# SGM4810
# Dual 158mW Headphone Amplifier with Active High Shutdown Mode

## GENERAL DESCRIPTION

The SGM4810 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.

SGM4810 features an externally controlled, active-high, micropower consumption shutdown mode, as well as an internal thermal shutdown protection mechanism.

The SGM4810 does not require bootstrap capacitors or snubber networks. It is optimally suited for low-power portable systems.

For maximum flexibility, the SGM4810 provides an externally controlled gain (with resistors), as well as an externally controlled turn-on time (with the bypass capacitor).

The SGM4810 is available in Pb-free MSOP-8 package. It operates over an ambient temperature range of -40℃ to +85℃.

## FEATURES

- **Active-High 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**
- **2.5V to 5.5V Operation**
- **Shutdown Pin is Compatible with 1.8V Logic**
- **Shutdown Current: 0.5μA (TYP)**
- **Click and Pop Reduction Circuitry**
- **-40℃ to +85℃ Operating Temperature Range**
- **Pb-Free MSOP-8 Package**

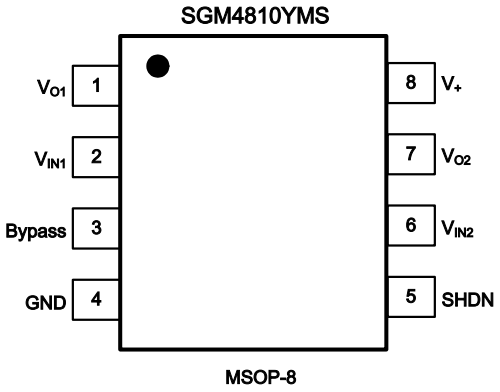
## APPLICATIONS

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

## PACKAGE/ORDERING INFORMATION

| MODEL | ORDER NUMBER | PACKAGE DESCRIPTION | PACKAGE OPTION | MARKING INFORMATION |
|---|---|---|---|---|
| SGM4810 | SGM4810YMS/TR | MSOP-8 | Tape and Reel, 3000 | SGM4810YMS |

## 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℃ to +150℃
Junction Temperature……..……150℃
Operating Temperature Range……..……-40℃ to +85℃
Lead Temperature Range (Soldering 10 sec)
……..……...260℃
ESD Susceptibility
HBM……..……..4KV
MM……..……..400V

NOTES

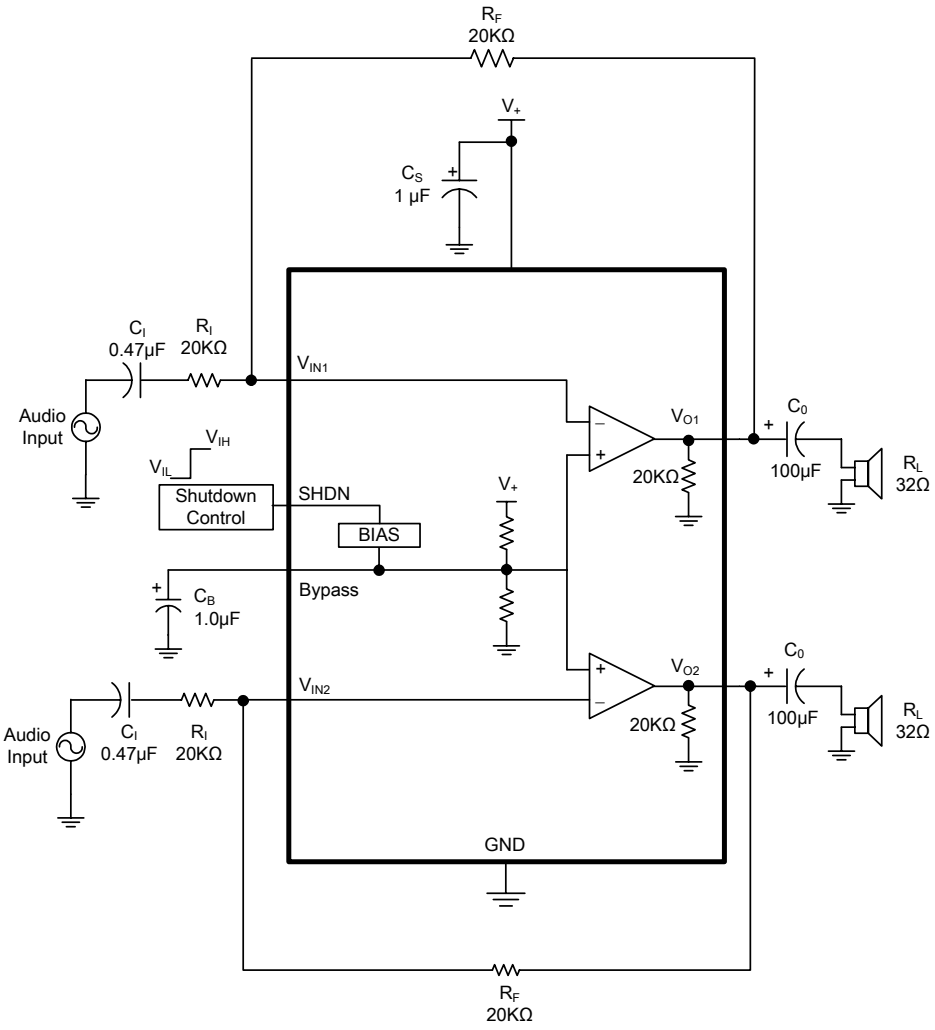
Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute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

