PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM4996	MSOP-10	-40℃ to +85℃	SGM4996YMS10G/TR	SGM4996 YMS10 XXXXX	Tape and Reel, 4000
	TDFN-3×3-10L	-40℃ to +85℃	SGM4996YD10G/TR	SGM 4996D XXXXX	Tape and Reel, 3000
	MSOP-8	-40℃ to +85℃	SGM4996YMS8G/TR	SGM4996 YMS8 XXXXX	Tape and Reel, 4000

NOTE: XXXXX = Date Code and Vendor Code.

Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage 6V
Input Voltage ..... -0.3V to (V_{CC}) + 0.3V
Storage Temperature Range ..... -65℃ to +150℃
Junction Temperature ..... 150℃
Lead Temperature (Soldering, 10s) ..... +260℃
ESD Susceptibility
HBM 4000V
MM 400V

RECOMMENDED OPERATING CONDITIONS

Operating Temperature Range ..... -40℃ to +85℃

OVERSTRESS CAUTION

Stresses beyond those listed may cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational section of the specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

ESD SENSITIVITY CAUTION

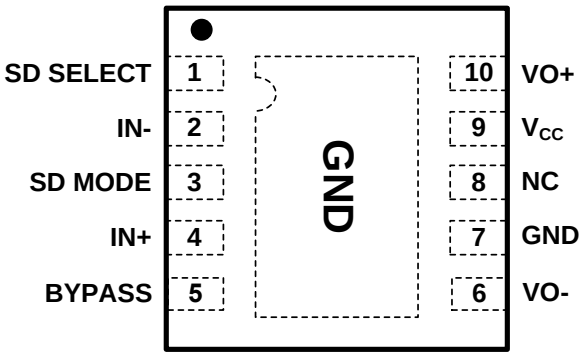
This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance 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.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, specification or other related things if necessary without notice at any time.

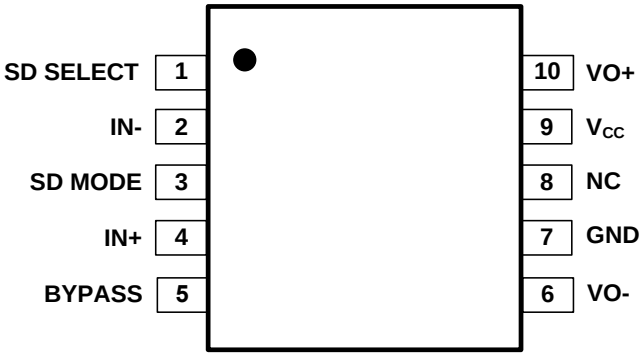
PIN CONFIGURATIONS

(TOP VIEW)



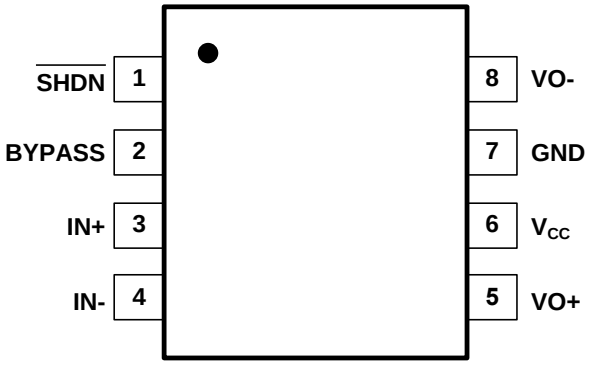
TDFN-3×3-10L

(TOP VIEW)



MSOP-10

(TOP VIEW)



MSOP-8

ELECTRICAL CHARACTERISTICS

(The following AC specifications apply for 8Ω load, A_V = 1V/V, T_A = +25℃, unless otherwise specified.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Supply Voltage	V_{CC}			2.5		5.5	V
Shutdown Current	I_{SD}	SDM = SDS = GND or SDM = SDS = V_{CC}	V_{CC} = 5.0V		0.01	2	μA
			V_{CC} = 3.6V		0.01		
			V_{CC} = 2.6V		0.01		
Output Offset Voltage	V_{OS}	V_{IN} = 0V, I_O = 0A		-10	2	10	mV
Quiescent Power Supply Current	I_Q	V_{IN} = 0V	V_{CC} = 5.0V, No Load		4.70	7.5	mA
			V_{CC} = 5.0V, 8Ω Load		4.73	8	
			V_{CC} = 3.6V, No Load		3.85	6	
			V_{CC} = 3.6V, 8Ω Load		3.87		
			V_{CC} = 2.6V, No Load		3.20		
			V_{CC} = 2.6V, 8Ω Load		3.21		
SD SELECT Threshold High	V_{SDSIH}			1.2			V
SD SELECT Threshold Low	V_{SDSIL}					0.4	
SD MODE Threshold High	V_{SDMIH}			1.2			
SD MODE Threshold Low	V_{SDMIL}					0.4	
Output Power (8Ω)	P_O	f = 1kHz, THD+N = 1%	V_{CC} = 5.0V		1.30		W
			V_{CC} = 3.6V		0.66		
			V_{CC} = 3.0V		0.46		
			V_{CC} = 2.6V		0.33		
		f = 1kHz, THD+N = 10%	V_{CC} = 5.0V		1.60		
			V_{CC} = 3.6V		0.82		
			V_{CC} = 3.0V		0.57		
			V_{CC} = 2.6V		0.41		
Total Harmonic Distortion + Noise	THD+N	P_O = 0.6Wrms, f = 1kHz, V_{CC} = 5.0V			0.013		%
Power Supply Rejection Ratio (1) (2)	PSRR	V_{RIPPLE} = 200mV_{P-P} C_B = 1μF, f = 217Hz	V_{CC} = 5.0V		-85		dB
			V_{CC} = 3.6V		-81		
			V_{CC} = 3.0V		-64		
			V_{CC} = 2.6V		-54		
		V_{RIPPLE} = 200mV_{P-P} C_B = 1μF, f = 1kHz	V_{CC} = 5.0V		-83		
			V_{CC} = 3.6V		-80		
			V_{CC} = 3.0V		-64		
			V_{CC} = 2.6V		-54		
Common Mode Rejection Ratio (2)	CMRR	f = 217Hz, V_{CM} = 200mV_{P-P}, V_{CC} = 5.0V			-81		dB
Wake-Up Time	T_{WU}	C_B = 1μF	V_{CC} = 5.0V		68		ms
			V_{CC} = 3.6V		53		
			V_{CC} = 3.0V		45		
			V_{CC} = 2.6V		40		

