

### General Description

The AS9893 is a mono audio power amplifier capable of delivering 1W of continuous average power into a 8Ω load with less than 1% distortion THD when powered by a 5V power supply. It does not require output coupling capacitors or bootstrap capacitors, and is ideal for mobile phone and other low voltage applications where minimal power consumption is a primary requirement.

The AS9893 features a low-power consumption shutdown mode, and an internal thermal shutdown protection mechanism. Advanced pop & click circuitry is built in to eliminate noises that would otherwise occur during turn-on and turn-off transitions. The AS9893 is unity-gain stable and can be configured by external gain-setting resistors.

A1semi products are Pb-free and RoHS compliant.

### Key Specifications

- BTL mode  $P_o$  at THD+N=1%,  $f=1\text{kHz}$ ,  $V_{DD}=5\text{V}$   
2.1W (typ) into 4Ω  
1.0W (typ) into 8Ω
- shutdown current 0.1uA(typ)  
PSRR at 217Hz,  $V_{DD}=5\text{V}$  60dB(typ)
- 2.6-5.5V operation

### Features

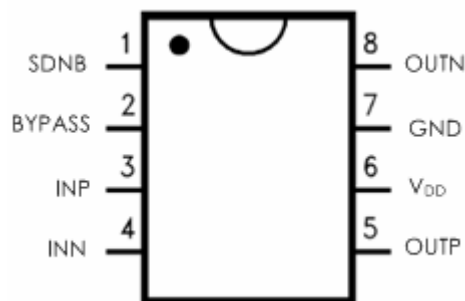
- No output coupling capacitors, bootstrap capacitors, or snubber circuits required
- Unity-gain stable
- DFN-8, MSOP-8
- External gain configuration capability

### Applications

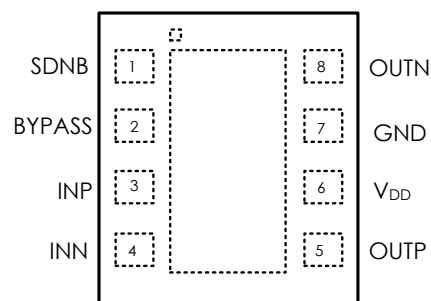
- Portable Electronic Devices
- Mobile Phones