## ELECTRICAL CHARACTERISTICS: $T_A$ = 25℃

| PARAMETER | SYMBOL | CONDITIONS | | | SGM4810 | | | UNITS |
|---|---|---|---|---|---|---|---|---|
| | | | | | MIN | TYP | MAX | |
| Supply Voltage | $V_+$ | | | | 2.5 | | 5.5 | V |
| Shutdown Current | $I_{SD}$ | $V_{IN}$ = 0V, $V_{SHDN}$ = $V_+$ = 5.0V | | | | 0.5 | 4 | μA |
| | | $V_{IN}$ = 0V, $V_{SHDN}$ = $V_+$ = 3.3V | | | | 0.5 | | |
| | | $V_{IN}$ = 0V, $V_{SHDN}$ = $V_+$ = 2.6V | | | | 0.1 | | |
| Output Offset Voltage | $V_{OS}$ | $V_{IN}$ = 0V, $V_{SHDN}$ = GND | | | -50 | 1 | 50 | mV |
| Quiescent Power Supply Current | $I_Q$ | $V_{IN}$ = 0V, $V_{SHDN}$ = GND | $V_+$ = 5.0V, No Load | | | 1.75 | 2.8 | mA |
| | | | $V_+$ = 3.3V, No Load | | | 1.64 | | |
| | | | $V_+$ = 2.6V, No Load | | | 1.58 | | |
| 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 = 1kHz THD+N=0.1% | $V_+$ = 5.0V | $R_L$ = 16Ω | | 158 | | mW |
| | | | | $R_L$ = 32Ω | | 87 | | |
| | | | $V_+$ = 3.6V | $R_L$ = 16Ω | | 84 | | |
| | | | | $R_L$ = 32Ω | | 47 | | |
| | | | $V_+$ = 3.0V | $R_L$ = 16Ω | | 58 | | |
| | | | | $R_L$ = 32Ω | | 33 | | |
| | | | $V_+$ = 2.6V | $R_L$ = 16Ω | | 42 | | |
| | | | | $R_L$ = 32Ω | | 25 | | |
| Total Harmonic Distortion + Noise | THD+N | $P_O$ = 78mWrms, $V_+$ = 5.0V, $R_L$ = 32Ω, f = 20Hz to 20kHz | | | | 0.3 | | % |
| Channel Separation | Crosstalk | $R_L$ = 32Ω, $P_O$ = 70mW, $V_+$ = 5.0V, f = 1kHz | | | | -100 | | dB |
| Power Supply Rejection Ratio | PSRR | f = 217Hz | $V_+$ = 5.0V | | | -62 | | dB |
| | | | $V_+$ = 3.6V | | | -62 | | |
| | | | $V_+$ = 3.0V | | | -62 | | |
| | | | $V_+$ = 2.6V | | | -62 | | |
| | | f = 1kHz | $V_+$ = 5.0V | | | -71 | | |
| | | | $V_+$ = 3.6V | | | -71 | | |
| | | | $V_+$ = 3.0V | | | -71 | | |
| | | | $V_+$ = 2.6V | | | -71 | | |

