1.25 WATT FULLY DIFFERENTIAL AUDIO POWER AMP W/INTERNAL FEEDBACK RESISTORS DETECTOR

A2211

Description

The A2211 is a fully differential audio power amplifier designed for portable communication device applications. It is capable of delivering 1.25 watt of continuous average power to an 8Ω BTL load with less than 1% distortion (THD+N) from a 5V battery voltage. It operates from 2.2V to 5.5V.

Features like 86dB PSRR at 217Hx, improved RF-rectification immunity, the space-saving 8-pin MSOP8 and 9-bump Micro SMD package, the advanced pop & click circuitry, a minimal count of external components and low-power shutdown mode make A2211 idea for wireless handsets.

The A2211 is unity-gain stable, and the gain can be configured by external input resistors and internal feedback resistors.

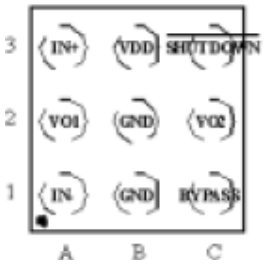
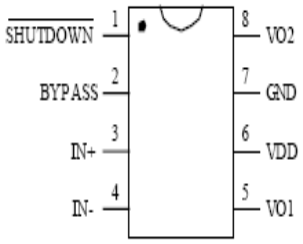
Features

- Fully Differential Amplifier
- Improved PSRR at 217Hz (V_{DD}>3.0V) 86dB(Typ)
- Power Output at 5.0V & 1% THD 1.25W(Typ)
- Power Output at 3.6V & 1% THD 0.6W(Typ)
- Ultra Low Shutdown Current 0.1uA(typ)
- Improved pop & click Circuitry Eliminates Noise During turn-on and turn-off Transitions
- Thermal Overload Protection Circuitry
- No Output Coupling Capacitors, Bootstrap Capacitors required
- Unity-Gain Stable
- External Gain Configuration Capability

Application

- Wireless Handsets
- Portable Audio Devices
- PDA
- Handheld Computer

Ordering Information

9 Bump Micro SMD Package	MSOP8 Package
 Top View	 Top View
PN: A2211B9	PN: A2211MS8

Pin Description

MSOP8	9-Bump Micro SMD	Symbol	Type	Functions
1	C3	Shutdown	I	Shutdown Pin, Active Low
2	C1	Bypass	I	Common Mode Voltage. Connect a Bypass Capacitor to GND for Common Mode Voltage Filtering. The Bypass Capacitor is Optional.
3	A3	IN+	I	Positive Differential Input
4	A1	IN-	I	Negative Differential Input
5	A2	V01	O	Positive Differential Output
6	B3	V_{DD}	I	Power Supply
7	B1, B2	GND	I	Ground
8	C2	V02	O	

Operation Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	V_{DD}	2.2		5.5	V
Operating Temperature Range	T_A	-40		85	^oC

Electrical Characteristics

Test Condition:

1. V_{DD}=5V(The following specifications apply for 8Ω load, A_V=1V/V, T_A=25°C, unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{DD}	Quiescent Power Supply Current	V_{IN}=0V, no Load		2.5	5	mA
		V_{IN}=0V, R_L=8Ω		4	8	
I_{SD}	Shutdown Current	$V_{SHUTDOWN}$=GND		0.01	1	uA
Po	Output Power	THD=1%(max, F=1KHz		1.25		W
THD+N	Total Harmonic Distortion +Noise	Po=0.6Wrms, F=1KHz		0.02		%
PSRR	Power Supply Rejection Ratio	Vripple=200mV sinep-p				dB
		F=217Hz (note1)		-88		
		F=1KHz (note2)		-83		
		F=217Hz (note2)		-83		
		F=1KHz (note2)		-83		
CMRR	Common Mode Rejection Ratio	F=217Hz V_{CM}=200mVpp		-78		dB
V_{OS}	Output Offset	V_{IN}=0V		2	8	mV
V_{SDIH}	Shutdown Voltage Input High		1.5			V
V_{SDIL}	Shutdown Voltage Input Low				0.5	V
A_V	Closed Loop Gain		36KΩ	40KΩ	44KΩ	V / V
			Ri	Ri	Ri	

