SGM4915
Dual 145mW Headphone Amplifier with Active Low Shutdown Mode

GENERAL DESCRIPTION

The SGM4915 is a dual audio power amplifier capable of delivering 145mW per channel of continuous average power with less than 0.1% distortion (THD) 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.

SGM4915 features an externally controlled, active-low, micropower consumption shutdown mode, as well as an internal thermal shutdown protection mechanism.

SGM4915 does not require bootstrap capacitors or snubber networks. It is optimally suited for low-power portable systems.

For maximum flexibility, the SGM4915 provides an externally controlled gain (with resistors), as well as an externally controlled turn-on time (with the bypass capacitor).

The SGM4915 is available in Green TDFN-2×2-8L package. It operates over an ambient temperature range of -40℃ to +85℃.

FEATURES

- **Active-Low Shutdown Mode**
- **145mW into 16Ω Load from 5V Power Supply at THD+N = 0.1% Typical (per Channel)**
- **85mW into 32Ω Load from 5V Power Supply at THD+N = 0.1% Typical (per Channel)**
- **Unity Gain Stable**
- **Shutdown Current: 0.02μA (TYP)**
- **2.5V to 5.5V Operation**
- **Shutdown Pin is Compatible with 1.8V Logic**
- **Click and Pop Reduction Circuitry**
- **-40℃ to +85℃ Operating Temperature Range**
- **Green TDFN-2×2-8L 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
SGM4915	SGM4915YDE8G/TR	TDFN-2×2-8L	Tape and Reel, 3000	4915

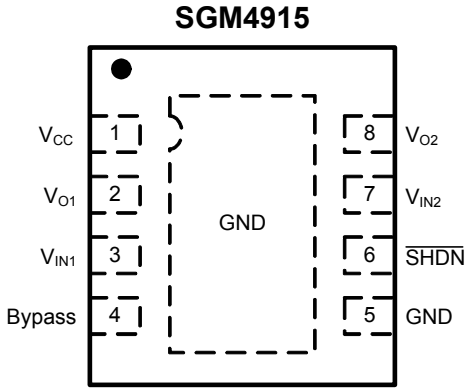
Note 1: Order number is defined as the follow:

ORDER NUMBER

SGM4915 X X G / TR

- Tape and Reel
- Green Product
- Package Type
  - DE8 TDFN-2×2-8L
- Operating Temperature Range
  - Y -40℃ to +85℃

PIN CONFIGURATION (Top View)



TDFN-2×2-8L

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.