### Connection Diagram

Mini Small Outline (MSOP8) Package



DFN-8 Package



Typical Application

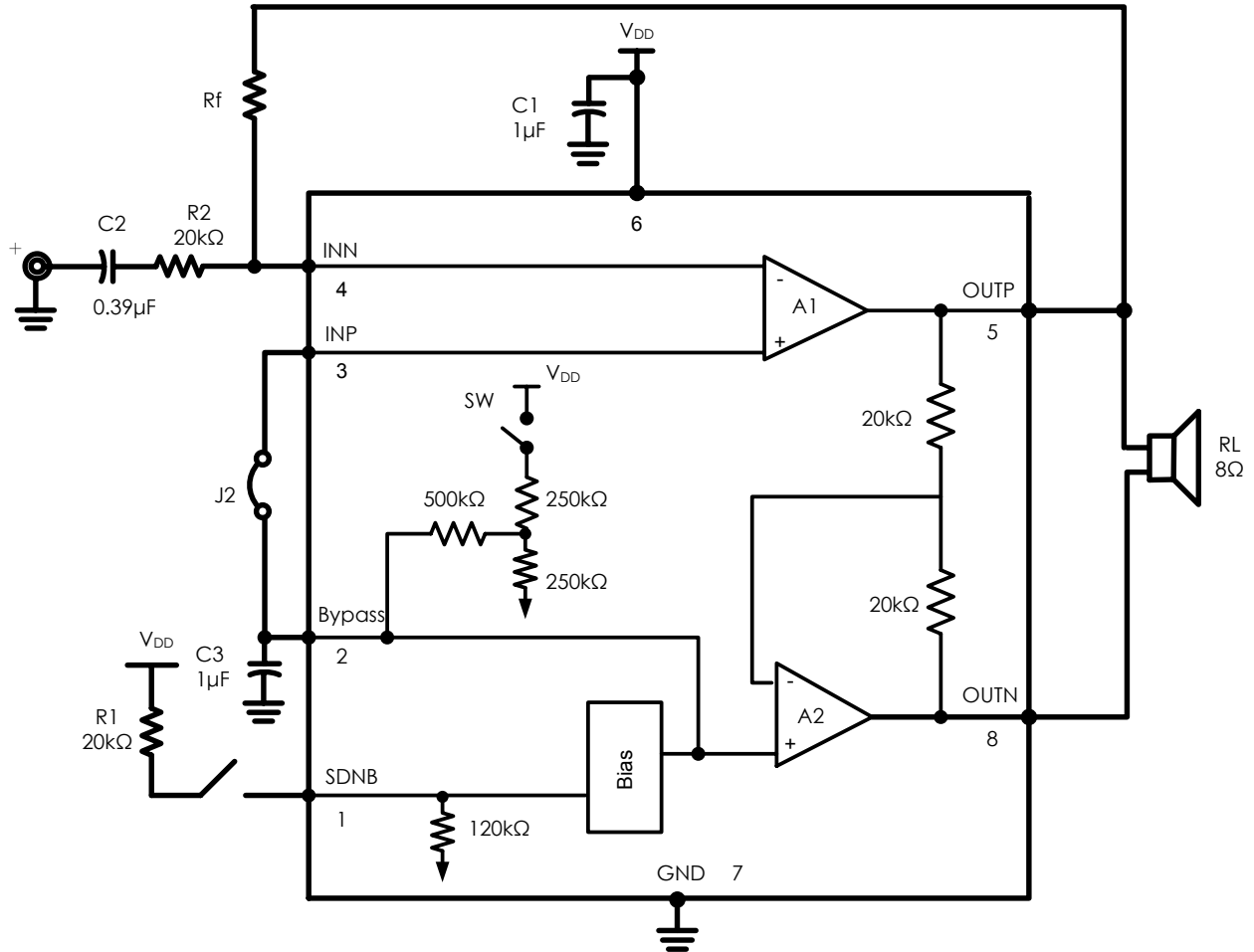


FIGURE 1. Typical Audio Amplifier Application Circuit



### Absolute Maximum Ratings

Supply Voltage	6.0V	Thermal Resistance	
Storage Temperature	-65°C to +150°C	$\theta_{JA}$ (DFN)	220°C/W
Input Voltage	-0.3V to VDD +0.3V	$\theta_{JA}$ (MSOP)	190°C/W
Power Dissipation	Internally Limited	$\theta_{JC}$ (MSOP)	56°C/W
ESD Susceptibility	HBM 4kV		
Operating Ratings			
Junction Temperature	150°C	Temperature Range	-40°C ≤ TA ≤ 85°C
		Supply Voltage	2.6V ≤ VDD ≤ 5.5V

### Electrical Characteristics

The following specifications apply for VDD = 5V and RL = 8Ω unless otherwise specified. Limits apply for TA = 25°C.

Symbol	Parameter	Conditions	Conditions			Units (Limits)
			Min	Typical	Limit	
IDD	Quiescent Power Supply Current	VIN = 0V, IO = 0A	4.0		8.0	mA
ISD	Shutdown Current	VSDNB = 0V		0.1	1.0	µA
VOs	Output Offset Voltage	VIN = 0V		5.0	25	mV
PO	Output Power	THD + N = 1 %, f = 1kHz RL = 4Ω RL = 8Ω		2.1 1.0		W
THD+N	Total Harmonic Distortion + Noise	PO=0.4W, f=1kHz		0.04		%
PSRR	Power Supply Rejection Ratio	VRIIPPLE=200mV, sine p-p at 217Hz, input 10Ω to GND		60	55	dB

