

## 1.28 Watt Audio Power Amplifier

# LR6212

### Features

- Improved PSRR at 217 Hz & 1 KHz      62 dB
- Power output at 5.0V, 1% THD+N, 8Ω      1.28 W (typ.)
- Power output at 3.0V, 1% THD+N, 8Ω      440 mW (typ.)
- Ultra low shutdown current      0.1 uA (typ.)
- 2.2V – 5.5V operation
- Improved circuitry eliminates pop-click noise during turn-on and turn-off transitions
- No output coupling capacitors, snubber networks or bootstrap capacitors required
- Unity-gain stable
- External gain configuration capability
- Available in space-saving packages: MSOP8, 9-BUMP WLCSP

### General Description

The LR6212 is a Class-AB audio power amplifier designed for mobile phones and other portable communication devices. It is capable of delivering 1.28 watts of continuous average power to an 8Ω BTL load with less than 1% distortion (THD+N) from a 5V<sub>DC</sub> power supply.

The LR6212 was designed specifically to provide high quality output power with a minimal amount of external components. It does not require output coupling capacitors or bootstrap capacitors. And with ultra low shutdown current, the LR6212 is ideally suited for mobile phone and other low voltage applications where minimal power consumption is a primary requirement.

With special pop-click eliminating circuit, the LR6212 provides perfect pop-click characteristic during turn-on and turn-off transitions.

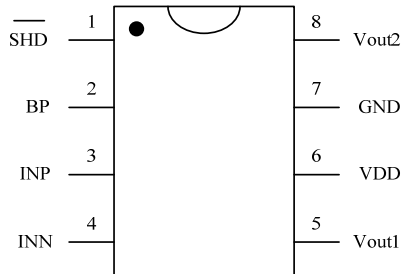
The LR6212 is unity-gain stable and can be configured by external gain-setting resistors.

### Applications

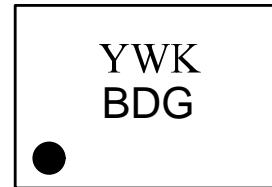
- Wireless handsets
- Portable electronic devices
- PDAs, Handheld computers

### Pin Diagrams

Mini Small Outline Package (MSOP8)  
(Top View)

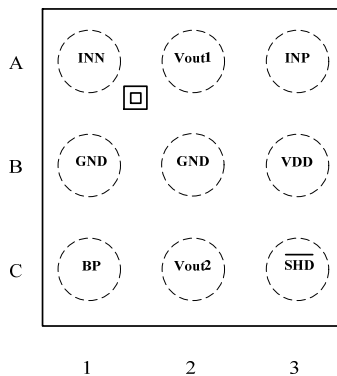


MSOP8 Marking  
(Top View)



Y - Year Code  
WK - Week Code  
BDG -MSOP8 ROHS

9 Bump WLCSP Package  
(Top View)



9 Bump WLCSP Marking  
(Top View)



Y - Year Code  
WK - Week Code  
BAG-9-BUMP ROHS

### Pin Description

No.	Pin Name	I/O	Description
1	$\overline{\text{SHD}}$	I	Shout-down Logical Control, '0' is active.
2	BP	I/O	Analog ground for inner OPAs. It's about a half of VDD.
3	INP	I	Positive Input
4	INN	I	Negative Input
5	Vout1	O	Negative BTL Output
6	VDD	I/O	Power Supply (2.2 – 5.5 V)
7	GND	I/O	Ground
8	Vout2	O	Positive BTL Output