Note1: Unterminated Input

Note2: 10Ω Terminated Input

2. V_{DD}=3.6V(The following specifications apply for 8Ω load, A_V=1V/V, T_A=25°C, unless otherwise noted.

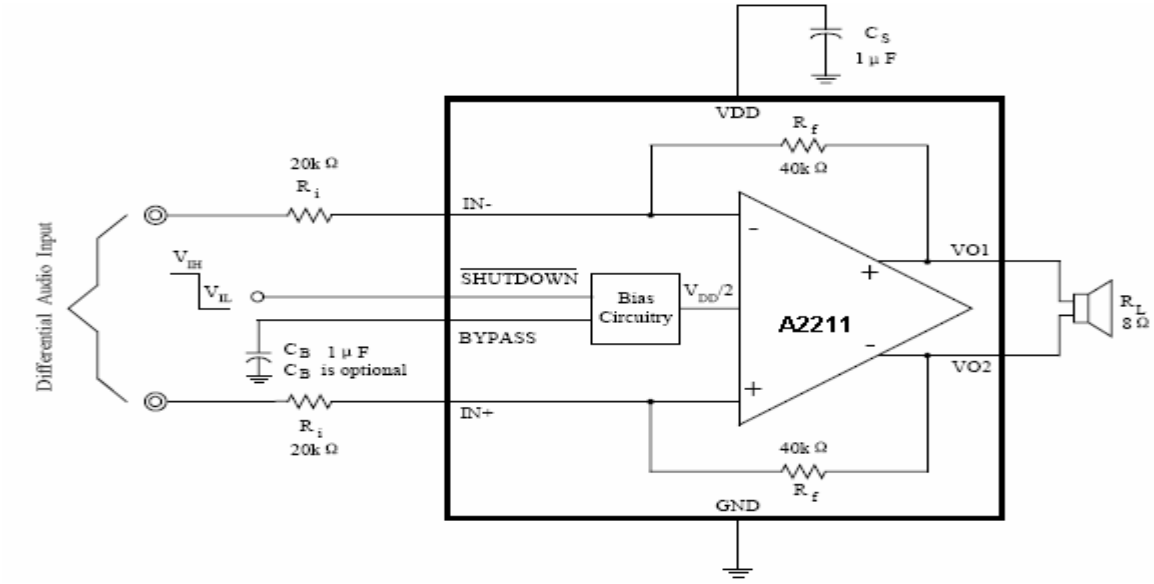
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{DD}	Quiescent Power Supply Current	V_{IN}=0V, no Load		2	4.5	mA
		V_{IN}=0V, R_L=8Ω		3.5	7.5	
I_{SD}	Shutdown Current	$V_{SHUTDOWN}$=GND		0.01	1	uA
Po	Output Power	THD=1%(max, F=1KHz		0.6		W
THD+N	Total Harmonic Distortion +Noise	Po=0.4Wrms, F=1KHz		0.02		%
PSRR	Power Supply Rejection Ratio	Vripple=200mV sinep-p				dB
		F=217Hz (note3)		-86		
		F=1KHz (note4)		-83		
		F=217Hz (note4)		-83		
		F=1KHz (note4)		-83		
CMRR	Common Mode Rejection Ratio	F=217Hz V_{CM}=200mVpp		-76		dB
V_{OS}	Output Offset	V_{IN}=0V		2	8	mV
V_{SDIH}	Shutdown Voltage Input High		1.5			V
V_{SDIL}	Shutdown Voltage Input Low				0.5	V
A_V	Closed Loop Gain		36KΩ	40KΩ	44KΩ	V / V
			Ri	Ri	Ri	

