SGM4866
1.28W Stereo Audio Power Amplifier

GENERAL DESCRIPTION

The SGM4866 is a stereo audio power amplifier that is designed for demanding applications in mobile phones and other portable communication device applications. It is capable of delivering 1.28W of continuous average power per channel into an 8Ω bridge tied load (BTL) with typically 1% distortion (THD+N) from a 5V power supply.

The SGM4866 features an externally controlled, low power consumption shutdown mode and thermal shutdown protection. It also utilizes circuitry to reduce “pop/click” during device turn-on.

The SGM4866 is unity-gain stable and can be configured by external gain-setting resistors.

The SGM4866 is available in Green TQFN-3×3-16L package. It operates over an ambient temperature range of -40℃ to +85℃.

FEATURES

- **1.28W into 8Ω BTL Load from 5V Supply at THD+N = 1% (Typical, per Channel)**
- **Excellent PSRR: Direct Connection to Battery**
- **Unity Gain Stable**
- **2.6V to 5.5V Operation**
- **Shutdown Current: 0.01μA (TYP)**
- **Improved Pop/Click Circuitry**
- **No Output Coupling Capacitors**
- **External Gain Configuration Capability**
- **Thermal Shutdown Protection Circuitry**
- **-40℃ to +85℃ Operating Temperature Range**
- **Available in Green TQFN-3×3-16L Package**

APPLICATIONS

Cell Phones, PDA, MP4, PMP
Portable and Desktop Computers
Desktops Audio System
Multimedia Monitors

PACKAGE/ORDERING INFORMATION

MODEL	ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	MARKING INFORMATION
SGM4866	SGM4866YTQ16G/TR	TQFN-3×3-16L	Tape and Reel, 3000	4866TQ

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 10sec)
. . . . . 260℃
ESD Susceptibility
HBM 3000V
MM 400V

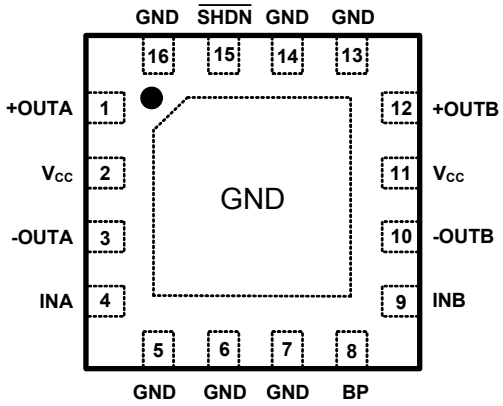
NOTE:
Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. 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 latest datasheet.

PIN CONFIGURATION (TOP VIEW)



TQFN-3×3-16L

ELECTRICAL CHARACTERISTICS

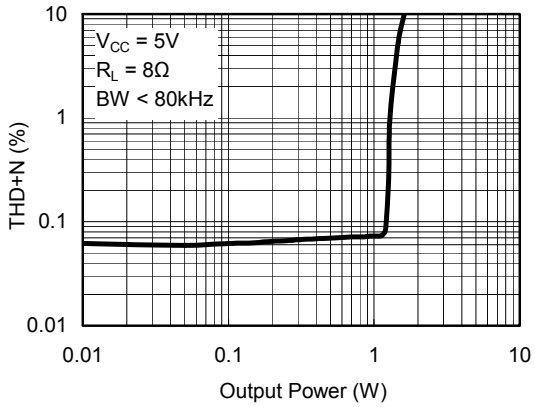
(T_A = +25℃, unless otherwise specified.)

