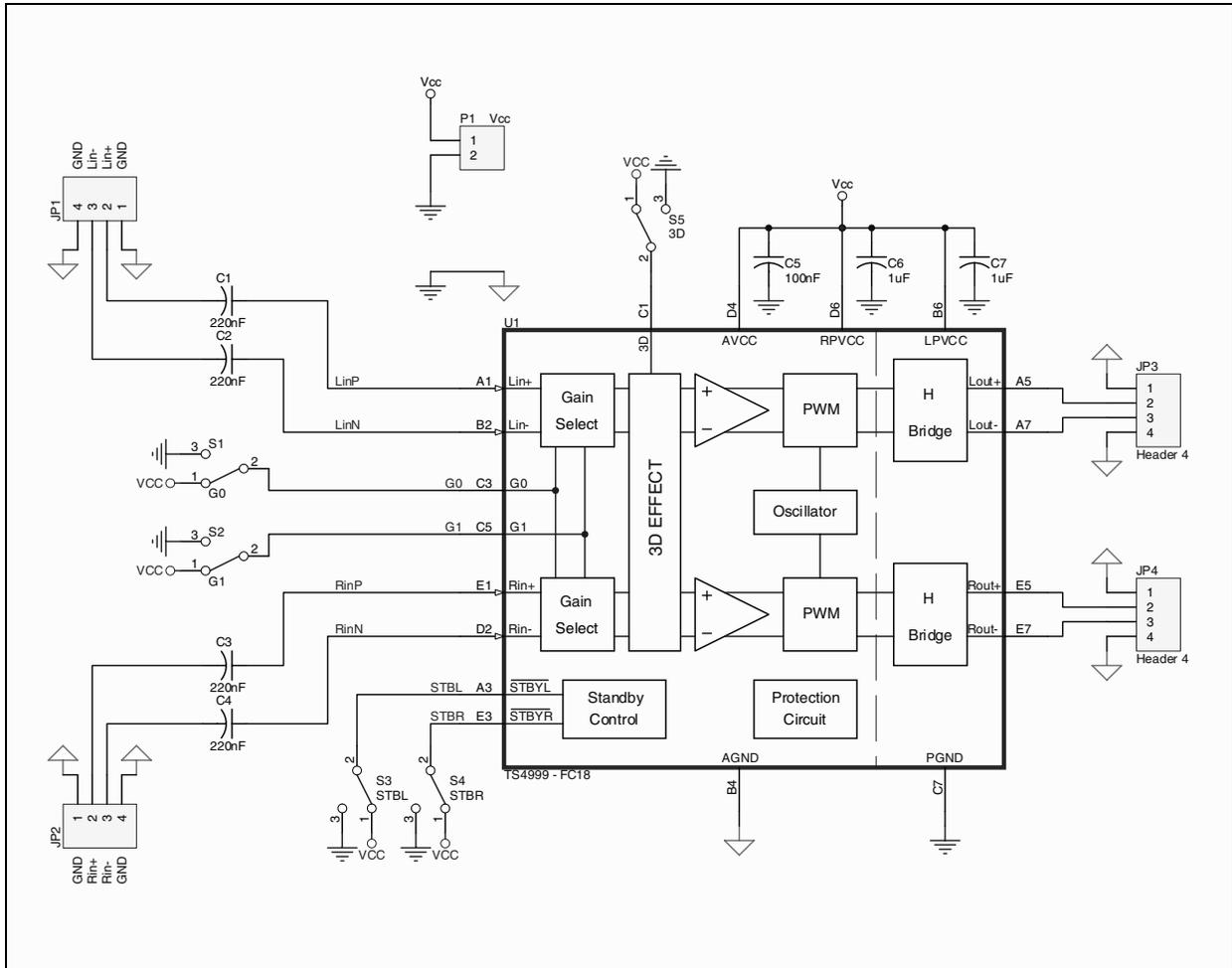


Table 1. Components list for the demonstration board

Designation	Quantity	Description
C1, C2, C3, C4	4	220 nF/16 V, SMD ceramic capacitor, 0603
C5	1	100 nF/16 V, SMD ceramic capacitor, 0603
C6, C7	1	1 μF/16 V, SMD ceramic capacitor, 0603
P1	1	2-pin header 2.54 mm pitch
S1, S2, S3, S4, S5	5	3-pin header 2.54 mm pitch
JP1, JP2, JP3, JP4	4	4-pin header 2.54 mm pitch
U1	1	TS4999 class-D audio amplifier

2 Demonstration board layouts

The following figures depict the top view and layers of the demonstration board.

