

Ordering number : ENN6146

Monolithic Linear IC



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

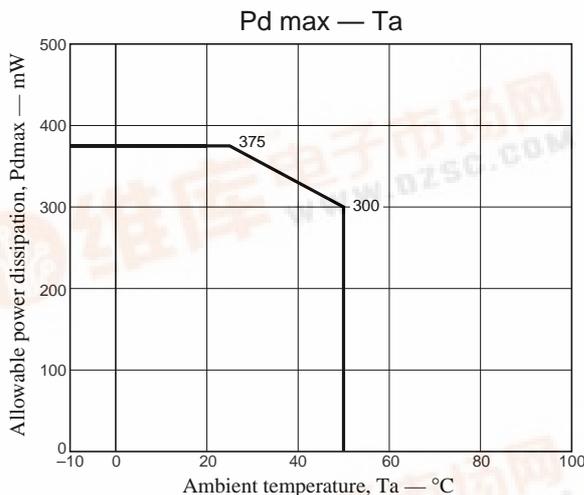
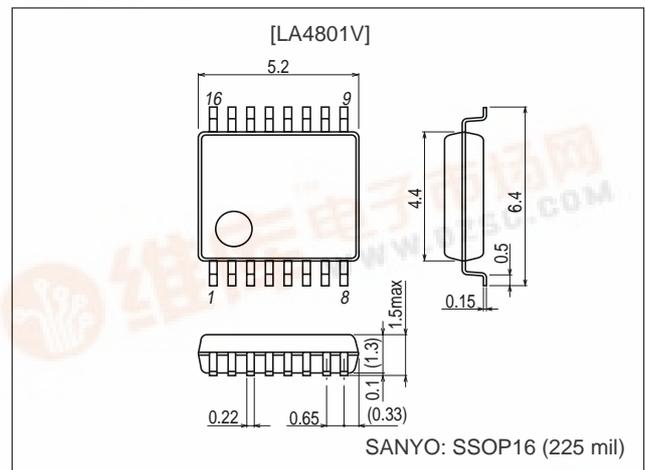
Features

- High signal-to-noise ratio (96 dB typical at 7 μ 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	Ω