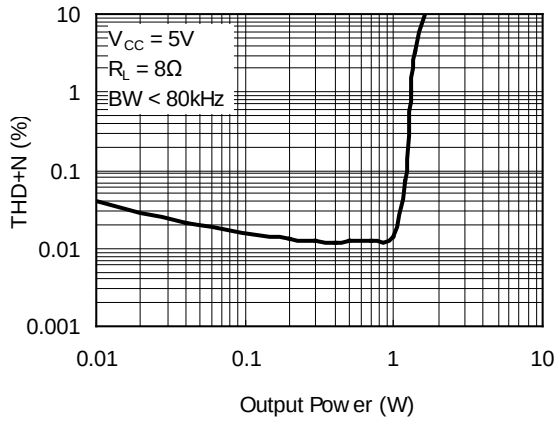
NOTES:

1. 10Ω terminated input.
2. PSRR and CMRR are affected by the matching between gain-setting resistor ratios.

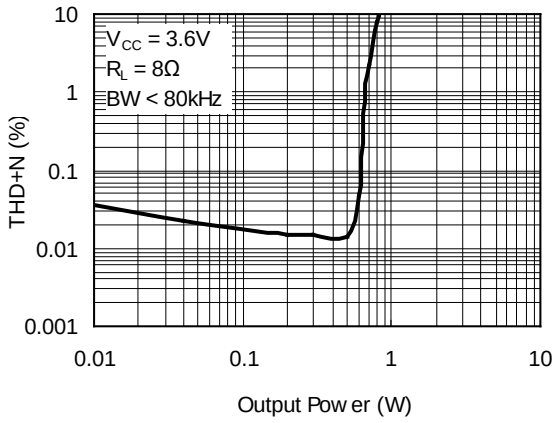
TYPICAL PERFORMANCE CHARACTERISTICS

At T_A = +25℃, A_V = 1, f = 1kHz, C_B = 1μF, unless otherwise noted.