Typical Application Circuit

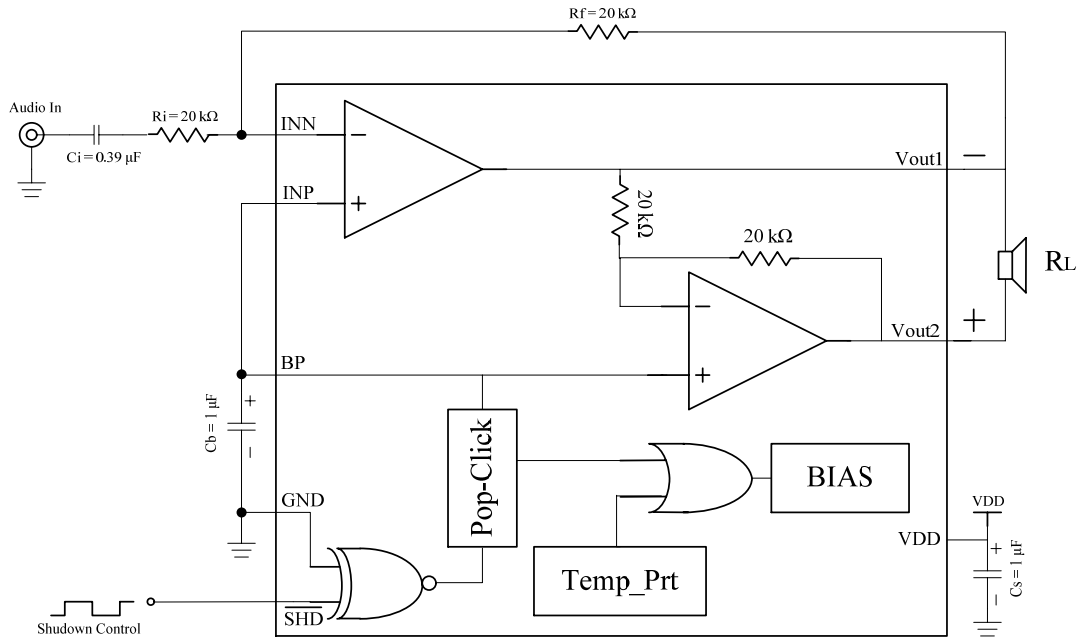


FIGURE 1. LR6212 Typical Application Circuit

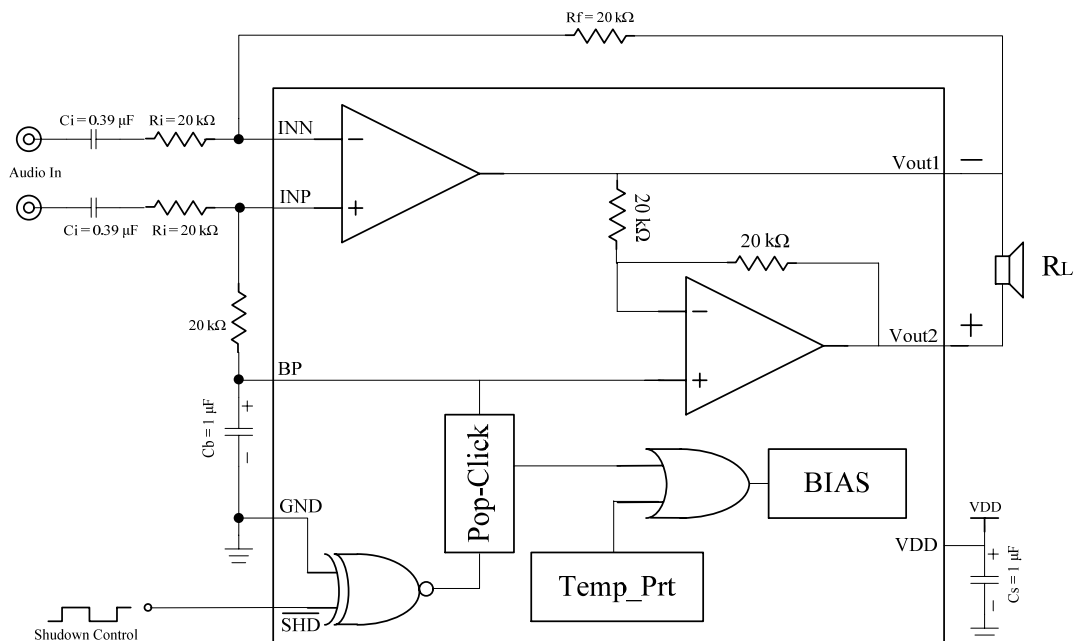


FIGURE 2. LR6212 Differential Amplifier Configuration

### External Components Description

Components	Functional Description
Ri	Inverting input resistance which sets the closed-loop gain in conjunction with Rf. This resistor also forms a high pass filter with Ci at $f_c = 1/(2\pi Ri \cdot Ci)$ .
Ci	Input coupling capacitor which blocks the DC voltage at the amplifiers input terminates. Also creates a high-pass filter with Ri at $f_c = 1/(2\pi Ri \cdot Ci)$ .
Rf	Feedback resistance which sets the closed-loop gain in conjunction with Ri.
Cs	Supply bypass capacitor which provides power supply filtering.
Cb	Bypass pin capacitor which provides half-supply filtering. Refer to the section.

### Absolute Maximum Ratings

Supply Voltage	-0.3V to 6V
Input Voltage	-0.3V to VDD+0.3V
Power Dissipation	

See Dissipation Rating Table

ESD Susceptibility (Human body model)  
4000V

Junction Temperature -40°C to +150°C  
Storage Temperature -65°C to +150°C

Thermal Resistance  
 $\theta_{JC}(\text{MSOP8})$  56°C/W  
 $\theta_{JA}(\text{MSOP8})$  190°C/W  
 $\theta_{JA}(\text{9-BUMP})$  180°C/W

### Operating Ratings

Temperature Range	$-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$
Supply Voltage	$2.2\text{V} \leq V_{DD} \leq 5.5\text{V}$

**NOTE:** Absolute Maximum Ratings indicate limits beyond which damage to the device may occur.  
Operating Rating indicate conditions for which the device is functional, but do not guarantee specific performance limits.

### Electrical Characteristics

The following specifications apply for the circuit shown in Figure 1, unless otherwise specified. Limits apply for  $T_A = 25^\circ\text{C}$ .

