



SGM4894

1.1W Fully Differential Audio Power Amplifier with Internal Feedback Resistors

GENERAL DESCRIPTION

The SGM4894 is a fully differential audio power amplifier that is designed for portable communication device applications and demanding applications in mobile phones. It is capable of delivering 1.1W of continuous average power to an 8Ω BTL load with less than 1% distortion (THD+N) from a 5V battery voltage. It operates from 2.5V to 5.5V power supply.

The SGM4894 features a low-power consumption shutdown mode. To facilitate this, Shutdown may be enabled by logic low. Additionally, the SGM4894 features an internal thermal shutdown protection mechanism.

The SGM4894 contains advanced pop & click circuitry, a minimal count of external components and low-power shutdown mode. All these features make SGM4894 ideal for wireless handsets and other low voltage applications where minimal power consumption is a primary requirement.

The SGM4894 is unity-gain stable and can be configured by external gain-setting resistors.

The SGM4894 is available in Pb-free CSP-9 and DFN-8 (3.0mm × 3.0mm) packages. It operates over an ambient temperature range of -40°C to +85°C.

FEATURES

- Fully Differential Amplifier
- Excellent PSRR: Direct Connection to the Battery
- 1.1W to 8Ω BTL Load from 5V Supply at THD+N < 1% (TYP)
- Unity Gain Stable
- 2.5V to 5.5V Operation
- Low Shutdown Current
- Shutdown Pin is Compatible with 1.8V Logic
- Improved Pop & Click Circuitry
- Thermal Overload Protection Circuitry
- No Output Coupling Capacitors, Bootstrap Capacitors Required
- External Gain Configuration Capability
- -40°C to +85°C Operating Temperature Range
- Pb-Free CSP-9 and DFN-8 (3.0mm×3.0mm) Packages

APPLICATIONS

Portable System
Wireless Handset
Mobile Phone
Handheld Computer
PDAs
GPS



SGM4894

1.1W Fully Differential Audio Power Amplifier with Internal Feedback Resistors

PACKAGE/ORDERING INFORMATION

MODEL	ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	MARKING INFORMATION
SGM4894	SGM4894YDB8/TR	DFN-8 (3.0mm×3.0mm)	Tape and Reel, 3000	SGM4894DB
	SGM4894YG/TR	CSP-9	Tape and Reel, 3000	4894YG

ABSOLUTE MAXIMUM RATINGS

Supply Voltage 6V
 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

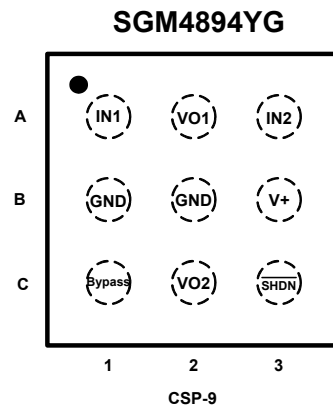
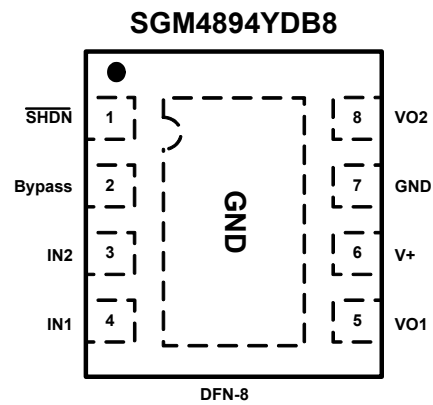
NOTES

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.

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.

PIN CONFIGURATIONS (Top View)