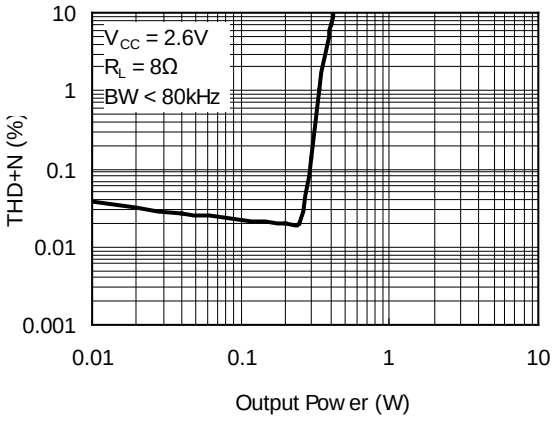
THD+N vs. Output Power



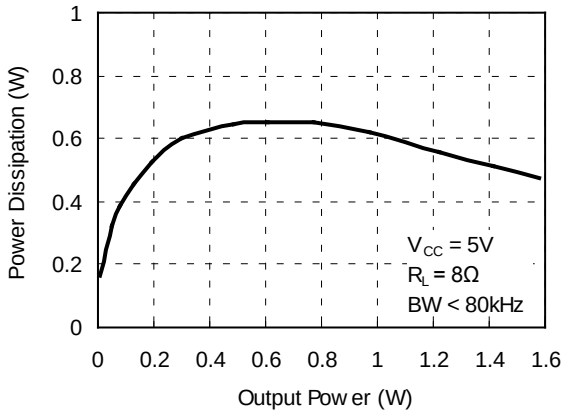
THD+N vs. Output Power



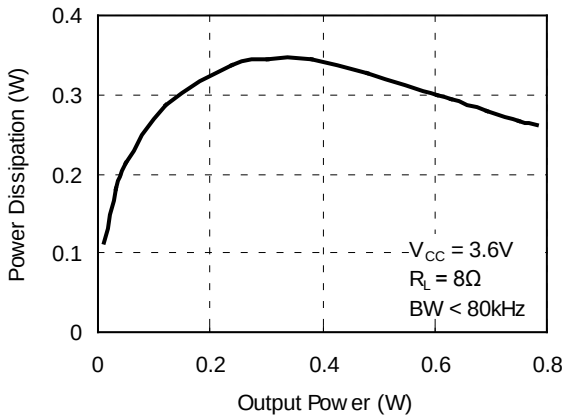
THD+N vs. Output Power



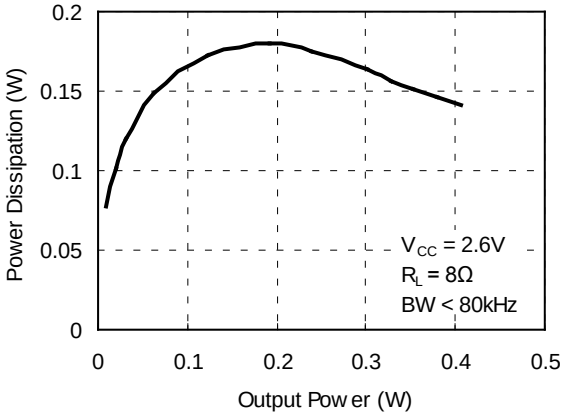
Power Dissipation vs. Output Power



Power Dissipation vs. Output Power



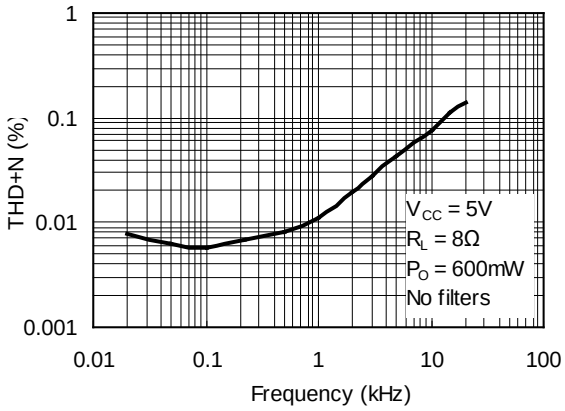
Power Dissipation vs. Output Power



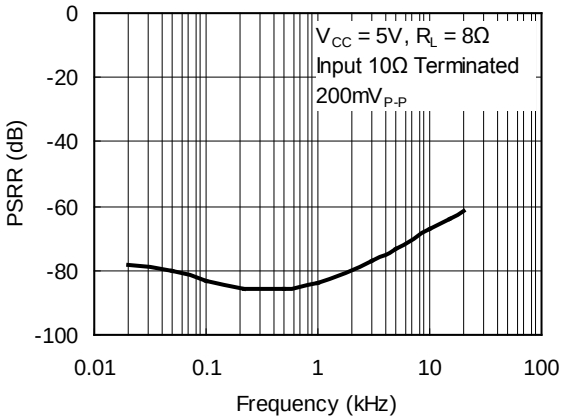
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

At T_A = +25℃, A_V = 1, f = 1kHz, C_B = 1μF, unless otherwise noted.

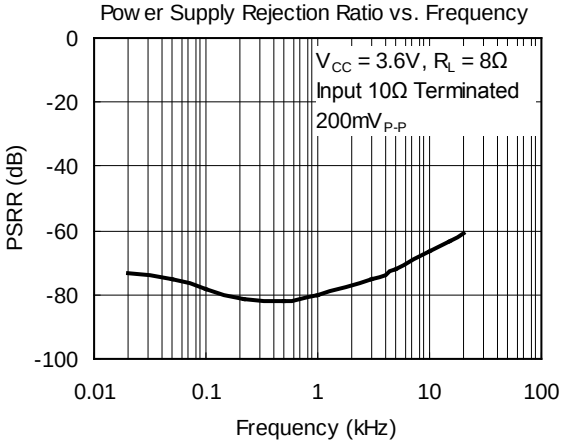
THD+N vs. Frequency



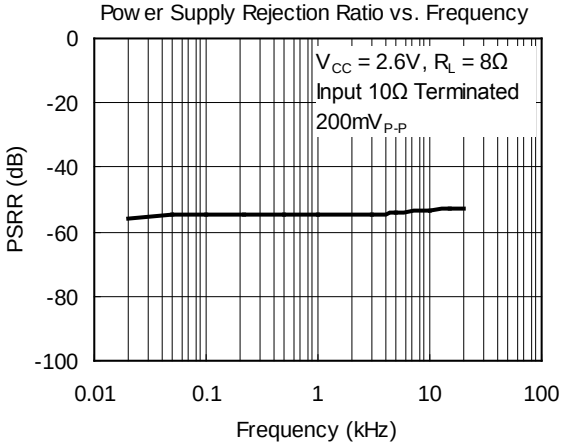
Power Supply Rejection Ratio vs. Frequency



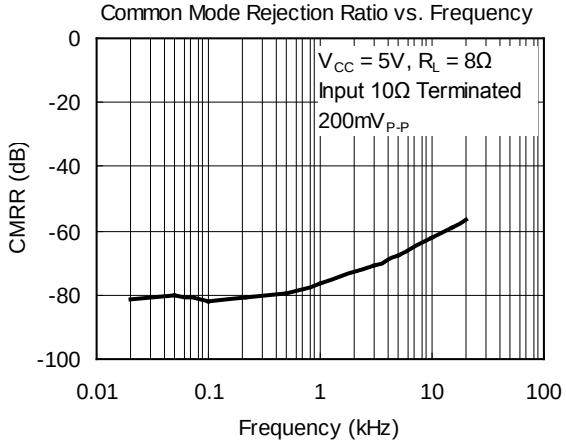
Power Supply Rejection Ratio vs. Frequency