□  $V_{DD} = 5\text{V}$

Symbol	Parameter	Conditions	Spec			Units
			Min.	Typ.	Max.	
I <sub>DD</sub>	Quiescent Power Supply Current	V <sub>IN</sub> = 0V, 8Ω Load		2.4	8	mA
		V <sub>IN</sub> = 0V, No Load		2.1	7	mA
I <sub>SD</sub>	Shutdown Current	V <sub>IN</sub> =0V, V <sub>SHD</sub> =GND, No Load		0.1	2	uA
V <sub>SDIH</sub>	Shutdown Voltage Input High			1.58		V
V <sub>SDIL</sub>	Shutdown Voltage Input Low			1.36		V
V <sub>OS</sub>	Output Offset Voltage		-50	6	50	mV

THD+N	Total Harmonic Distortion+Noise	Po=0.5Wrms, f=1KHz,		0.04		%
P <sub>O</sub>	Output Power	THD+N<=1%, f=1KHz, 8Ω Load	0.9	1.28		W
PSRR	Power Supply Rejection Ratio	Input terminated with 10Ω, V <sub>DDRIPPLE</sub> =0.2V <sub>P-P</sub> , f=217Hz	55	60		dB
		Input terminated with 10Ω, V <sub>DDRIPPLE</sub> =0.2V <sub>P-P</sub> , f=1KHz	55	64		dB
T <sub>WU</sub>	Wake-up time			100		ms
R <sub>OUT</sub>	Resistor Output to GND		5.8	7.3	9.7	kΩ

□ V<sub>DD</sub> = 3V

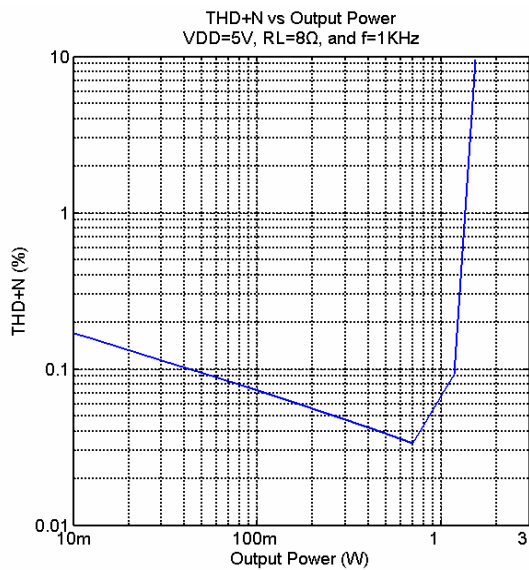
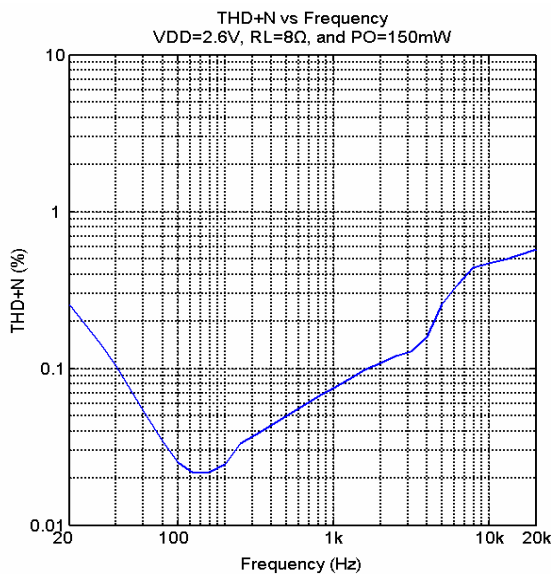
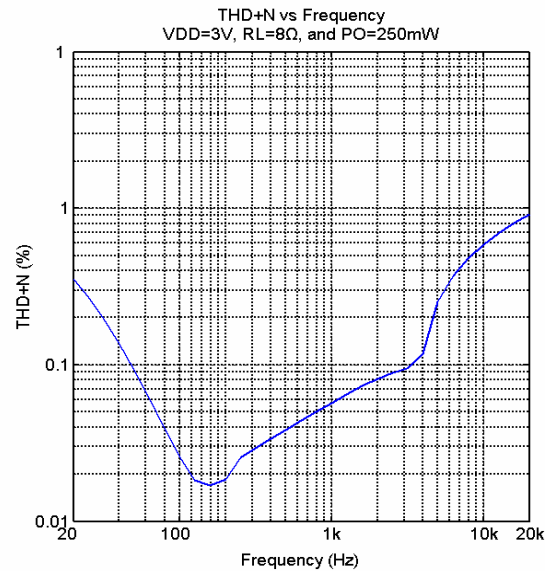
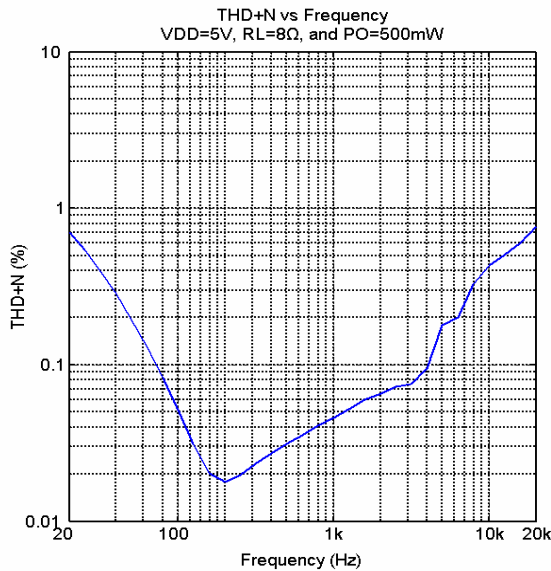
Symbol	Parameter	Conditions	Spec			Units
			Min.	Typ.	Max.	
I <sub>DD</sub>	Quiescent Power Supply Current	V <sub>IN</sub> = 0V, 8Ω Load		1.9	7	mA
		V <sub>IN</sub> = 0V, No Load		1.7	6	mA
I <sub>SD</sub>	Shutdown Current	V <sub>IN</sub> =0V, V <sub>SHD</sub> =GND, No Load		0.1	2	uA
V <sub>SDIH</sub>	Shutdown Voltage Input High			1.27		V
V <sub>SDIL</sub>	Shutdown Voltage Input Low			1.08		V
V <sub>OS</sub>	Output Offset Voltage		-50	6	50	mV
THD+N	Total Harmonic Distortion+Noise	Po=0.25Wrms, f=1KHz,		0.06		%
P <sub>O</sub>	Output Power	THD+N<=1%, f=1KHz, 8Ω Load		440		mW
PSRR	Power Supply Rejection Ratio	Input terminated with 10Ω, V <sub>DDRIPPLE</sub> =0.2V <sub>P-P</sub> , f=217Hz	55	62		dB
		Input terminated with 10Ω, V <sub>DDRIPPLE</sub> =0.2V <sub>P-P</sub> , f=1KHz	55	68		dB
T <sub>WU</sub>	Wake-up time			75		ms
R <sub>OUT</sub>	Resistor Output to GND		5.8	7.3	9.7	kΩ