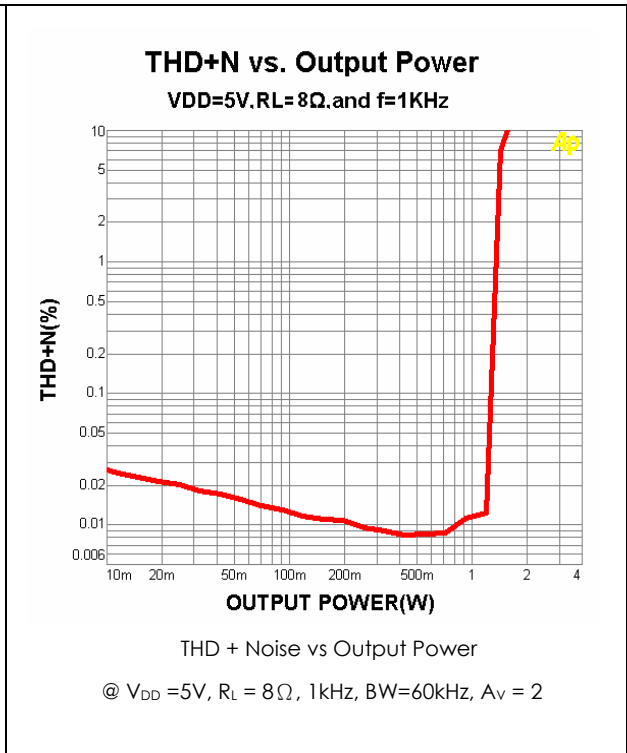
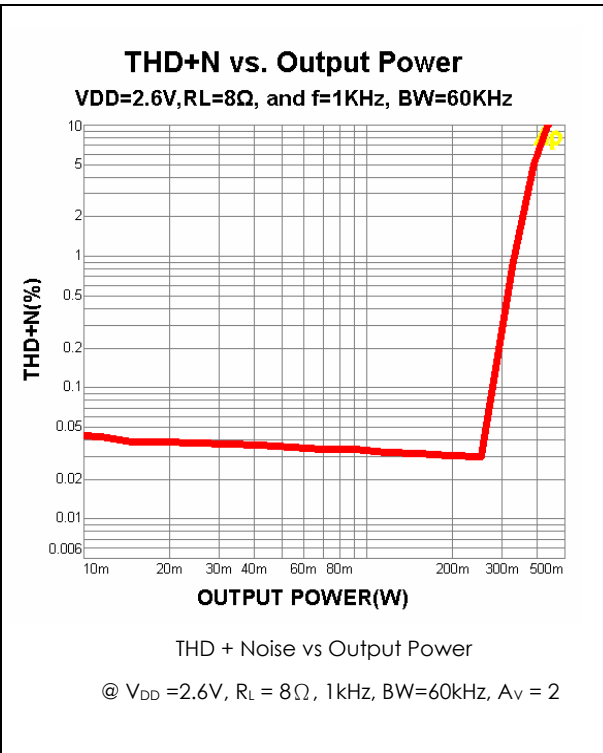
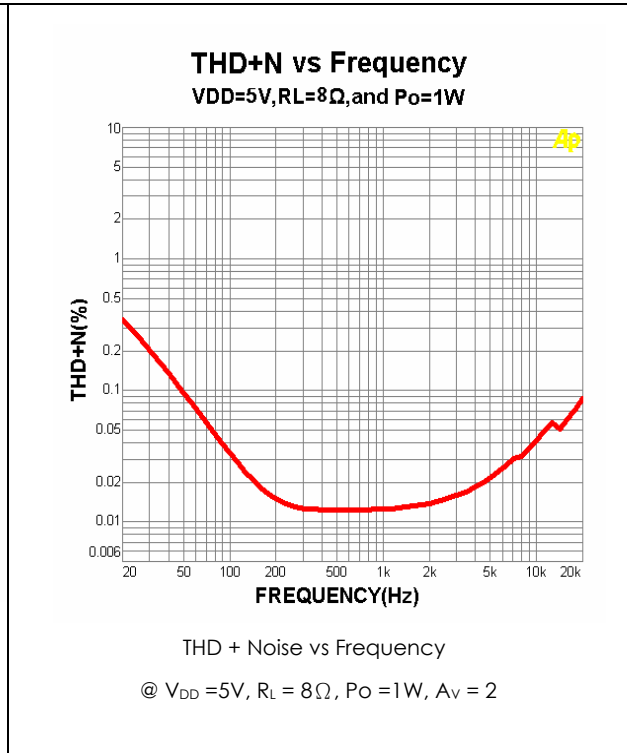
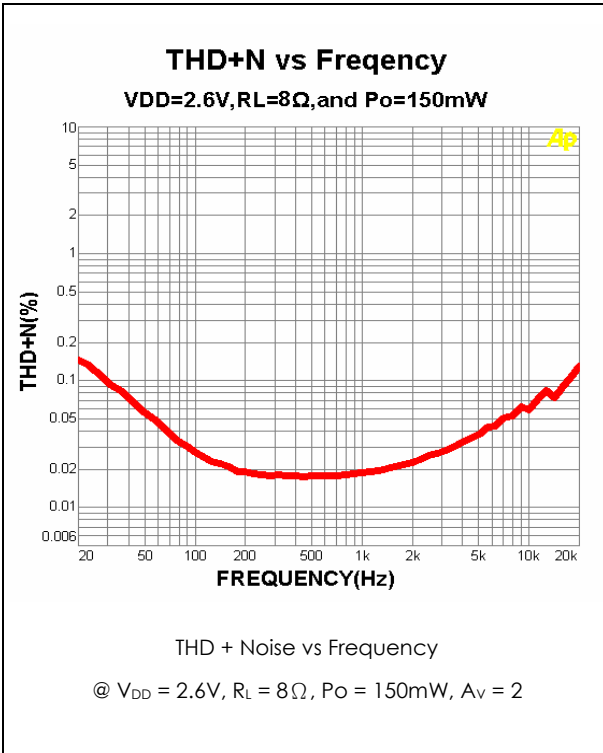


