DESCRIPTION

The A2230 is a Class-AB audio power amplifier. It is capable of delivering 1.7 watts of continuous average power to an 4Ω BTL load with less than 10% distortion (THD+N) from a $5V_{DC}$ power supply, or 1.1 watts continuous average power to an 8Ω BTL load with less than 1% distortion.

The A2230 is designed specifically to provide high quality output power with a minimal amount of external components. It does not require output coupling capacitors or bootstrap capacitors. The A2230 is ideally suited for audio speakers and other low voltage applications.

With special pop-click eliminating circuit, the A2230 provides perfect pop-click characteristic during turn-on and turn-off transitions.

The A2230 is unity-gain stable and can be configured by external gain-setting resistors.

The A2230 is available in SOP8 package.

FEATURES

- Improved PSRR at 217 Hz & 1 KHz 60dB
- Power output at 5.0V, 10% THD+N, 4Ω
  1.7 W (typ.)
- Power output at 5.0V, 1% THD+N, 8Ω
  1.1 W (typ.)
- 2.2V ~ 5.5V operation
- Improved circuitry eliminates pop-click noise during turn-on and turn-off transitions
- No output coupling capacitors, snubber networks or bootstrap capacitors required
- Unity-gain stable
- External gain configuration capability
- Available in SOP8 package.

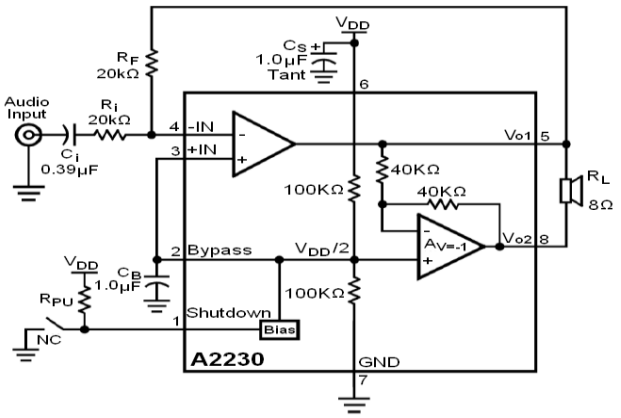
APPLICATION

- Audio speakers
- Desktop computers
- Low voltage audio systems

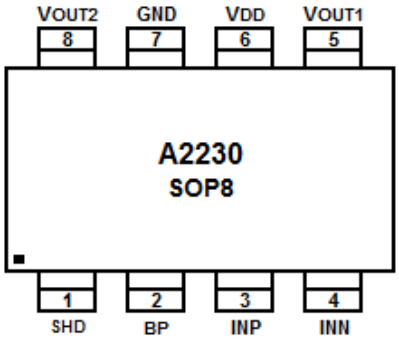
ORDERING INFORMATION

Package Type	Part Number	
SOP8	M8	A2230M8R
		A2230M8VR
Note	V: Halogen free Package R: Tape & Reel SPQ: 2.5K/Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

TYPICAL APPLICATION



PIN DESCIPTION



TOP VIEW

Pin #	Symbol	I/O	Functions
1	SHD	I	Shut-down Logical Control, '1' is active.
2	BP	I/O	Analog ground for inner OPAs. It's about a half of V_{DD}.
3	INP	I	Positive Input
4	INN	I	Negative Input
5	V_{OUT1}	O	Negative BTL Output
6	V_{DD}	I/O	Power Supply (2.2~5.5 V)
7	GND	I/O	Ground
8	V_{OUT2}	O	Positive BTL Output

