



# SGM4866

## 1.28W Stereo Audio Power Amplifier

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### 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°C to +85°C.

### 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°C to +85°C 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 <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 10sec)	260°C
ESD Susceptibility	
HBM	3000V
MM	400V

**NOTE:**

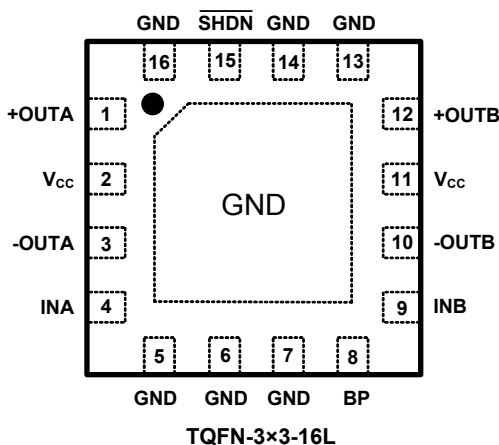
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



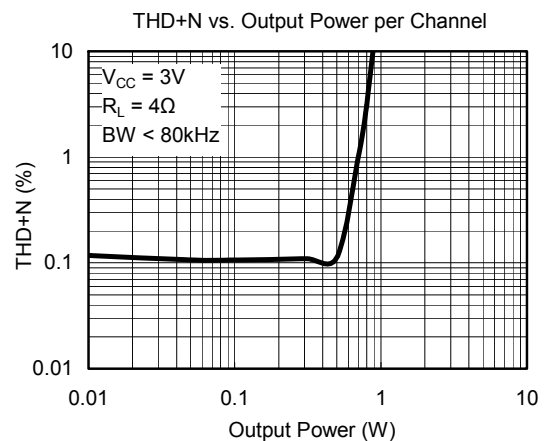
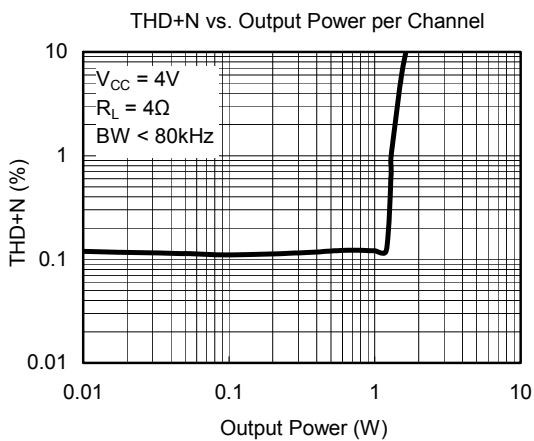
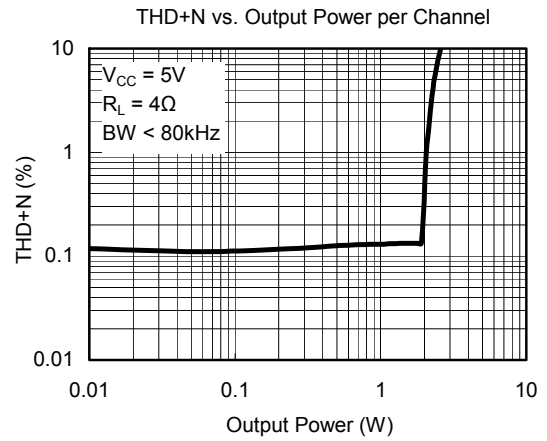
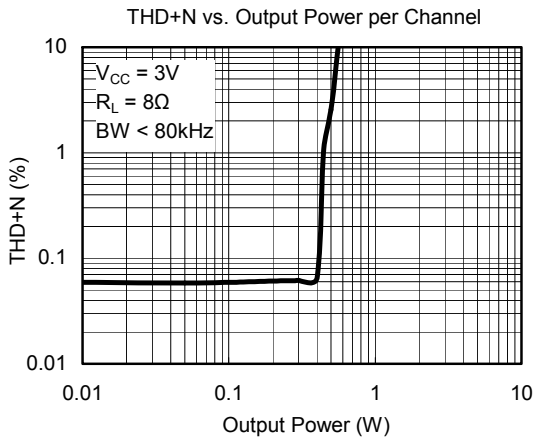
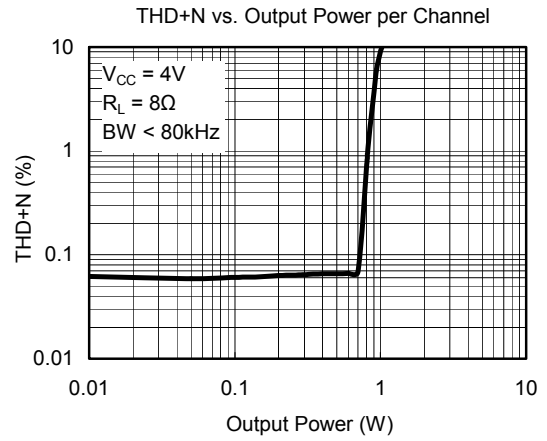
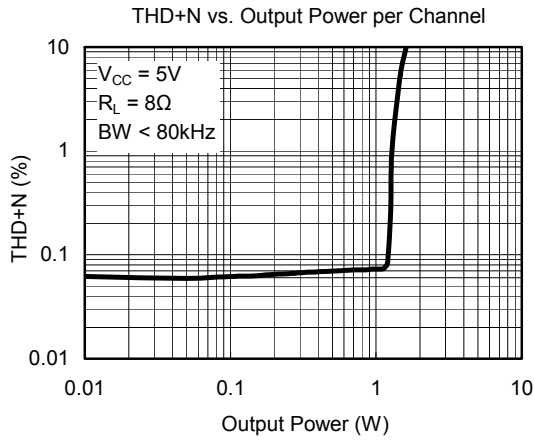
## ELECTRICAL CHARACTERISTICS

