

## Description

The PAM8100 is a 3-VRMS pop-free stereo line driver designed to allow the removal of the output DC-blocking capacitors for reduced component count and cost. The device is ideal for single-supply electronics where size and cost are critical design parameters.

The PAM8100 is capable of driving 3Vrms into a 2.5-kΩ load with 5-V supply voltage. The device has differential inputs and uses external gain-setting resistors to support a gain range of  $\pm 1$  V/V to  $\pm 10$  V/V. The PAM8100 has built-in mute control for pop-free on/off control. The PAM8100 has an external and internal undervoltage detector that mutes the output.

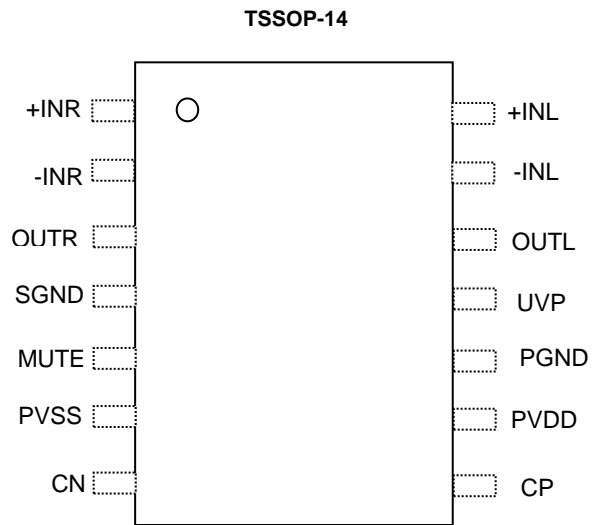
Using the PAM8100 in audio products can reduce component count considerably compared to traditional methods of generating a 3-Vrms output.

The PAM8100 is available in a 14-pin TSSOP.

## Features

- Eliminates Pop/Clicks
  - Eliminates Output DC-Blocking Capacitors
  - Provides Flat Frequency Response 20Hz-20kHz
- Low Noise and THD
  - SNR > 105 dB
  - Typical  $V_n < 13\mu\text{Vrms}$
  - THD+N < 0.005%
- Output Voltage Into 2.5-kΩ Load
  - 2 Vrms With 3.3V Supply Voltage
  - 3 Vrms With 5V Supply Voltage
- Differential Input
  - External Undervoltage Mute
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

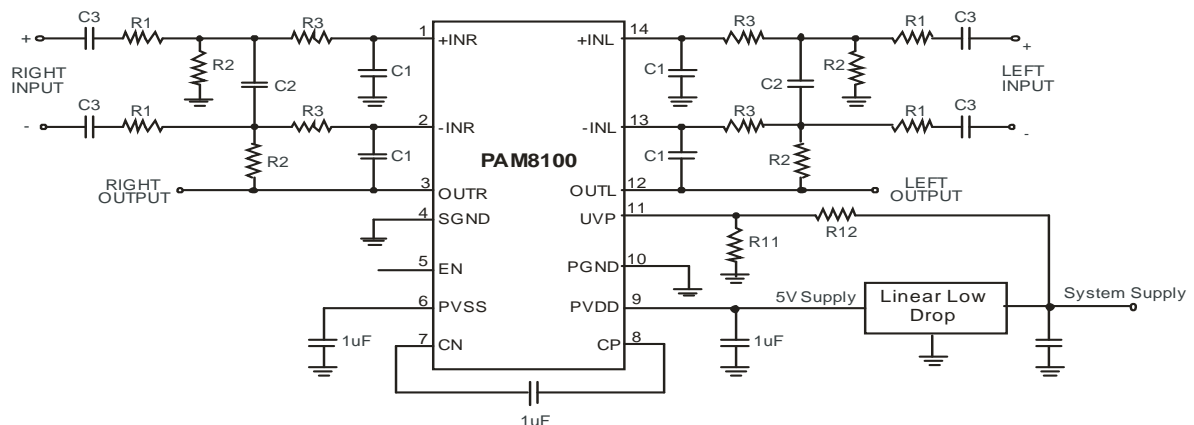
## Pin Assignments



## Applications

- PDP / LCD TVs
- Blu-ray Disc™, DVD Players
- Home Theater in a Box
- Set-Top Boxes