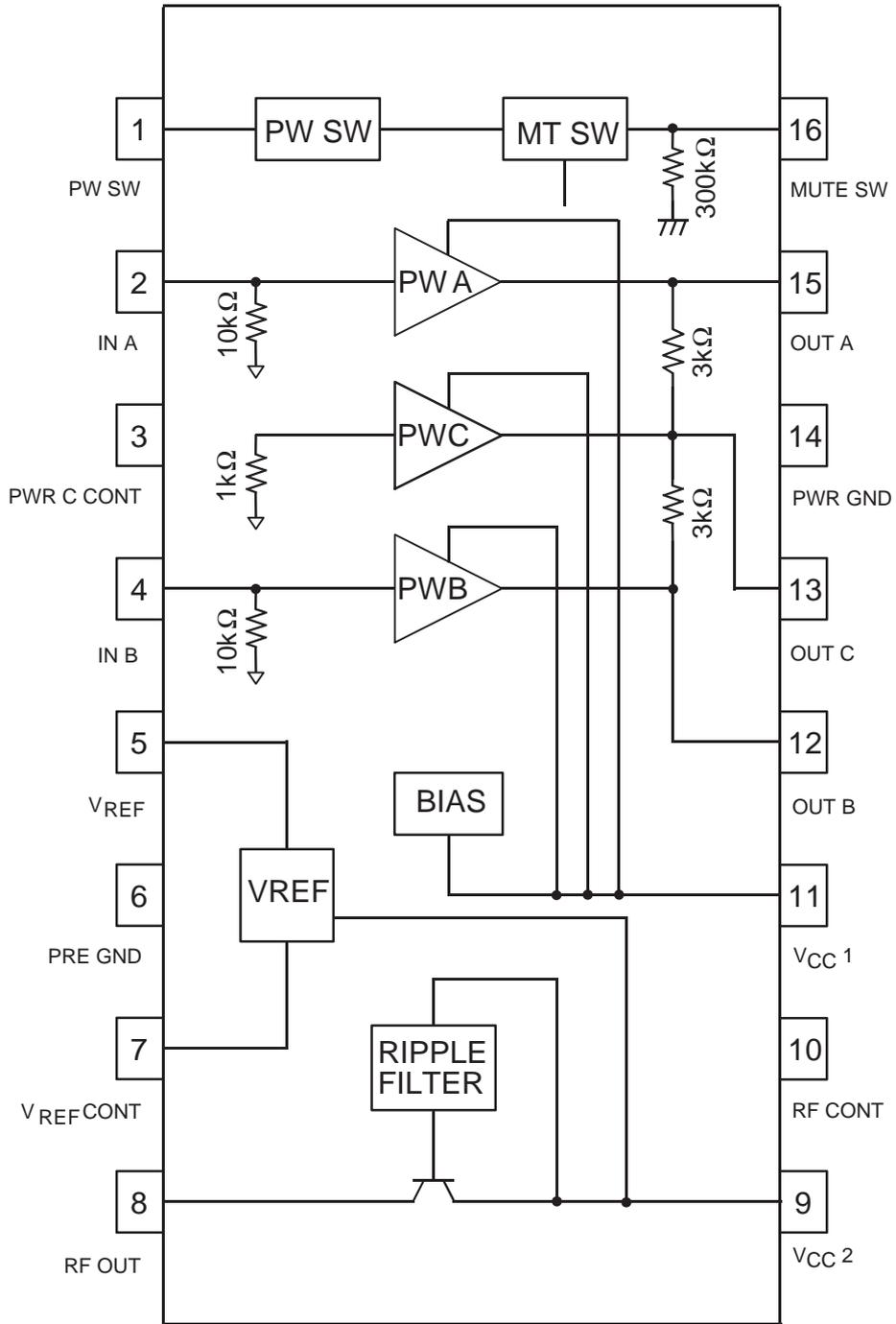
Note: * However, when V_{CC2} is under 2.5 V, with a 1.5 V minimum, V_{CC1} must be less than or equal to V_{CC2} .

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	μA
	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	ΔVG	$V_O = -10\text{ dBm}$	-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	μV
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	μV
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	μV
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