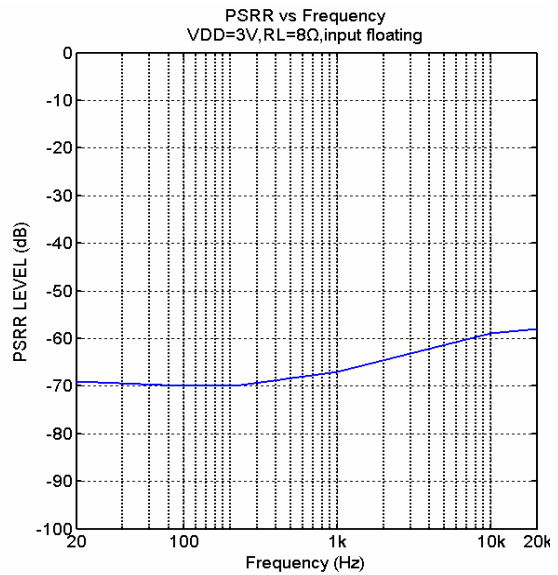
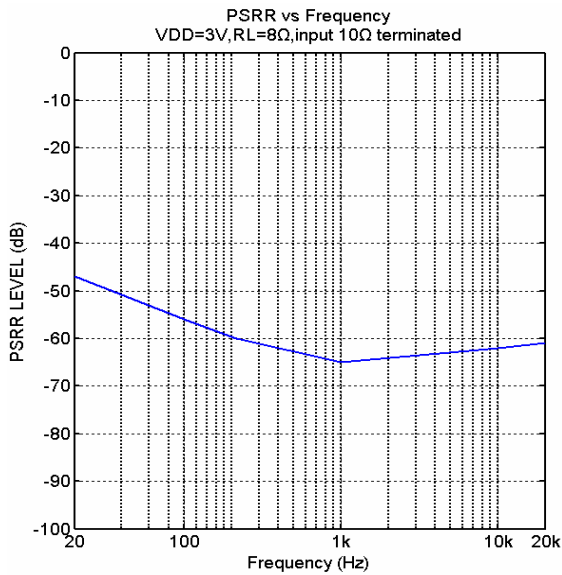
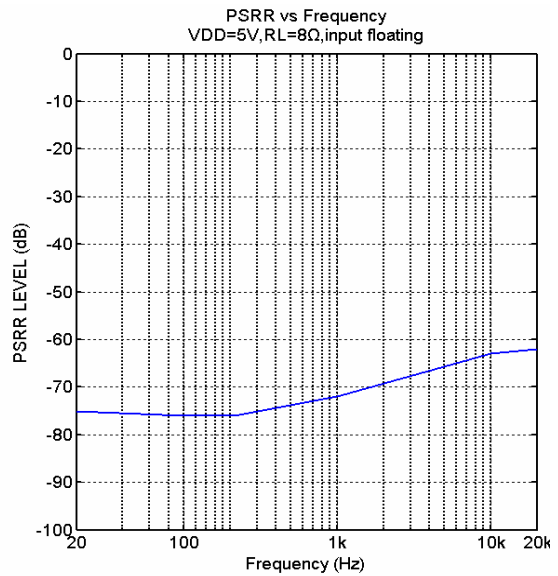
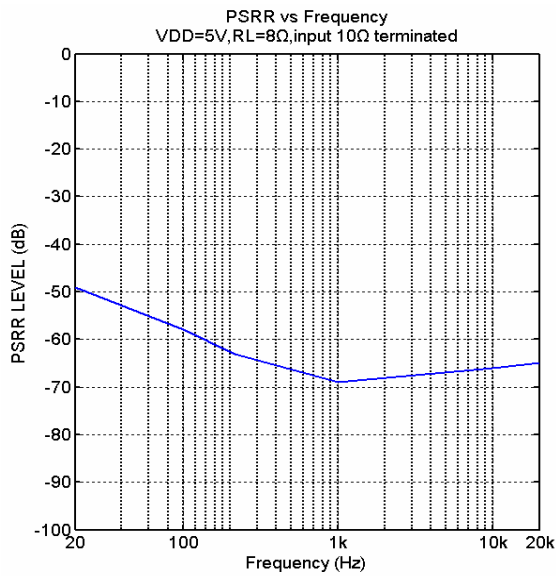
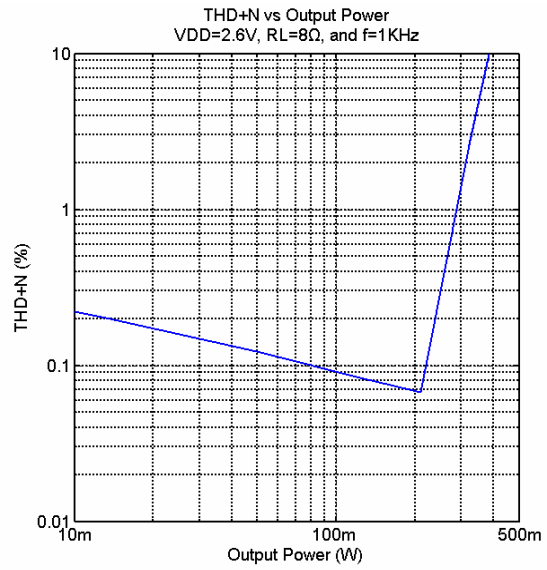
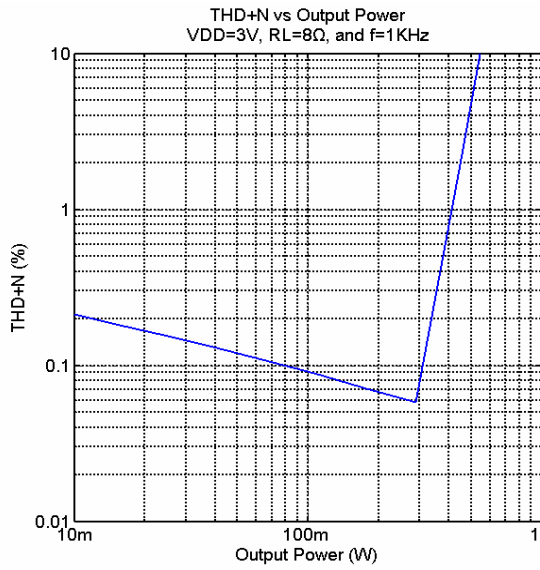
□ V<sub>DD</sub> = 2.6V