ELECTRICAL CHARACTERISTICS

(The following AC specifications apply for 8Ω load, $A_V = 1V/V$, $T_A = 25^\circ\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	CONDITIONS	SGM4894			UNITS
			MIN	TYP	MAX	
Supply Voltage	V_+		2.5		5.5	V
Shutdown Current	I_{SD}	$V_{IN} = 0V, V_{SHDN} = GND, V_+ = 5.0V$		0.03	1	μA
		$V_{IN} = 0V, V_{SHDN} = GND, V_+ = 3.3V$		0.03	1	
		$V_{IN} = 0V, V_{SHDN} = GND, V_+ = 2.6V$		0.03		
Output Offset Voltage	V_{OS}	$V_{IN} = 0V, V_{SHDN} = V_+ = 5.0V$	-10	0.93	10	mV
		$V_{IN} = 0V, V_{SHDN} = V_+ = 3.3V$	-10	0.80	10	
		$V_{IN} = 0V, V_{SHDN} = V_+ = 2.6V$		0.74		
Quiescent Power Supply Current	I_Q	$V_{IN} = 0V, I_O = 0A,$ $V_{SHDN} = V_+$	$V_+ = 5.0V, \text{No Load}$	5.47	8	mA
			$V_+ = 5.0V, 8\Omega \text{ Load}$	5.48	8	
			$V_+ = 3.3V, \text{No Load}$	5.43	7.5	
			$V_+ = 3.3V, 8\Omega \text{ Load}$	5.42	7.5	
			$V_+ = 2.6V, \text{No Load}$	5.08		
			$V_+ = 2.6V, 8\Omega \text{ Load}$	5.08		
Shutdown Voltage Input High	V_{SDIH}		1.2			V
Shutdown Voltage Input Low	V_{SDIL}			0.4		V
Output Power	P_O	$f = 1\text{kHz}, \text{THD+N} < 1\%$	$V_+ = 5.0V$	1.10		W
			$V_+ = 3.6V$	0.60		
			$V_+ = 3.0V$	0.40		
			$V_+ = 2.6V$	0.30		
Total Harmonic Distortion + Noise	THD+N	$P_O = 0.6W_{rms}, f = 1\text{kHz}$		0.03		%
Power Supply Rejection Ratio	PSRR	$f = 217\text{Hz (Note 1)}$	$V_+ = 5.0V$	-86		dB
			$V_+ = 3.6V$	-86		
			$V_+ = 3.0V$	-86		
			$V_+ = 2.6V$	-86		
		$f = 1\text{kHz (Note 1)}$	$V_+ = 5.0V$	-75		
			$V_+ = 3.6V$	-75		
			$V_+ = 3.0V$	-76		
			$V_+ = 2.6V$	-76		
Common Mode Rejection Ratio	CMRR	$f = 217\text{Hz}, V_{CM} = 200mV_{PP}$ (Note 2)		-70		dB
Wake-Up Time	T_{WU}	$C_{BYPASS} = 1\mu\text{F}$	$V_+ = 5.0V$	158		ms
			$V_+ = 3.6V$	122		
			$V_+ = 3.0V$	106		
			$V_+ = 2.6V$	95		
Shutdown Time	T_{SDT}		$V_+ = 5.0V$	180		μs
			$V_+ = 3.6V$	96		
			$V_+ = 3.0V$	56		
			$V_+ = 2.6V$	48		

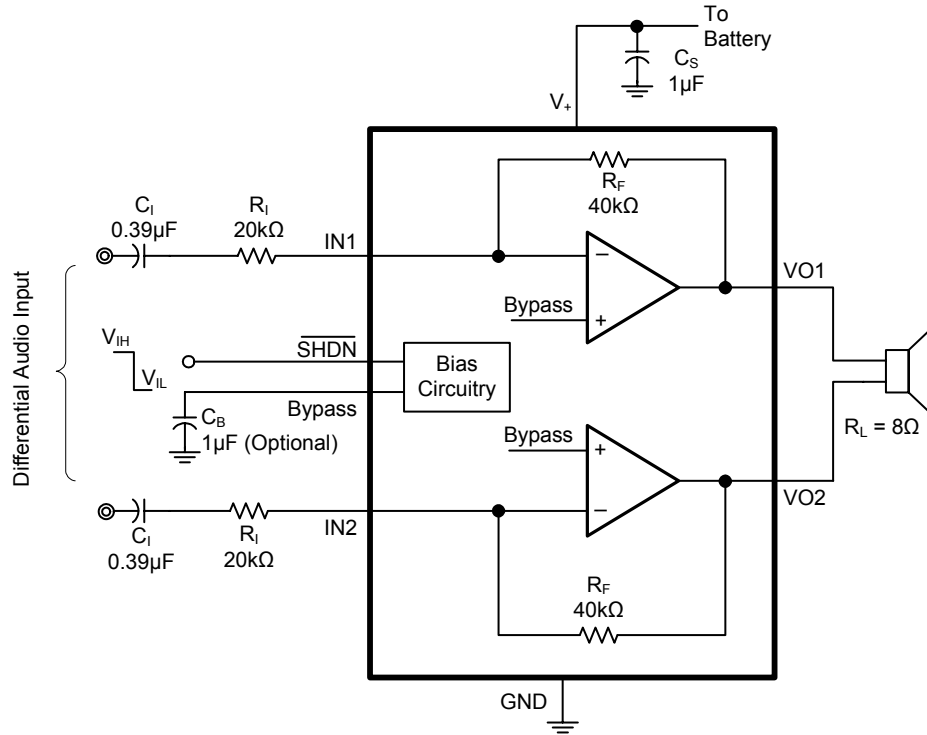
Specifications subject to changes without notice.

