



# LA4801V

## Headphone Stereo Power Amplifier

### Overview

The LA4801V is a headphone stereo power amplifier for portable CD and MD players. It features a high signal-to-noise ratio, a high ripple rejection ratio, low distortion, and low current drain.

### Functions

- Headphone stereo power amplifier
- Power switch
- Muting switch
- Center amplifier switch

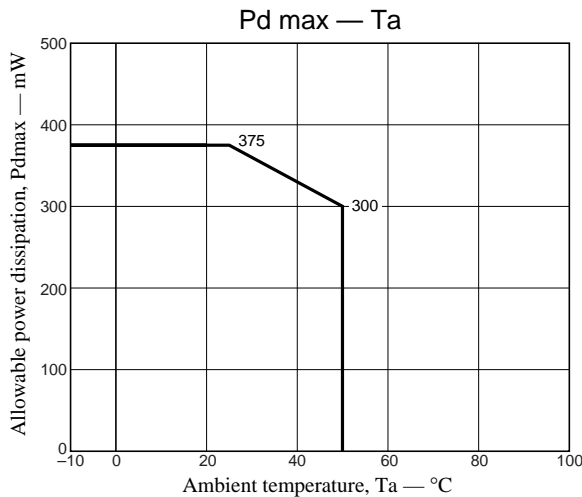
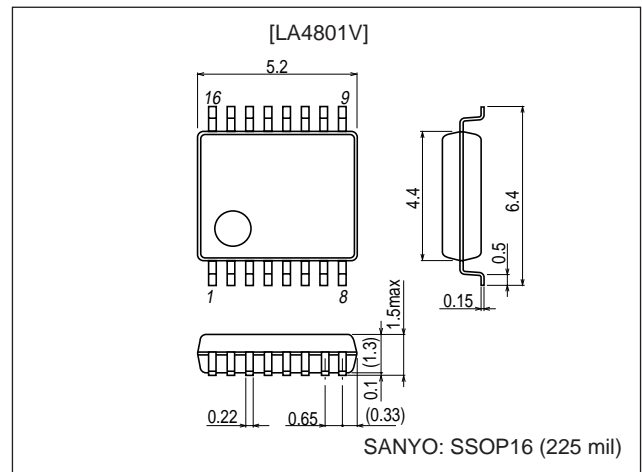
### Features

- High signal-to-noise ratio (96 dB typical at 7  $\mu$ V)
- High ripple rejection ratio (76 dB typical)
- Low current drain (4.8 mA typical)
- Low power consumption achieved through the use of a dual power supply system.
- No electrolytic capacitors required for the outputs.
- Ultraminiature package (SSOP-16)

### Package Dimensions

unit: mm

3178A-SSOP16



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### Specifications

#### Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\text{ max}}$		4.5	V
Allowable power dissipation	$P_{d\text{ max}}$		375	mW
Operating temperature	$T_{opr}$		-15 to +50	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-40 to +150	$^\circ\text{C}$