ABSOLUTE MAXIMUM RATINGS

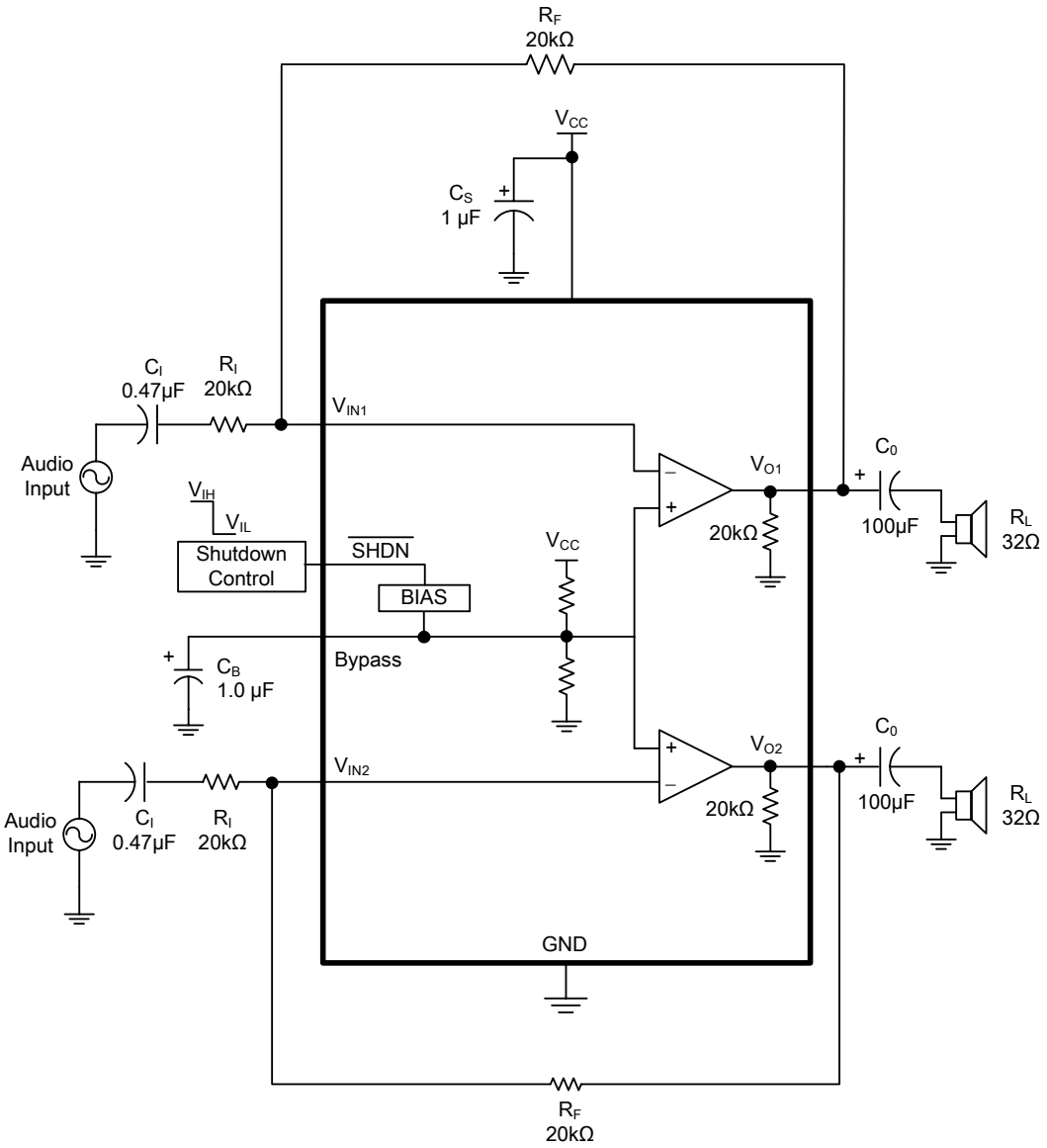
Supply Voltage 6V
Input Voltage ..... -0.3V to (V_{CC}) + 0.3V
Storage Temperature Range ..... -65℃ to +150℃
Junction Temperature .....150℃
Operating Temperature Range ..... -40℃ to +85℃
Lead Temperature Range (Soldering 10 sec)
..... 260℃
ESD Susceptibility
HBM.....2000V
MM.....200V

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.

ELECTRICAL CHARACTERISTICS: T_A = 25°C

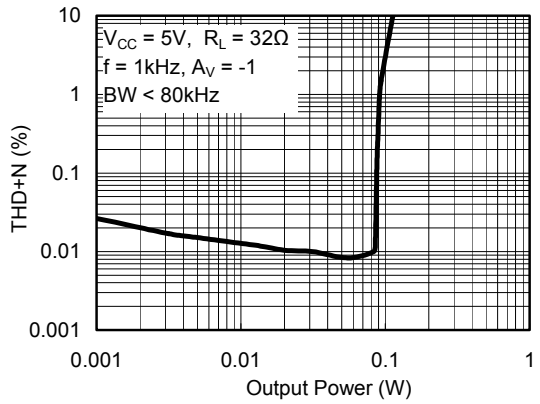
PARAMETER	SYMBOL	CONDITIONS			SGM4915			UNITS
					MIN	TYP	MAX	
Supply Voltage	V_{CC}				2.5		5.5	V
Shutdown Current	I_{SD}	V_{IN} = 0V, V_{SHDN} = GND, V_{CC} = 5.0V				0.02	4	μA
		V_{IN} = 0V, V_{SHDN} = GND, V_{CC} = 3.3V				0.02		
		V_{IN} = 0V, V_{SHDN} = GND, V_{CC} = 2.6V				0.02		
Output Offset Voltage	V_{OS}	V_{IN} = 0V, V_{SHDN} = V_{CC} = 5.0V			-50	2.5	50	mV
		V_{IN} = 0V, V_{SHDN} = V_{CC} = 3.3V				2.5		
		V_{IN} = 0V, V_{SHDN} = V_{CC} = 2.6V				2.5		
Quiescent Power Supply Current	I_Q	V_{IN} = 0V, V_{SHDN} = V_{CC}	V_{CC} = 5.0V, No Load			1.65	2.8	mA
			V_{CC} = 3.3V, No Load			1.50		
			V_{CC} = 2.6V, No Load			1.40		
Shutdown Voltage Input High	V_{SDIH}				1.2			V
Shutdown Voltage Input Low	V_{SDIL}						0.4	V
Output Power (per Channel)	P_O	f = 1kHz THD+N = 0.1%	V_{CC} = 5.0V	R_L = 16Ω		145		mW
				R_L = 32Ω		85		
			V_{CC} = 3.6V	R_L = 16Ω		78		
				R_L = 32Ω		44		
			V_{CC} = 3.0V	R_L = 16Ω		54		
				R_L = 32Ω		31		
			V_{CC} = 2.6V	R_L = 16Ω		40		
				R_L = 32Ω		23		
Total Harmonic Distortion + Noise	THD+N	P_O = 78mW, V_{CC} = 5.0V, R_L = 32Ω, f = 20Hz to 20kHz				0.1		%
Crosstalk	X_{talk}	R_L = 32Ω, P_O = 70mW, V_{CC} = 5V, f = 1kHz				-85		dB
Power Supply Rejection Ratio	PSRR	f = 217Hz, C_B = 1μF, R_L = 32Ω V_{RIPPLE} = 200mVp-p, Input Grounded with 10Ω	V_{CC} = 5.0V			-67		dB
			V_{CC} = 3.6V			-67		
			V_{CC} = 3.0V			-65		
			V_{CC} = 2.6V			-64		
		f = 1kHz, C_B = 1μF, R_L = 32Ω V_{RIPPLE} = 200mVp-p, Input Grounded with 10Ω	V_{CC} = 5.0V			-75		
			V_{CC} = 3.6V			-75		
			V_{CC} = 3.0V			-74		
			V_{CC} = 2.6V			-65		

