



## SGM4872 1.2 Watt Audio Power Amplifier

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### GENERAL DESCRIPTION

The SGM4872 is a 1.2-W, fully integrated, audio power amplifier. It is designed to maximize audio performance in portable applications such as mobile phone. The portable application requires audio power amplifier has minimum of external components and can operate from a single 2.5V to 5.5V power supply. SGM4872 is capable of delivering 1.2W of continuous output power with 1% distortion (THD + N) when it drives an 8Ω speaker from a 5.0V power supply.

The SGM4872 features a low-power consumption shutdown mode, which is achieved by driving the shutdown pin with a logic high. Additionally, the SGM4872 features an internal thermal shutdown protection mechanism.

The SGM4872 does not require output coupling capacitors or bootstrap capacitors, and therefore is ideally suited for mobile phone and other low voltage applications where minimal power consumption is a primary requirement.

For maximum flexibility, the SGM4872 provides an externally controlled gain (with resistors), as well as an externally controlled turn-on time (with the bypass capacitor). When using a 1μF bypass capacitor, it offers 165ms wake up time when  $V_{CC}$  is equal to 5.0V.

The SGM4872 is available in Green SOIC-8 package. It operates over an ambient temperature range of  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ .

### FEATURES

- **Ideal for Notebook Computers, PDAs, and Other Small Portable Audio Devices**
- **1.2W to 8Ω Load from 5V Supply at THD =1% (Typical)**
- **Excellent PSRR: Direct Connection to the Battery**
- **Fast Turn On Time**
- **Unity Gain Stable**
- **2.5V to 5.5V Operation**
- **Shutdown Current: 0.04μA Typical**
- **$-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Operating Temperature Range**
- **Green SOIC-8 Package**

### APPLICATIONS

Portable Systems  
MP3 Players  
Mobile Phone  
PDAs  
GPS

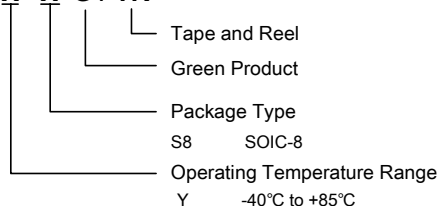


## PACKAGE/ORDERING INFORMATION

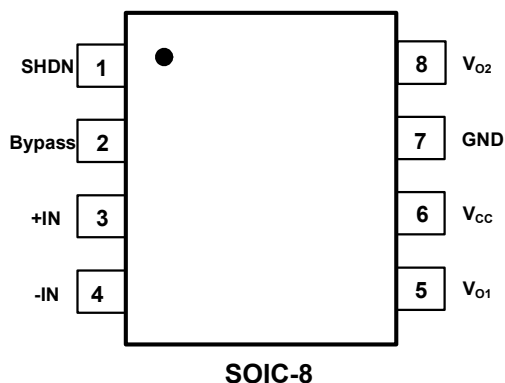
MODEL	ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	MARKING INFORMATION
SGM4872	SGM4872YS8G/TR	SOIC-8	Tape and Reel, 2500	SGM4872YS8

## ORDER NUMBER

SGM4872 X X G / TR



## PIN CONFIGURATION (TOP VIEW)



## PIN DESCRIPTION

PIN	NAME	FUNCTION
1	SHDN	Chip Disable – Digital input. A logic “0” sets normal operation. A logic “1” sets the power down mode.
2	Bypass	A capacitor at this pin increases power supply rejection, and affects turn–on time.
3	+IN	Amplifier input. Turn–on time of the circuit is affected by the capacitor on this pin. This pin can be used as an alternate input.
4	-IN	Amplifier input. The input capacitor and resistor set low frequency rolloff and input impedance. The feedback resistor is connected to this pin and V <sub>O1</sub> .
5	V <sub>O1</sub>	Output1.
6	V <sub>CC</sub>	Power supply.
7	GND	Ground
8	V <sub>O2</sub>	Output 2.

**ABSOLUTE MAXIMUM RATINGS**

Supply Voltage .....	6V
Input Voltage .....	-0.3V to (V <sub>CC</sub> ) + 0.3V
Storage Temperature Range .....	-65°C to +150°C
Junction Temperature.....	150°C
Operating Temperature Range .....	-40°C to +85°C
Lead Temperature Range (Soldering 10 sec) .....	260°C
ESD Susceptibility	
HBM .....	4000V
MM .....	400V

**NOTE**

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**CAUTION**

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

SGMICRO reserves the right to make any change in circuit design, specification or other related things if necessary without notice at any time. Please contact SGMICRO sales office to get the last datasheet.