#### Operating Conditions at $T_a = 25^\circ\text{C}$

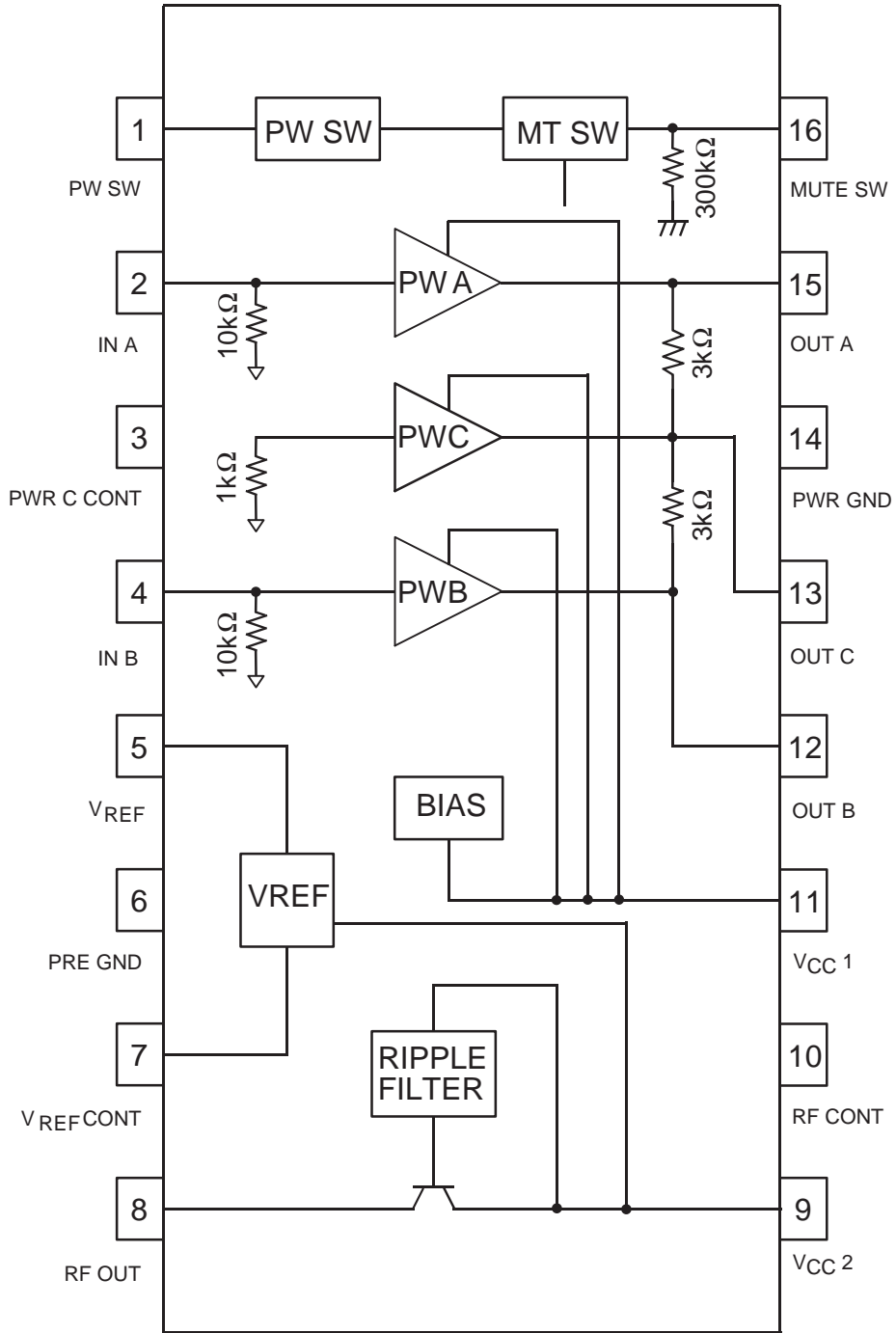
Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_{CC1}$		1.5	V
	$V_{CC2}$		2.5	V
Operating supply voltage range	$V_{CC1\text{ op}}$		0.9 to 4.5	V
	$V_{CC2\text{ op}}$	*	1.5 to 3.5	V
Recommended load resistance	$R_L$		16 to 32	$\Omega$

Note: \* However, when  $V_{CC2}$  is under 2.5 V, with a 1.5 V minimum,  $V_{CC1}$  must be less than or equal to  $V_{CC2}$ .

#### Electrical Characteristics at $T_a = 25^\circ\text{C}$ , $V_{CC1} = 1.5\text{ V}$ , $V_{CC2} = 2.5\text{ V}$ , $f_{IN} = 1\text{ kHz}$ , $R_L = 16\ \Omega$