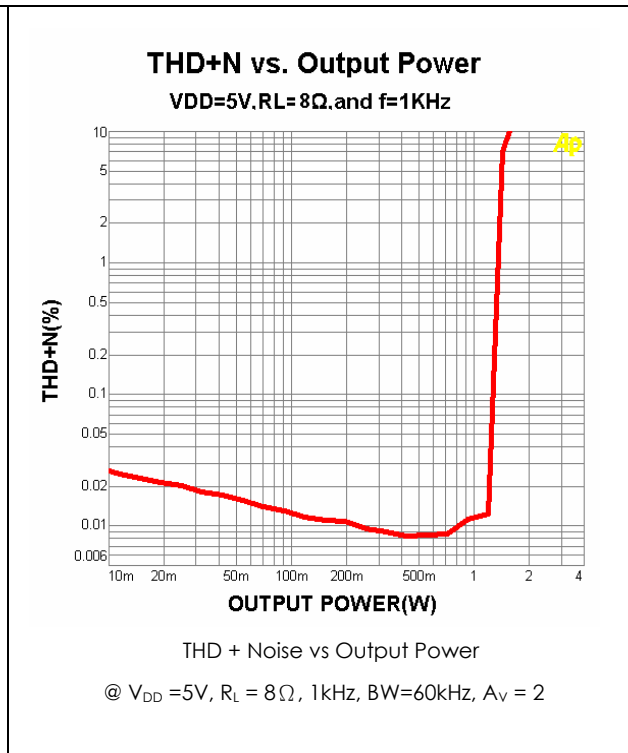
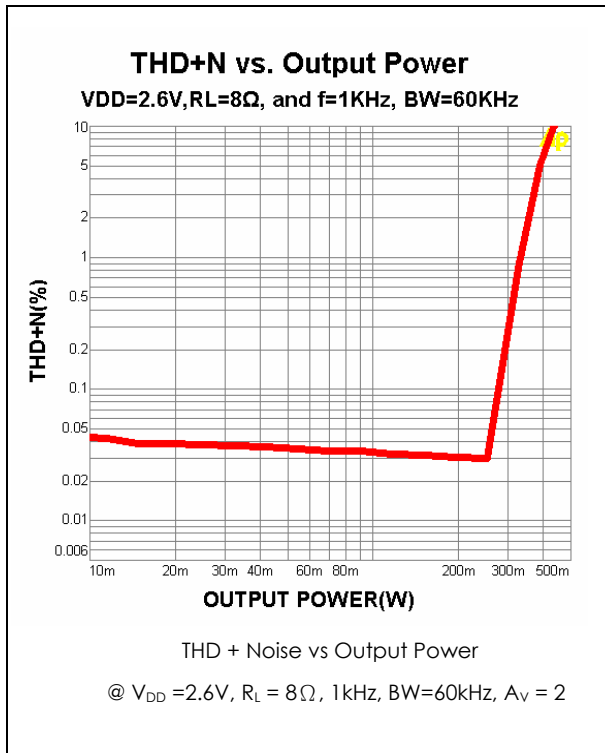
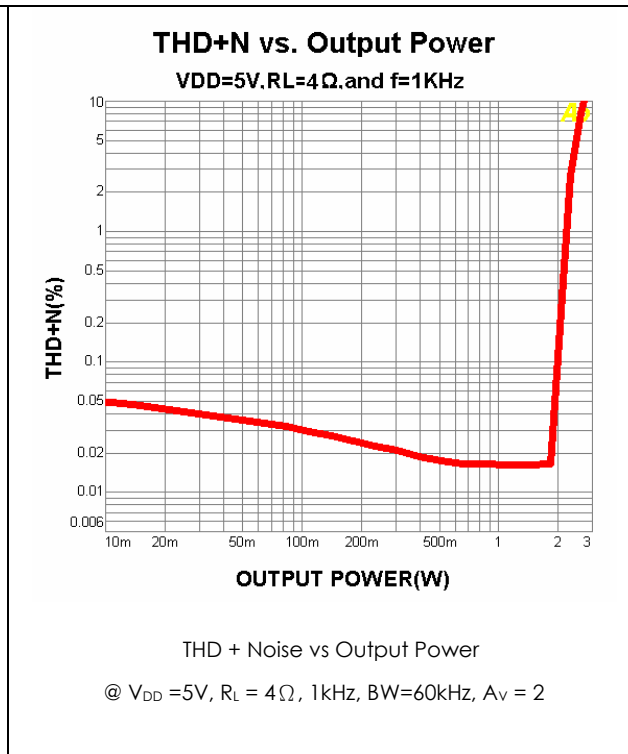