PARAMETER	SYMBOL	CONDITIONS		SGM4866			UNITS
				MIN	TYP	MAX	
Supply Voltage	V_{CC}			2.6		5.5	V
Shutdown Current	I_{SD}	V_{IN} = 0V, V_{SHDN} = GND, V_{CC} = V_+			0.01	3	μA
Output Offset Voltage	V_{OS}	V_{IN} = 0V, V_{SHDN} = V_{CC} = 5.0V		-25	5.0	25	mV
		V_{IN} = 0V, V_{SHDN} = V_{CC} = 3.0V		-25	4.3	25	
Quiescent Power Supply Current	I_Q	V_{IN} = 0V	V_{CC} = +5V, No Load		11.6	17	mA
			V_{CC} = +5V, 8Ω Load		11.9	18	
			V_{CC} = +3V, No Load		10.2	15	
			V_{CC} = +3V, 8Ω Load		10.4		
Shutdown Voltage Input High	V_{SDIH}			1.2			V
Shutdown Voltage Input Low	V_{SDIL}					0.4	
Output Power per Channel (8Ω)	P_O	f = 1kHz, THD+N = 1%	V_{CC} = +5V		1.28		W
			V_{CC} = +3.6V		0.65		
			V_{CC} = +3V		0.44		
		f = 1kHz, THD+N = 10%	V_{CC} = +5V		1.60		
			V_{CC} = +3.6V		0.80		
			V_{CC} = +3V		0.55		
Output Power per Channel (4Ω)	P_O	f = 1kHz, THD+N = 1%	V_{CC} = +5V		2.05		W
			V_{CC} = +3.6V		1.00		
			V_{CC} = +3V		0.70		
		f = 1kHz, THD+N = 10%	V_{CC} = +5V		2.58		
			V_{CC} = +3.6V		1.30		
			V_{CC} = +3V		0.88		
Total Harmonic Distortion + Noise	THD+N	f = 1kHz, A_V = 2, R_L = 8Ω	V_{CC} = +5V, P_O = 0.9W		0.07		%
			V_{CC} = +3V, P_O = 0.35W		0.06		
Power Supply Rejection Ratio	PSRR	Input 10Ω terminated, f = 217Hz, C_{BYPASS} = 1μF	V_{CC} = +5V		-64		dB
			V_{CC} = +3V		-66		
		Input 10Ω terminated, f = 1kHz, C_{BYPASS} = 1μF	V_{CC} = +5V		-65		
			V_{CC} = +3V		-68		
Crosstalk	X_{TALK}	f = 1kHz, C_{BYPASS} = 1μF, P_O = 1W			-85		dB
Turn-On Time	T_{ON}	C_{BYPASS} = 1μF	V_{CC} = +5V		150		ms
			V_{CC} = +3V		104		

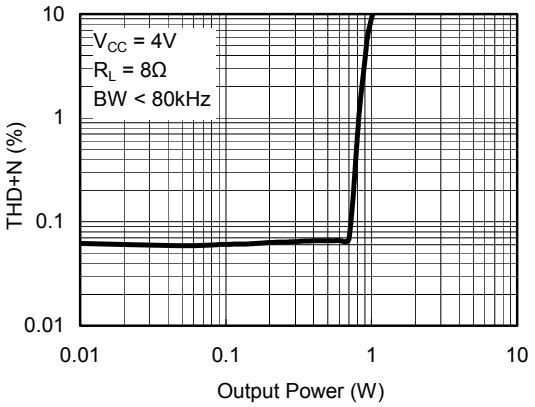
TYPICAL PERFORMANCE CHARACTERISTICS

At T_A = +25℃, A_V = 2, f = 1kHz, C_{BYPASS} = 1μF, unless otherwise noted.