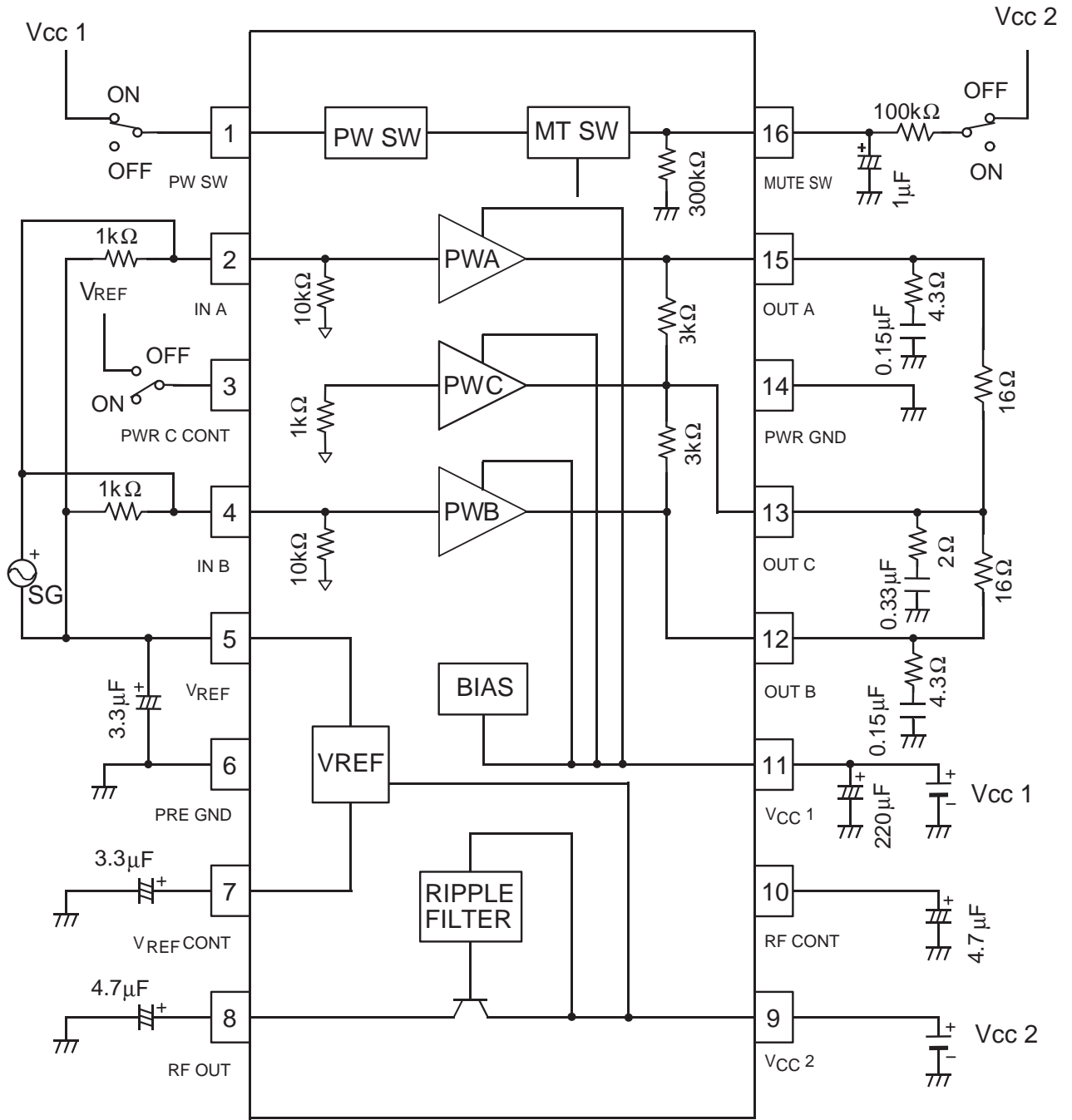
Item	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	$I_{CCO1}$	IC off: with pin 1 open.		0.05	1.0	$\mu\text{A}$
	$I_{CCO2}$	Mute on		1.3	3.0	mA
	$I_{CCO3}$	Center amplifier off: with pin 3 at $V_{ref}$		3.3	8.0	mA
	$I_{CCO4}$	No input		4.8	9.0	mA
Voltage gain	VG	$V_O = -10\text{ dBm}$	10.3	11.8	13.3	dB
Channel balance	$\Delta VG$	$V_O = -10\text{ dBm}$	-1	0	1	dB
Output power	$P_O$	THD = 10%	6	13		mW
Total harmonic distortion	THD	$P_O = 0.5\text{ mW}$		0.2	1.0	%
Output noise voltage	$V_{NO}$	$R_g = 1\text{ k}\Omega$ , DIN AUDIO		7.8	15	$\mu\text{V}$
Crosstalk	CT	$T_{UN}1\text{ kHz}$ , $V_O = -10\text{ dBm}$	35	45		dB
Ripple rejection ratio	SVRR	$V_{CC} = 1.0\text{ V}$ , $f_r = 100\text{ kHz}$ , $V_r = -20\text{ dBm}$ , $T_{UN}100\text{ Hz}$	60	70		dB
Muting attenuation	$V_{OFF}$	THD = 1%, $T_{UN}1\text{ kHz}$	-80	-96		dB
Output DC offset	$V_{DC\text{ OFF}}$	$V_1 = 0\text{ V}$ , $R_g = 1\text{ k}\Omega$	-20		+20	mV
Power on current sensitivity	I1 ON	$V_{CC1} = 0.9\text{ V}$ , $V_{CC2} = 1.5\text{ V}$ , $V_5 \geq 0.7\text{ V}$		20	40	$\mu\text{V}$
Power off voltage sensitivity	V1 OFF	$V_{CC1} = 0.9\text{ V}$ , $V_{CC2} = 1.5\text{ V}$ , $V_5 \leq 0.1\text{ V}$	0.5	0.6		V
Mute off current sensitivity	I16 OFF	$V_{CC1} = 0.9\text{ V}$ , $V_{CC2} = 1.5\text{ V}$ , $V_5 \geq 0.7\text{ V}$		4.0	6.0	$\mu\text{V}$
Mute on voltage sensitivity	V16 ON	$V_{CC1} = 0.9\text{ V}$ , $V_{CC2} = 1.5\text{ V}$ , $V_5 \geq 0.7\text{ V}$		0.9	1.0	V