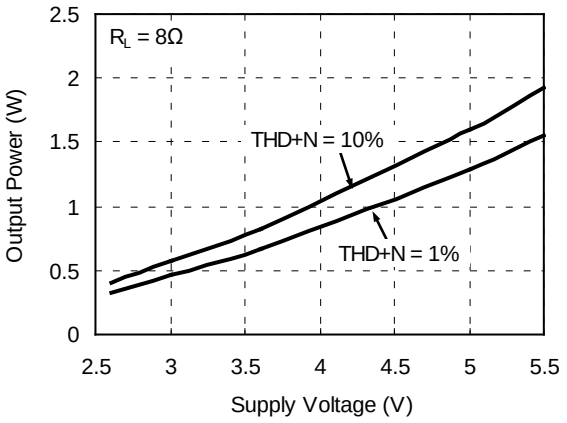
Power Supply Rejection Ratio vs. Frequency



Common Mode Rejection Ratio vs. Frequency



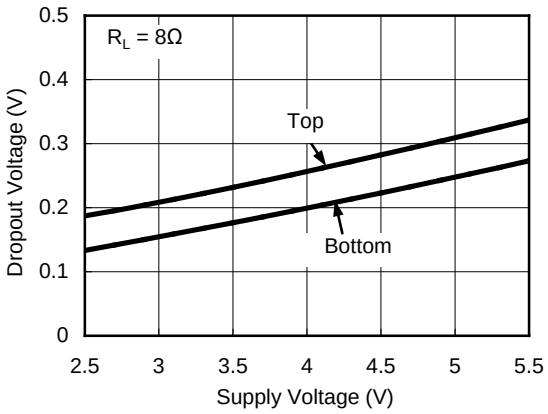
Output Power vs. Supply Voltage



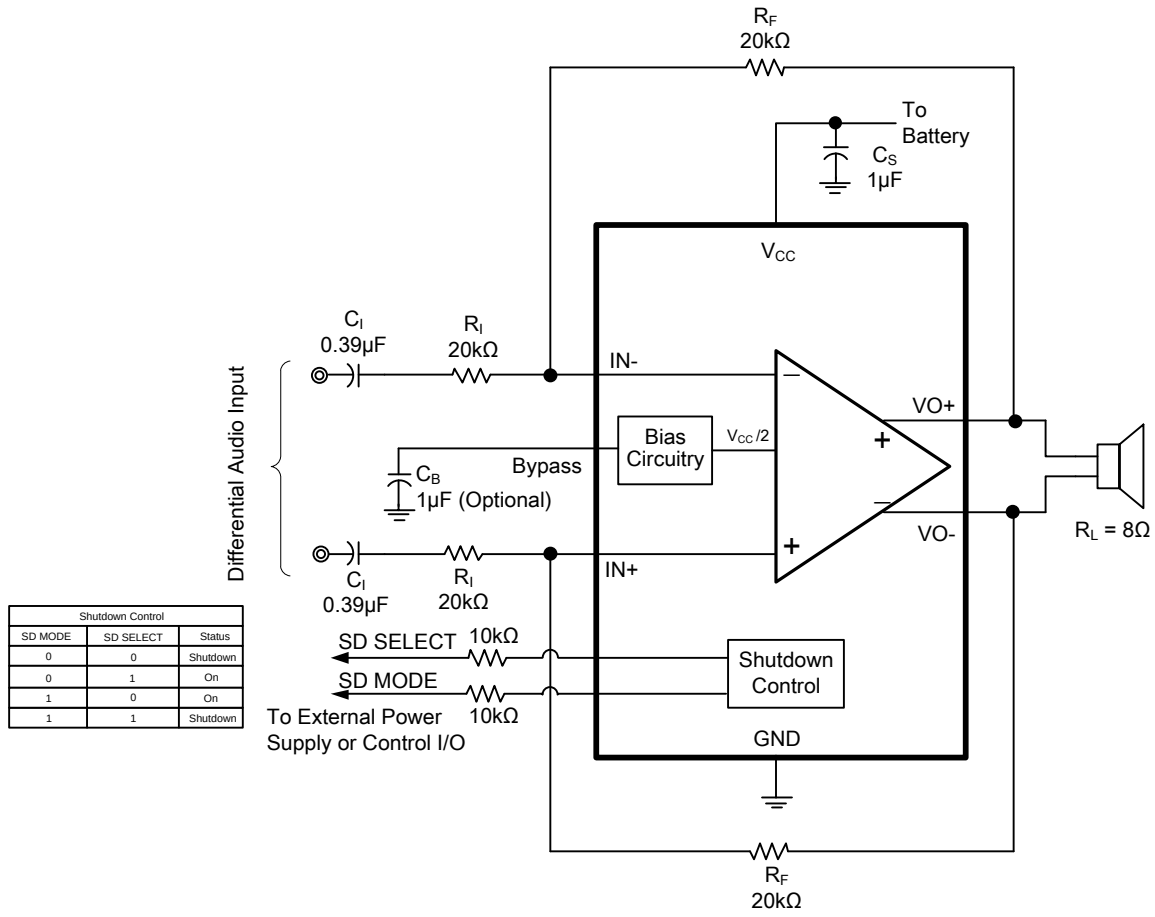
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

At T_A = +25℃, A_V = 1, f = 1kHz, C_B = 1μF, unless otherwise noted.