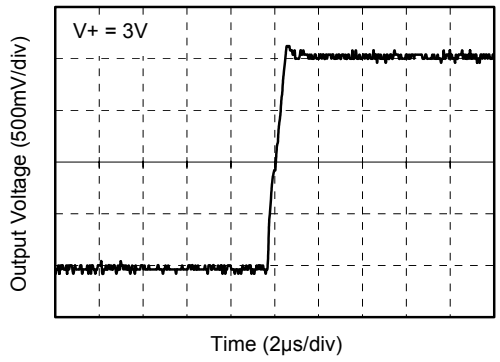
Specifications subject to changes without notice.

## TYPICAL APPLICATION

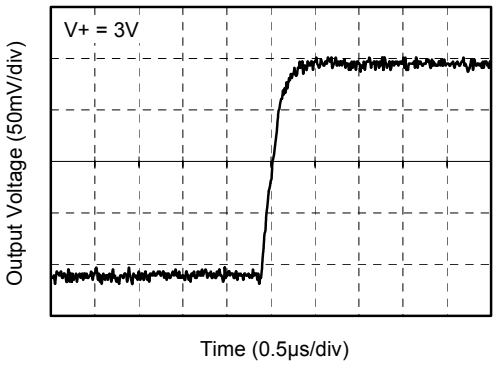


## TYPICAL PERFORMANCE CHARACTERISTICS

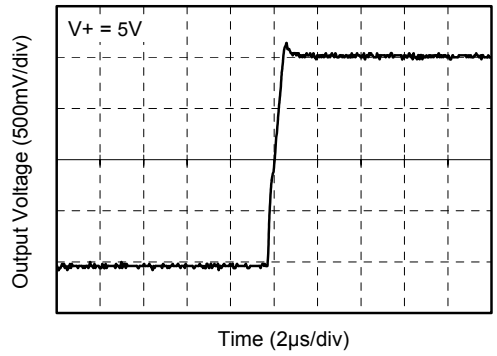
Large Signal Step Response



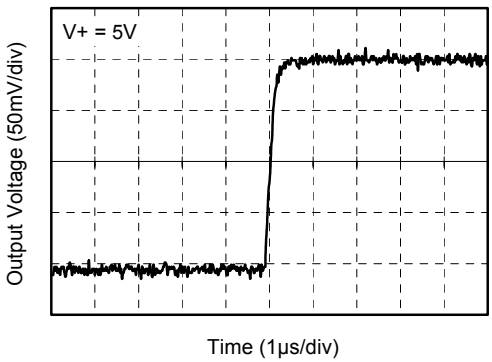

Small Signal Step Response



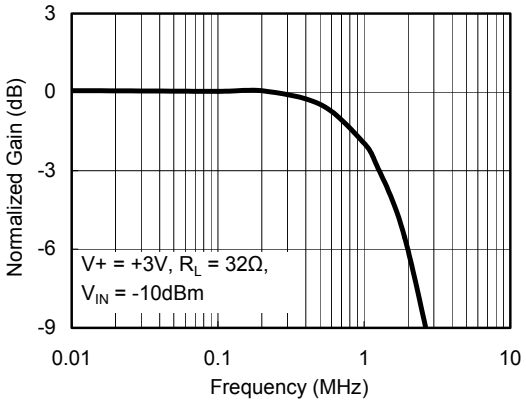

Large Signal Step Response



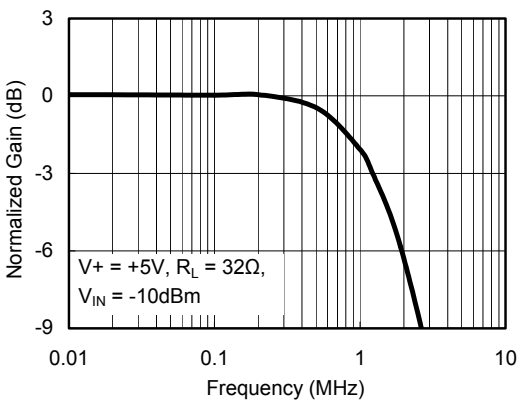

Small Signal Step Response