Figure 2. PCB top layer

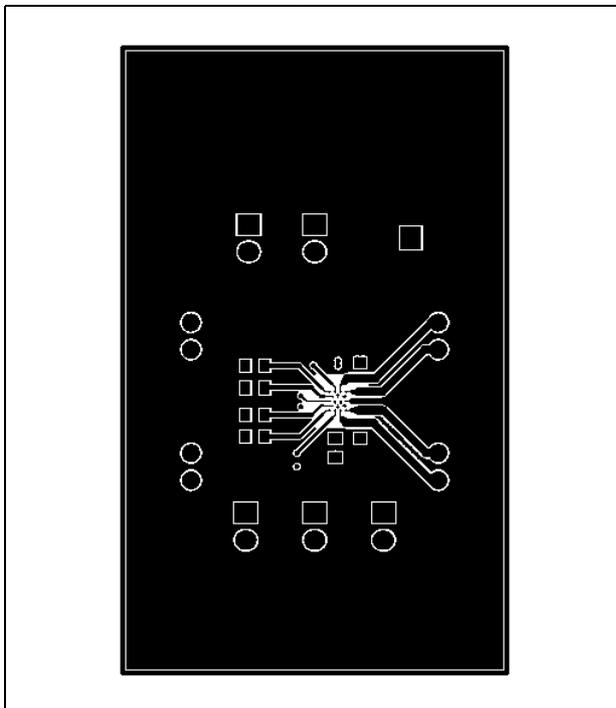


Figure 3. PCB middle layer 1

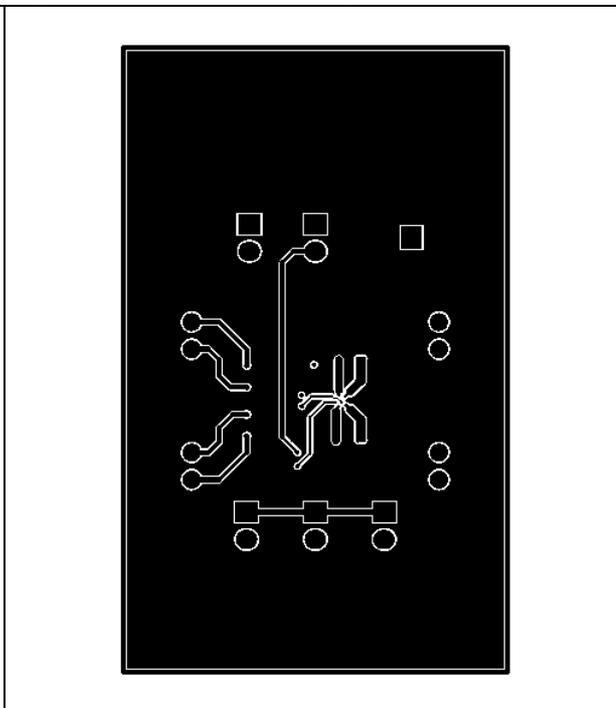


Figure 4. PCB middle layer 2

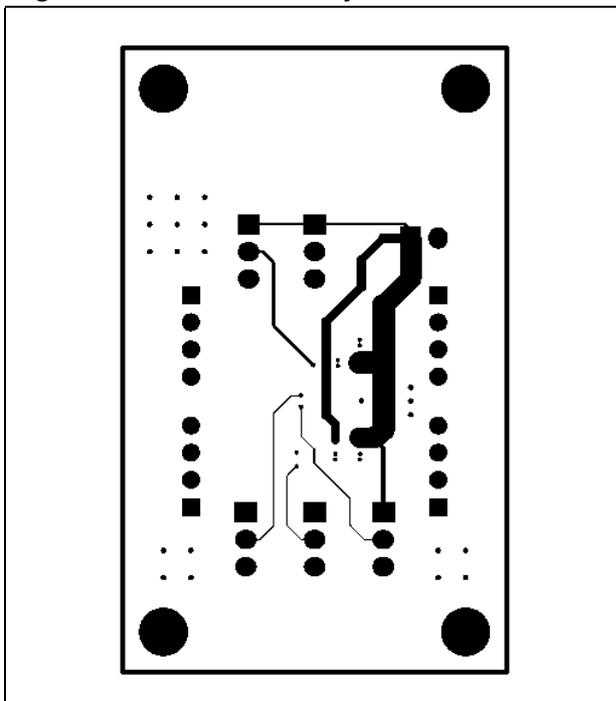
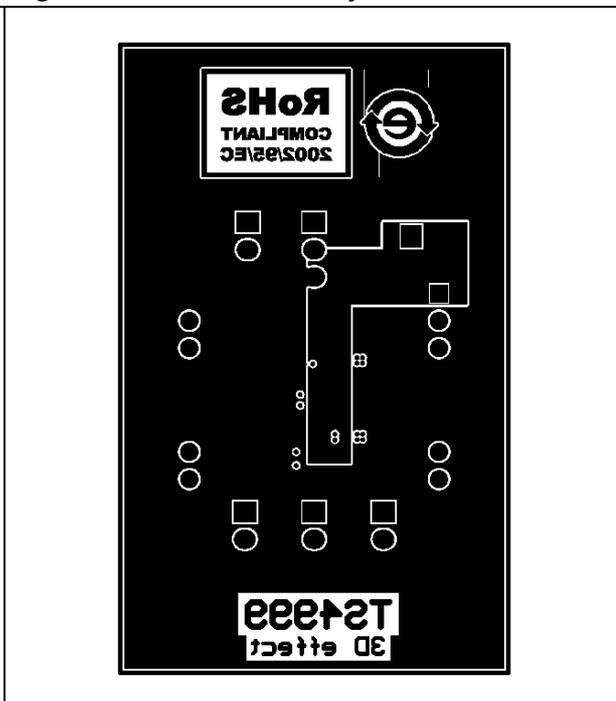


Figure 5. PCB bottom layer



3 Revision history

Table 2. Document revision history

Date	Revision	Changes
11-Jun-2009	1	Initial release.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2009 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Audio IC Development Tools](#) category:

Click to view products by [STMicroelectronics](#) manufacturer:

Other Similar products are found below :

[1580/5171-DEMO](#) [LM4906MMBD](#) [LM4935RLEVAL](#) [LME49710NABD](#) [LME49740MABD](#) [LME49740NABD](#) [LME49860MABD](#)