## Typical Applications Circuit



- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

## Pin Descriptions

Pin Number	Name	I/O	Description
1	+INR	I	Right-channel OPAMP positive input
2	-INR	I	Right-channel OPAMP negative input
3	OUTR	O	Right-channel OPAMP output
4	SGND	P	Signal ground
5	MUTE	I	Mute, active-high
6	PVSS	P	Supply voltage
7	CN	I/O	Charge-pump flying capacitor negative terminal
8	CP	I/O	Charge-pump flying capacitor positive terminal
9	PVDD	P	Positive supply
10	PGND	P	Power ground
11	UVP	I	Under voltage protection input
12	OUTL	O	Left-channel OPAMP output
13	-INL	I	Left-channel OPAMP negative input
14	+INL	I	Left-channel OPAMP positive input

## Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol	Description	VALUE	UNIT
V <sub>DD</sub>	Supply Voltage	-0.3 to 6.0	V
V <sub>I</sub>	Input Pins	GND-0.3 to VDD + 0.3	V
T <sub>A</sub>	Operating Free-Air Temperature Range	-40 to +85	°C
T <sub>J</sub>	Operating Junction Temperature Range	-40 to +150	°C
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C

## Recommended Operating Conditions (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol	Parameter	Min	Nom	Max	Unit
V <sub>IN</sub>	Supply Voltage	2.5	-	5	V
R <sub>L</sub>	Load Impedance	0.6	10	-	kΩ
V <sub>IH</sub>	High-Level Input Voltage	1.2	-	V <sub>IN</sub>	V
V <sub>IL</sub>	Low-Level Input Voltage	-0.3	-	0.4	V
T <sub>A</sub>	Operating Free-Air Temperature	-40	25	+85	°C

## Thermal Information

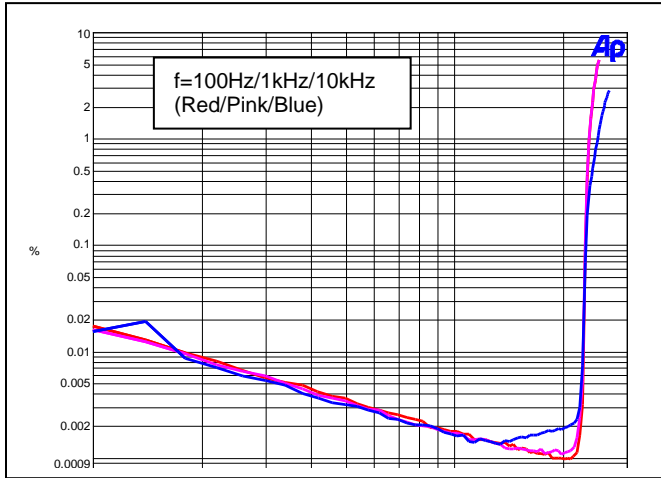
Parameter	Symbol	Package	Maximum	Unit
Thermal Resistance (Junction to Ambient)	θ <sub>JA</sub>	TSSOP-14	35	°C/W
Thermal Resistance (Junction to Case)	θ <sub>JC</sub>	TSSOP-14	14	°C/W

**Electrical Characteristics** (@VDD=3.3V, TA=+25°C, RL=10kΩ, C(PUMP)=C(PVSS) =1μF, CIN=2.2μF, RIN=15kΩ, Rfb=30kΩ, Unless otherwise specified.)