Clipping (Dropout) Voltage vs. Supply Voltage



APPLICATION CIRCUITS

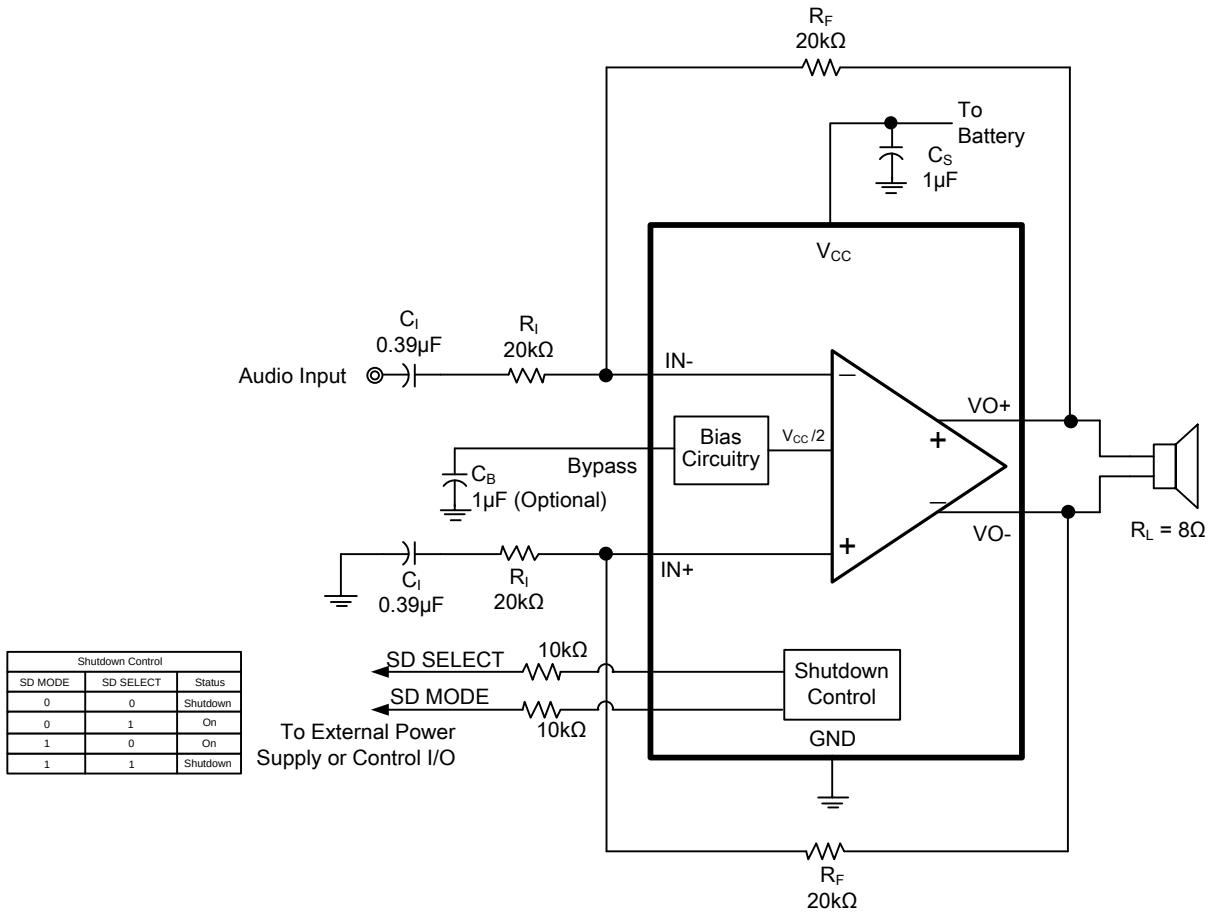


Shutdown Control		
SD MODE	SD SELECT	Status
0	0	Shutdown
0	1	On
1	0	On
1	1	Shutdown

NOTE: A 10kΩ resistor must be serially connected to SD SELECT or SD MODE pin.

Figure 1. Typical Differential Input Application Schematic

APPLICATION CIRCUITS (continued)