EXTERNAL COMPONENTS DESCRIPTION

Components	Functional Description
Ri	Inverting input resistance which sets the closed-loop gain in conjunction with Rf. This resistor also forms a high pass filter with Ci at fc = 1/(2πRi*Ci).
Ci	Input coupling capacitor which blocks the DC voltage at the amplifiers input terminates. Also creates a high-pass filter with Ri at fc = 1/(2πRi*Ci).
Rf	Feedback resistance which sets the closed-loop gain in conjunction with Ri. The gain is A_{VD}=2*(Rf/Ri).
Cs	Supply bypass capacitor which provides power supply filtering.
Cb	Bypass pin capacitor which provides half-supply filtering. Refer to the section.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	-0.3V~6.0V
Input Voltage	-0.3V~V_{DD}+0.3V
Power dissipation	See Dissipation Rating Table
Junction Temperature	-40℃~+150℃
Storage Temperature	-65℃~+150℃
Thermal Resistance	
θ_{JA}(SOP8)	184℃/W

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device..These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

OPERATING RATINGS

Parameter	Value
Temperature Range	−40°C ≤ T_A ≤ 85°C
Supply Voltage	2.2V ≤ V_{DD} ≤ 5.5V

ELECTRICAL CHARACTERISTICS

The following specifications apply for the circuit shown in Figure 1, unless otherwise specified.
Limits apply for T_A = 25℃.

V_{DD} = 5V

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Quiescent Power Supply Current	I_{DD}	V_{IN} = 0V, 8Ω Load	-	3.0	8.0	mA
		V_{IN} = 0V, No Load	-	2.5	7.0	
Shutdown Current	I_{SD}	V_{IN}=0V, V_{SHD}=GND, No Load	-	0.5	-	μA
Shutdown Voltage Input High	V_{SDIH}		1.2	-	-	V
Shutdown Voltage Input Low	V_{SDIL}		-	-	0.9	V
Output Offset Voltage	V_{OS}		-50	6.0	50	mV
Total Harmonic Distortion + Noise	THD+N	Po=0.5Wrms, f=1KHz	-	0.07	-	%
Output Power	P_O	THD+N<=1%, f=1KHz, 8Ω Load	-	1.1	-	W
		THD+N<=10%, f=1KHz, 4Ω Load	-	1.7	-	
Power Supply Rejection Ratio	PSRR	Input terminated with 10Ω, $V_{DDRIPPLE}$=0.2V_{P-P}, f=217Hz	-	60	-	dB
		Input terminated with 10Ω, $V_{DDRIPPLE}$=0.2V_{P-P}, f=1KHz	-	61	-	dB
Wake-up time	T_{WU}		-	100	-	ms

V_{DD} = 3V

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Quiescent Power Supply Current	I_{DD}	V_{IN} = 0V, 8Ω Load	-	2.0	7.0	mA
		V_{IN} = 0V, No Load	-	1.5	6.0	
Shutdown Current	I_{SD}	V_{IN}=0V, V_{SHD}=GND, No Load	-	0.5	-	μA
Shutdown Voltage Input High	V_{SDIH}		1.0	-	-	V
Shutdown Voltage Input Low	V_{SDIL}		-	-	0.7	V
Output Offset Voltage	V_{OS}		-50	6.0	50	mV
Total Harmonic Distortion + Noise	THD+N	Po=0.25Wrms, f=1KHz	-	0.08	-	%
Output Power	P_O	THD+N<=1%, f=1KHz, 8Ω Load	-	310	-	mW
Power Supply Rejection Ratio	PSRR	Input terminated with 10Ω, $V_{DDRIPPLE}$=0.2V_{P-P}, f=217Hz	-	57	-	dB
		Input terminated with 10Ω, $V_{DDRIPPLE}$=0.2V_{P-P}, f=1KHz	-	58	-	dB
Wake-up time	T_{WU}		-	75	-	ms