TYPICAL APPLICATION



TYPICAL PERFORMANCE CHARACTERISTICS

THD+N vs. Output Power per Channel



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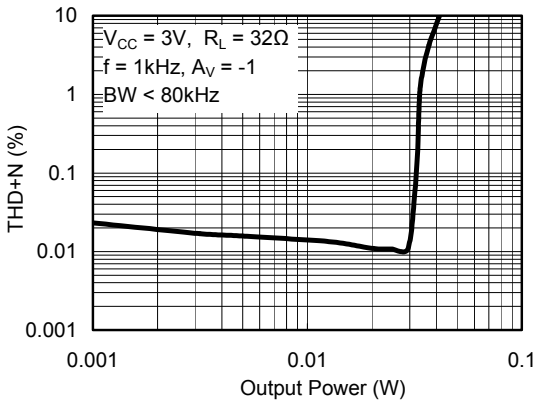

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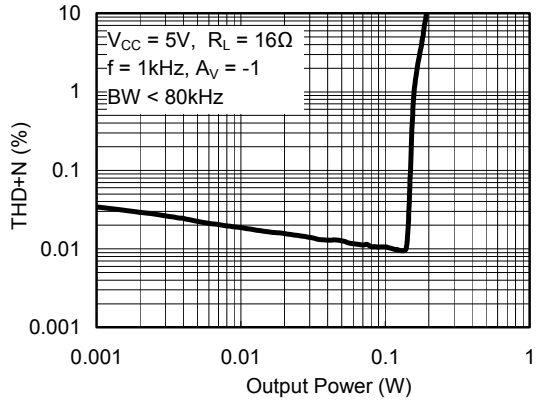
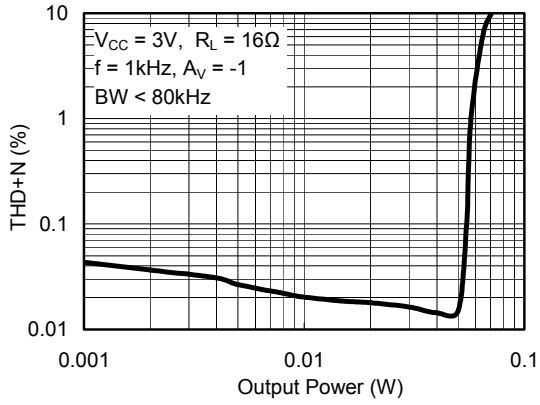
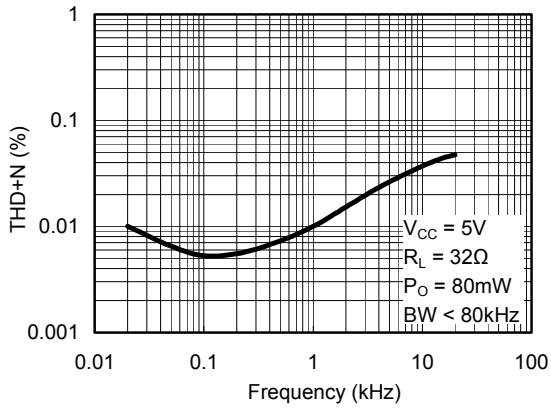