Note3: Unterminated Input

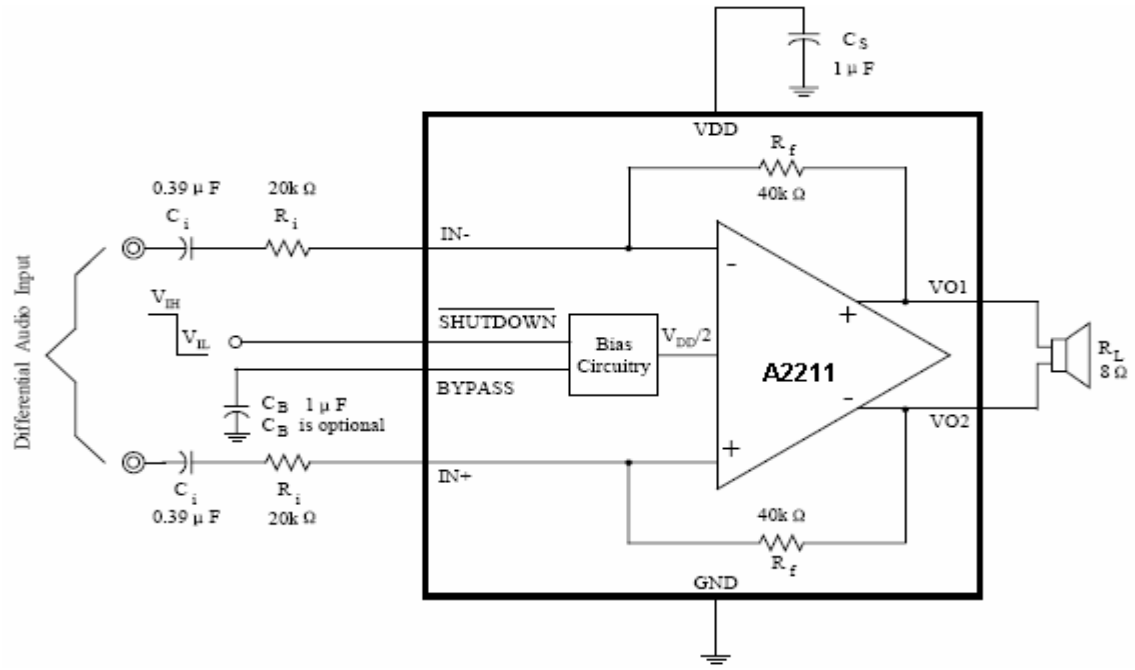
Note4: 10Ω Terminated Input

Typical Application

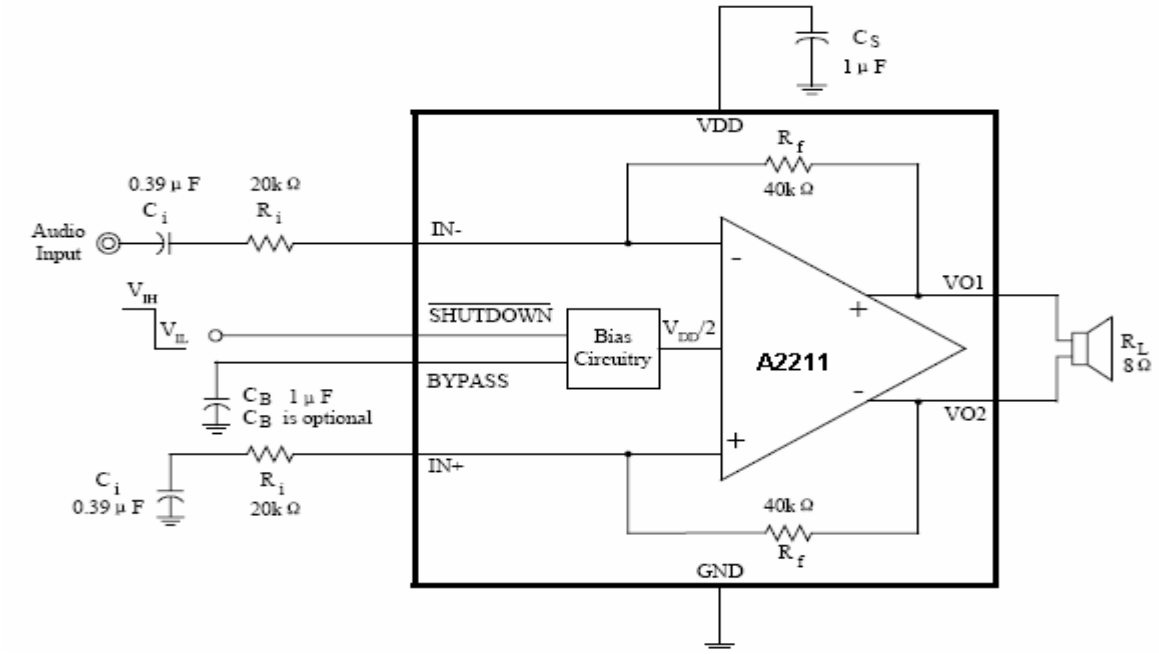
1. Typical Differential Input Application