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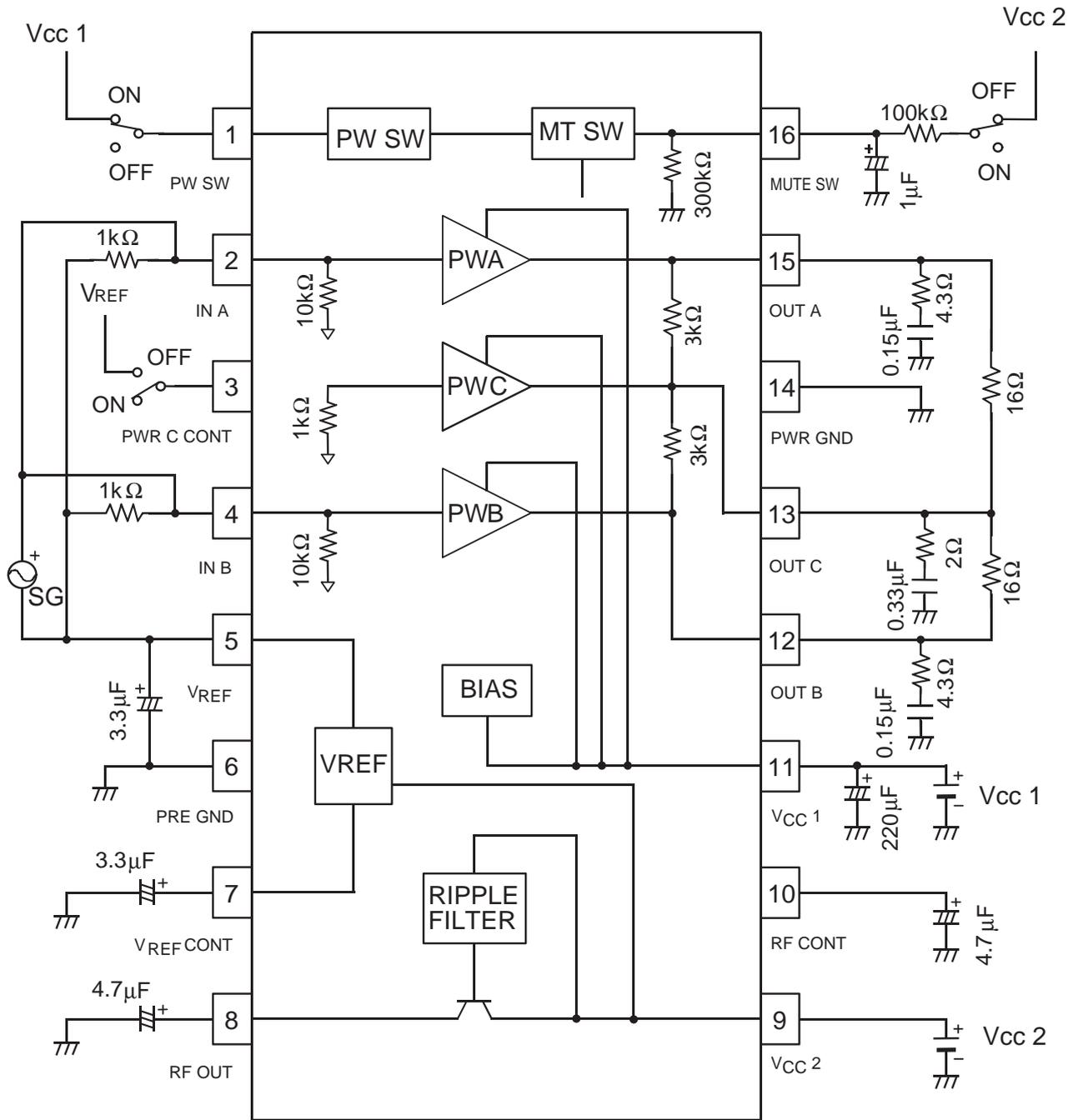
Pin Assignment and Block Diagram



