



SGM4809

Dual 158mW Headphone Amplifier with Active Low Shutdown Mode

GENERAL DESCRIPTION

The SGM4809 is a dual audio power amplifier capable of delivering 158mW per channel of continuous average power with less than 0.1% distortion (THD + N) when it drives a 16Ω speaker from a 5.0V power supply. 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.

SGM4809 features an externally controlled, active-low, micropower consumption shutdown mode, as well as an internal thermal shutdown protection mechanism.

SGM4809 does not require bootstrap capacitors or snubber networks. It is optimally suited for low-power portable systems.

For maximum flexibility, the SGM4809 provides an externally controlled gain (with resistors), as well as an externally controlled turn-on time (with the bypass capacitor).

The SGM4809 is available in Pb-free MSOP-8 package. It operates over an ambient temperature range of -40°C to +85°C.

FEATURES

- **Active-Low Shutdown Mode**
- **158mW into 16Ω Load from 5V Power Supply at THD+N = 0.1% Typical (per Channel)**
- **87mW into 32Ω Load from 5V Power Supply at THD+N = 0.1% Typical (per Channel)**
- **Unity Gain Stable**
- **Shutdown Current: 0.6μA (TYP)**
- **2.5V to 5.5V Operation**
- **Shutdown Pin is Compatible with 1.8V Logic**
- **Click and Pop Reduction Circuitry**
- **-40°C to +85°C Operating Temperature Range**
- **Pb-Free MSOP-8 Package**

APPLICATIONS

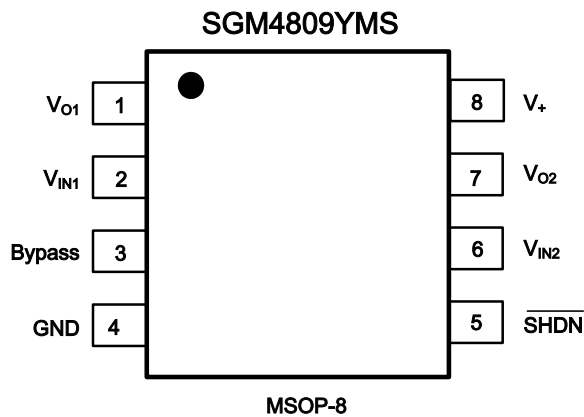
Portable Systems
Headphone Amplifier
Microphone Preamplifier
Notebook Computers
Mobile Phone
PDAs
GPS



PACKAGE/ORDERING INFORMATION

MODEL	ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	MARKING INFORMATION
SGM4809	SGM4809YMS/TR	MSOP-8	Tape and Reel, 3000	SGM4809YMS

PIN CONFIGURATION (Top View)



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.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	6V
Input Voltage	-0.3V to (V ₊) + 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	4KV
MM	400V