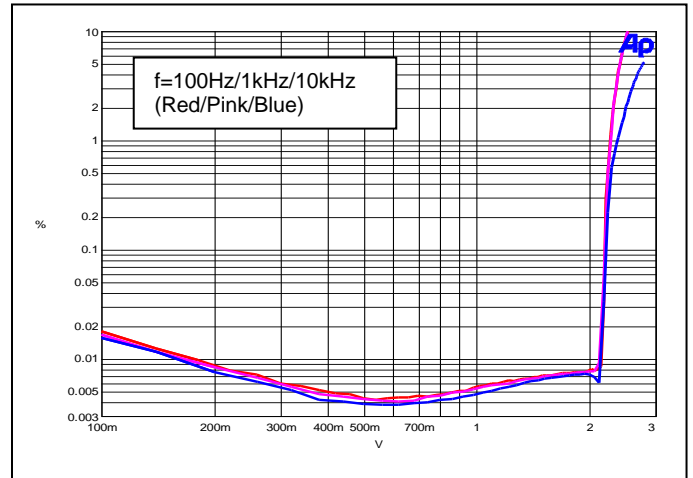
PARAMETER	Symbol	Conditions	Min	Typ	Max	Units
Output Offset Voltage	V <sub>OS</sub>	No load	-	-	3	mV
Power-Supply Rejection Ratio	P <sub>SRR</sub>	Input AC-GND, f=1kHz, V <sub>pp</sub> =200mV	-	70	-	dB
High-Level Output Voltage	V <sub>OH</sub>	VDD=3.3V	3.1	-	-	V
Low-Level Output Voltage	V <sub>OL</sub>	VDD=3.3V	-	-	-3.05	V
MUTE High	V <sub>IH</sub>	VDD=3.3V	1.5	-	-	V
MUTE Low	V <sub>IL</sub>	VDD=3.3V	-	-	0.4	V
Supply Current	I <sub>DD</sub>	No load, MUTE=VDD	-	10	-	mA
		No load, MUTE=GND	-	10	-	mA
Output Voltage (outputs in phase)	V <sub>O</sub>	THD=1%, VDD=3.3V, f=1kHz	2.0	2.4	-	V <sub>rms</sub>
Total Harmonic Distortion Plus Noise	THD+N	V <sub>O</sub> =2V <sub>rms</sub> , f=1kHz	-	0.0015	-	%
Crosstalk	CS	V <sub>O</sub> =1V <sub>rms</sub> , f=1kHz	-	-110	-	dB
Maximum Capacitive Load	MCL	-	-	470	-	pF
Noise Output Voltage	V <sub>N</sub>	Input AC-GND, A-weighted	-	13	-	uV <sub>rms</sub>
Signal-to-Noise Ratio	SNR	V <sub>O</sub> =2V <sub>rms</sub> , A-weighted	-	104	-	dB
External UnderVoltage Detection	V <sub>UVP</sub>	-	-	1.25	-	V
External Under-Voltage Detection Hysteresis Current	I <sub>HYSI</sub>	-	-	5	-	μA
Charge Pump Frequency	f <sub>CP</sub>	-	200	300	400	kHz

**Performance Characteristics** (@ $T_A=+25^\circ\text{C}$ ,  $V_{DD}=3.3\text{V}$ ,  $C(\text{PUMP})=C(\text{PVSS})=1\mu\text{F}$ ,  $C_{IN}=2.2\mu\text{F}$ ,  $R_{IN}=15\text{ k}\Omega$ ,  $R_{fb}=30\text{ k}\Omega$ , unless otherwise specified.)

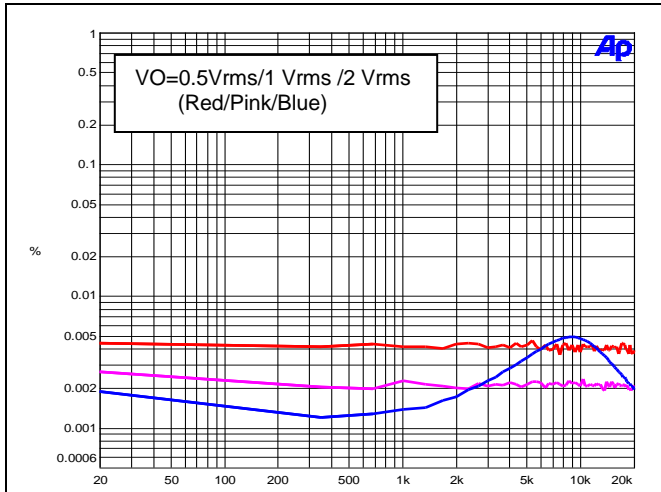
THD+N vs. Output Voltage (RL=10k $\Omega$ )