**ELECTRICAL CHARACTERISTICS:**

The following specifications apply for  $T_A = 25^\circ\text{C}$ ,  $R_L = 8\Omega$  and  $A_V = 4\text{V/V}$ , unless otherwise specified.

PARAMETER	SYMBOL	CONDITIONS	SGM4872			UNITS	
			MIN	TYP	MAX		
Supply Voltage	$V_{CC}$		2.5		5.5	V	
Quiescent Power Supply Current	$I_Q$	$V_{IN} = 0\text{V}$	$V_{CC} = +5\text{V}$ , No Load		5.65	8	mA
			$V_{CC} = +5\text{V}$ , 8 $\Omega$ Load		5.70	10	
			$V_{CC} = +3.0\text{V}$ , No Load		4.89	7	
			$V_{CC} = +3.0\text{V}$ , 8 $\Omega$ Load		4.92	9	
Shutdown Current	$I_{SD}$	$V_{SHUTDOWN} = 5\text{V}$		0.04	4	$\mu\text{A}$	
Shutdown Voltage Input High	$V_{SDIH}$		1.2			V	
Shutdown Voltage Input Low	$V_{SDIL}$				0.4	V	
Output Offset Voltage	$V_{OS}$	$V_{CC} = +5\text{V}$	-30	5.40	30	mV	
		$V_{CC} = +3.0\text{V}$		4.90			
Output Power (8 $\Omega$ )	$P_O$	f = 1 kHz, THD+N = 1%	$V_{CC} = +5\text{V}$		1.20	W	
			$V_{CC} = +3.0\text{V}$		0.40		
		f = 1 kHz, THD+N = 10%	$V_{CC} = +5\text{V}$		1.50		
			$V_{CC} = +3.0\text{V}$		0.50		
Total Harmonic Distortion + Noise	THD+N	$V_{CC} = +5\text{V}$ , $P_O = 0.4\text{Wrms}$ , f = 1kHz		0.075		%	
Power Supply Rejection Ratio	PSRR	f = 217Hz, $C_B = 1\mu\text{F}$ input 10 $\Omega$ terminated	$V_{CC} = +5\text{V}$		61	dB	
			$V_{CC} = +3.0\text{V}$		62		
		f = 1kHz, $C_B = 1\mu\text{F}$ input 10 $\Omega$ terminated	$V_{CC} = +5\text{V}$		65		
			$V_{CC} = +3.0\text{V}$		67		
Wake -up Time	$T_{WU}$	$C_B = 1\mu\text{F}$	$V_{CC} = +5\text{V}$		165	ms	
			$V_{CC} = +3.0\text{V}$		113		