TYPICAL APPLICATION CIRCUIT

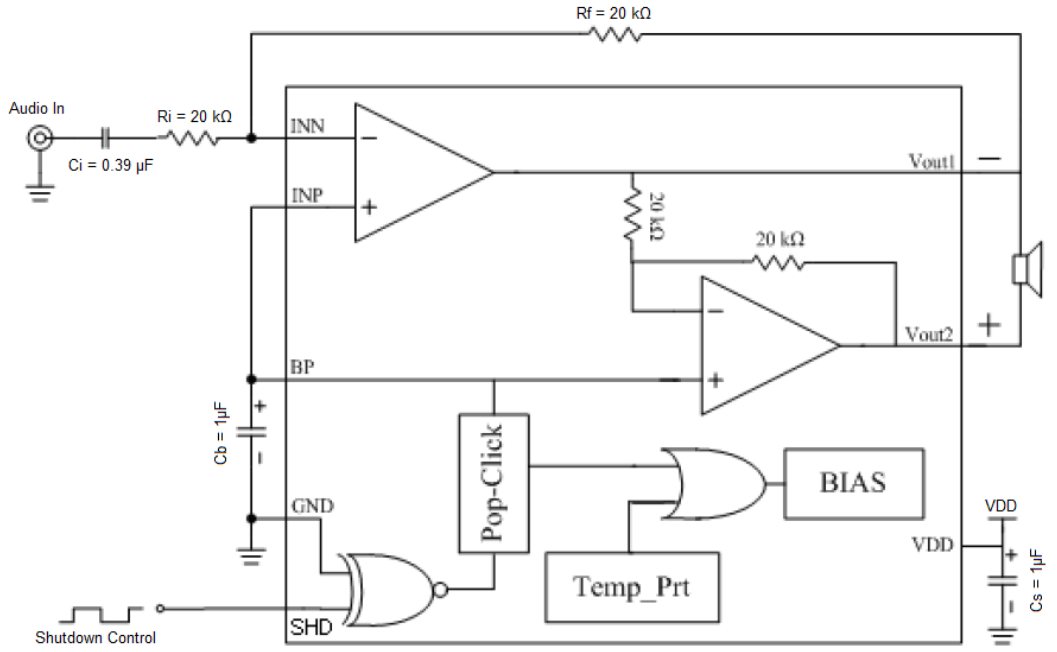


Figure 1. A2230 Typical Application Circuit

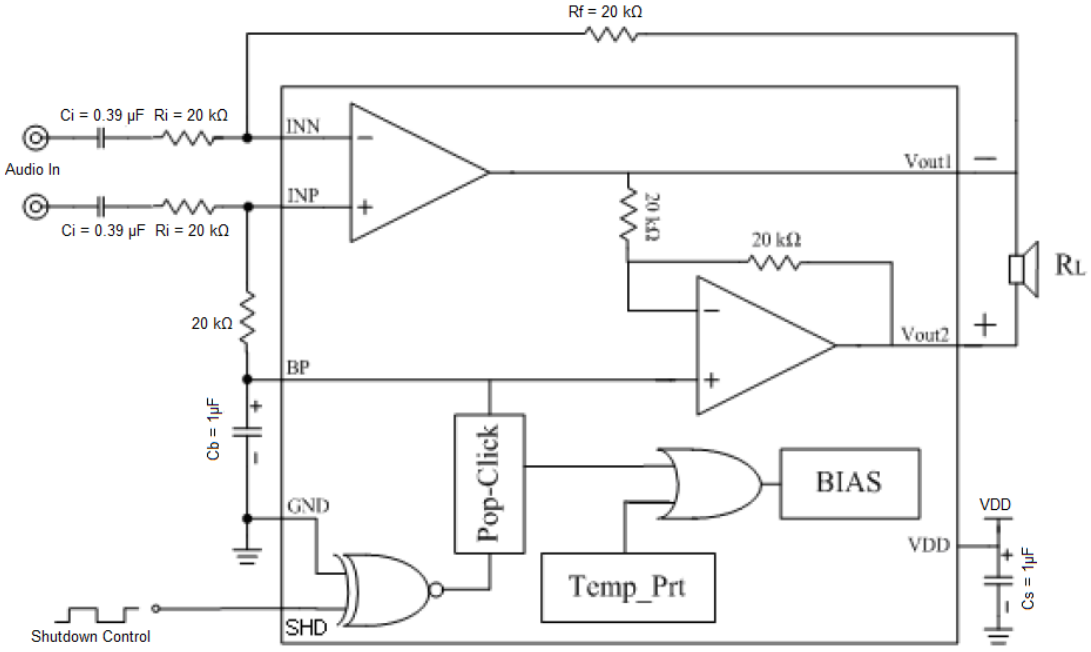
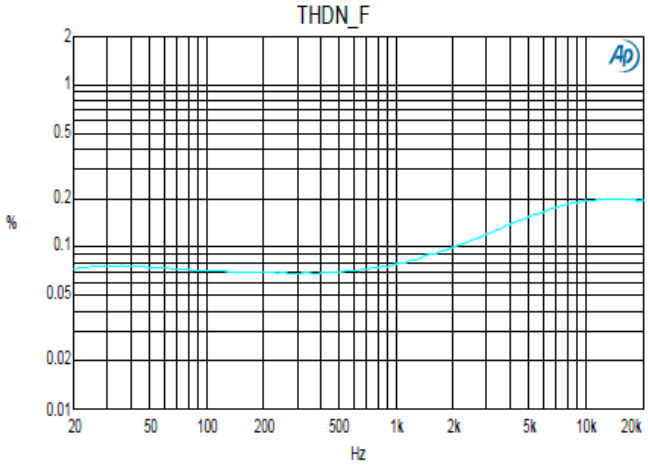