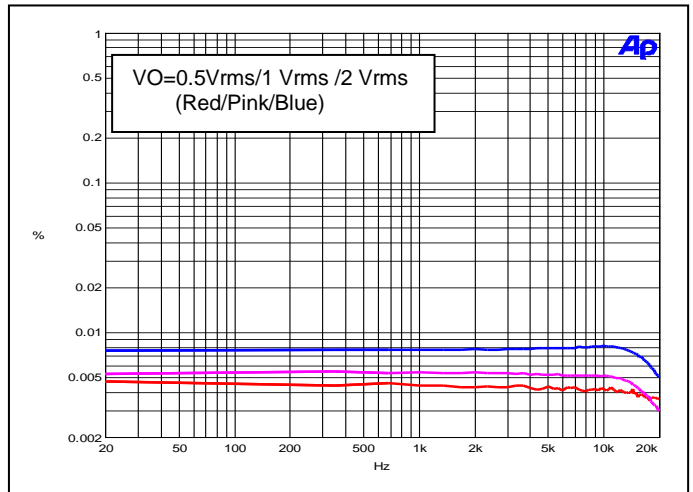
THD+N vs. Output Voltage (RL=600 $\Omega$ )



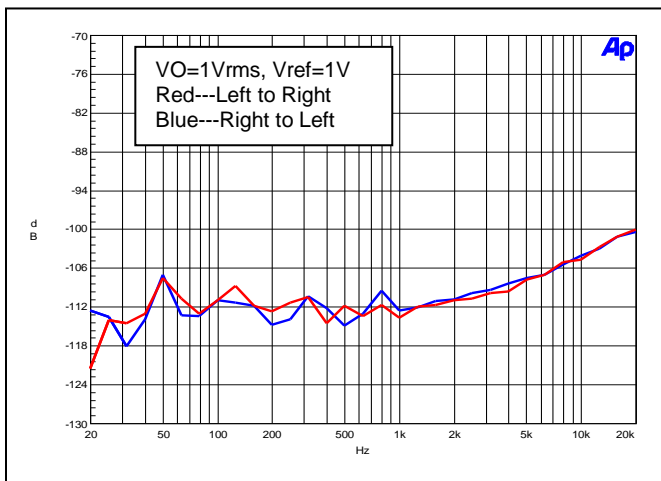
THD+N vs. Frequency (RL=10k $\Omega$ )



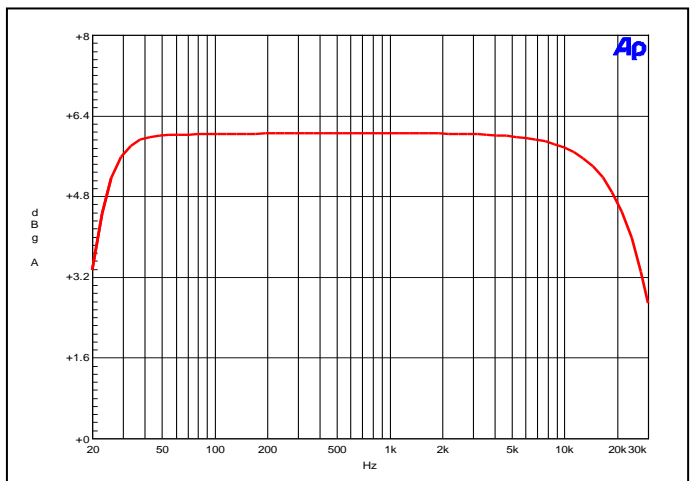
THD+N vs. Frequency (RL=600 $\Omega$ )