NOTES

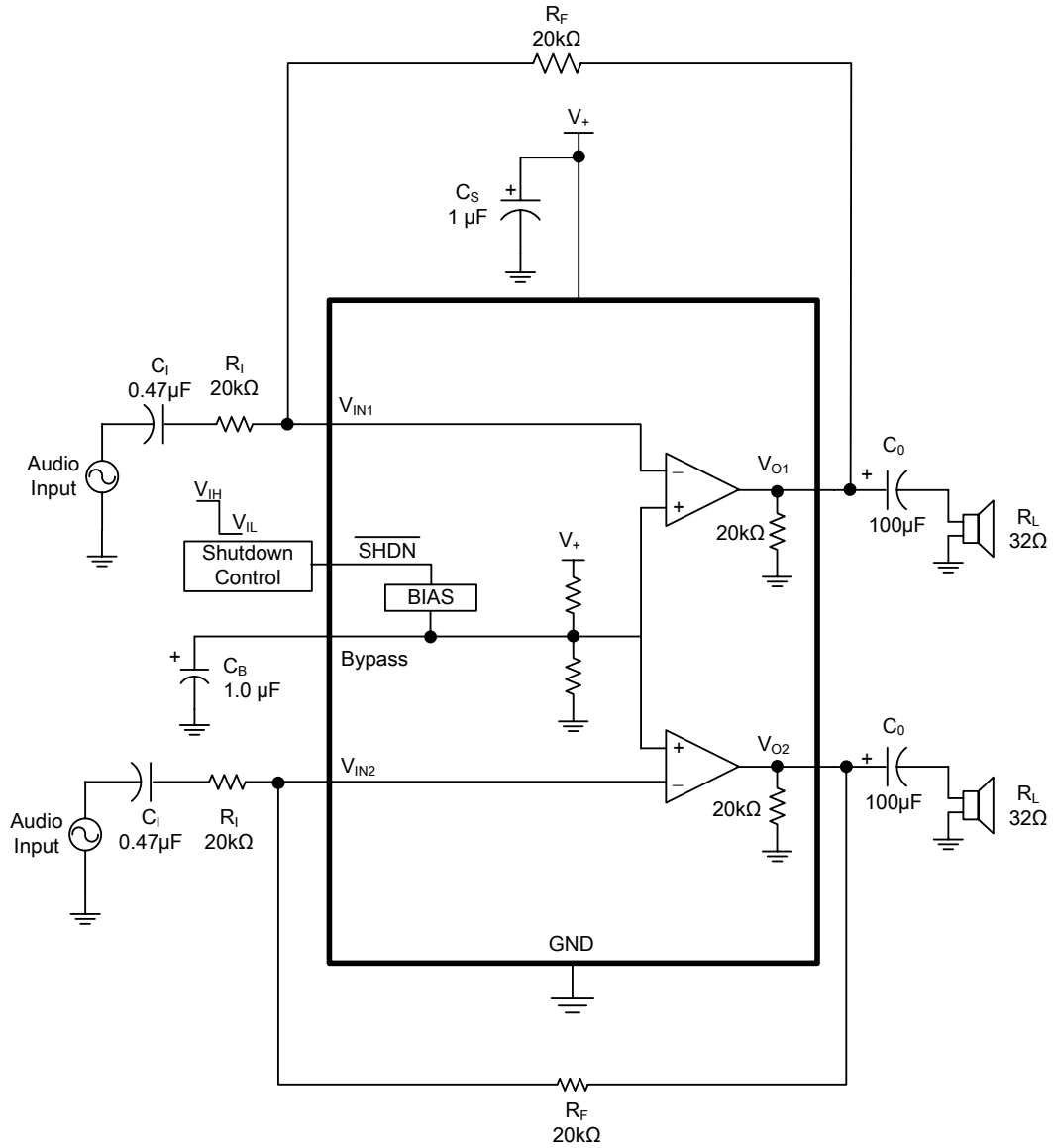
1. Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to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