(T<sub>A</sub> = +25°C, unless otherwise specified.)

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

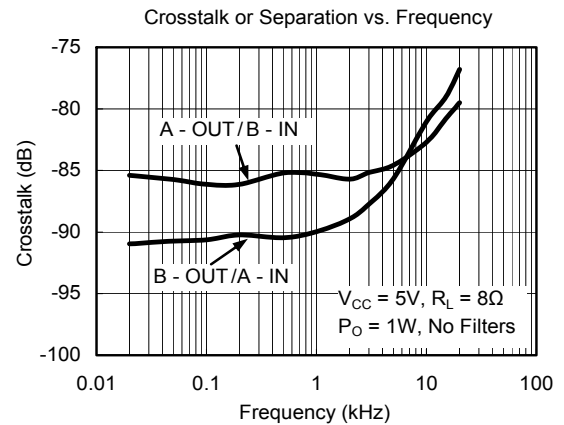
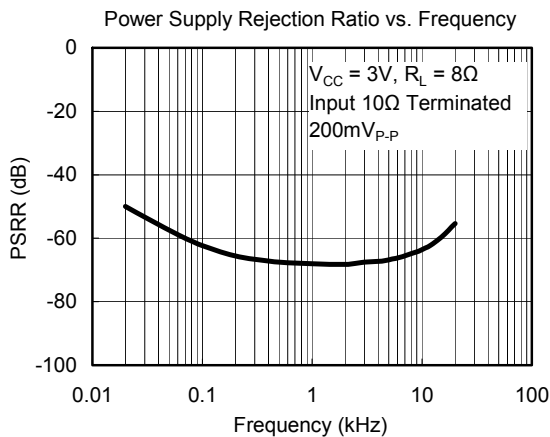
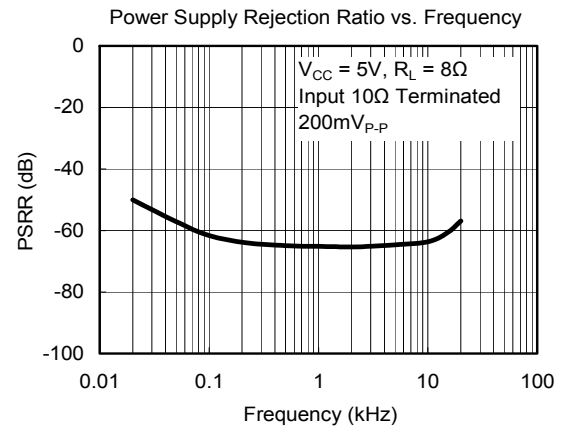
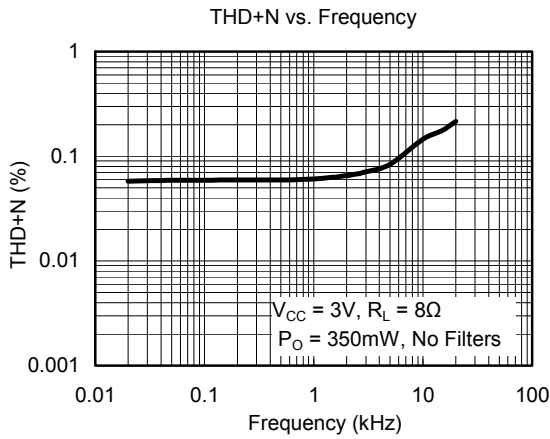
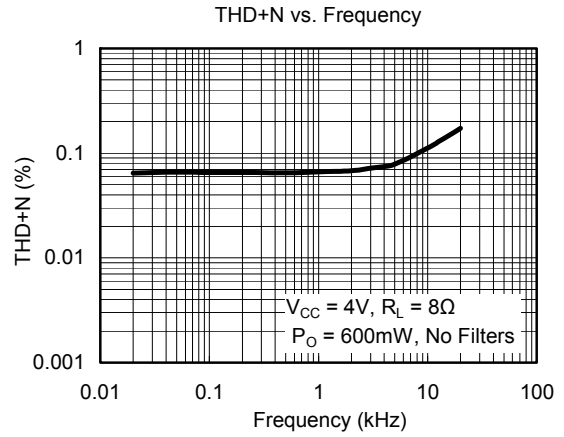
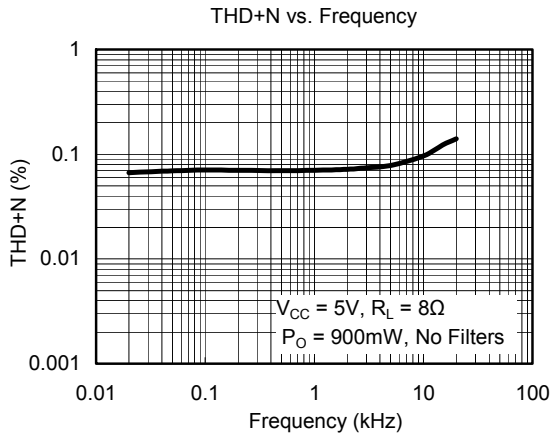
TYPICAL PERFORMANCE CHARACTERISTICS