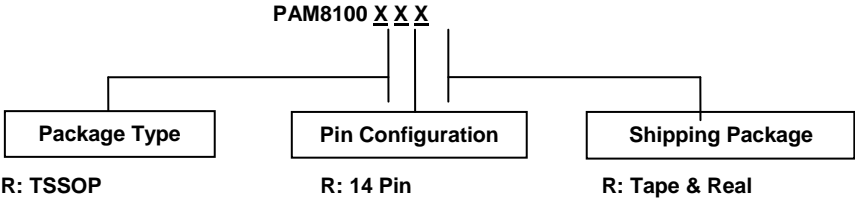
Crosstalk vs. Frequency (RL=10k $\Omega$ )



Gain vs. Frequency (RL=10k $\Omega$ )

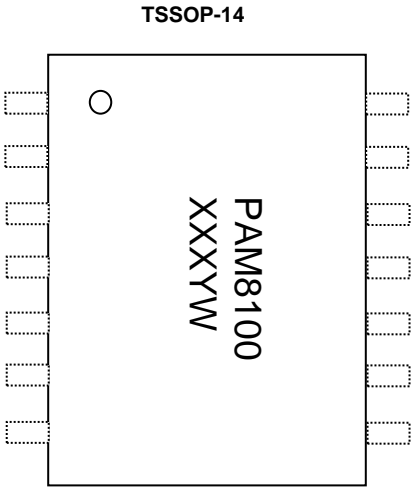


**Ordering Information**



Part Number	Package Type	Shipping
PAM8100RRR	TSSOP-14	2,500/Tape & Real

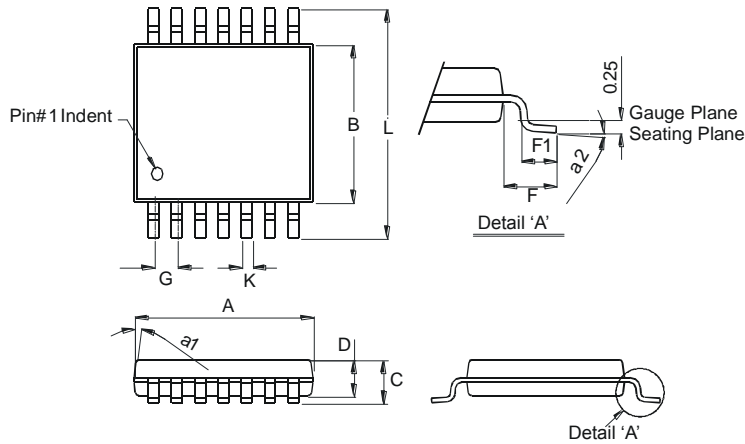
**Marking Information**



XXX: Internal Code  
 Y: Year: 1, 2, 3 ~  
 W: Week: "A-Z" means week 1 to week 26; "a-y" mean week 27 to 51, "z" means 52 and 53

**Package Outline Dimensions** (All dimensions in mm.)

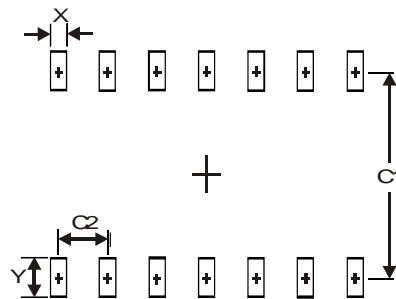
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



TSSOP-14		
Dim	Min	Max
a1	7° (4X)	
a2	0°	8°
A	4.9	5.10
B	4.30	4.50
C	—	1.2
D	0.8	1.05
F	1.00 Typ	
F1	0.45	0.75
G	0.65 Typ	
K	0.19	0.30
L	6.40 Typ	
<b>All Dimensions in mm</b>		

**Suggested Pay Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
X	0.45
Y	1.45
C1	5.9
C2	0.65

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