2. Differential Input application with Input Capacitors

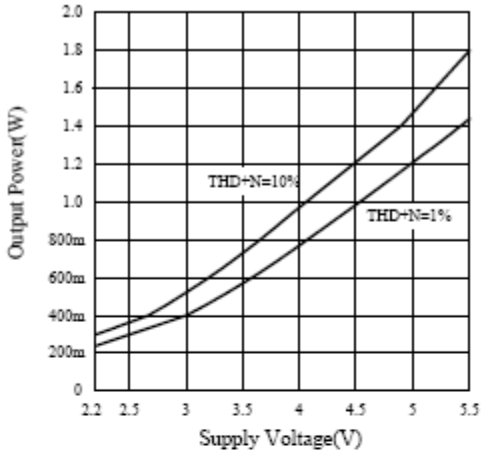


3. Single-Ended Input Application

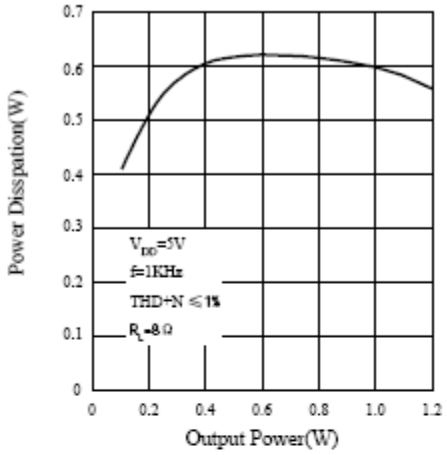


Typical Performance Characteristics

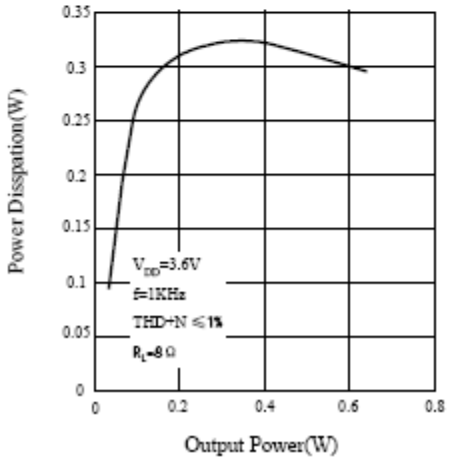
Output Power vs Supply Voltage
R_L=8 Ω



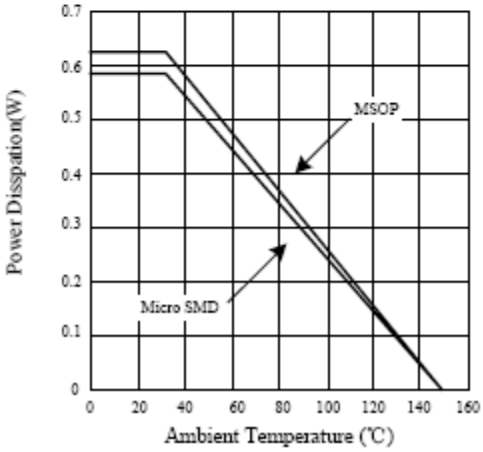
Power Dissipation vs Output Power



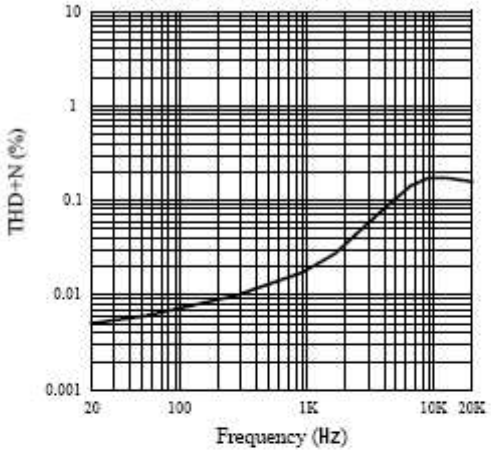
Power Dissipation vs Output Power



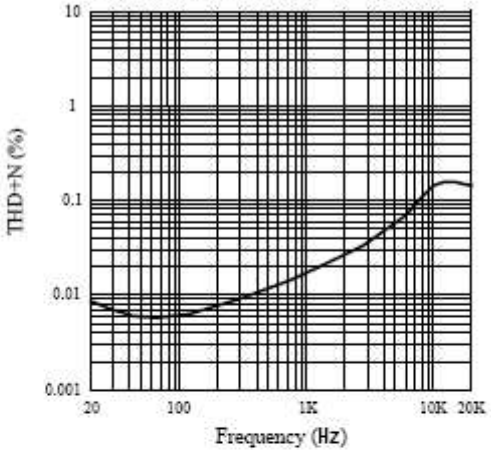