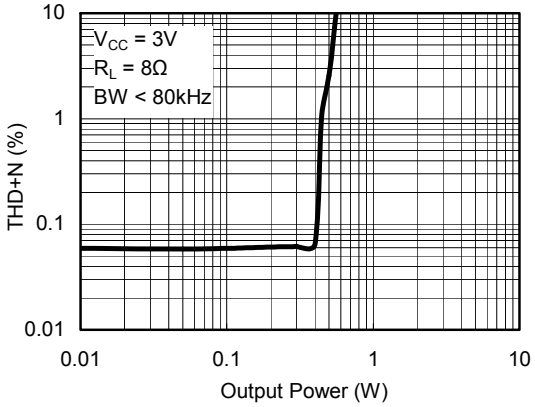
THD+N vs. Output Power per Channel



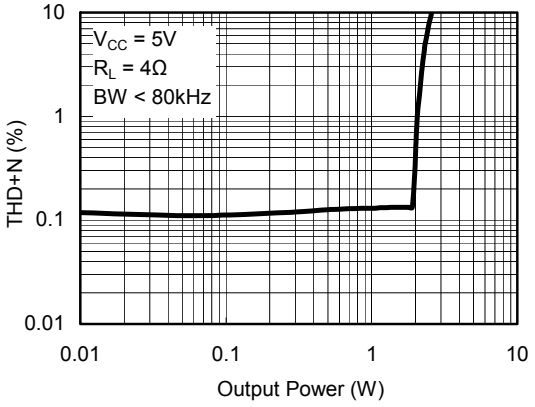
THD+N vs. Output Power per Channel



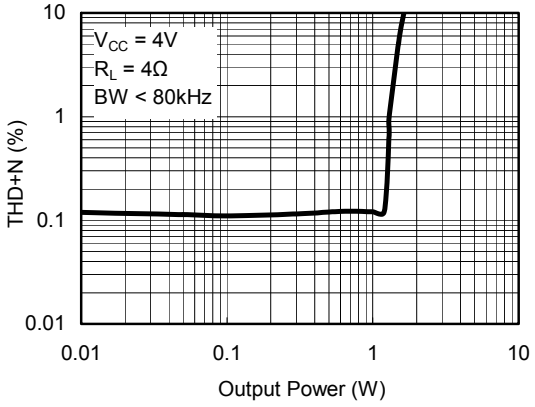
THD+N vs. Output Power per Channel



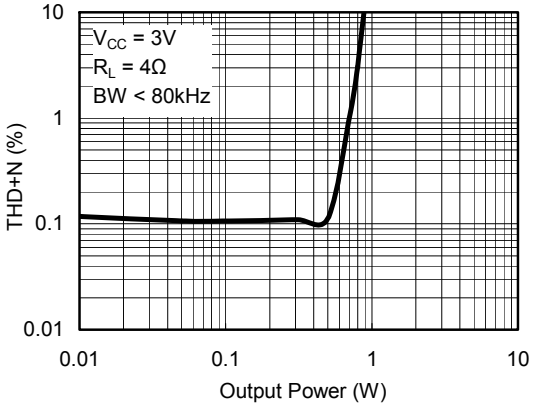
THD+N vs. Output Power per Channel



THD+N vs. Output Power per Channel



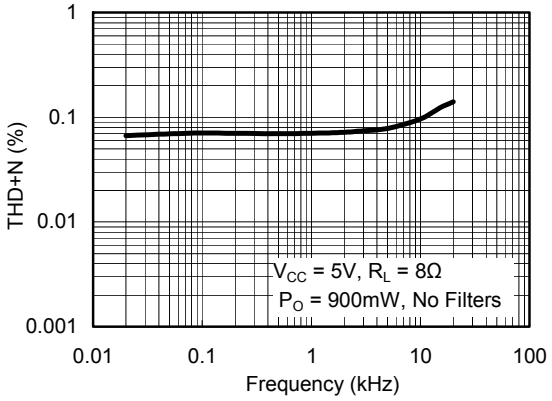
THD+N vs. Output Power per Channel



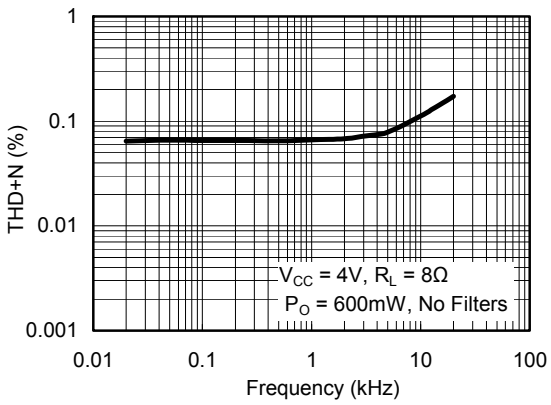
TYPICAL PERFORMANCE CHARACTERISTICS

At T_A = +25℃, A_V = 2, f = 1kHz, C_{BYPASS} = 1μF, unless otherwise noted.