At  $T_A = +25^\circ\text{C}$ ,  $A_V = 2$ ,  $f = 1\text{kHz}$ ,  $C_{\text{BYPASS}} = 1\mu\text{F}$ , unless otherwise noted.



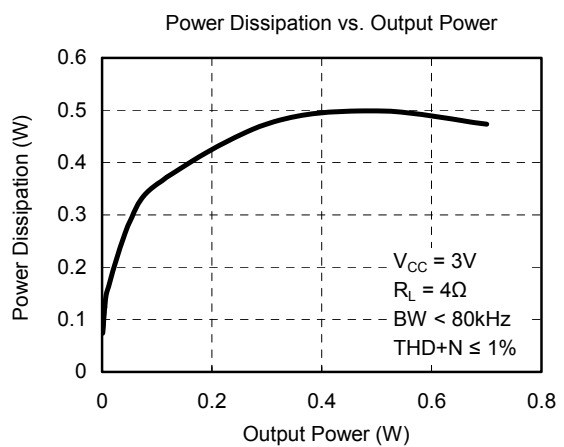
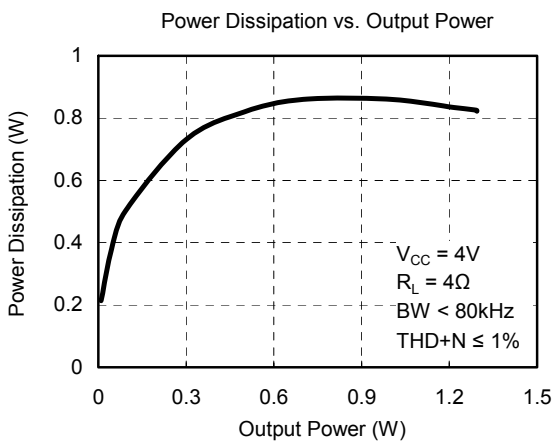
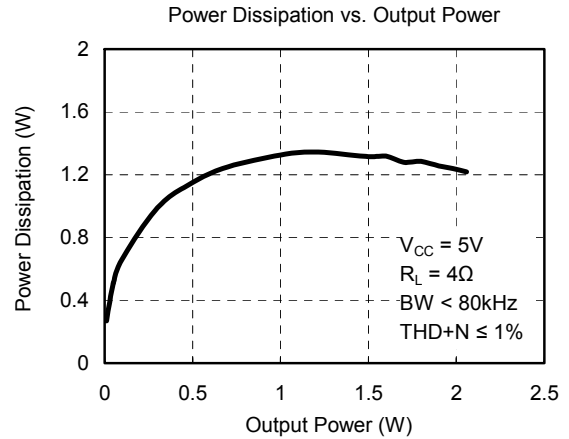
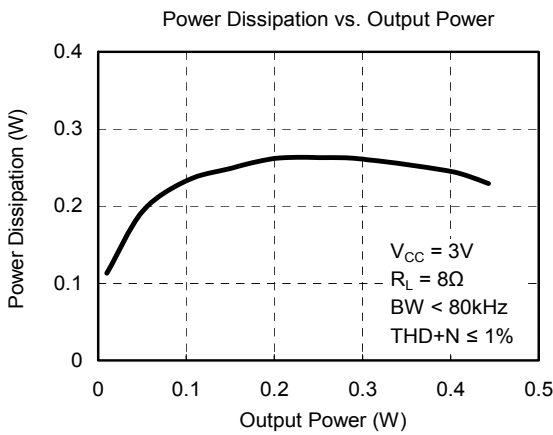