Power Derating Curve



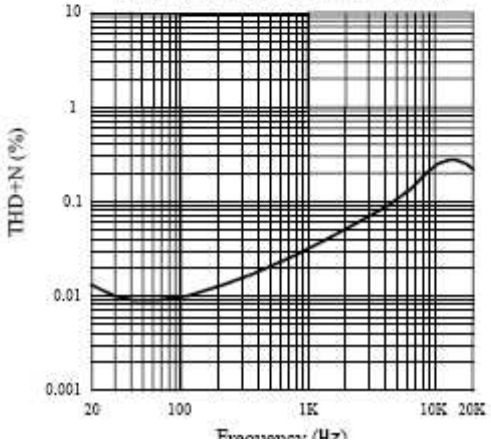
THD+N vs Frequency
V_{DD}=5V, R_L=8 Ω ,P_O=600mW



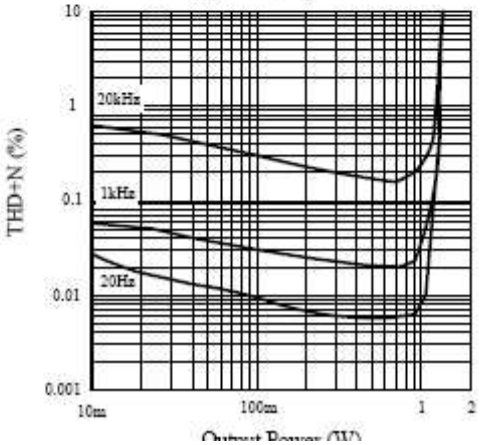
THD+N vs Frequency
V_{DD}=3.6V, R_L=8 Ω ,P_O=400mW



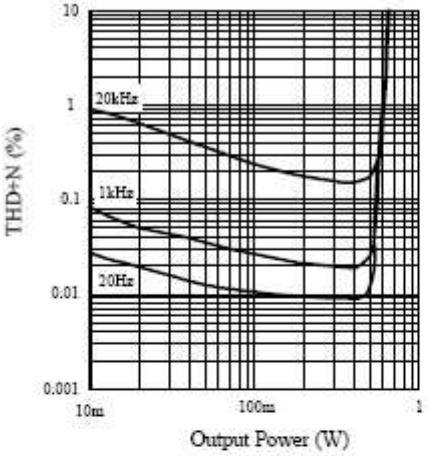
THD+N vs Frequency
V_{DD}=2.5V, R_L=8 Ω ,P_O=150mW



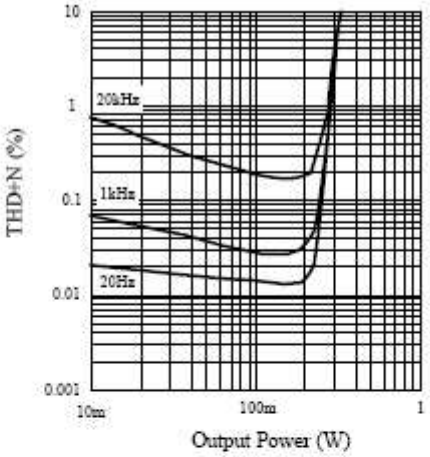
THD+N vs Output Power
V_{DD}=5V, R_L=8 Ω



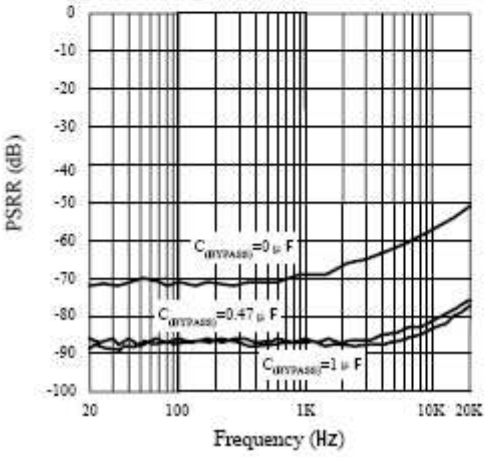
THD+N vs Output Power
V_{DD}=3.6V, R_L=8 Ω