ELECTRICAL CHARACTERISTICS: $T_A = 25^\circ\text{C}$

PARAMETER	SYMBOL	CONDITIONS		SGM4809			UNITS
				MIN	TYP	MAX	
Supply Voltage	V_+			2.5		5.5	V
Shutdown Current	I_{SD}	$V_{IN} = 0V, V_{SHDN} = GND, V_+ = 5.0V$			0.6	4	μA
		$V_{IN} = 0V, V_{SHDN} = GND, V_+ = 3.3V$			0.18		
		$V_{IN} = 0V, V_{SHDN} = GND, V_+ = 2.6V$			0.1		
Output Offset Voltage	V_{OS}	$V_{IN} = 0V, V_{SHDN} = V_+ = 5.0V$		-50	5.3	50	mV
		$V_{IN} = 0V, V_{SHDN} = V_+ = 3.3V$		-50	4.7	50	
		$V_{IN} = 0V, V_{SHDN} = V_+ = 2.6V$		-50	4.4	50	
Quiescent Power Supply Current	I_Q	$V_{IN} = 0V,$ $V_{SHDN} = V_+$	$V_+ = 5.0V, \text{No Load}$		1.83	2.8	mA
			$V_+ = 3.3V, \text{No Load}$		1.72		
			$V_+ = 2.6V, \text{No Load}$		1.65		
Shutdown Voltage Input High	V_{SDIH}			1.8			V
Shutdown Voltage Input Low	V_{SDIL}					0.4	V
Output Power (per Channel)	P_O	$f = 1\text{kHz}$ $\text{THD+N} = 0.1\%$	$V_+ = 5.0V$	$R_L = 16\Omega$		158	mW
				$R_L = 32\Omega$		87	
			$V_+ = 3.6V$	$R_L = 16\Omega$		84	
				$R_L = 32\Omega$		47	
			$V_+ = 3.0V$	$R_L = 16\Omega$		58	
				$R_L = 32\Omega$		33	
			$V_+ = 2.6V$	$R_L = 16\Omega$		42	
				$R_L = 32\Omega$		25	
Total Harmonic Distortion + Noise	THD+N	$P_O = 78\text{mW}, V_+ = 5.0V, R_L = 32\Omega,$ $f = 20\text{Hz to } 20\text{kHz}$			0.3		%
Crosstalk	X_{talk}	$R_L = 32\Omega, P_O = 70\text{mW}, V_+ = 5V, f = 1\text{kHz}$			-100		dB
Power Supply Rejection Ratio	PSRR	$f = 217\text{Hz}$	$V_+ = 5.0V$		-62	dB	
			$V_+ = 3.6V$		-62		
			$V_+ = 3.0V$		-62		
			$V_+ = 2.6V$		-62		
		$f = 1\text{kHz}$	$V_+ = 5.0V$		-71		
			$V_+ = 3.6V$		-71		
			$V_+ = 3.0V$		-71		
			$V_+ = 2.6V$		-71		

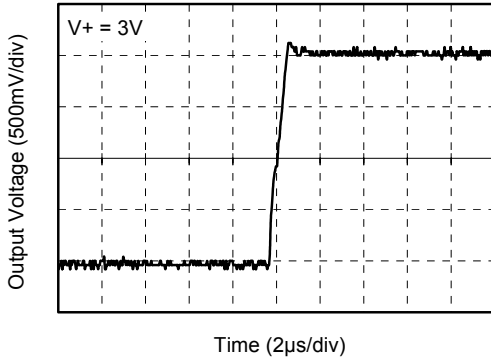
Specifications subject to changes without notice.