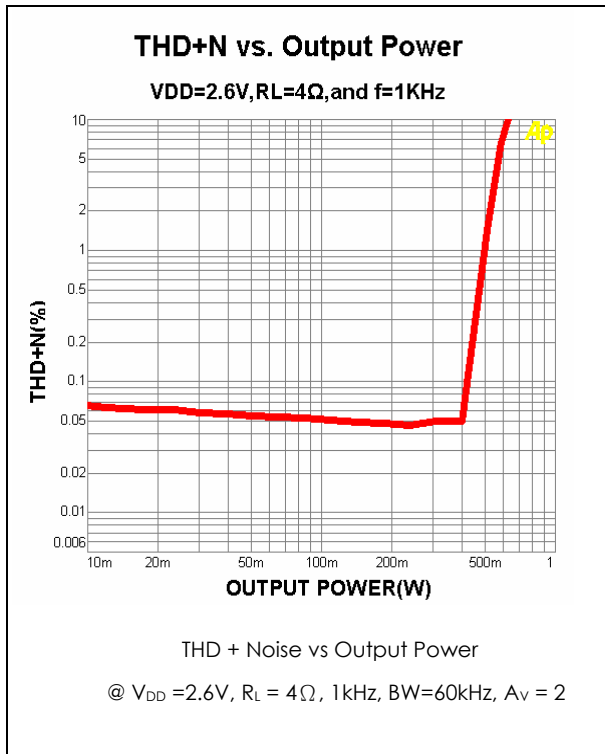
**Electrical Characteristics  $V_{DD} = 2.6V$** 