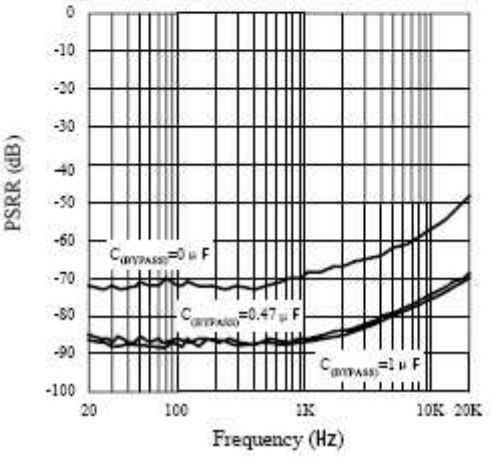
THD+N vs Output Power
V_{DD}=2.5V, R_L=8 Ω



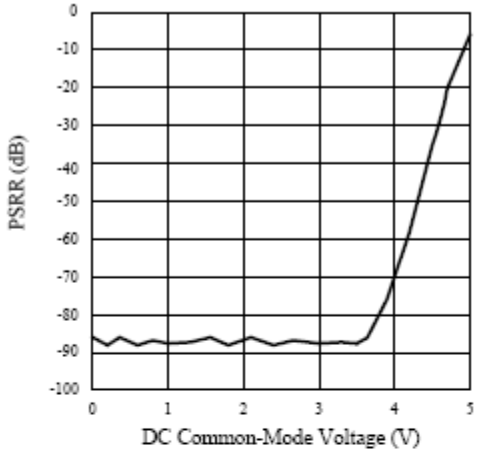
PSRR vs Frequency
V_{DD}=5.0V, R_L=8 Ω ,input 10 Ω Terminated



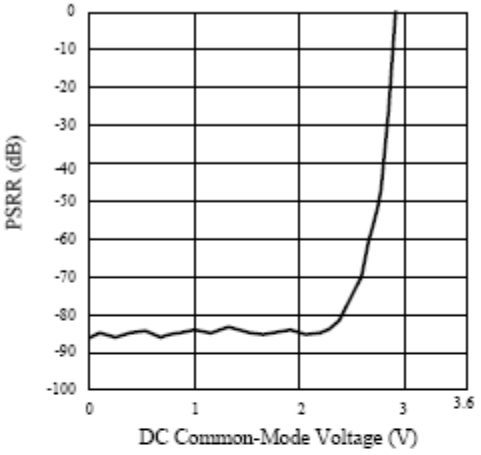
PSRR vs Frequency
V_{DD}=3.6V, R_L=8 Ω ,input 10 Ω Terminated



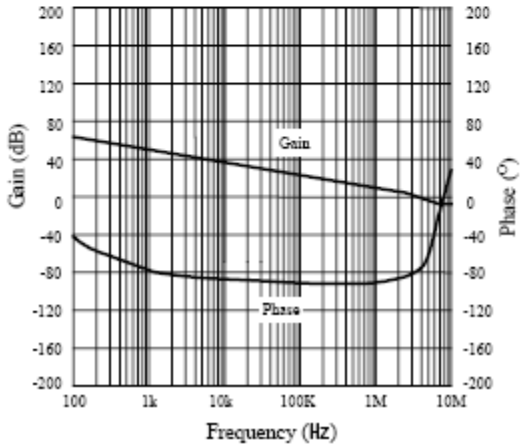
PSRR vs Common Mode voltage
V_{DD}=5.0V, R_L=8 Ω , 217Hz, 200mV_{pp}



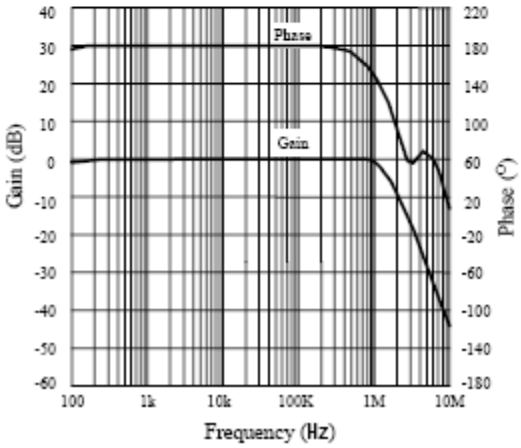
PSRR vs Common Mode voltage
V_{DD}=3.6V, R_L=8 Ω , 217Hz, 200mV_{pp}