Pin Assignment and Block Diagram



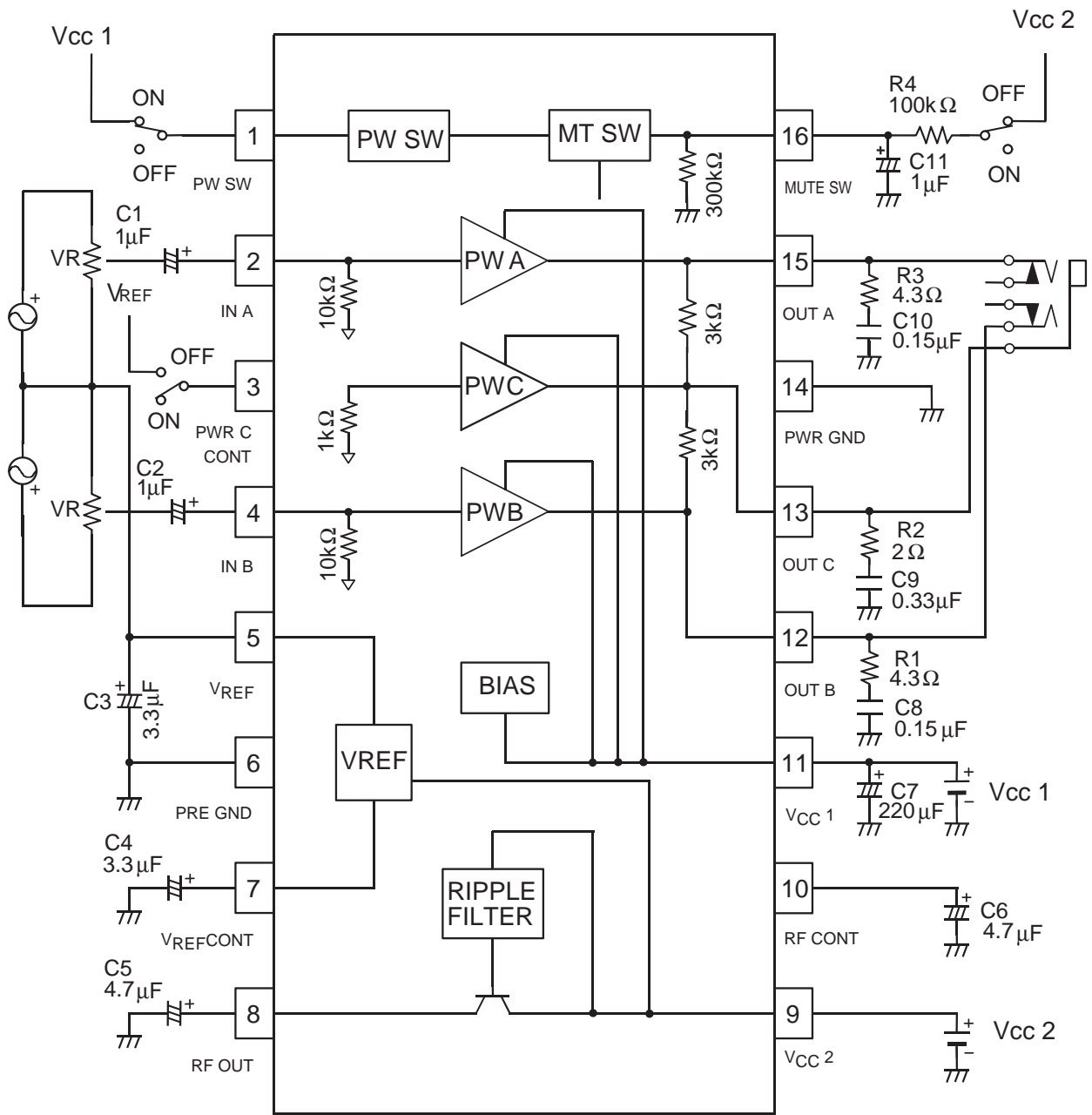
Top view

Test Circuit



Top view

Sample Application Circuit



Top view

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## Pin Descriptions

The pin voltage applies when  $V_{CC} = 1.5\text{ V}$  and  $V_{CC2} = 2.5\text{ V}$ .

Pin No.	Pin name	Pin voltage (V)	Pin description	Equivalent circuit
1	POWER SW		<ul style="list-style-type: none"> <li>IC on/off switch</li> </ul>	
2 4	POWER IN	0.82	<ul style="list-style-type: none"> <li>Power input</li> </ul>	
3	POWER C CONT		<ul style="list-style-type: none"> <li>Center amplifier on/off switch</li> <li>The center amplifier is on when this input is floating or at the ground level.</li> </ul>	
5	$V_{REF}$ OUT	0.82	<ul style="list-style-type: none"> <li><math>V_{REF}</math> amplifier output</li> </ul>	
6	PRE GND			
7	$V_{REF}$ CONT	0.82	<ul style="list-style-type: none"> <li><math>V_{REF}</math> amplifier reference</li> </ul>	