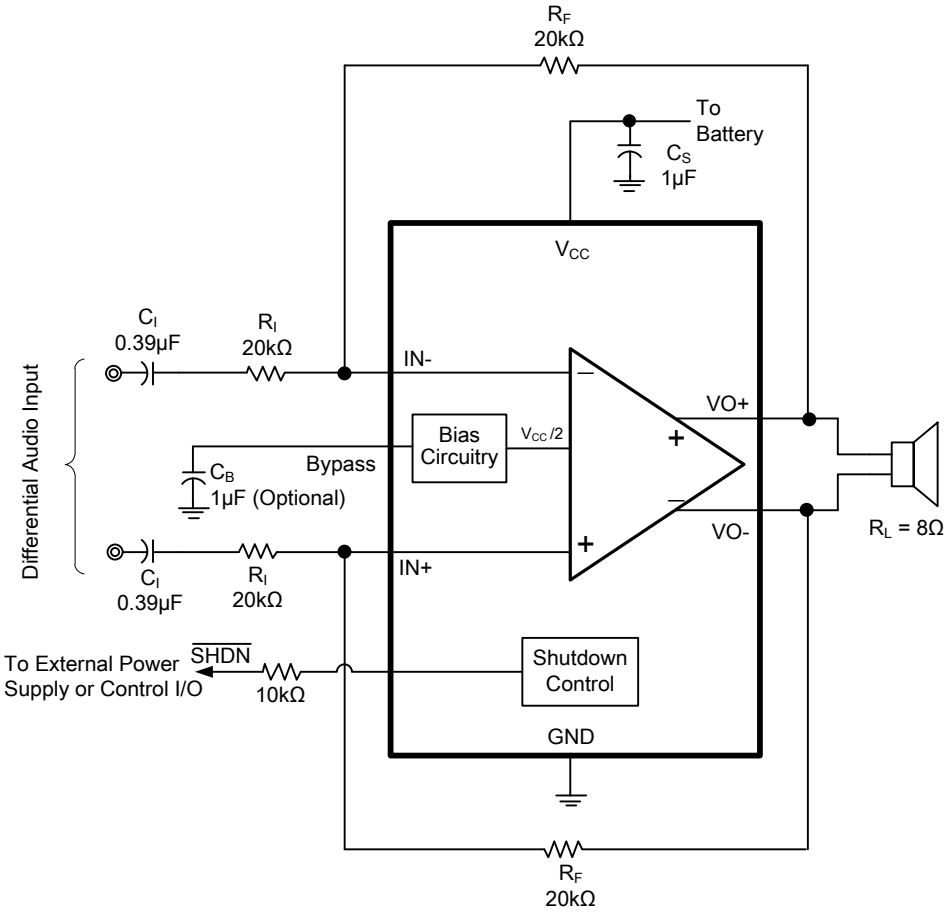


Shutdown Control		
SD MODE	SD SELECT	Status
0	0	Shutdown
0	1	On
1	0	On
1	1	Shutdown

NOTE: A 10kΩ resistor must be serially connected to SD SELECT or SD MODE pin.

Figure 2. Single-Ended Input Application Schematic

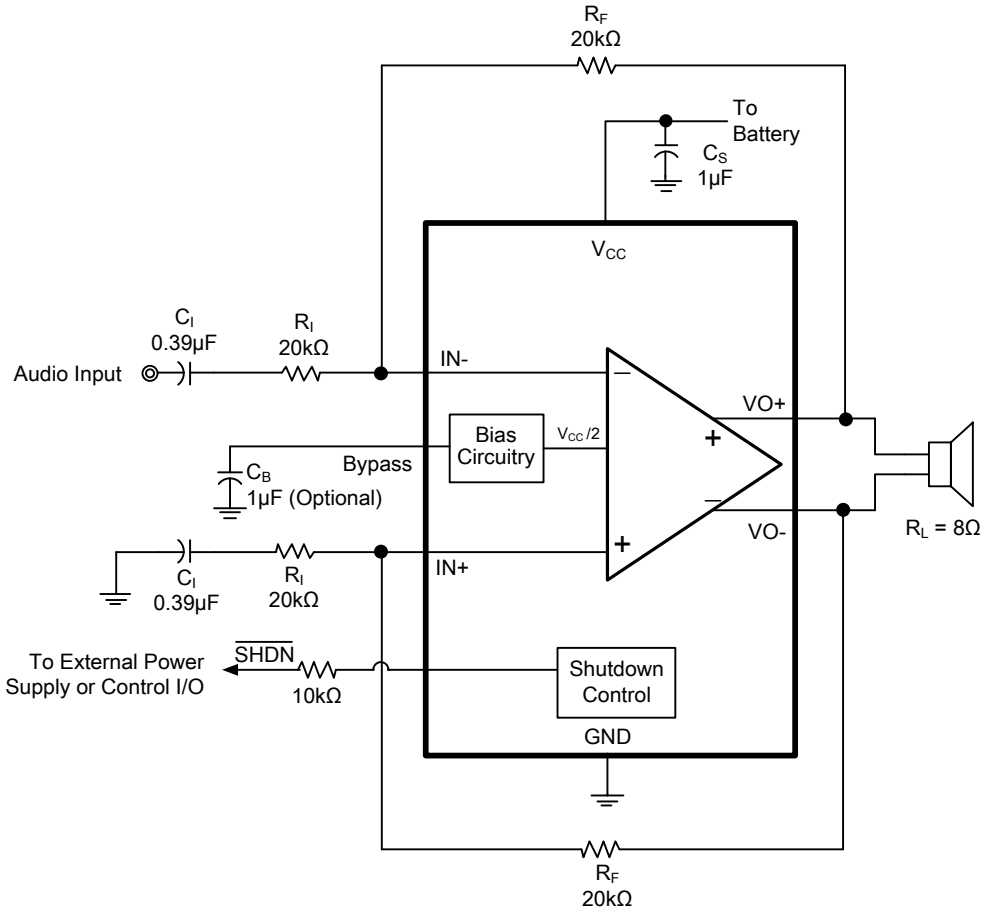
APPLICATION CIRCUITS (continued)



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

Figure 3. Typical Differential Input Application Schematic for SGM4996YMS8G

APPLICATION CIRCUITS (continued)