TYPICAL APPLICATION

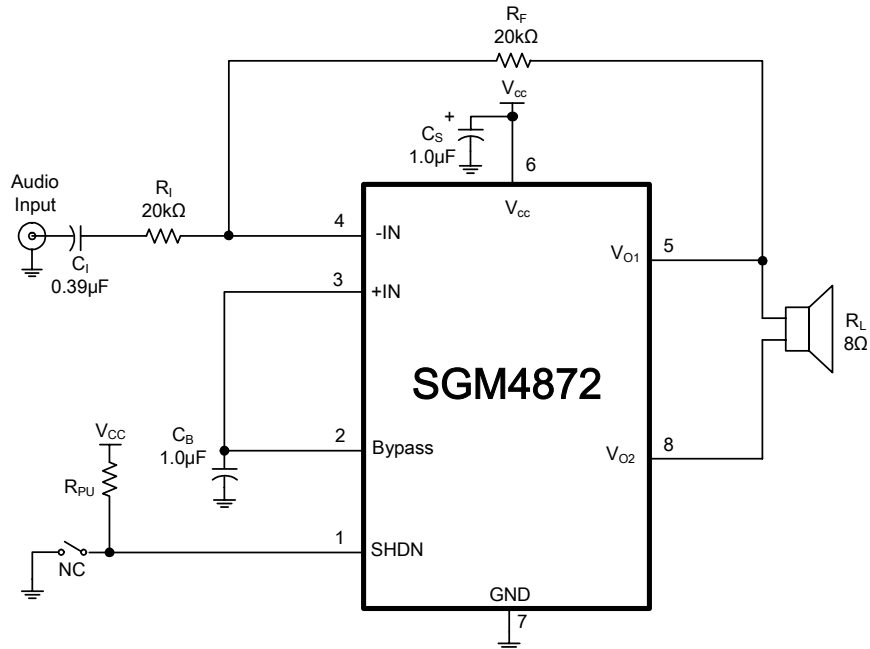


Figure 1

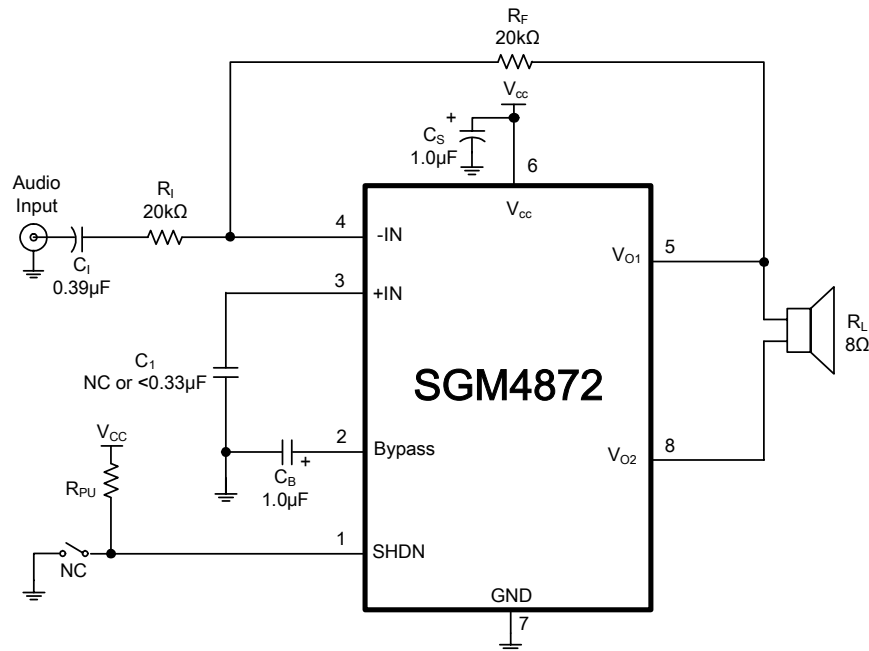
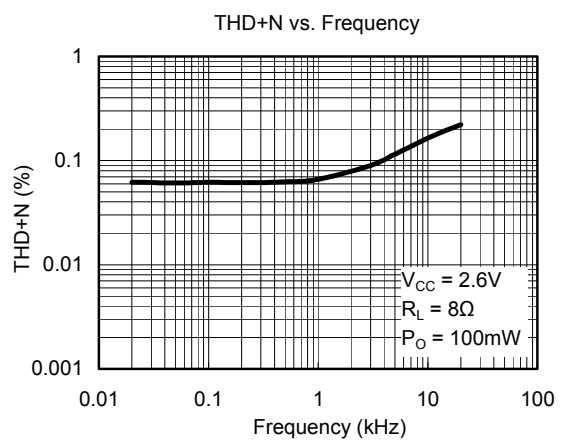
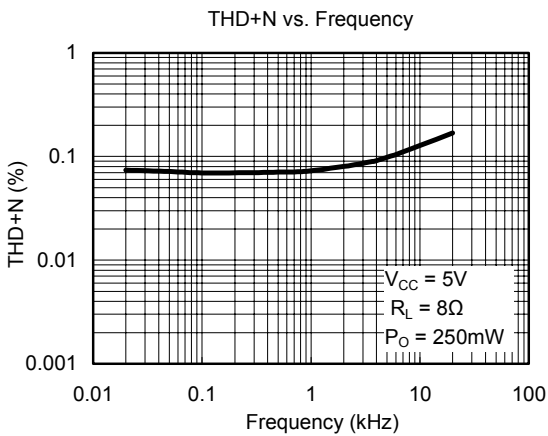