Note 1: 10Ω terminated input.

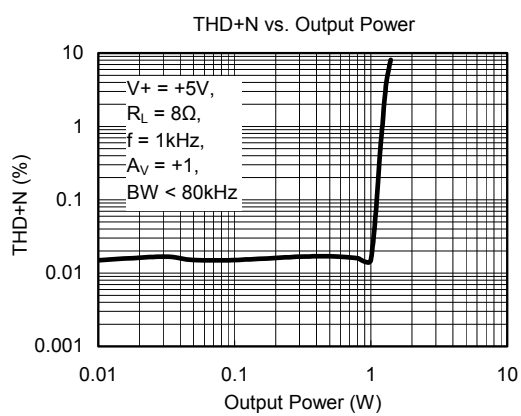
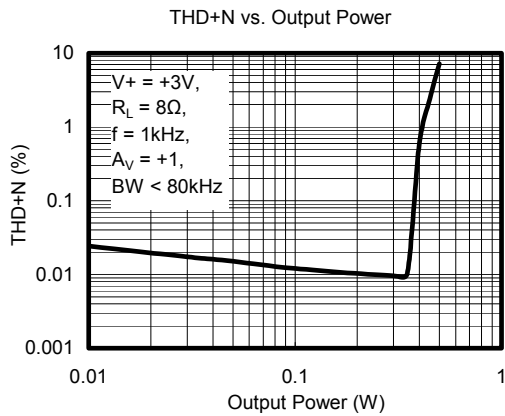
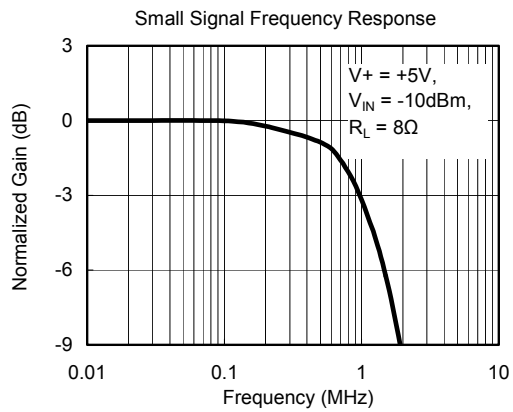
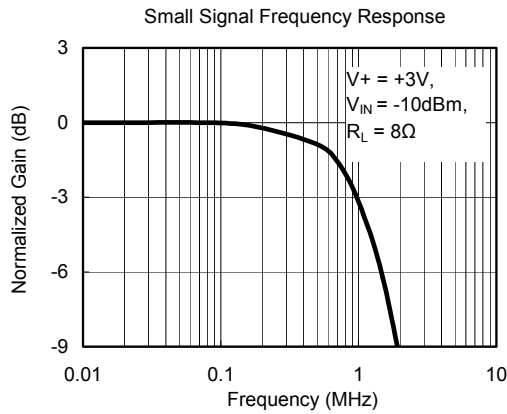
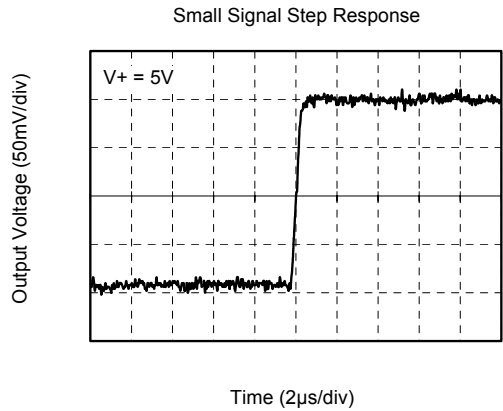
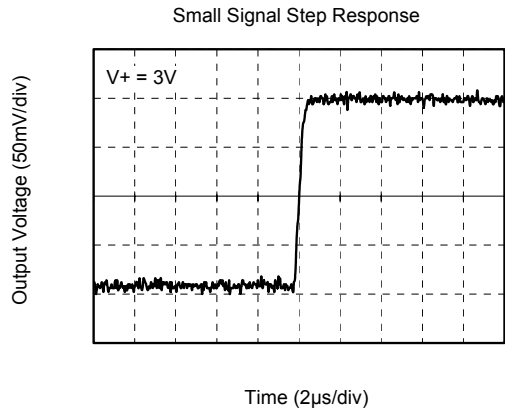
Note 2: CMRR is affected by the matching between external gain-setting resistor ratios.