Figure 2. A2230 Differential Amplifier Configuration

TYPICAL PERFORMANCE CHARACTERISTICS

1. THDN vs. Frequency

V_{DD}=5V R_L=8Ω P_O=500mW

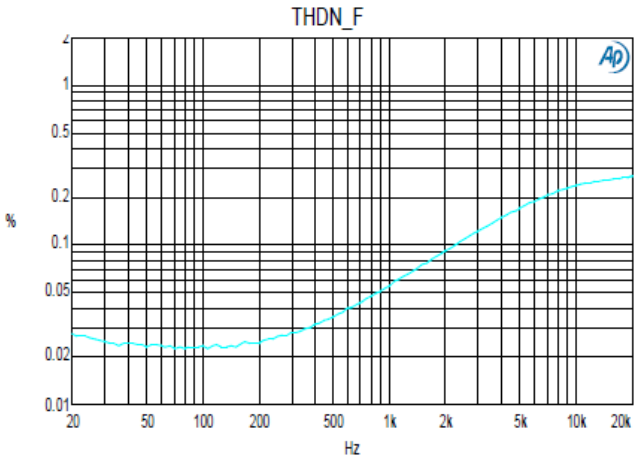


Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Cyan	Solid	1	Analyzer.THD+N Ratio B	Left	

THDN_F.ats2

2. THDN vs. Frequency

V_{DD}=3V R_L=8Ω P_O=250mW

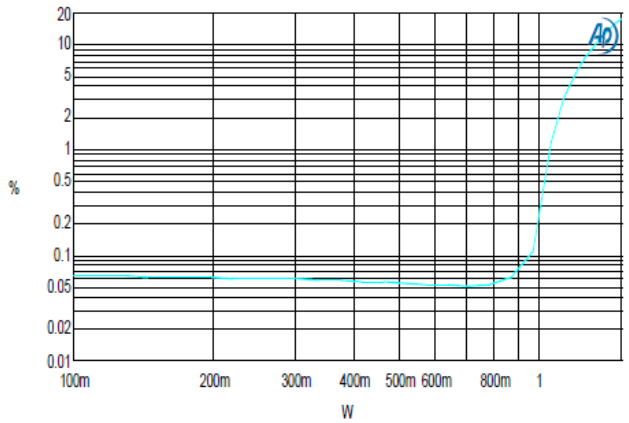


Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Cyan	Solid	1	Analyzer.THD+N Ratio B	Left	