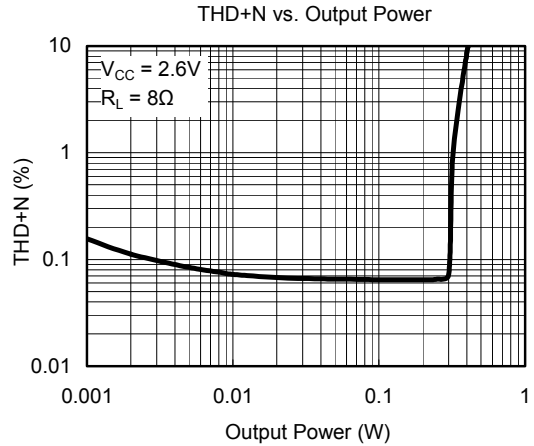
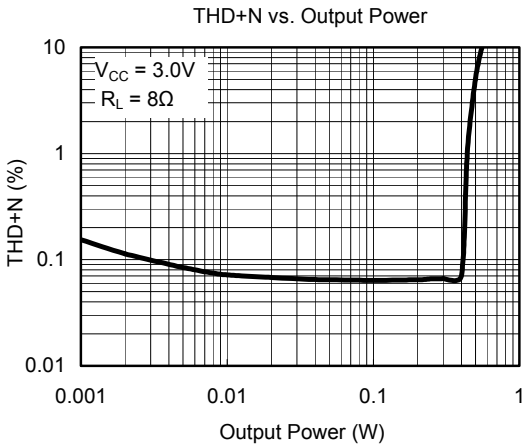
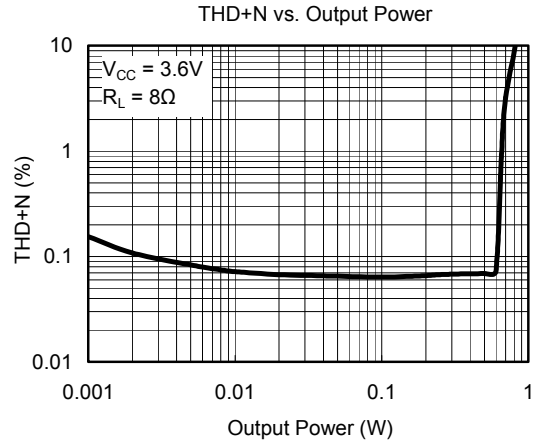
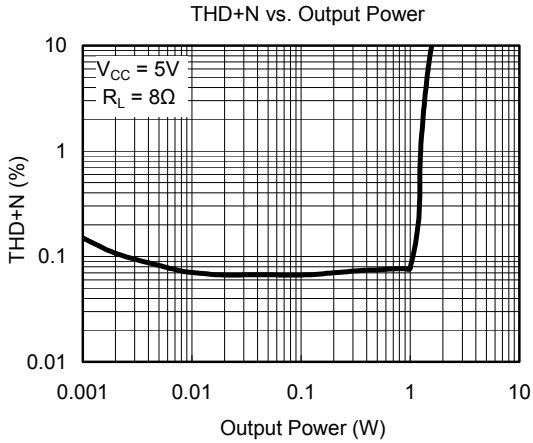