Small Signal Frequency Response

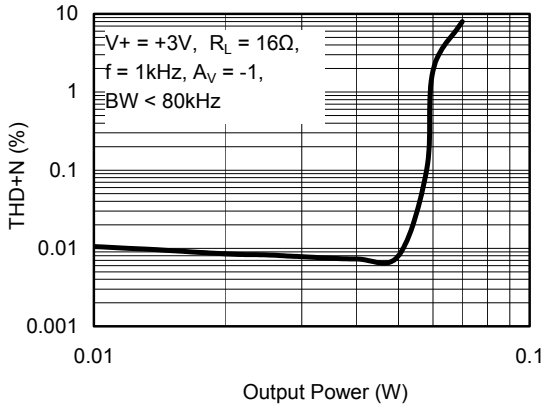



Small Signal Frequency Response



## TYPICAL PERFORMANCE CHARACTERISTICS

THD+N vs. Output Power per Channel

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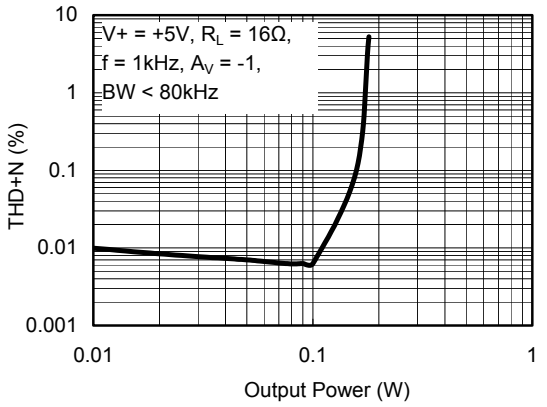


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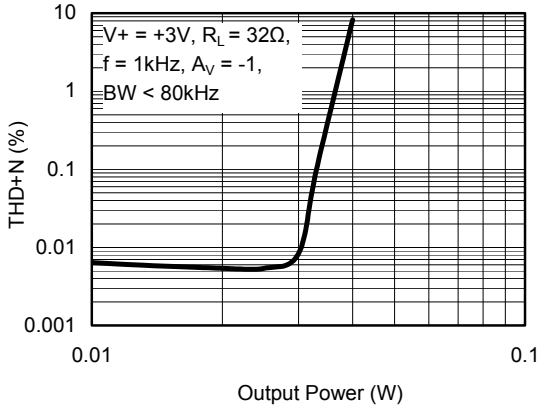
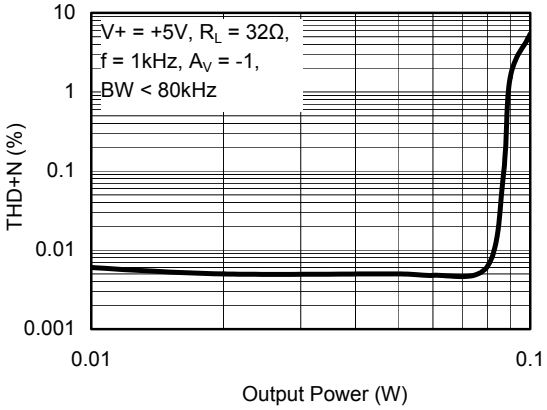
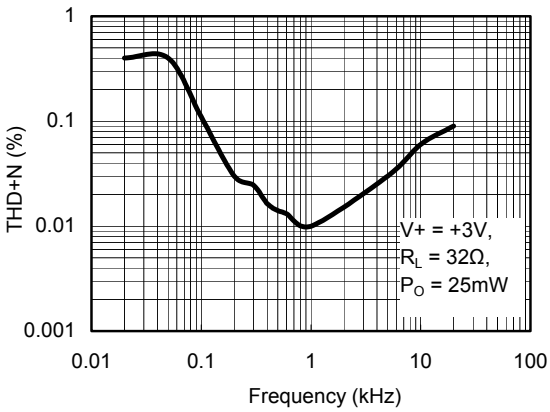