TYPICAL APPLICATION

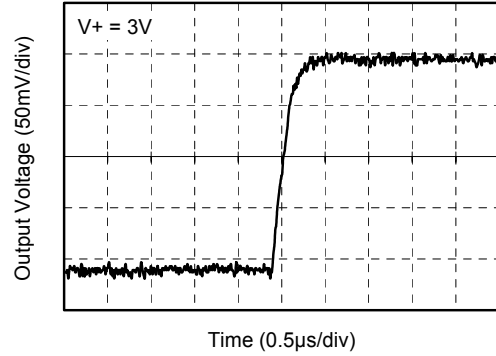


TYPICAL PERFORMANCE CHARACTERISTICS

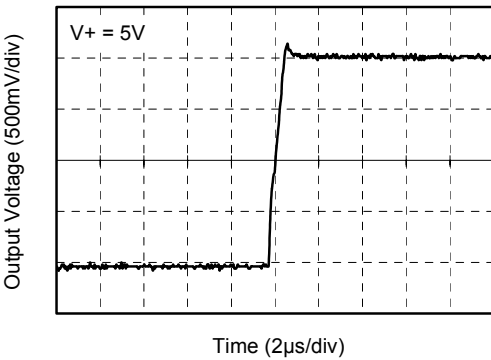
Large Signal Step Response



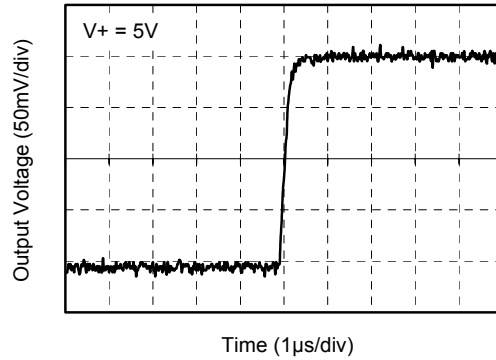
Small Signal Step Response



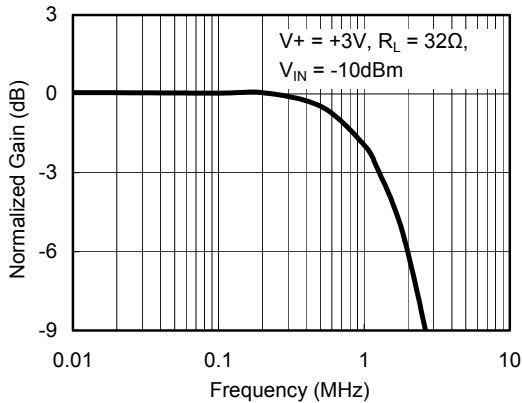
Large Signal Step Response



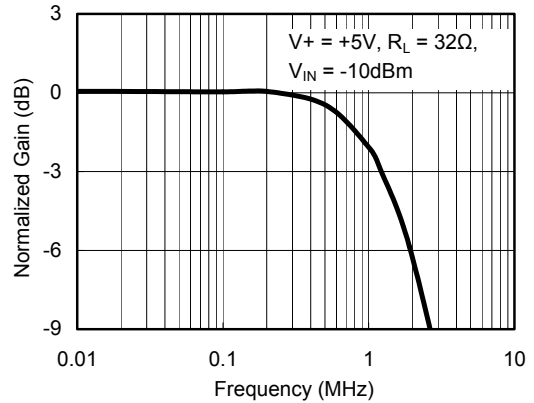
Small Signal Step Response