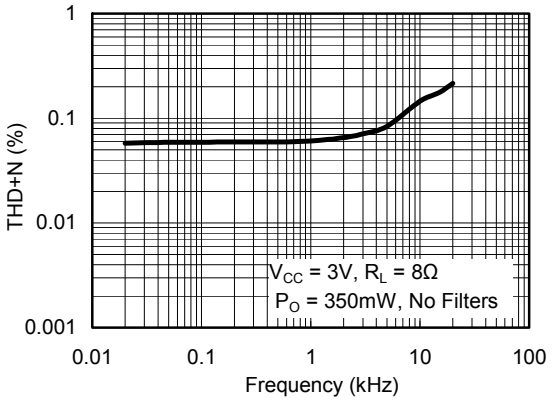
THD+N vs. Frequency



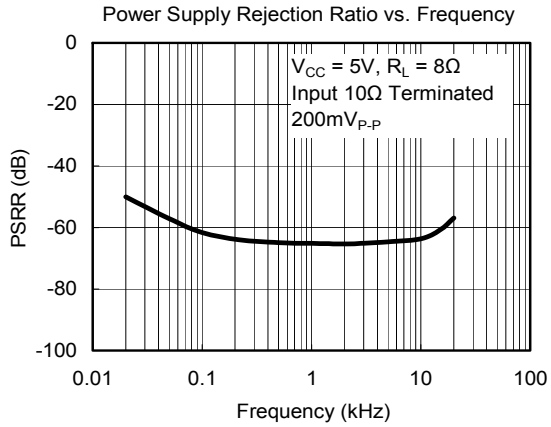
THD+N vs. Frequency



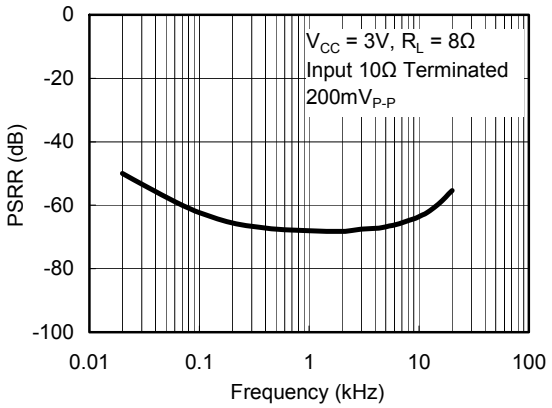
THD+N vs. Frequency



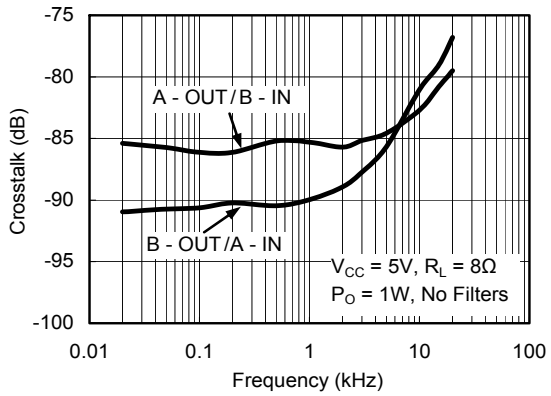
Power Supply Rejection Ratio vs. Frequency