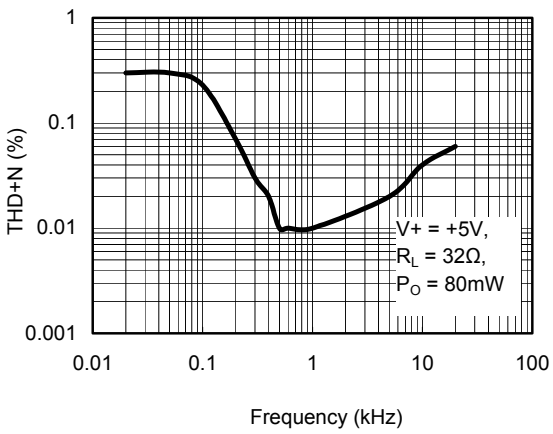

THD+N vs. Output Power per Channel




THD+N vs. Frequency

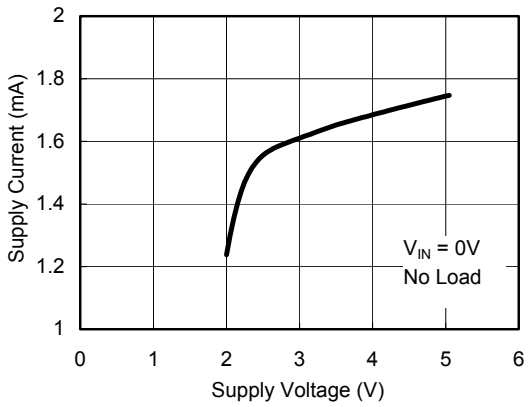



THD+N vs. Frequency

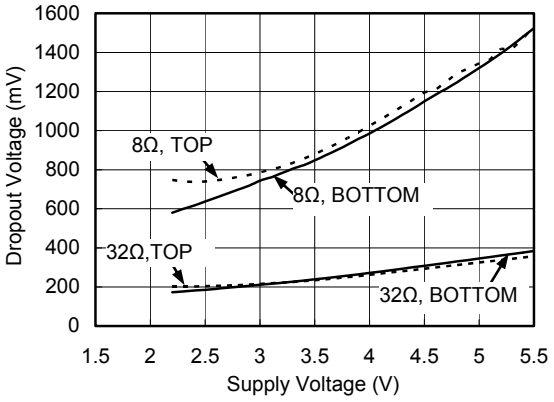


## TYPICAL PERFORMANCE CHARACTERISTICS

Supply Current vs. Supply Voltage

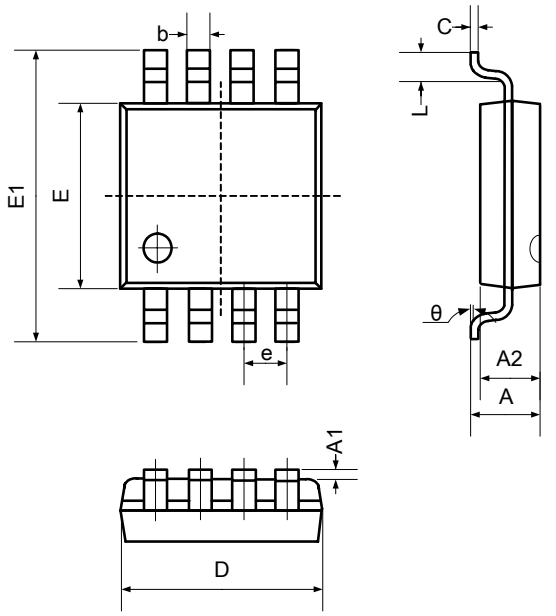



Dropout Voltage vs. Supply Voltage



# PACKAGE OUTLINE DIMENSIONS

## MSOP-8




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.800 | 1.200 | 0.031 | 0.047 |
| A1 | 0.000 | 0.200 | 0.000 | 0.008 |
| A2 | 0.760 | 0.970 | 0.030 | 0.038 |
| b | 0.30 TYP | | 0.012 TYP | |
| C | 0.15 TYP | | 0.006 TYP | |
| D | 2.900 | 3.100 | 0.114 | 0.122 |
| e | 0.65 TYP | | 0.026 TYP | |
| E | 2.900 | 3.100 | 0.114 | 0.122 |
| E1 | 4.700 | 5.100 | 0.185 | 0.201 |
| L | 0.410 | 0.650 | 0.016 | 0.026 |
| θ | 0° | 6° | 0° | 6° |

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