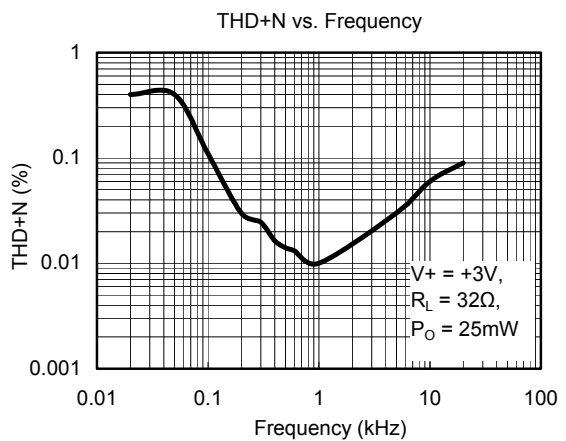
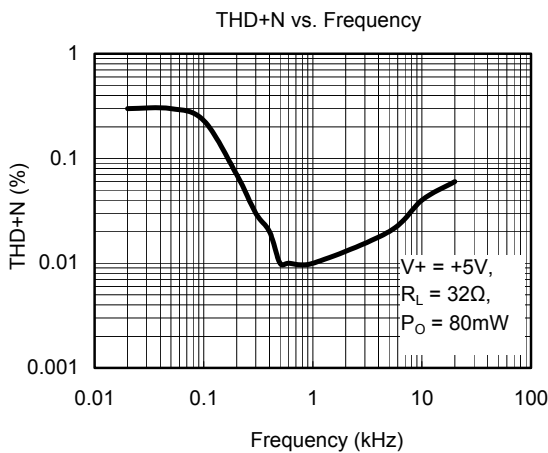
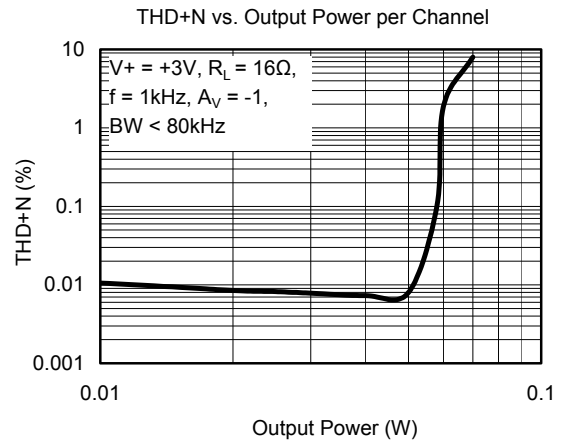
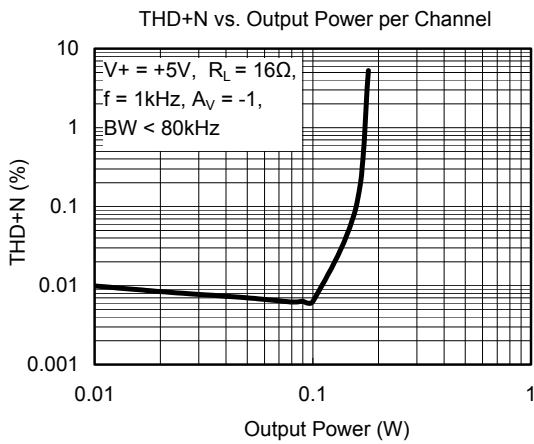
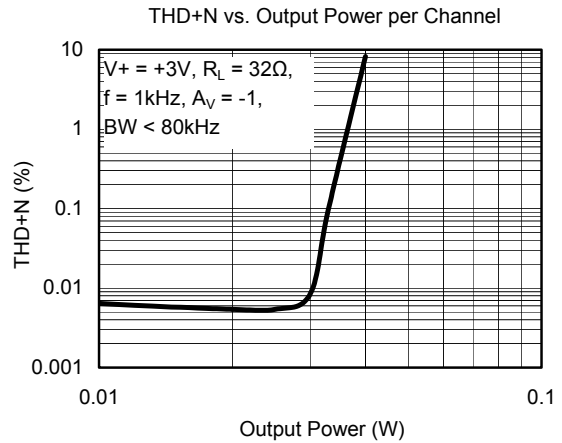
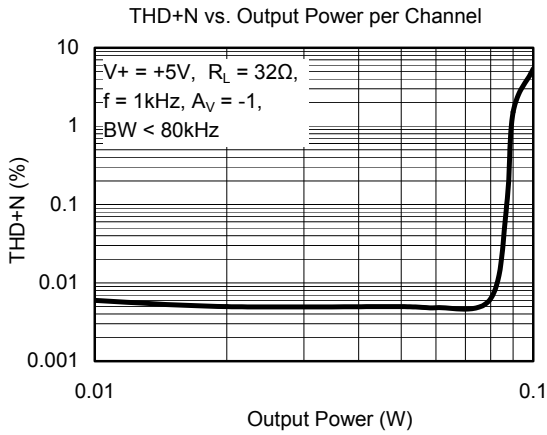
Small Signal Frequency Response



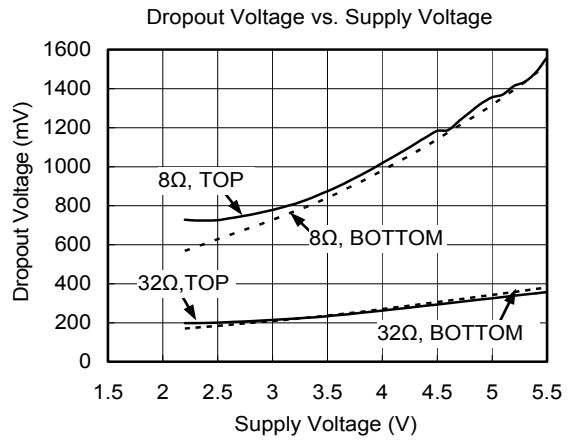
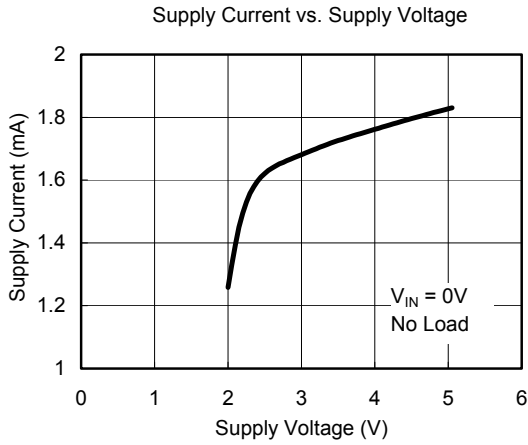
Small Signal Frequency Response