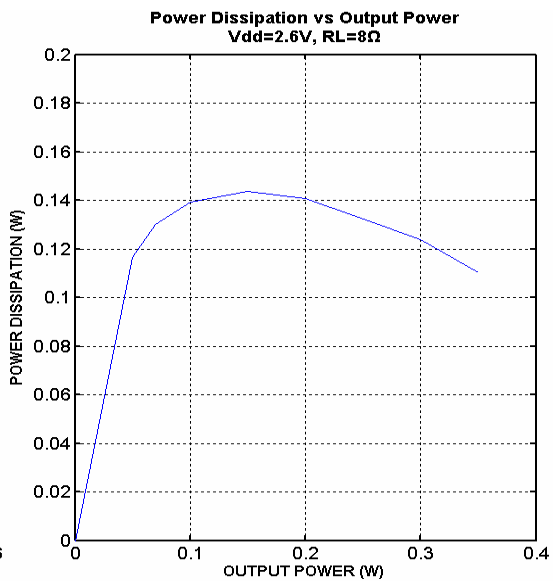
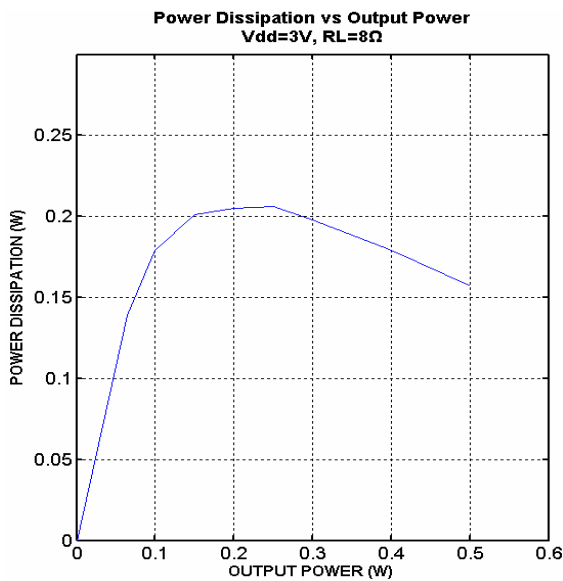
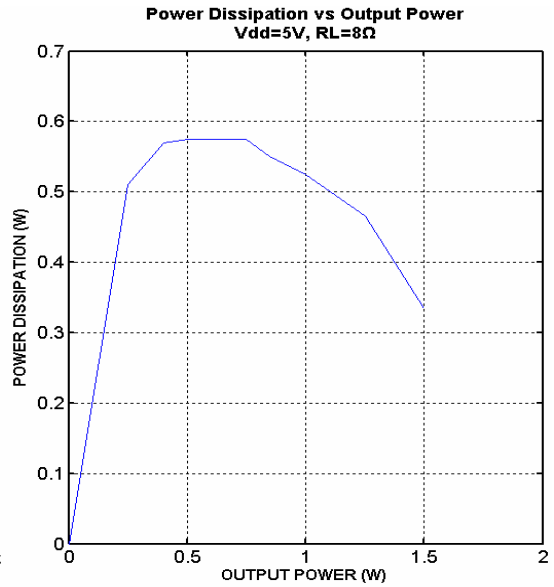
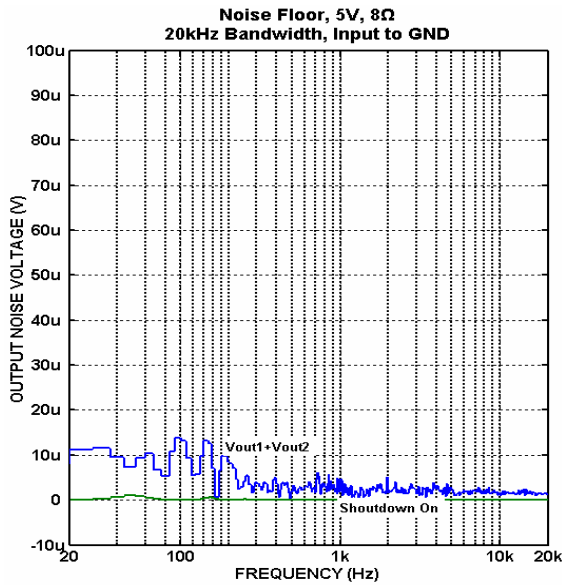
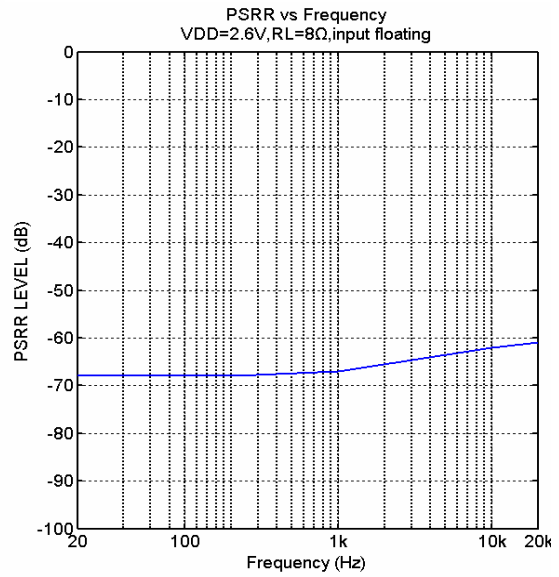
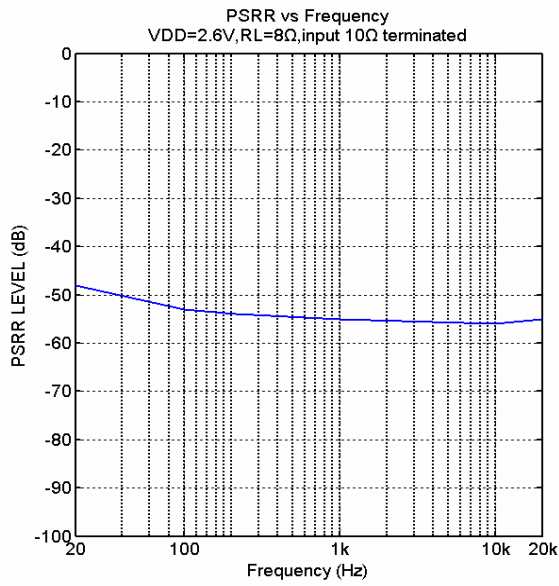
Symbol	Parameter	Conditions	Spec			Units
			Min.	Typ.	Max.	
I <sub>DD</sub>	Quiescent Power Supply Current	V <sub>IN</sub> = 0V, 8Ω Load		1.7		mA
		V <sub>IN</sub> = 0V, No Load		1.47		mA
I <sub>SD</sub>	Shutdown Current	V <sub>IN</sub> =0V, V <sub>SHD</sub> =GND, No Load		0.1		uA
V <sub>SDIH</sub>	Shutdown Voltage Input High			1.20		V
V <sub>SDIL</sub>	Shutdown Voltage Input Low			1.01		V
V <sub>OS</sub>	Output Offset Voltage		-50	4	50	mV
THD+N	Total Harmonic Distortion+Noise	Po=0.15Wrms, f=1KHz,		0.08		%