Open Loop Frequency Response

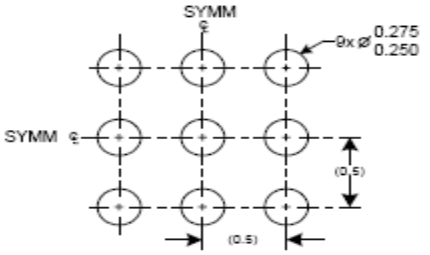


Closed Loop Frequency Response

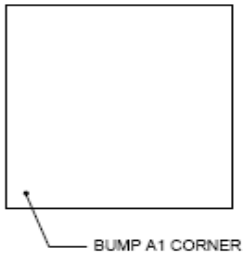


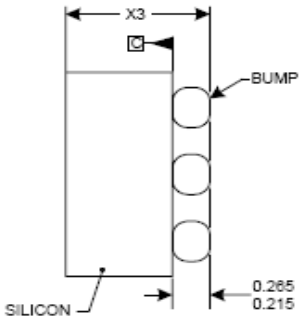
Package Information

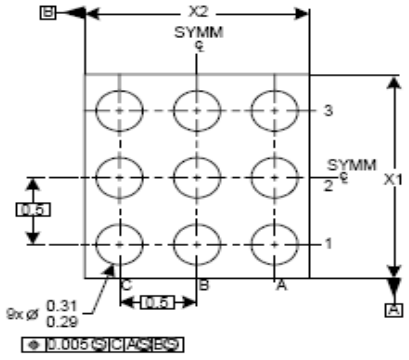
Dimension in 9 Bump Micro SMD (Unit: mm)



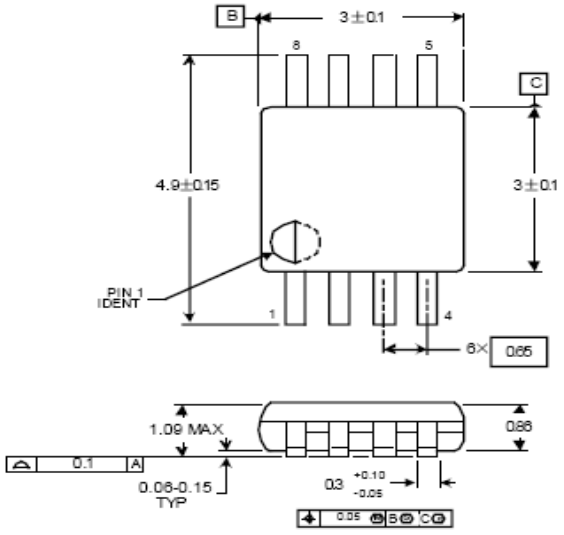
LAND PATTERN RECOMMENDATION

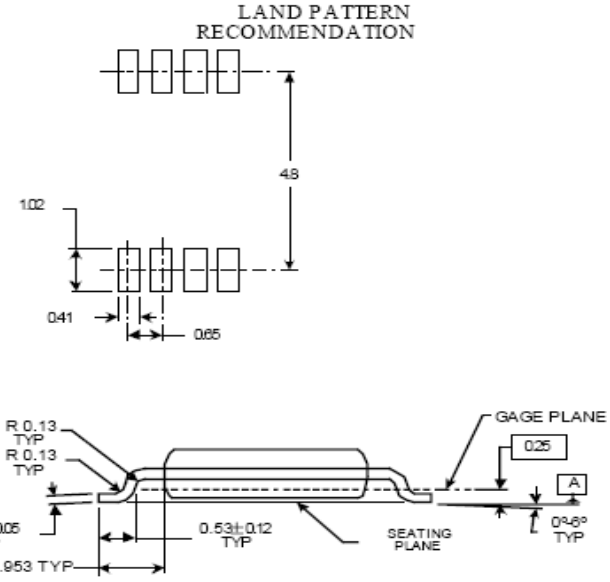






Dimension in MSOP8 Package





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