TYPICAL PERFORMANCE CHARACTERISTICS

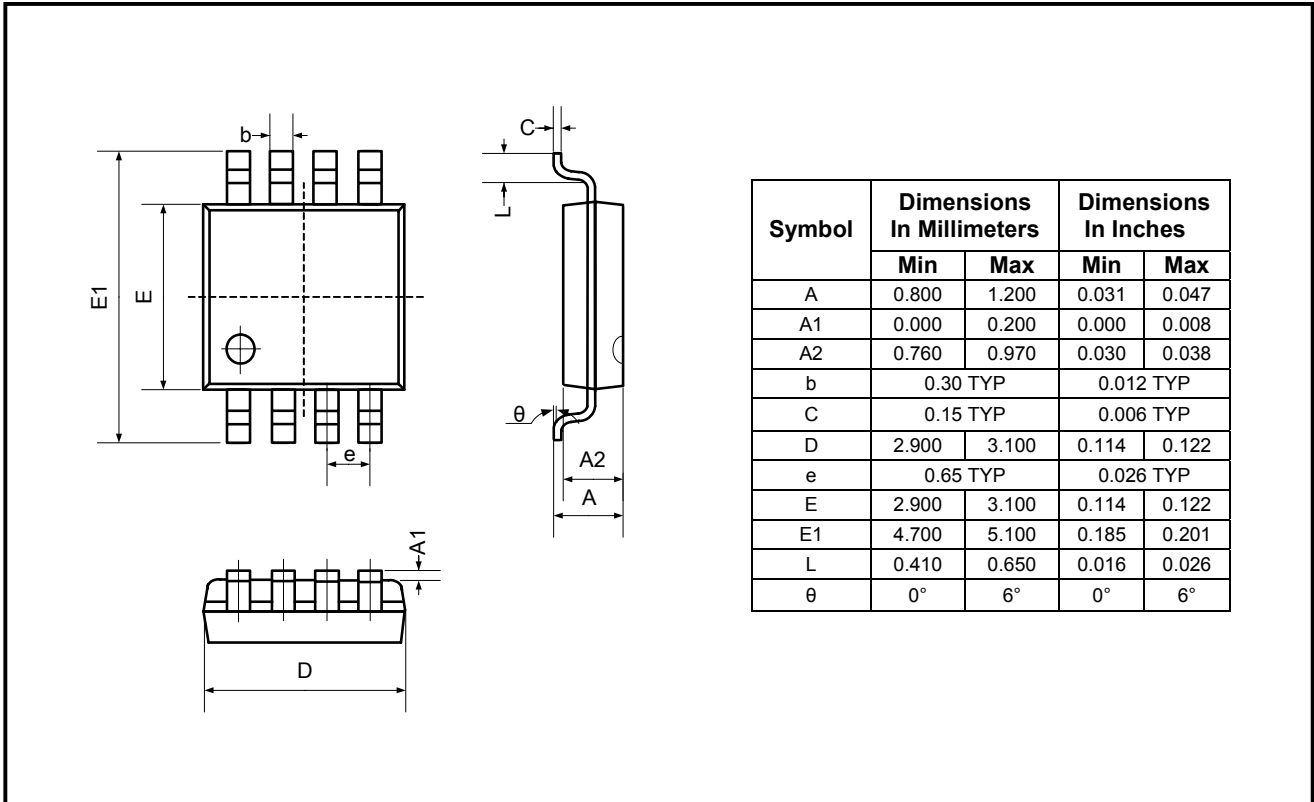


TYPICAL PERFORMANCE CHARACTERISTICS



PACKAGE OUTLINE DIMENSIONS

MSOP-8



04/2008 REV. A

SGMICRO is dedicated to provide high quality and high performance analog IC products to customers. All SGMICRO products meet the highest industry standards with strict and comprehensive test and quality control systems to achieve world-class consistency and reliability.

For information regarding SGMICRO Corporation and its products, see www.sg-micro.com