$P_O$	Output Power	THD+N $\leq$ 1%, 8 $\Omega$ Load	$f=1\text{KHz}$ ,		320		mW
PSRR	Power Supply Rejection Ratio	Input terminated with 10 $\Omega$ , $V_{\text{DDRIPPLE}}=0.2V_{\text{P-P}}$ , $f=217\text{Hz}$	51	56			dB
		Input terminated with 10 $\Omega$ , $V_{\text{DDRIPPLE}}=0.2V_{\text{P-P}}$ , $f=1\text{KHz}$	51	59			dB
$T_{\text{WU}}$	Wake-up time				70		ms
$R_{\text{OUT}}$	Resistor Output to GND			5.8	7.3	9.7	k $\Omega$

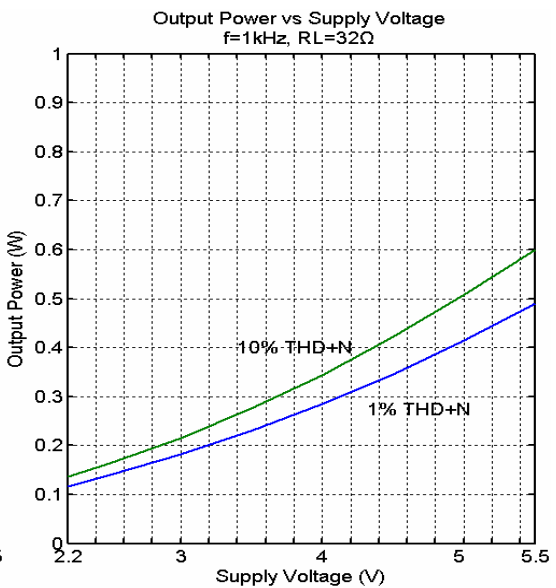
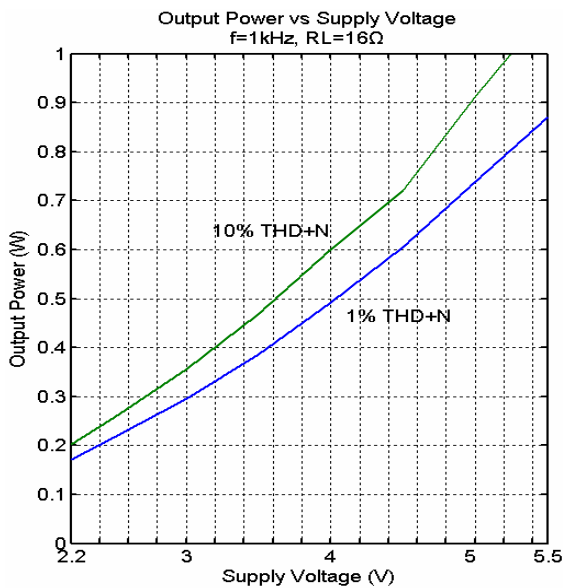
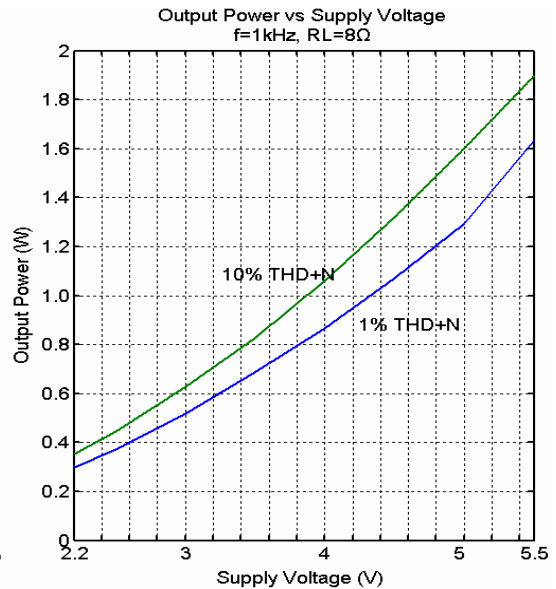
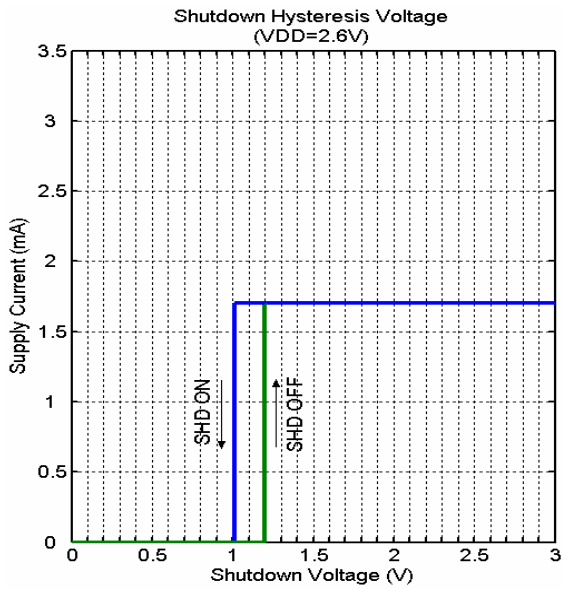
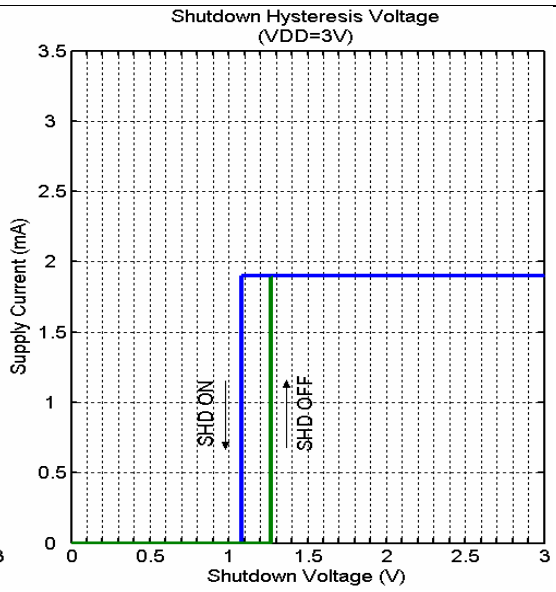
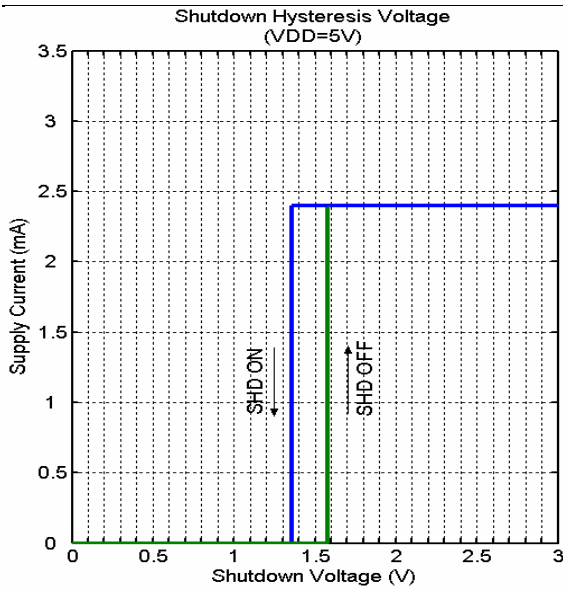
### Typical Performance Characteristics