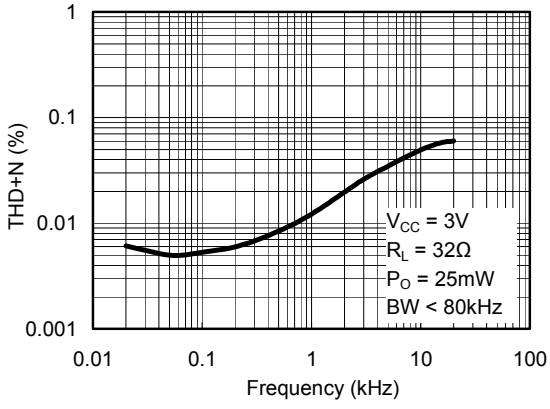
THD+N vs. Output Power per Channel



THD+N vs. Frequency

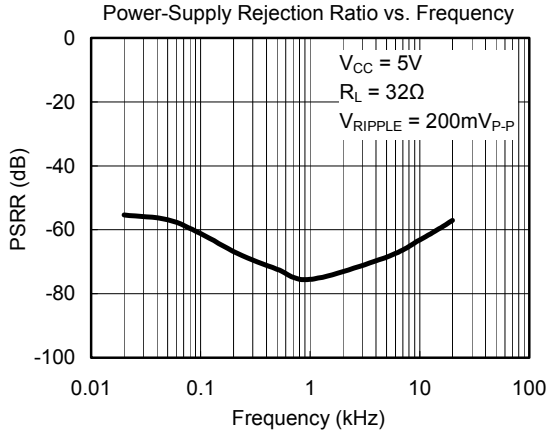


THD+N vs. Frequency



TYPICAL PERFORMANCE CHARACTERISTICS

Power-Supply Rejection Ratio vs. Frequency



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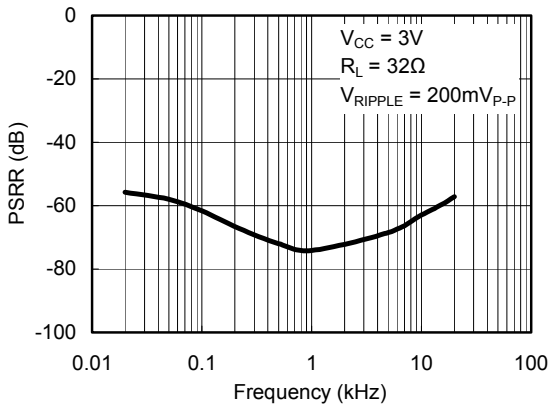
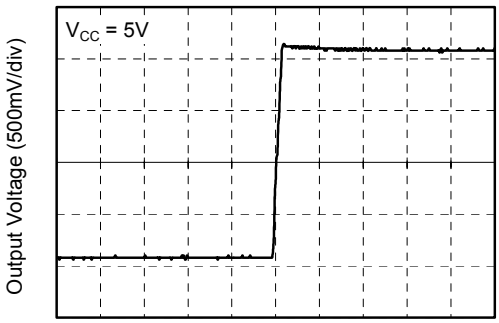


Large Signal Step Response



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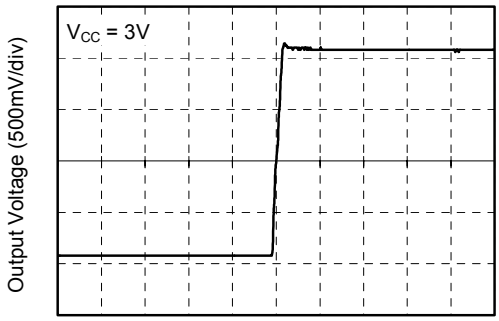
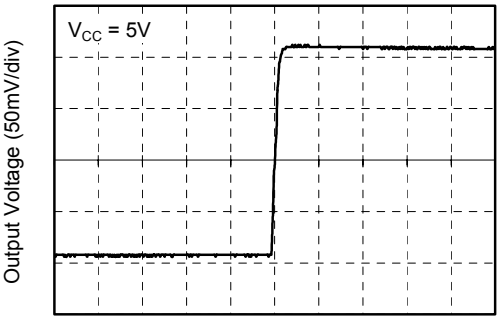