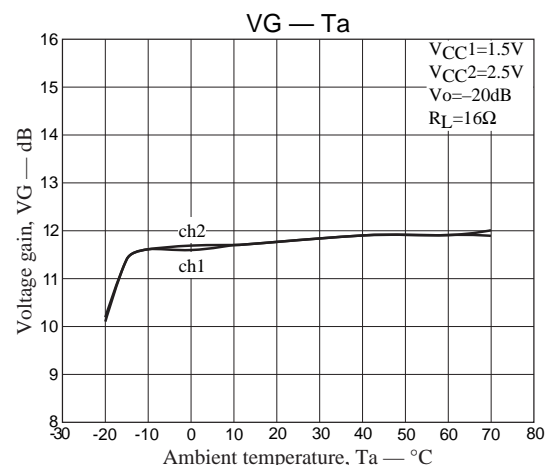
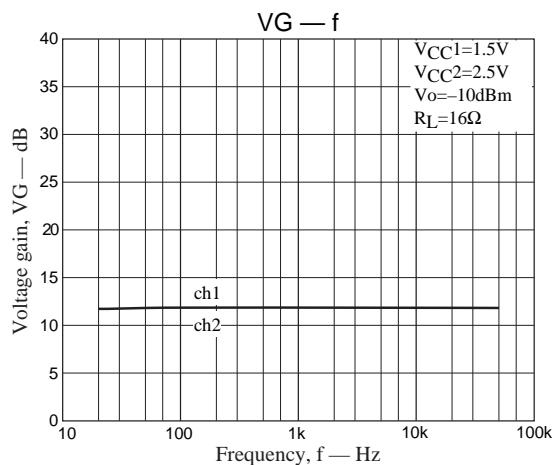
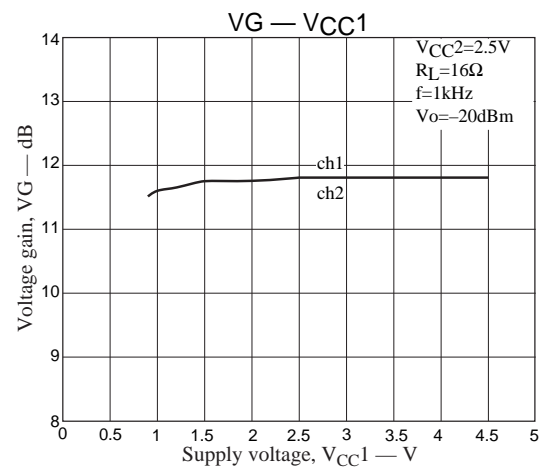
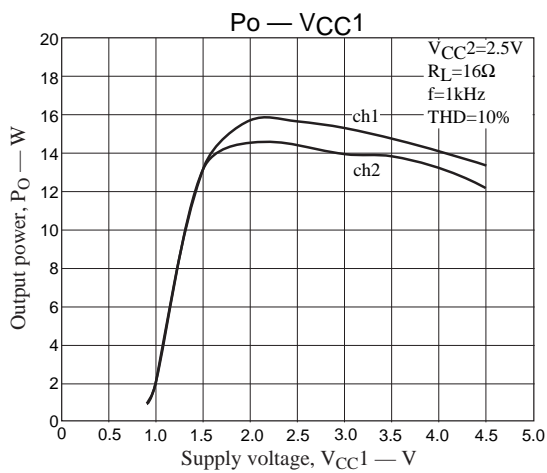
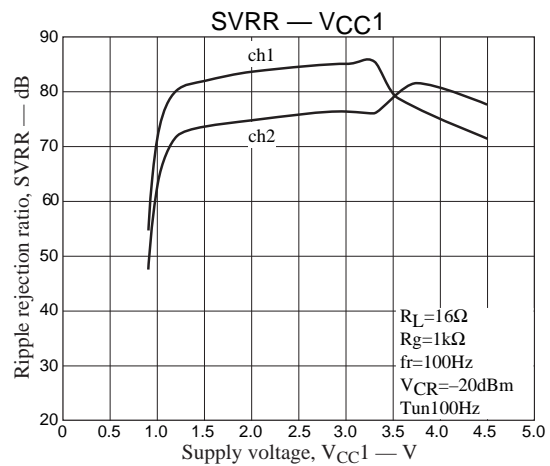
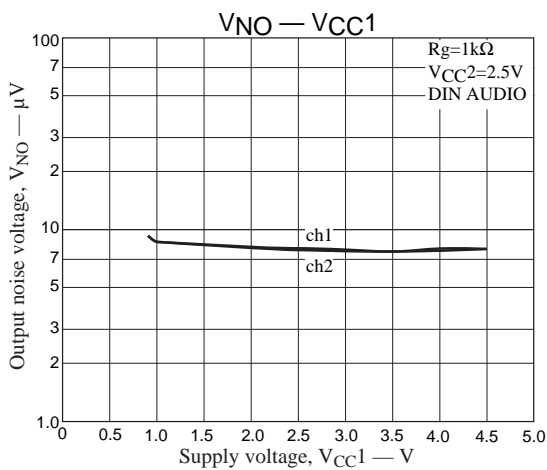
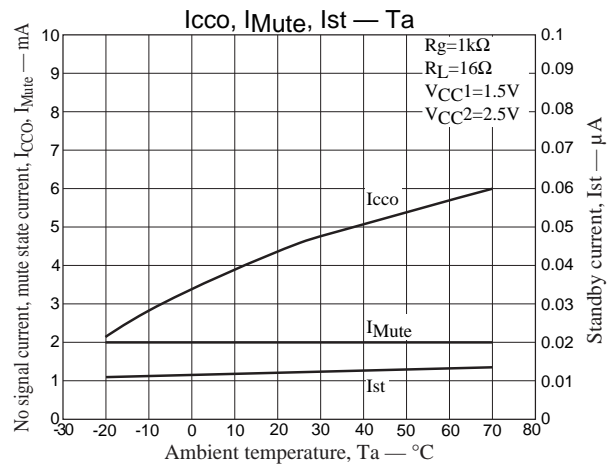
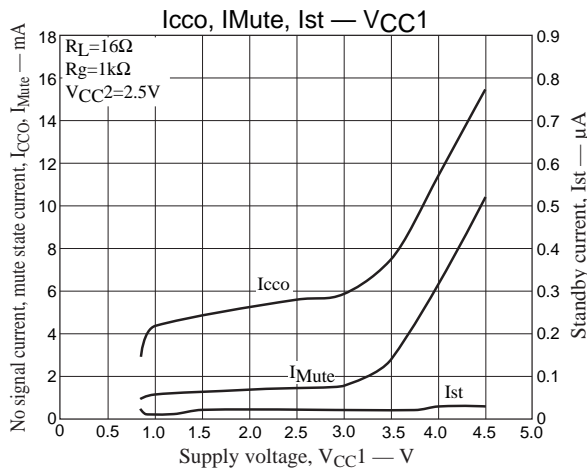
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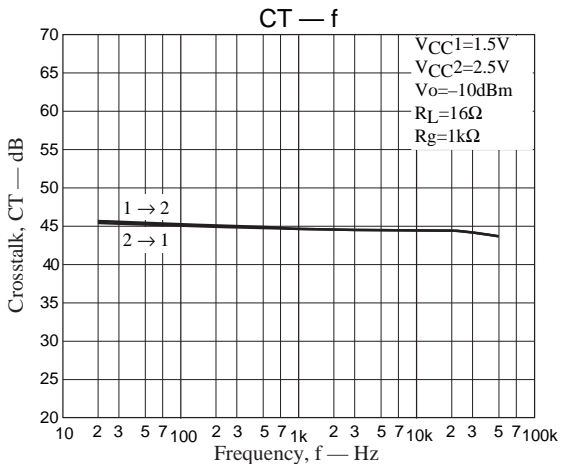
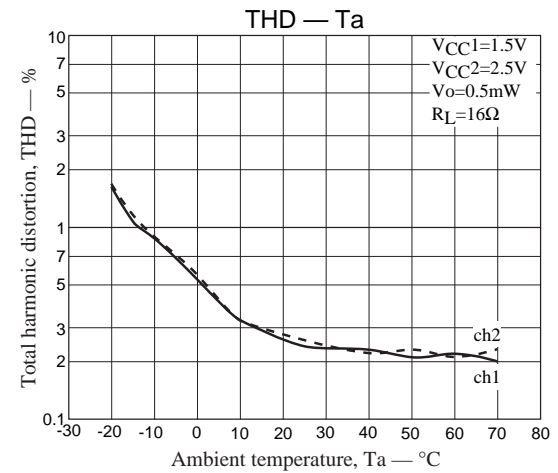
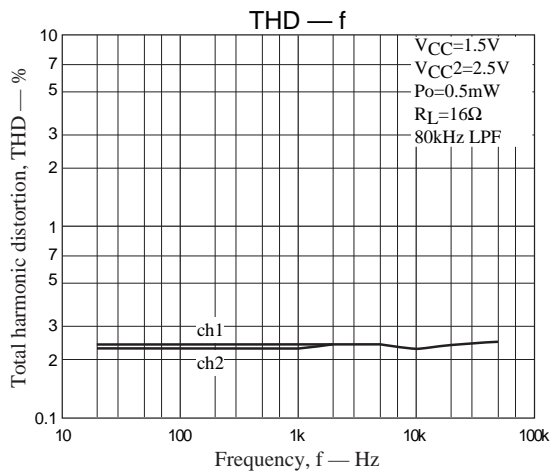