Power Supply Rejection Ratio vs. Frequency



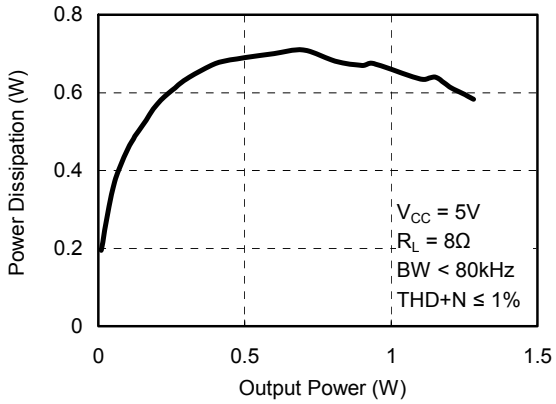
Crosstalk or Separation vs. Frequency



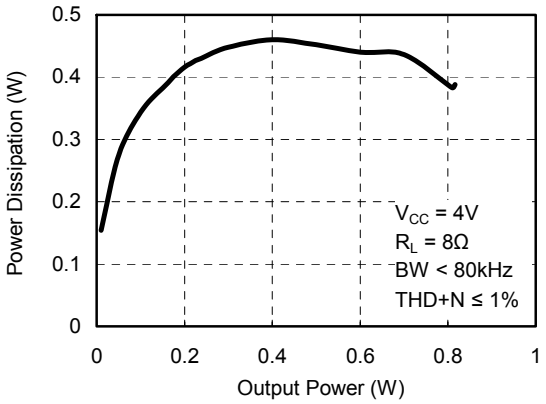
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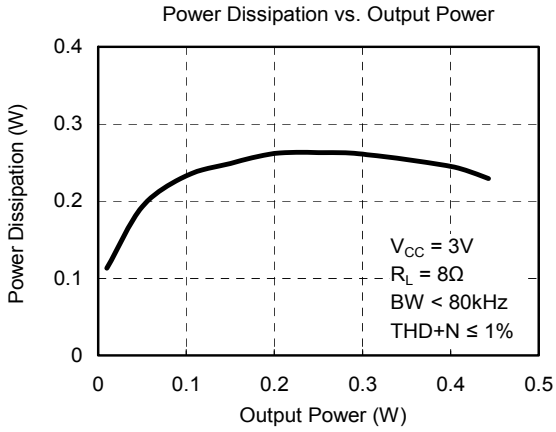
Power Dissipation vs. Output Power