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

Figure 4. Single-Ended Input Application Schematic for SGM4996YMS8G

REVISION HISTORY

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

MARCH 2017 – REV.A.2 to REV.A.3

Changed Packing Option 2

NOVEMBER 2012 – REV.A.1 to REV.A.2

Added notes of Typical Application Circuits 8, 9, 10, 11

MAY 2011 – REV.A to REV.A.1

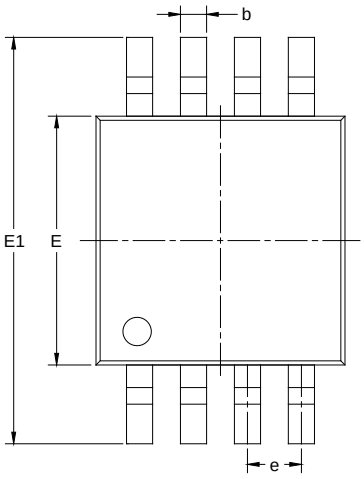
Updated Package Description ..... All

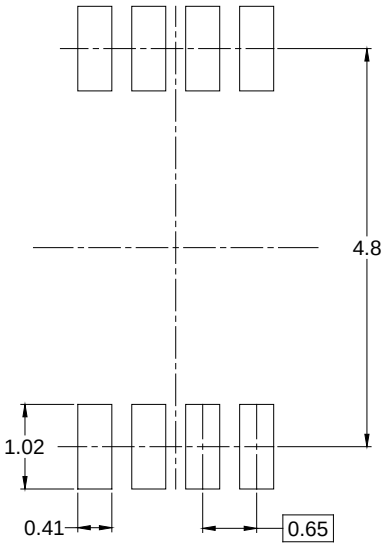
Changes from Original (MARCH 2010) to REV.A

Changed from product preview to production data ..... All

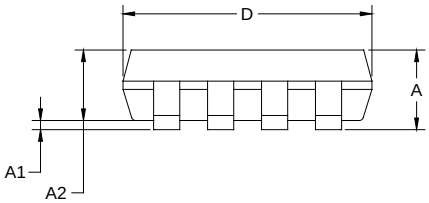
PACKAGE OUTLINE DIMENSIONS

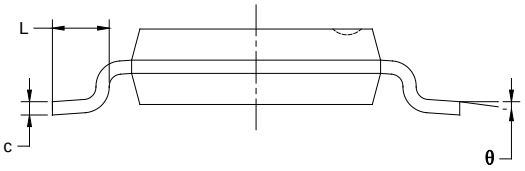
MSOP-8





RECOMMENDED LAND PATTERN (Unit: mm)

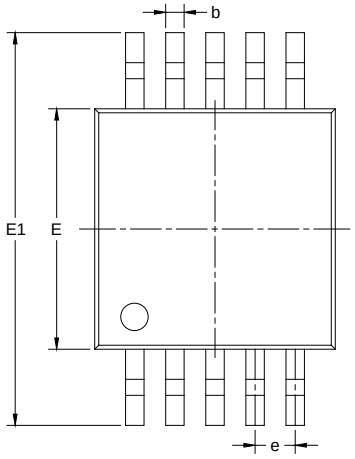


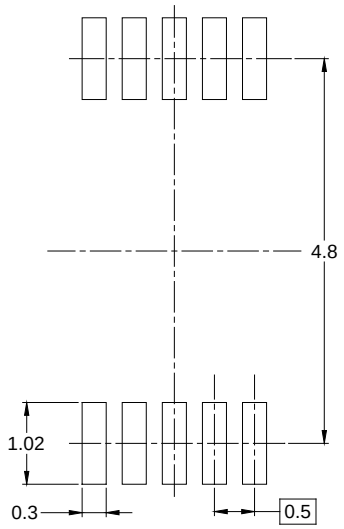


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
e	0.650 BSC		0.026 BSC	
L	0.400	0.800	0.016	0.031
θ	0°	6°	0°	6°

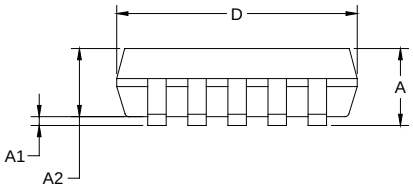
PACKAGE OUTLINE DIMENSIONS

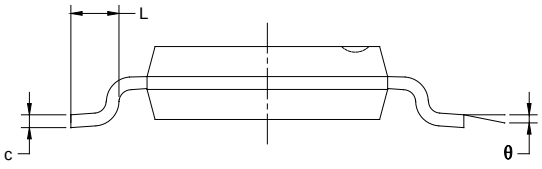
MSOP-10





RECOMMENDED LAND PATTERN (Unit: mm)

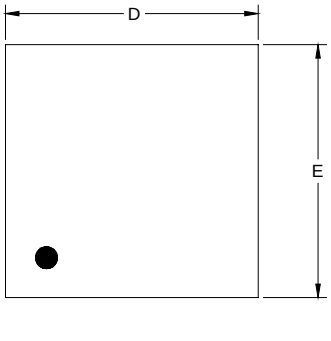




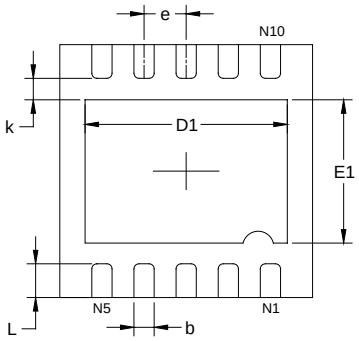
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.180	0.280	0.007	0.011
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
e	0.500 BSC		0.020 BSC	
L	0.400	0.800	0.016	0.031
θ	0°	6°	0°	6°