Top view

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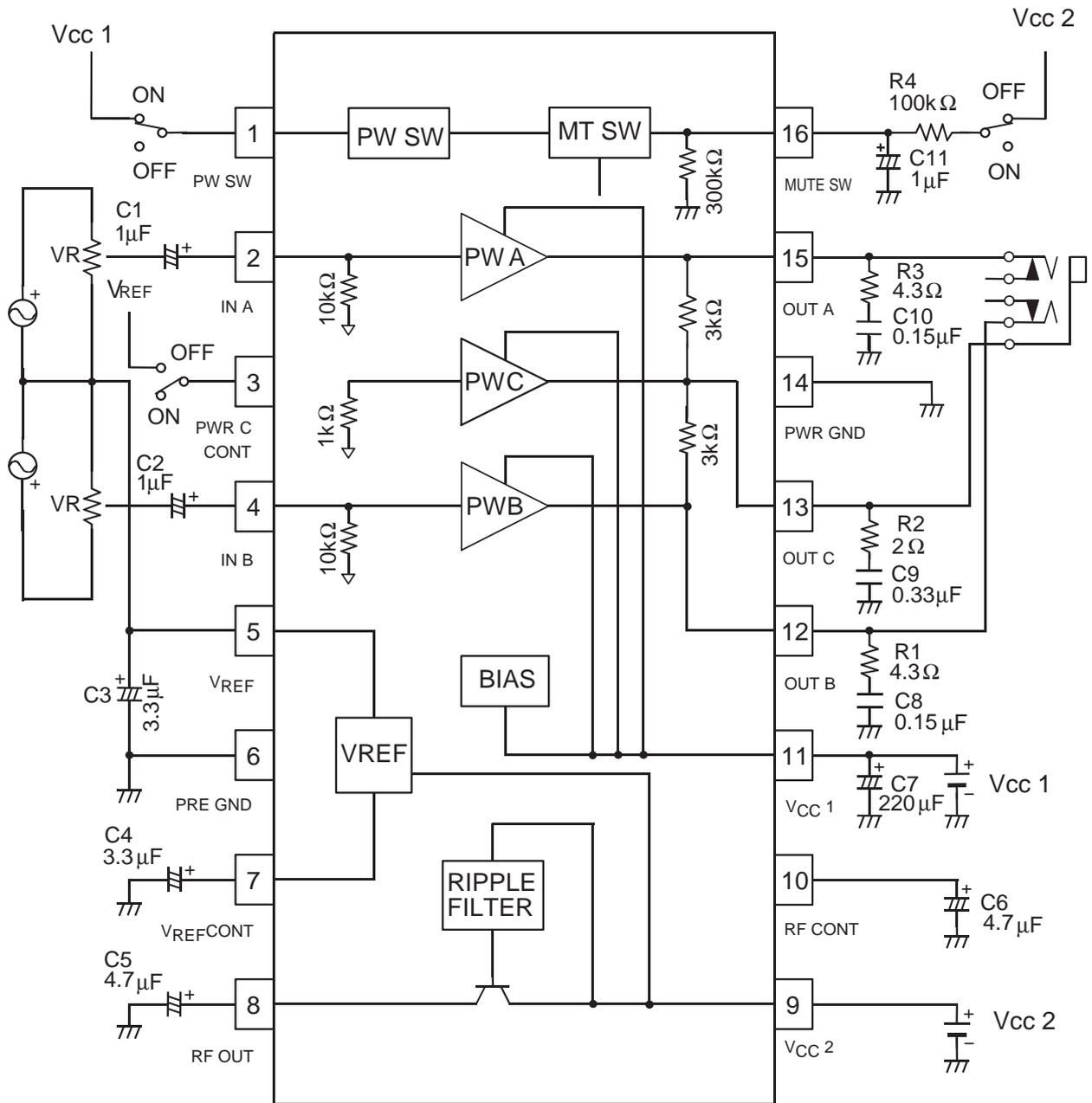
Test Circuit



Top view

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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"> IC on/off switch 	
2 4	POWER IN	0.82	<ul style="list-style-type: none"> Power input 	
3	POWER C CONT		<ul style="list-style-type: none"> Center amplifier on/off switch The center amplifier is on when this input is floating or at the ground level. 	
5	V_{REF} OUT	0.82	<ul style="list-style-type: none"> V_{REF} amplifier output 	
6	PRE GND			
7	V_{REF} CONT	0.82	<ul style="list-style-type: none"> V_{REF} amplifier reference 	