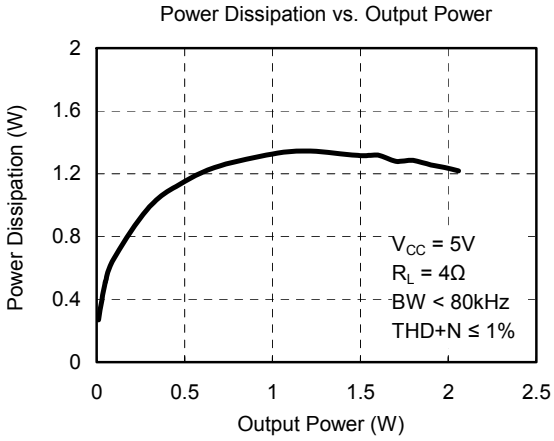
Power Dissipation vs. Output Power



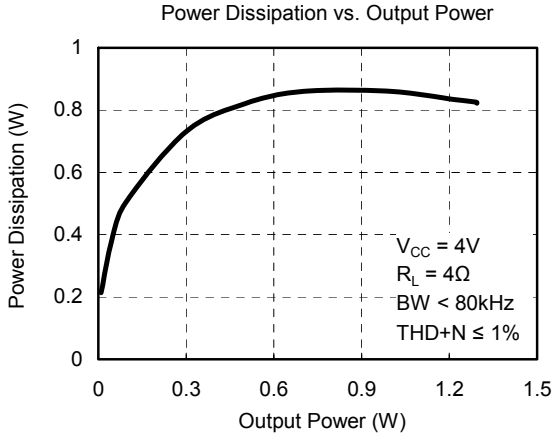
Power Dissipation vs. Output Power



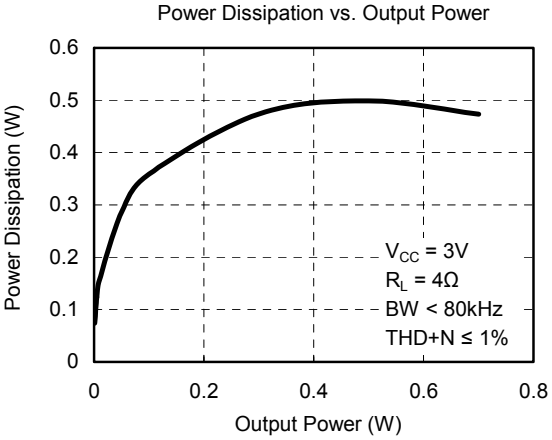
Power Dissipation vs. Output Power



Power Dissipation vs. Output Power

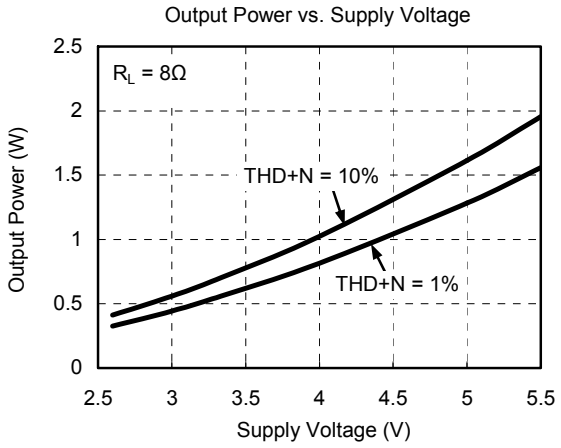


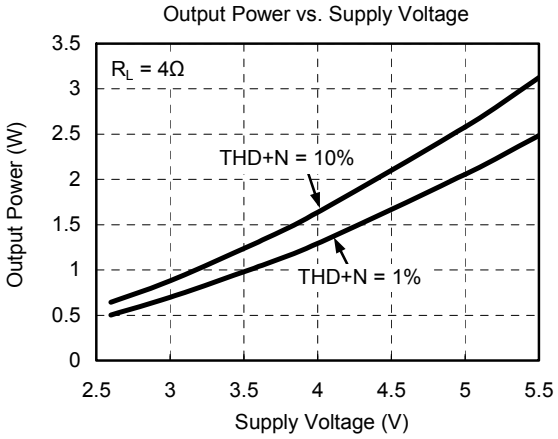
Power Dissipation vs. Output Power



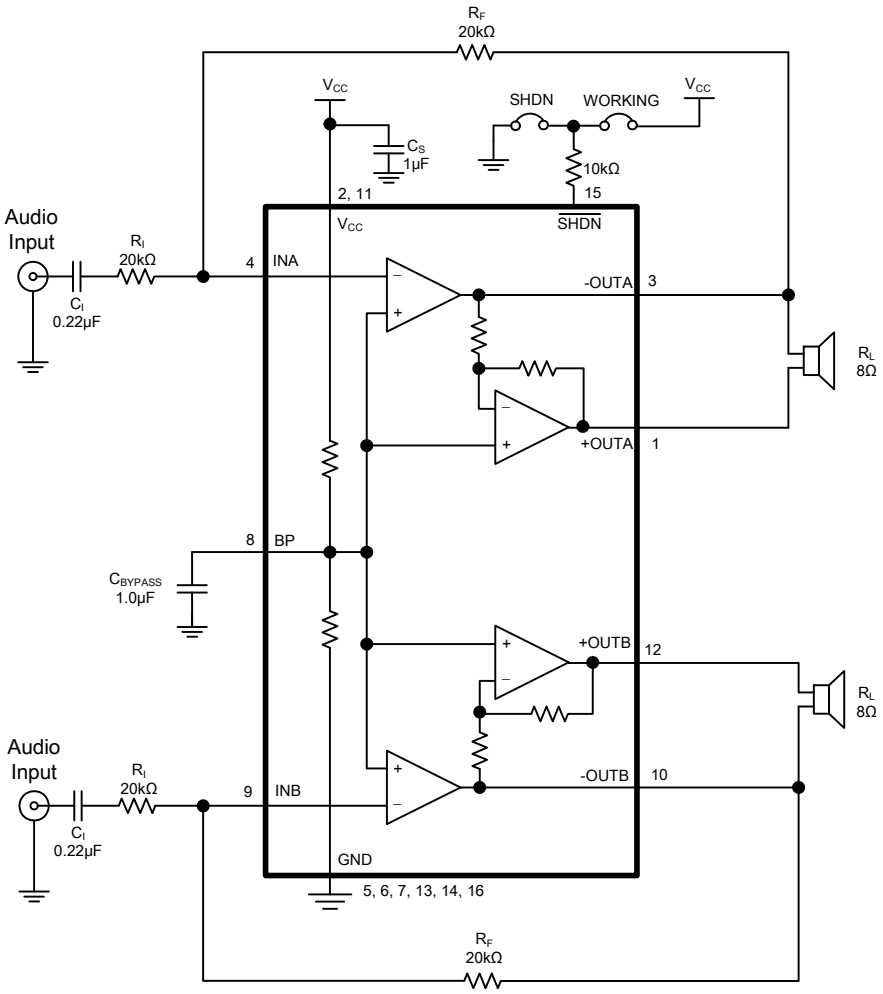
TYPICAL PERFORMANCE CHARACTERISTICS

At T_A = +25℃, A_V = 2, f = 1kHz, C_{BYPASS} = 1μF, unless otherwise noted.





TYPICAL APPLICATION CIRCUIT



NOTE:
1. A 10kΩ resistor must be serially connected to $\overline{SHDN}$ pin.

APPLICATION NOTE

PCB Design Recommendations (Thermal Design Considerations)

Thermal Vias

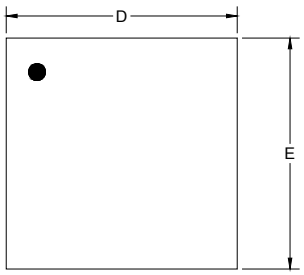
SGM4866 is capable of delivering 2.05W of continuous average power per channel into a 4Ω bridge tied load (BTL) with typically 1% distortion (THD+N) from a 5V power supply, but thermal vias are necessary. They conduct heat from the exposed pad of the package to the ground plane. The number of vias is application specific and is dependent upon electrical requirements and power dissipation.

The via diameter should be 0.2mm to 0.33mm with 1oz. copper via barrel plating. It is important to plug the via to avoid any solder wicking inside the via during the soldering process. The thermal vias can be tented with solder mask on the top surface of the PCB. The solder mask diameter should be at least 75microns (or 3mils) larger than the via diameter. The solder mask thickness should be the same across the entire PCB.

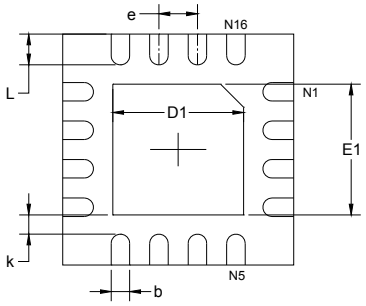
A package thermal performance may be improved by increasing the number of vias.