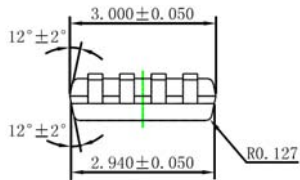
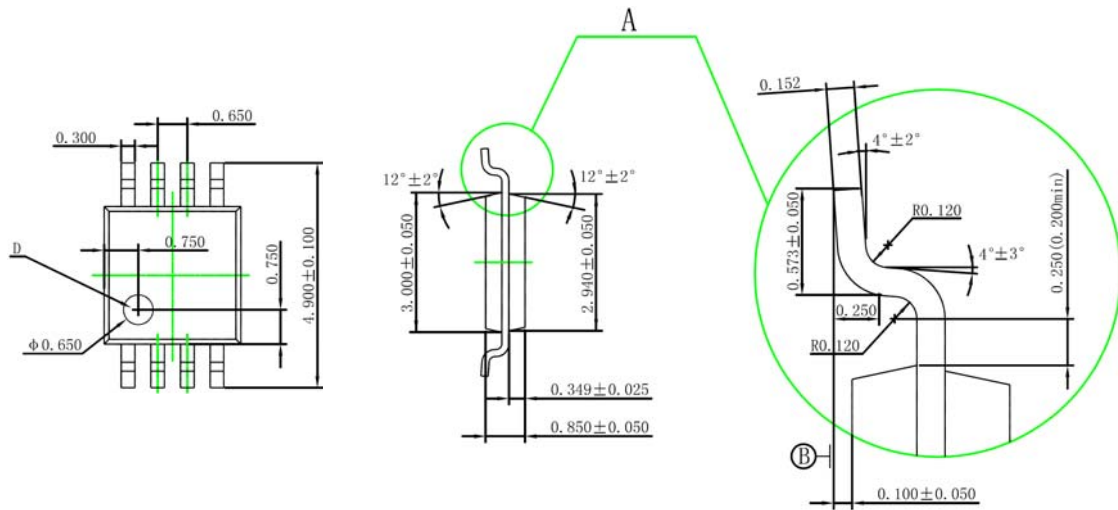




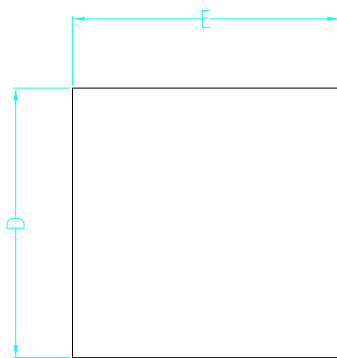




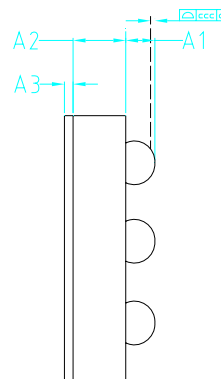
Package Dimensions



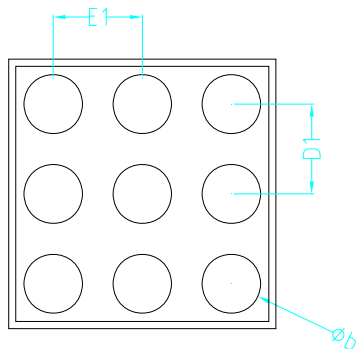
**MSOP8**  
All dimension values are in millimeter.



TOP VIEW



9 Bump WLCSP Dimensions (mm)



BOTTOM VIEW

REF	MIN	TYP	MAX
A1	0.215	0.235	0.255
A2	0.355	0.380	0.405
A3	0.020	0.035	0.050
D	1.485	1.500	1.515
D1		0.500	
E	1.485	1.500	1.515
E1		0.500	
b	0.300	0.320	0.340
CCC		0.080	

单击下面可查看定价，库存，交付和生命周期等信息

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