PACKAGE OUTLINE DIMENSIONS

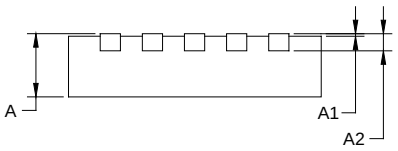
TDFN-3×3-10L



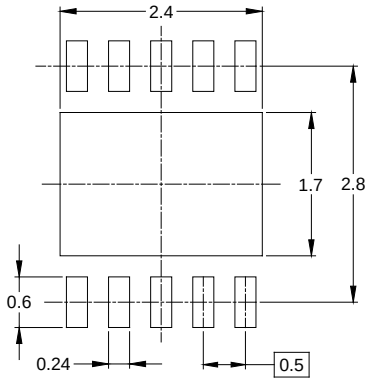
TOP VIEW



BOTTOM VIEW



SIDE VIEW

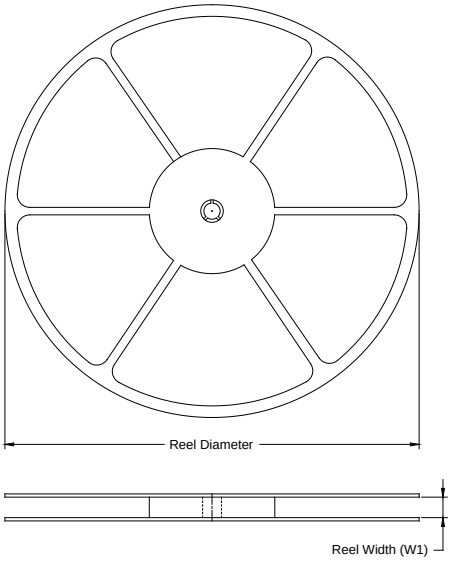


RECOMMENDED LAND PATTERN (Unit: mm)

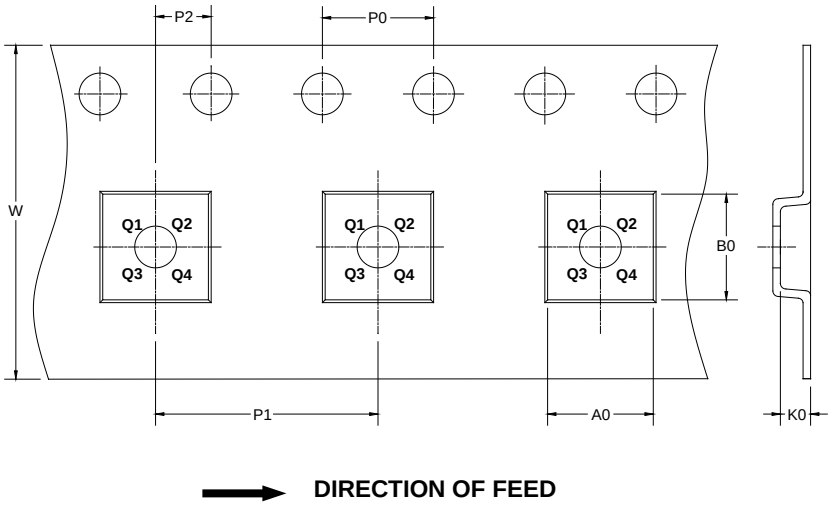
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.103
E	2.900	3.100	0.114	0.122
E1	1.500	1.800	0.059	0.071
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	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



DIRECTION OF FEED

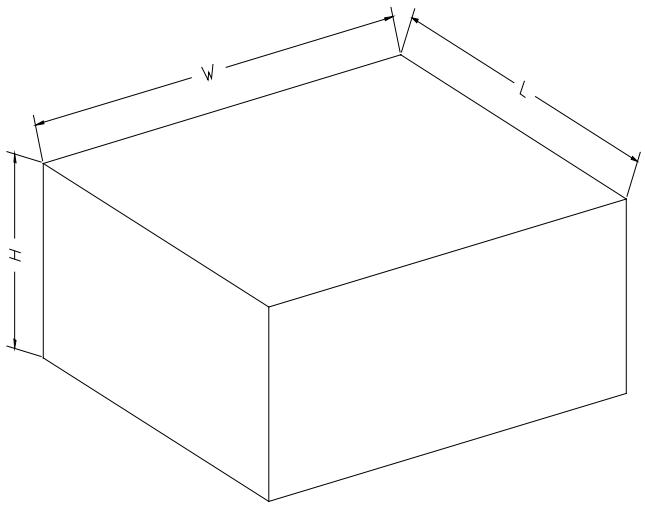
NOTE: The picture is only for reference. Please make the object as the standard.

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
MSOP-8	13″	12.4	5.20	3.30	1.50	4.0	8.0	2.0	12.0	Q1
MSOP-10	13″	12.4	5.20	3.30	1.20	4.0	8.0	2.0	12.0	Q1
TDFN-3×3-10L	13″	12.4	3.35	3.35	1.13	4.0	8.0	2.0	12.0	Q1

DD0001

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

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