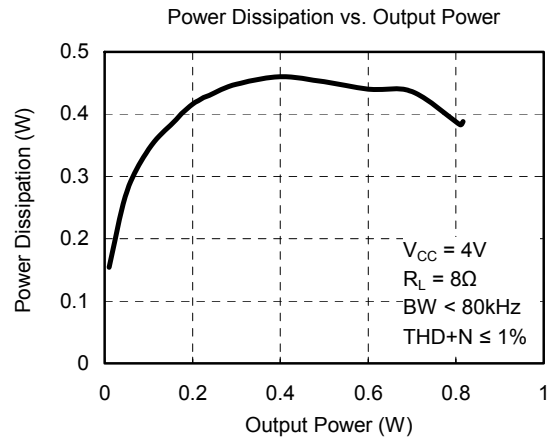
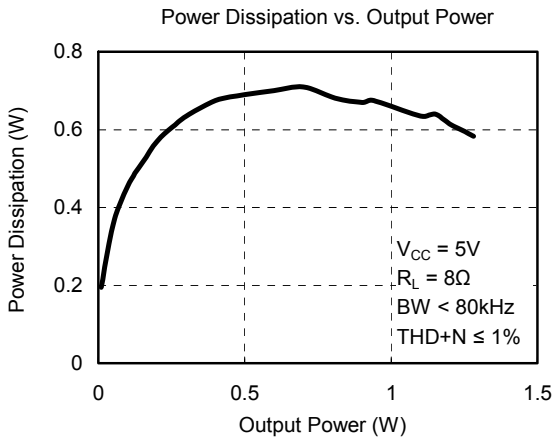
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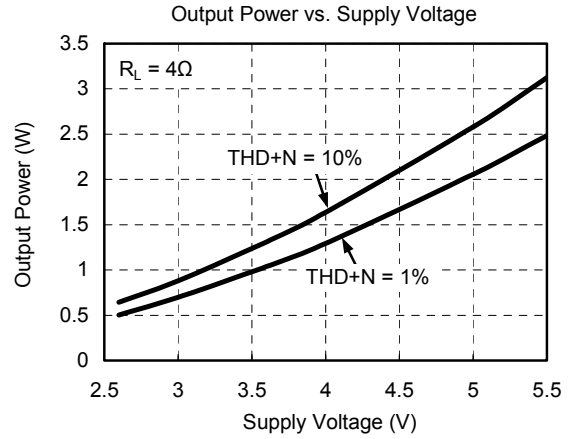
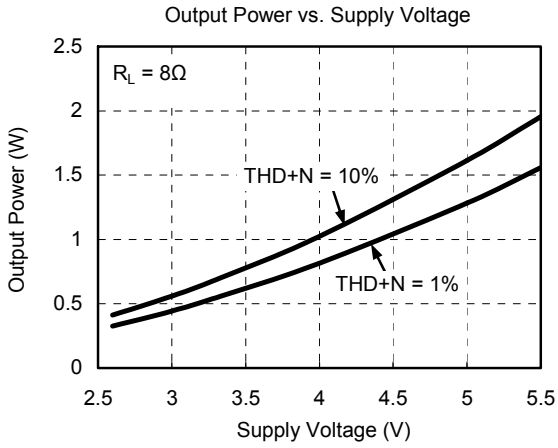
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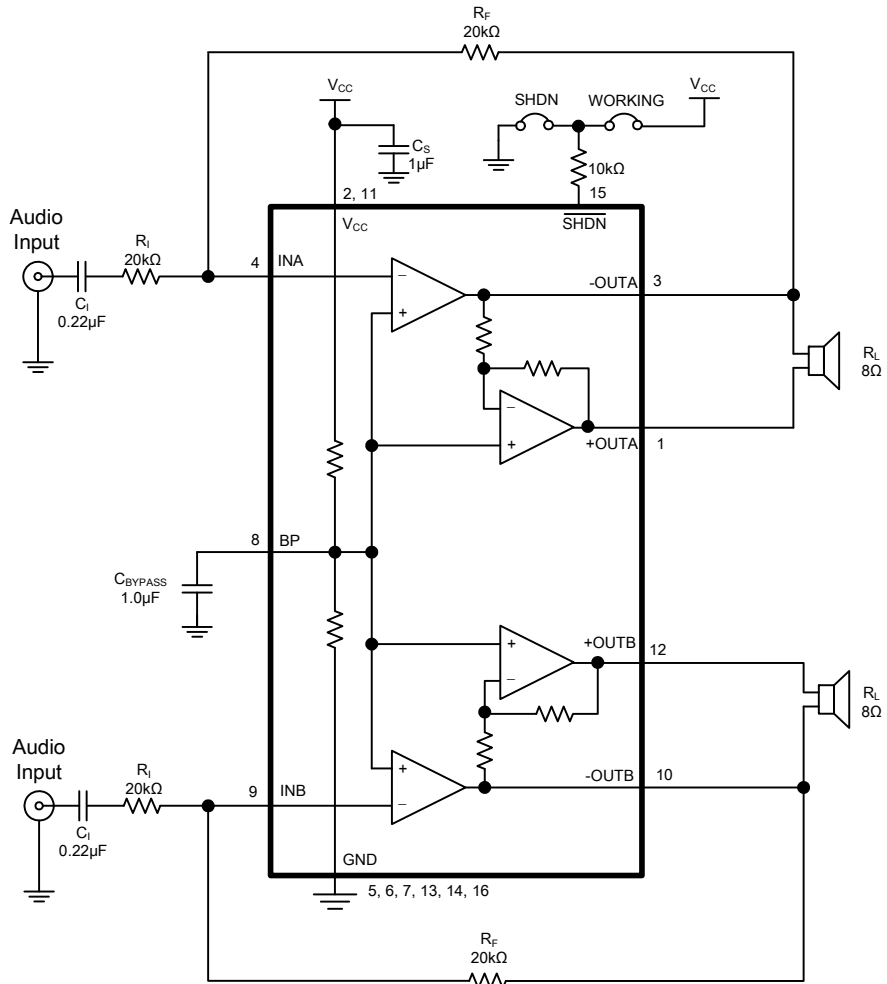