THDN_F.ats2

3. THDN vs. Output Power

V_{DD}=5V R_L=8Ω F=1KHz

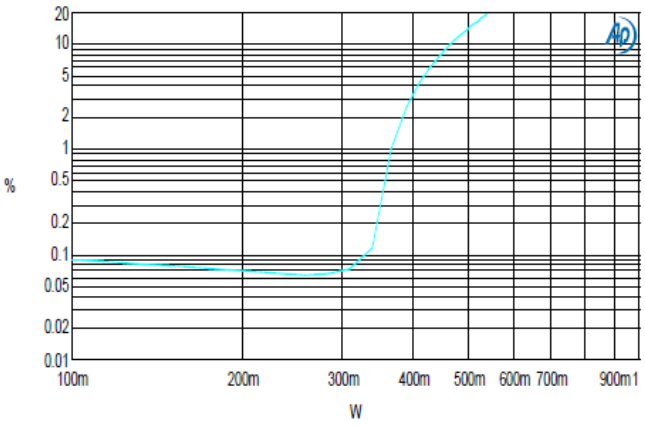


Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Cyan	Solid	1	Analyzer.THD+N Ratio B	Left	

THDN_F.ats2

4. THDN vs. Output Power

V_{DD}=3V R_L=8Ω F=1KHz

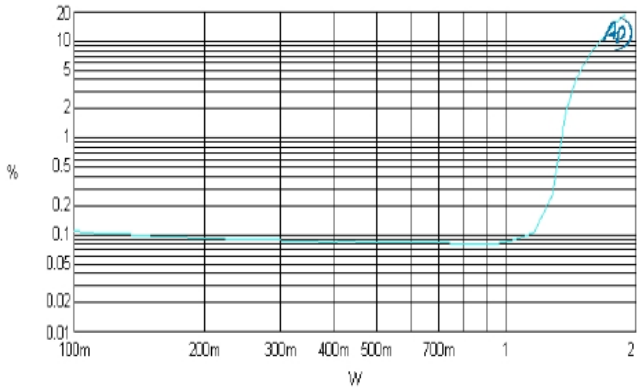


Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Cyan	Solid	1	Analyzer.THD+N Ratio B	Left	

THDN_F.ats2

5. THDN vs. Output Power

V_{DD}=5V R_L=4Ω F=1KHz

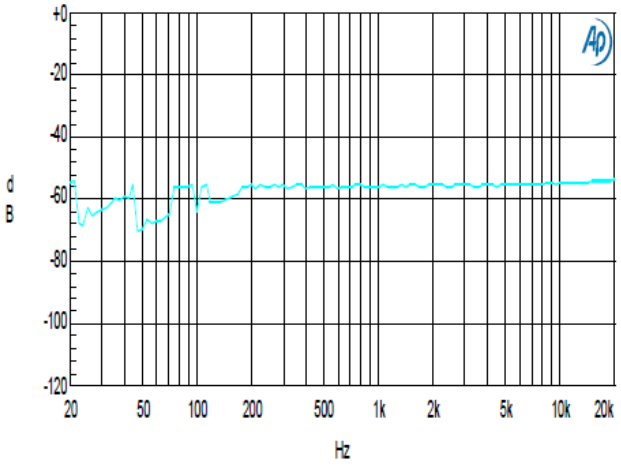


Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Cyan	Solid	1	Analyzer.THD+N Ratio B	Left	

THDN_F.ats2

6. PSRR vs. Frequency

V_{DD}=5V R_L=8Ω

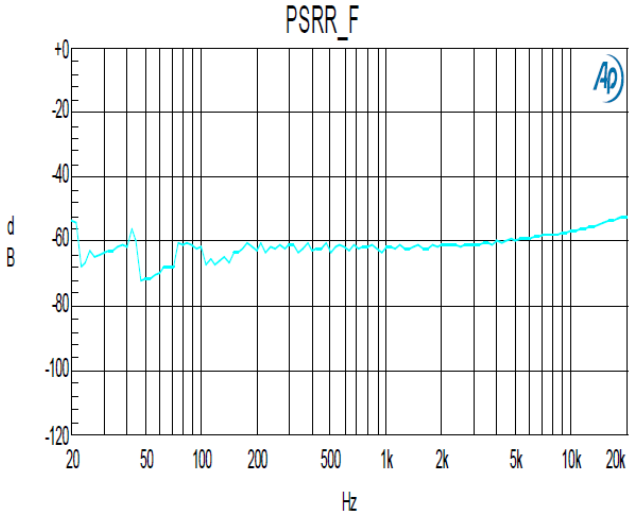


Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Cyan	Solid	1	Analyzer.Crosstalk B	Left	