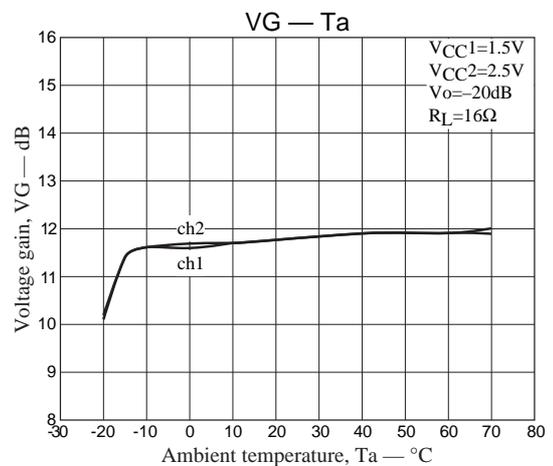
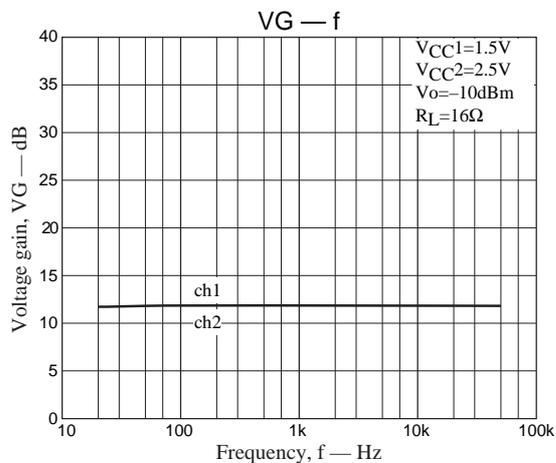
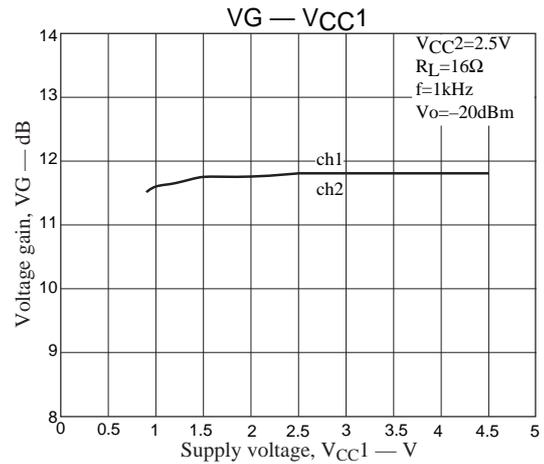
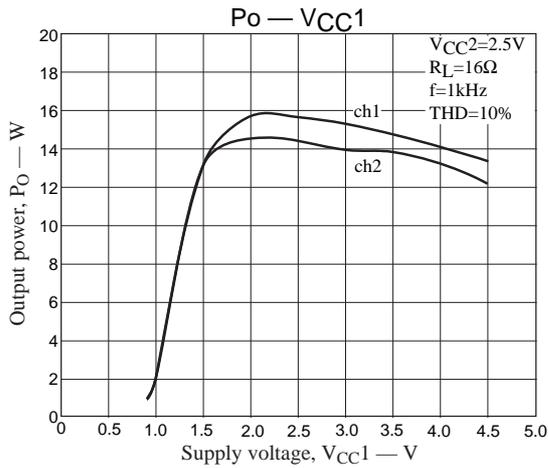
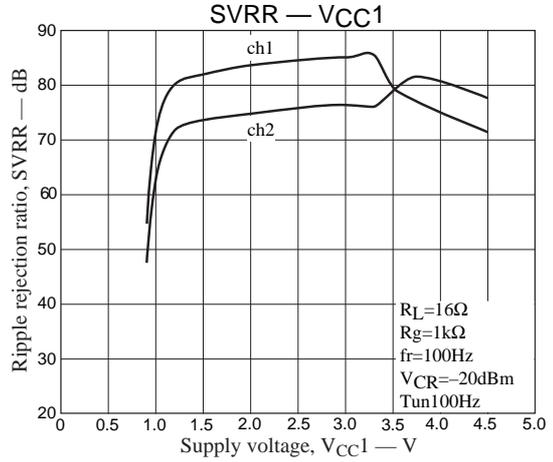
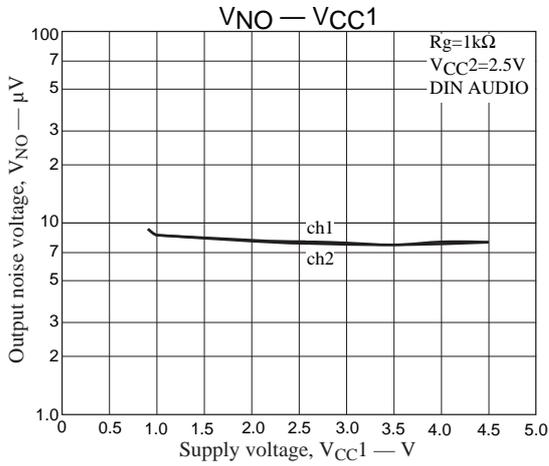
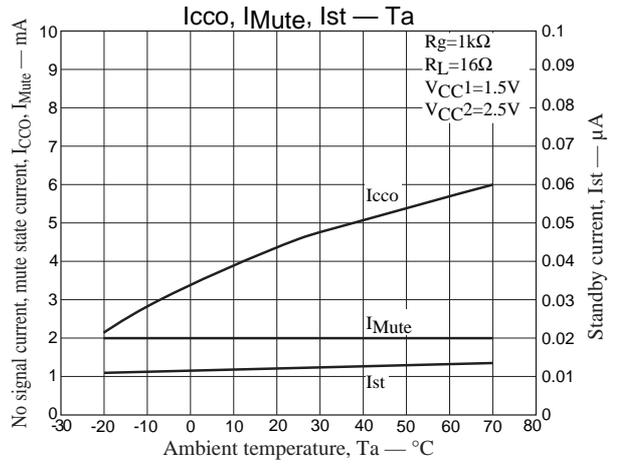
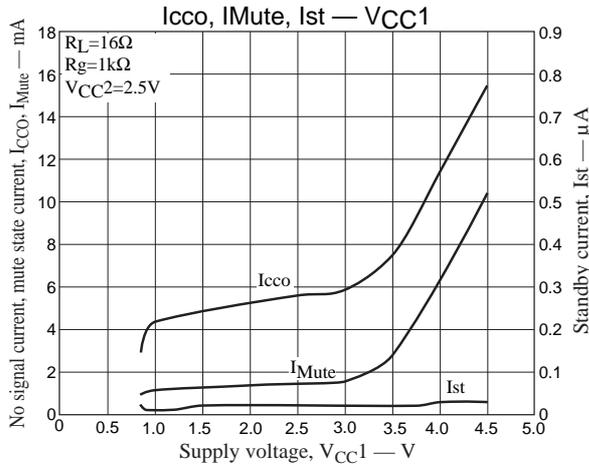