Small Signal Step Response



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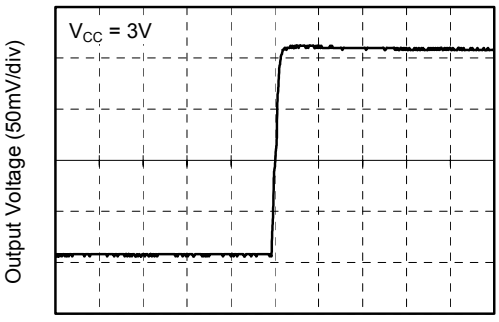
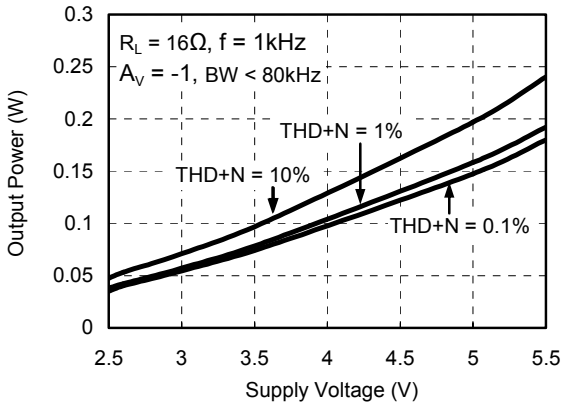


TYPICAL PERFORMANCE CHARACTERISTICS

Output Power vs. Supply Voltage



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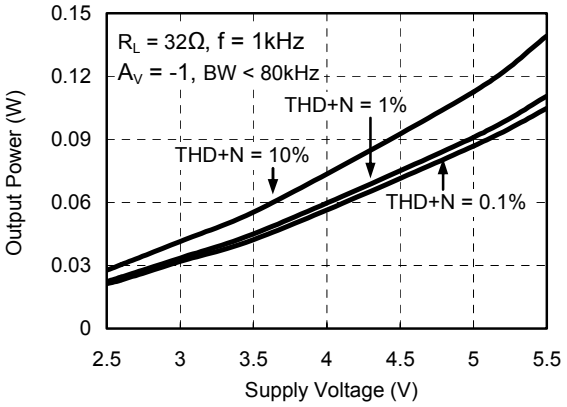
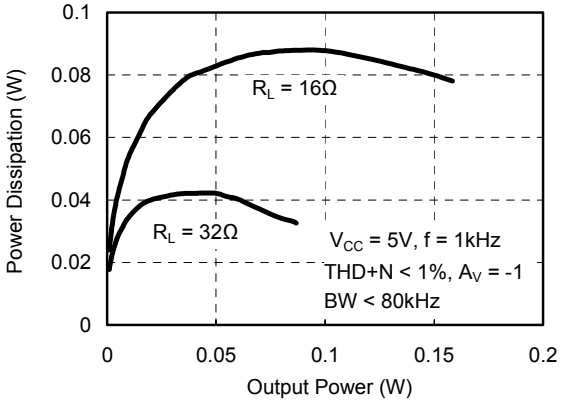
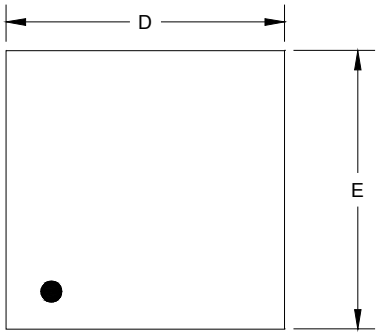


Power Dissipation vs. Output Power per channel

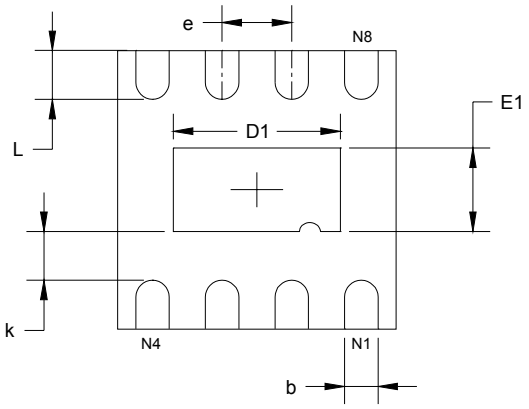


PACKAGE OUTLINE DIMENSIONS

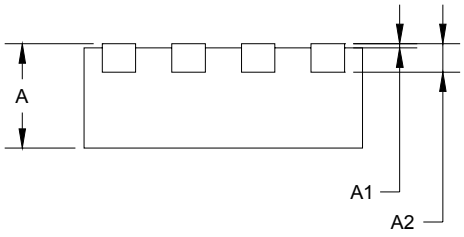
TDFN-2×2-8L



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	1.900	2.100	0.075	0.083
D1	1.100	1.300	0.043	0.051
E	1.900	2.100	0.075	0.083
E1	0.500	0.700	0.020	0.028
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.500 TYP		0.020 TYP	
L	0.250	0.450	0.010	0.018