PSRR_fats2

7. PSRR vs. Frequency

V_{DD}=3V R_L=8Ω

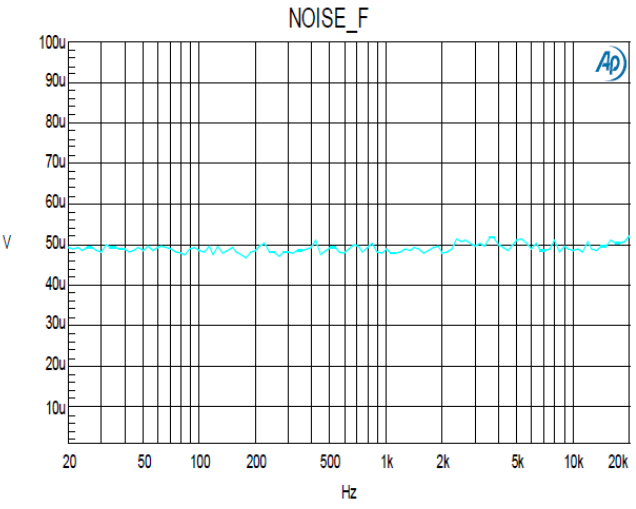


Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Cyan	Solid	1	Analyzer.Crosstalk B	Left	

PSRR_fats2

8. Noise Floor 20KBW

V_{DD}=5V R_L=8Ω

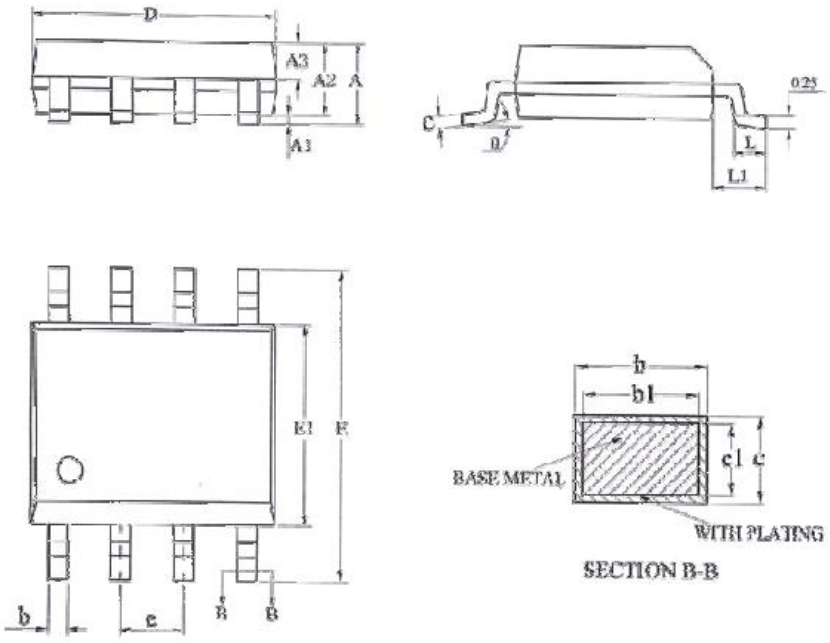


Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Cyan	Solid	1	Analyzer.Amplitude B	Left	

NOISE_F.ats2

PACKAGE INFORMATION

Dimension in SOP8 (Unit: mm)



Symbol	Min	Max
A	-	1.77
A1	0.08	0.28
A2	1.20	1.60
A3	0.55	0.75
b	0.39	0.48
b1	0.38	0.43
c	0.21	0.26
c1	0.19	0.21
D	4.70	5.10
E	5.80	6.20
E1	3.70	4.10
e	1.270(BSC)	
L	0.50	0.80
L1	1.050(BSC)	
θ	0°	8°

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