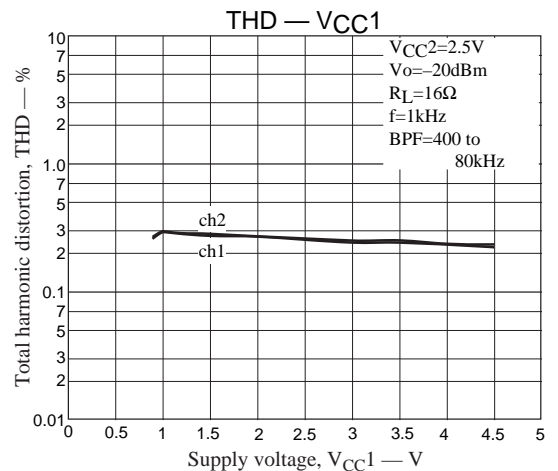
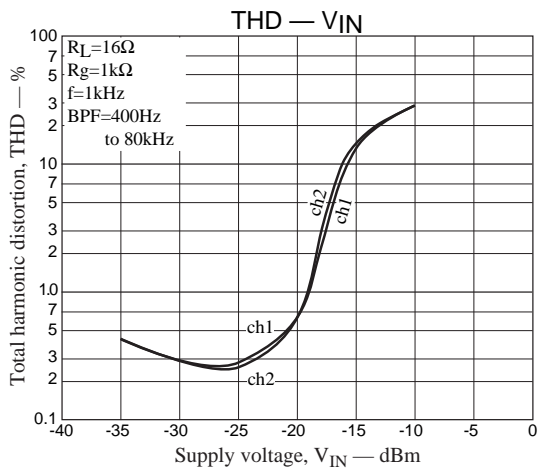
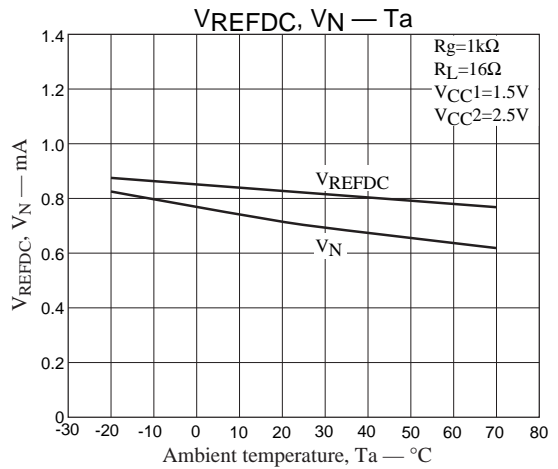
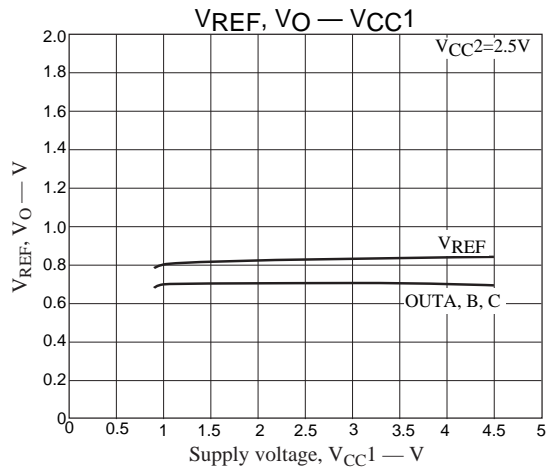
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Pin No.	Pin name	Pin voltage (V)	Pin description	Equivalent circuit
8	RF OUT	2.17	<ul style="list-style-type: none"> <li>Ripple filter output</li> </ul>	
9	V <sub>CC2</sub>			
10	RF CONT	2.19	<ul style="list-style-type: none"> <li>Ripple filter reference</li> </ul>	
11	V <sub>CC1</sub>			
12 13 15	OUT B OUT C OUT A	0.69	<ul style="list-style-type: none"> <li>OUT A and OUT B are the power amplifier outputs.</li> <li>Pin 13 (OUT C) is the center amplifier output. This pin is a virtual ground when driving headphones.</li> </ul>	
14	PWR GND			
16	MUTE SW		<ul style="list-style-type: none"> <li>Mute on/off switch</li> <li>The mute function is on when this pin is at the ground level.</li> </ul>	

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