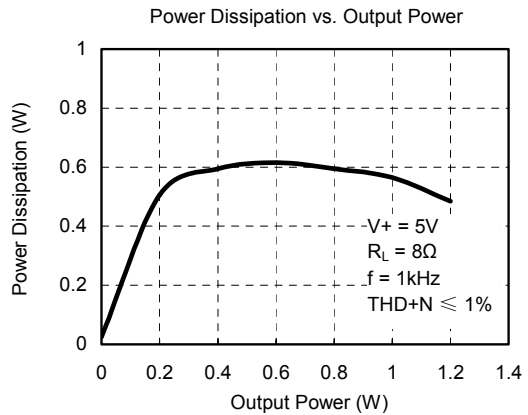
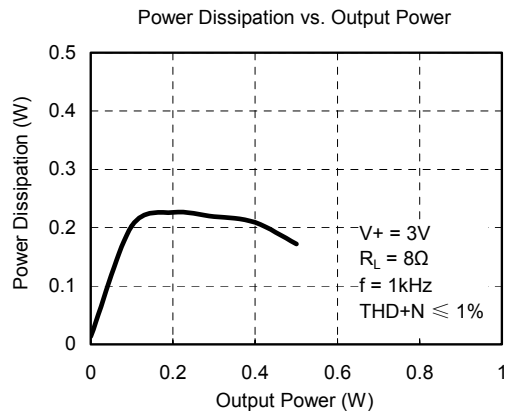
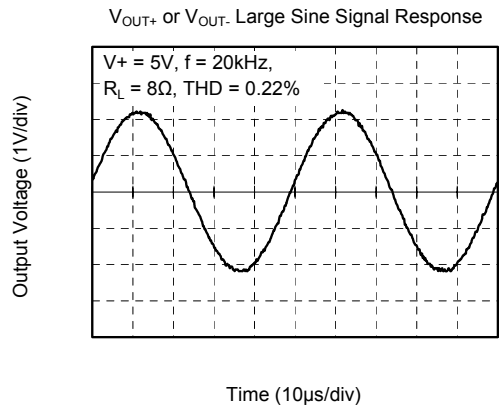
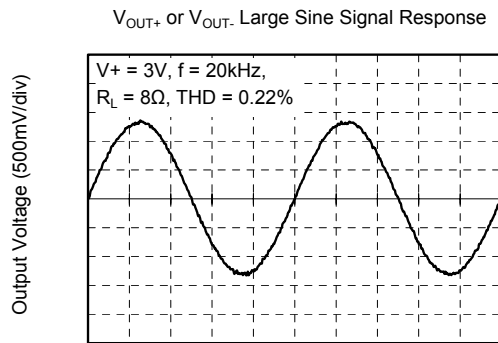
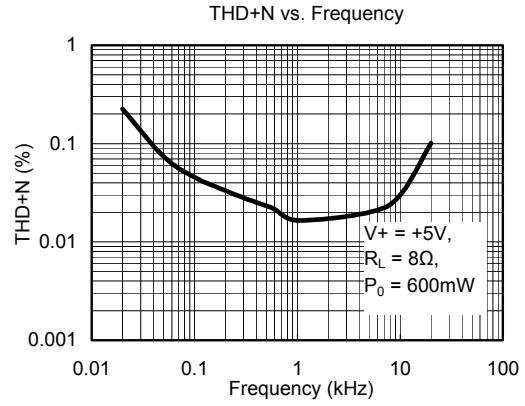
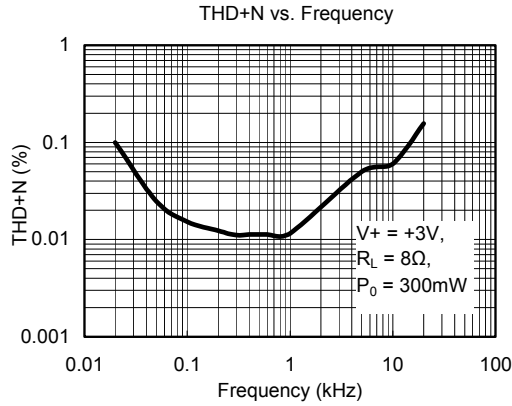
TYPICAL APPLICATION