Figure 2

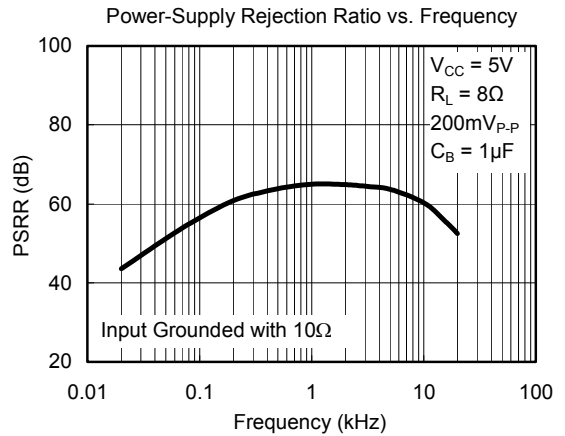
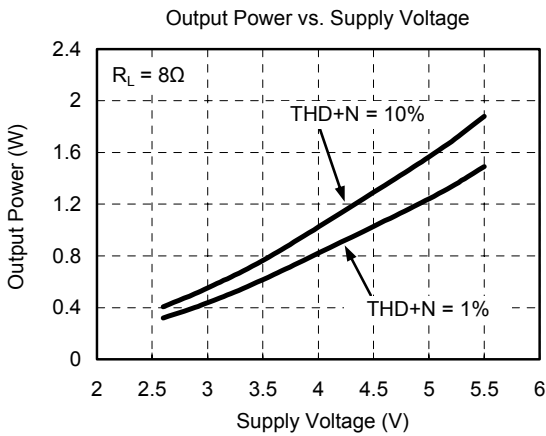
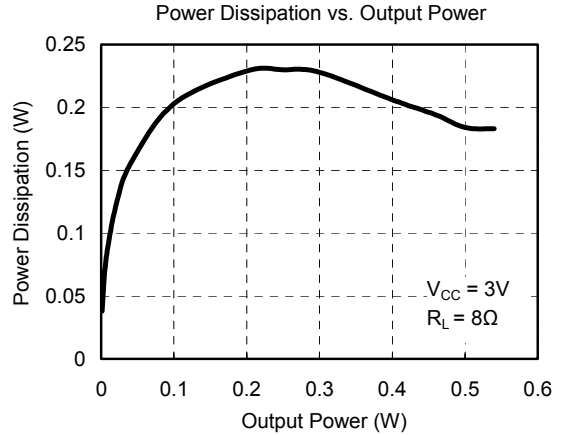
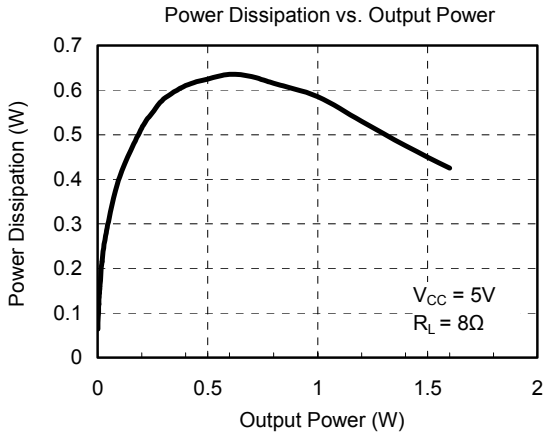
**TYPICAL PERFORMANCE CHARACTERISTICS**

At  $T_A = +25^\circ\text{C}$ ,  $A_v = 4$ ,  $f = 1\text{kHz}$ ,  $C_B = 1\mu\text{F}$ , unless otherwise noted.



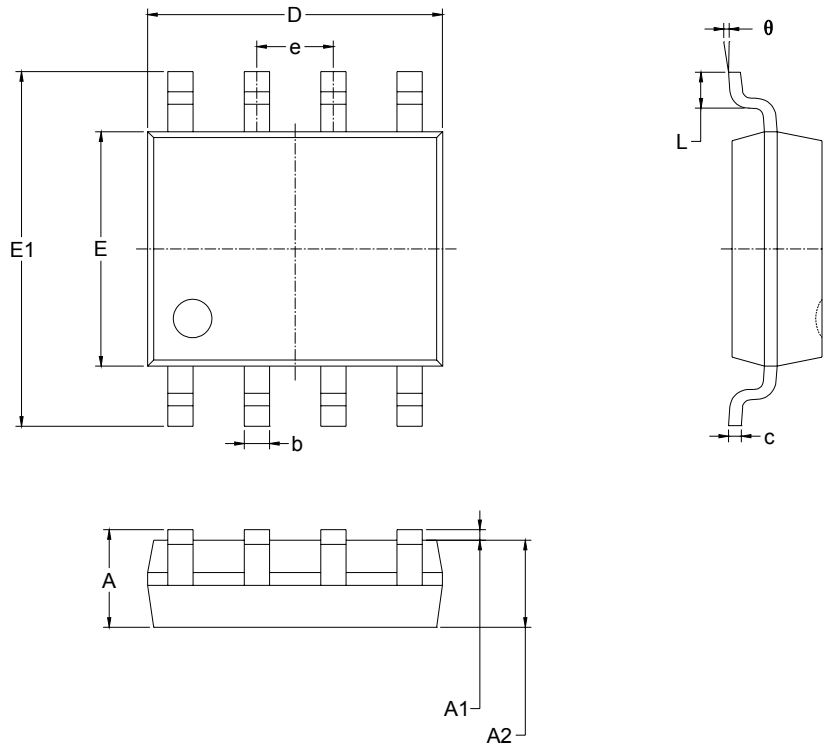
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PACKAGE OUTLINE DIMENSIONS

SOIC-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27 BSC		0.050 BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°