[LME49870MABD](#) [EVAL-AD1940AZ](#) [EVAL-ADAU1401AEBZ](#) [SRC4382EVM-PDK](#) [TLV320AIC36EVM-K](#) [TPA5052EVM](#)
[TPA6136A2YFFEVM](#) [LM4562HABD](#) [LM4906LDBD](#) [LM4923LQBD](#) [LM4992SDBD](#) [LME49710MABD](#) [LME49713MABD](#)
[LME49860NABD](#) [MAX98300EVKIT+WLP](#) [MAX9738EVKIT+](#) [MAX98358EVSYS#WLP](#) [MAX9723DEVKIT+](#) [EVAL-ADAV803EBZ](#)
[MAX9890EVKIT+](#) [LM4809MBD](#) [LM4674TLBD](#) [CDBWM8725-M-1](#) [CDBWM8533-M-1](#) [EV_IC3-40740-FX](#) [SDCK3](#) [PIM524](#)
[MAX9723DEVCMODU+](#) [DEV-17737](#) [EVALAHNBIM69D130V01TOBO1](#) [1063](#) [TAS5756MDCAEVM](#) [TLV320ADC3101EVM-K](#)
[TLV320AIC3007EVM-K](#) [TLV320AIC3105EVM-K](#) [TLV320AIC3253EVM-K](#) [TPA2016D2EVM](#) [TPA2035D1EVM](#) [TPA2051D3YFFEVM](#)
[TPA3107D2EVM](#) [TPA6120A2EVM](#) [TPA6132A2EVM2](#) [MIKROE-2454](#)