PACKAGE OUTLINE DIMENSIONS

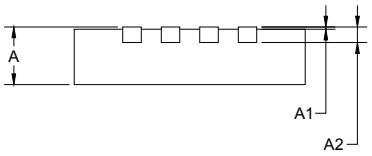
TQFN-3×3-16L



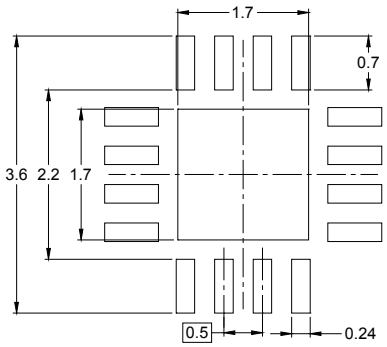
TOP VIEW



BOTTOM VIEW



SIDE VIEW

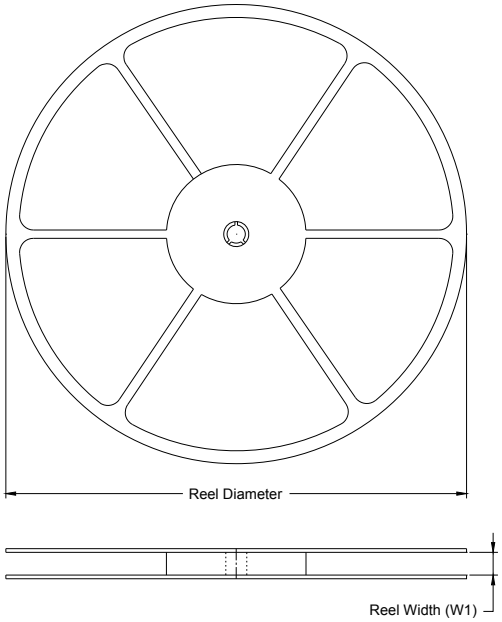


RECOMMENDED LAND PATTERN (Unit: mm)

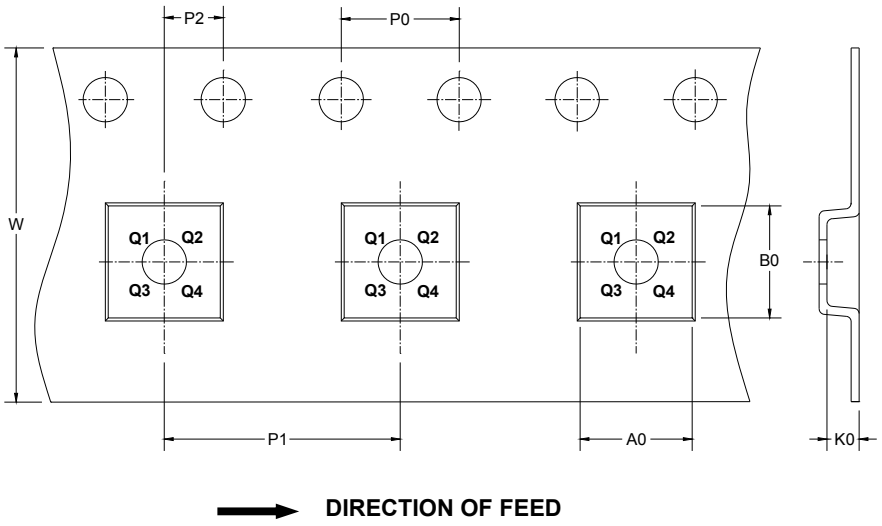
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	2.900	3.100	0.114	0.122
D1	1.600	1.800	0.063	0.071
E	2.900	3.100	0.114	0.122
E1	1.600	1.800	0.063	0.071
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.500 TYP		0.020 TYP	
L	0.300	0.500	0.012	0.020

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS

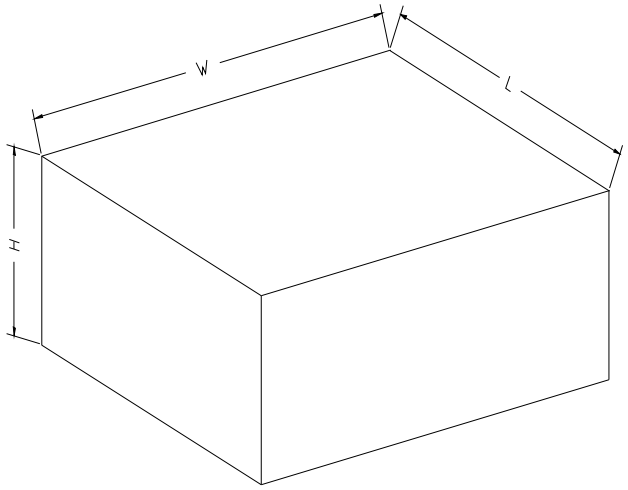


NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TQFN-3×3-16L	13″	12.40	3.35	3.35	1.13	4.00	4.00	2.00	12.00	Q1

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
13″	386	280	370	5