TYPICAL PERFORMANCE CHARACTERISTICS

At  $T_A = +25^\circ\text{C}$ ,  $A_V = 2$ ,  $f = 1\text{kHz}$ ,  $C_{\text{BYPASS}} = 1\mu\text{F}$ , unless otherwise noted.



TYPICAL APPLICATION CIRCUIT



NOTE:

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

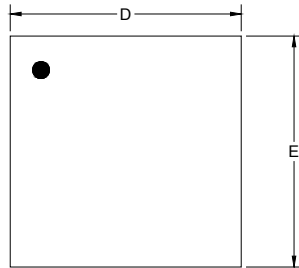
The via diameter should be 0.2mm to 0.33mm with 1oz. copper via barrel plating. It is important to plug the via to avoid any solder wicking inside the via during the soldering process. The thermal vias can be tented with solder mask on the top surface of the PCB. The solder mask diameter should be at 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.

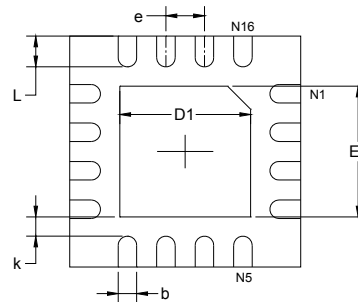


PACKAGE OUTLINE DIMENSIONS

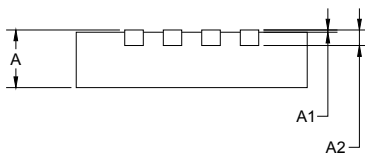
TQFN-3x3-16L



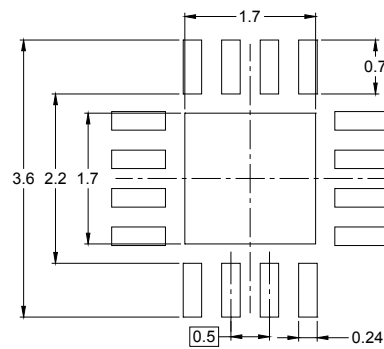
TOP VIEW



BOTTOM VIEW



SIDE VIEW

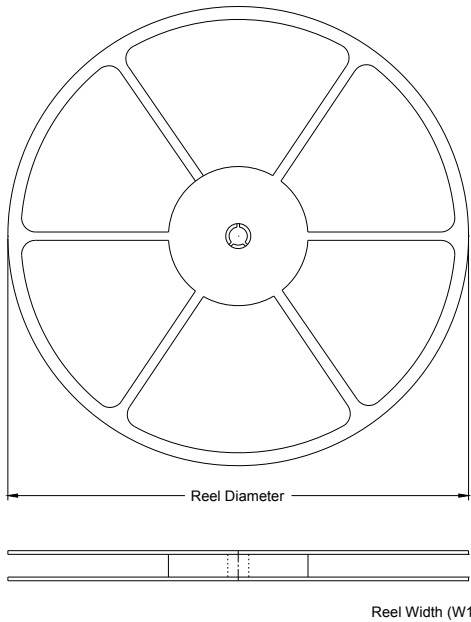


RECOMMENDED LAND PATTERN (Unit: mm)

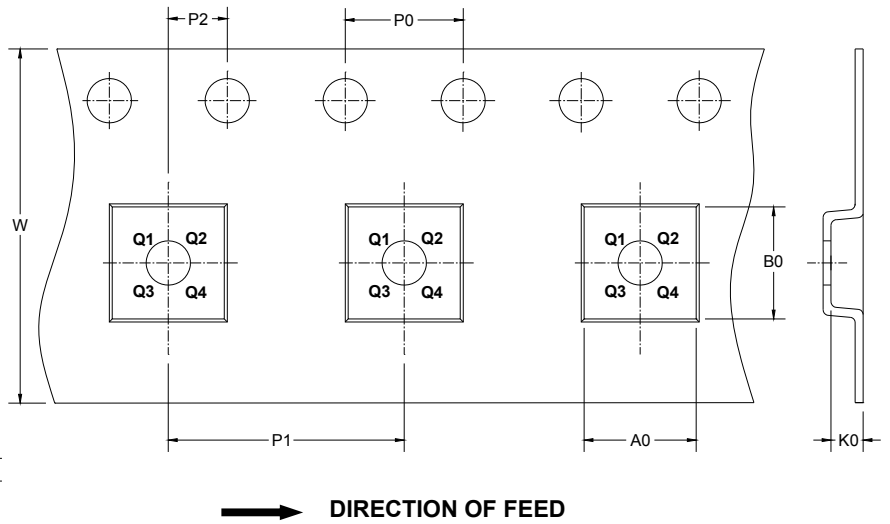
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	2.900	3.100	0.114	0.122
D1	1.600	1.800	0.063	0.071
E	2.900	3.100	0.114	0.122
E1	1.600	1.800	0.063	0.071
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007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

**TAPE AND REEL INFORMATION**

**REEL DIMENSIONS**



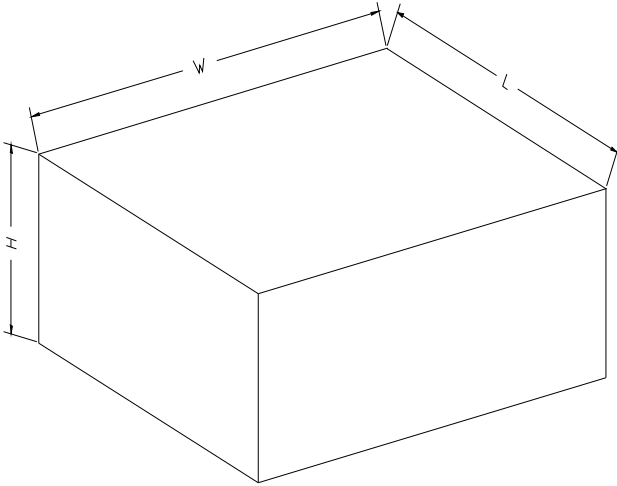
**TAPE DIMENSIONS**



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