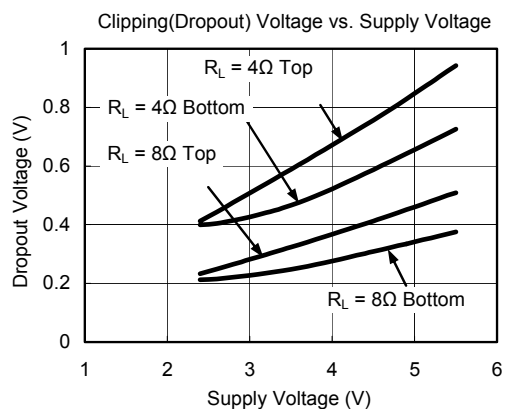
TYPICAL PERFORMANCE CHARACTERISTICS



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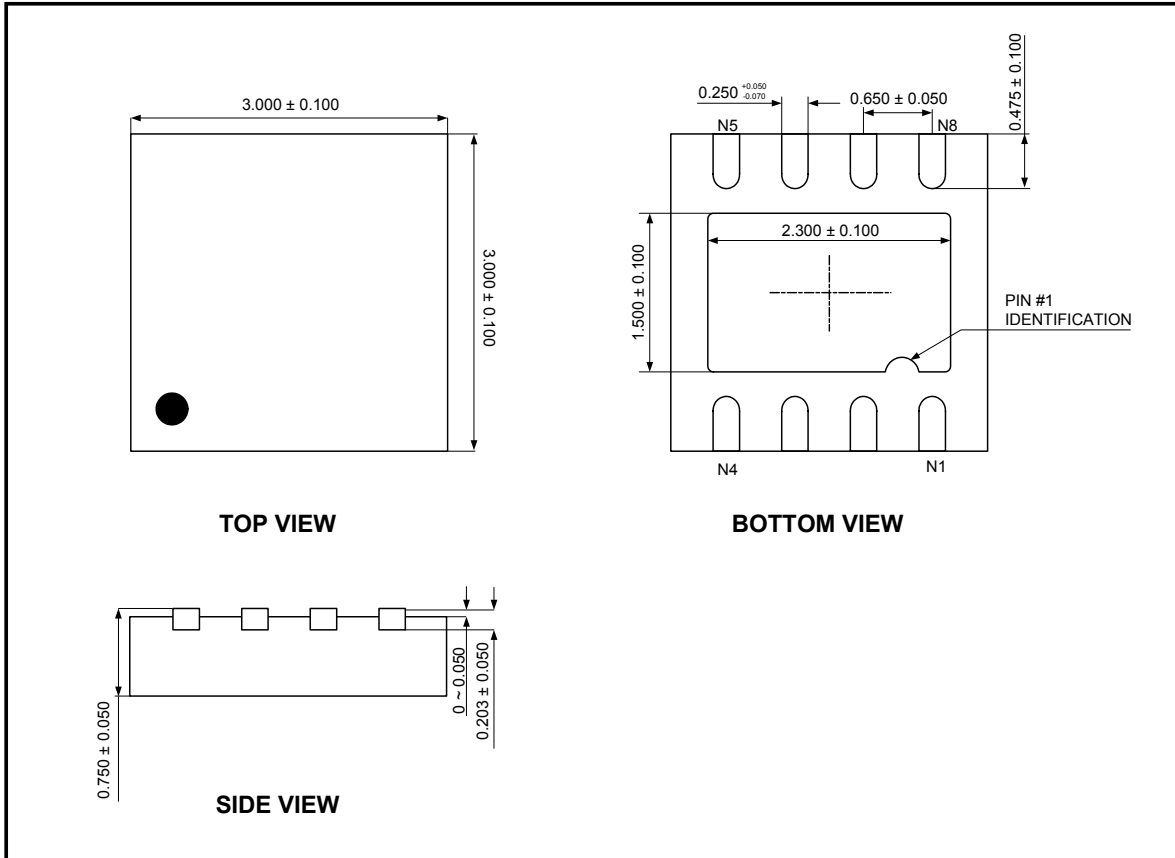