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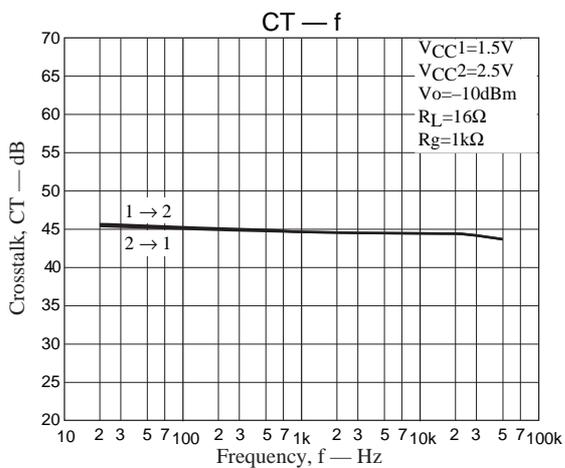
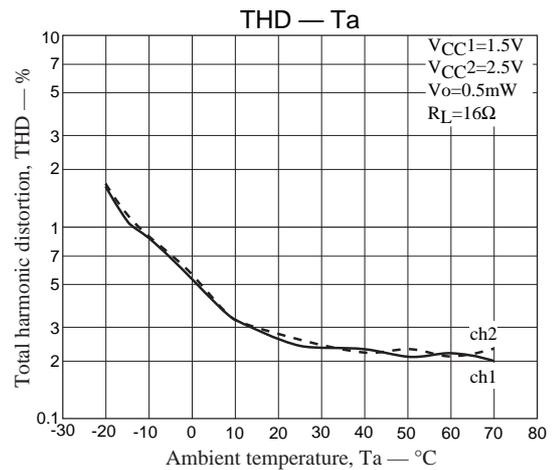
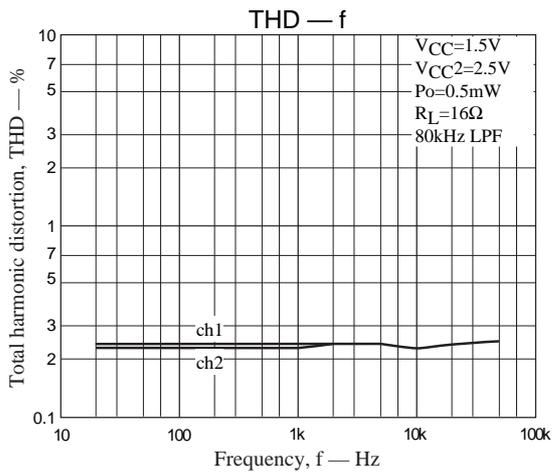
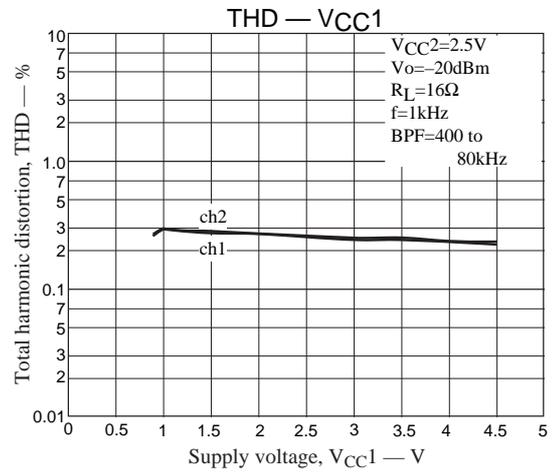
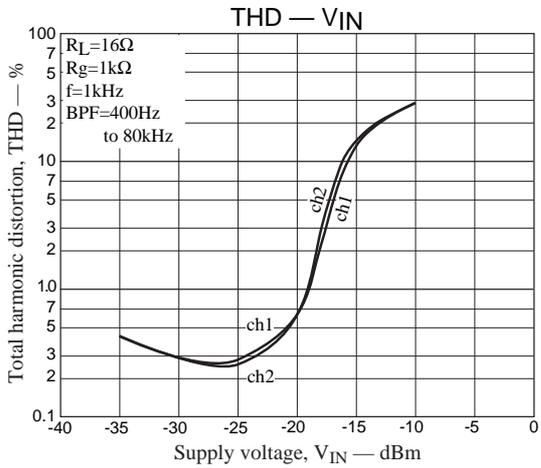
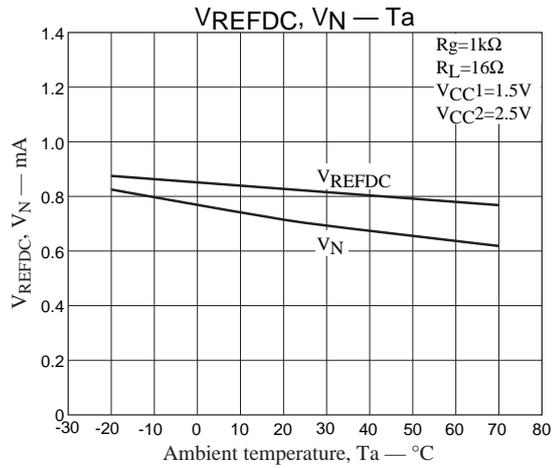
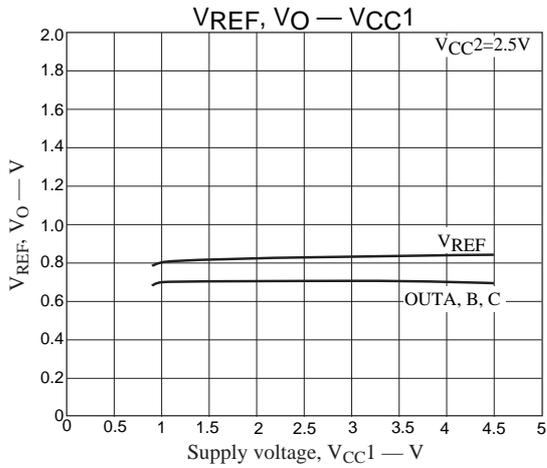
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Pin No.	Pin name	Pin voltage (V)	Pin description	Equivalent circuit
8	RF OUT	2.17	<ul style="list-style-type: none"> Ripple filter output 	
9	V _{CC2}			
10	RF CONT	2.19	<ul style="list-style-type: none"> Ripple filter reference 	
11	V _{CC1}			
12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

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