TYPICAL PERFORMANCE CHARACTERISTICS



PACKAGE OUTLINE DIMENSIONS

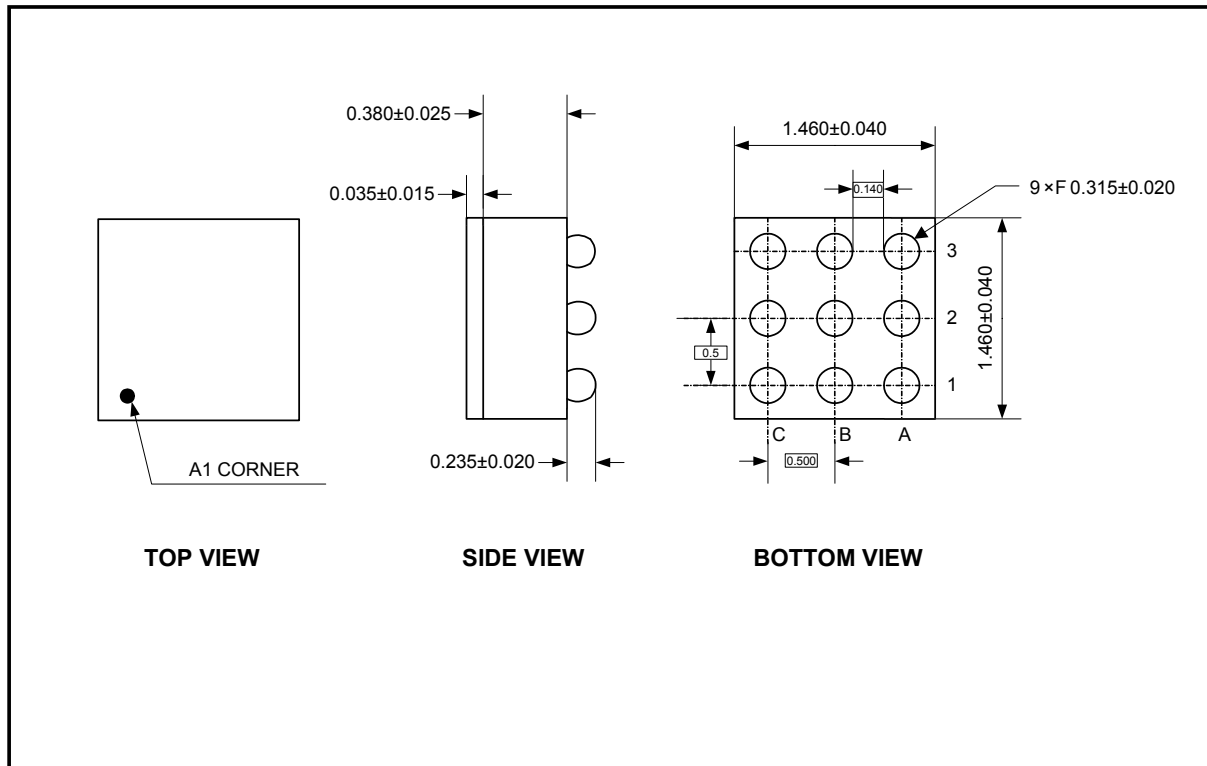
DFN-8 (3mm × 3mm)



Note: All linear dimensions are in millimeters.

PACKAGE OUTLINE DIMENSIONS

CSP-9



Note: All linear dimensions are in millimeters.

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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.

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