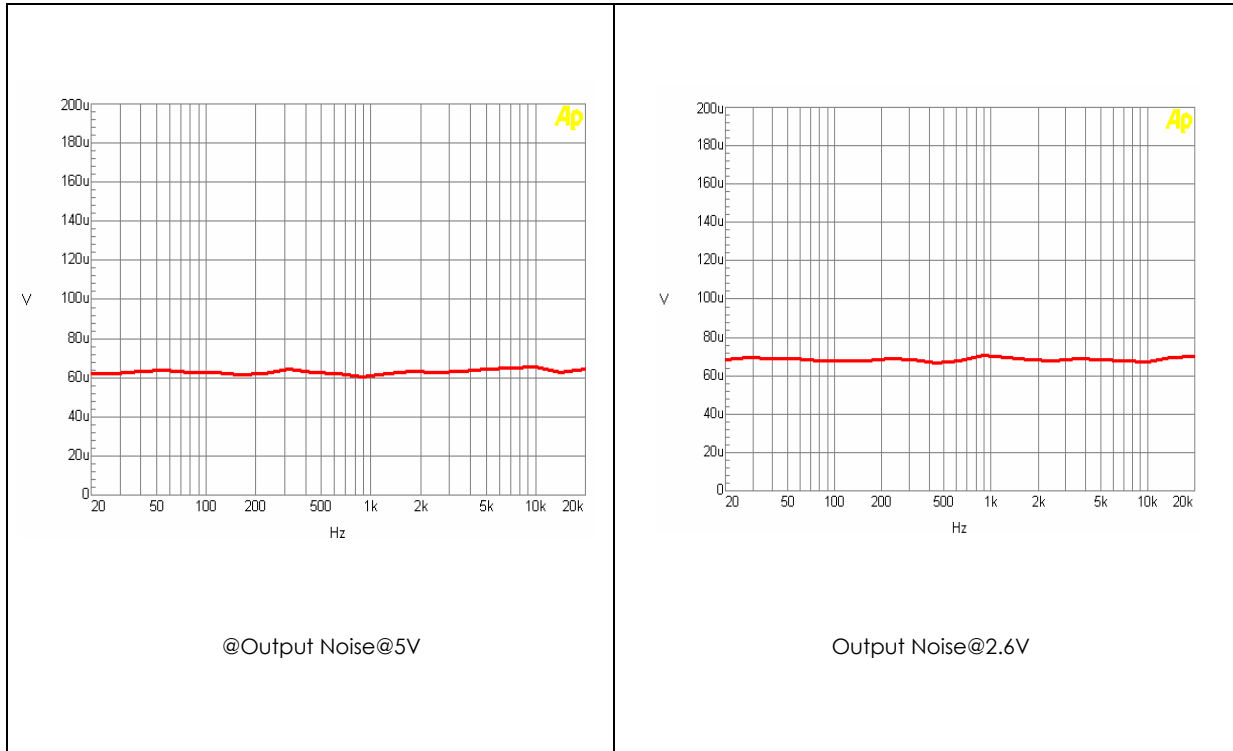
The following specifications apply for the circuit shown in Figure 1 unless otherwise specified. Limits apply for  $T_A = 25^\circ C$ .

Symbol	Parameter	Conditions	Conditions		Units (Limits)
			Typical	Limit	
$I_{DD}$	Quiescent Power Supply Current	$V_{IN} = 0V, I_o = 0A, NoLoad$	3	5	mA (max)
$I_{SD}$	Shutdown Current	$V_{SHUTDOWN} = 0V$	0.1	1.0	$\mu A$ (max)
$V_{OS}$	Output Offset Voltage		5	25	mV (max)
$P_O$	Output Power ( $8\Omega$ )	THD = 1% (max); f = 1 kHz	0.25	0.20	W(min)
THD+N	Total Harmonic Distortion + Noise	$P_O = 0.2 W_{rms}; f = 1kHz$	0.03		%
PSRR (Note 10)	Power Supply Rejection Ratio	$V_{ripple} = 200mV$ sine p-p Input Terminated with 10 ohms to ground	60 (f = 217Hz) 65 (f = 1kHz)	55	dB (min)

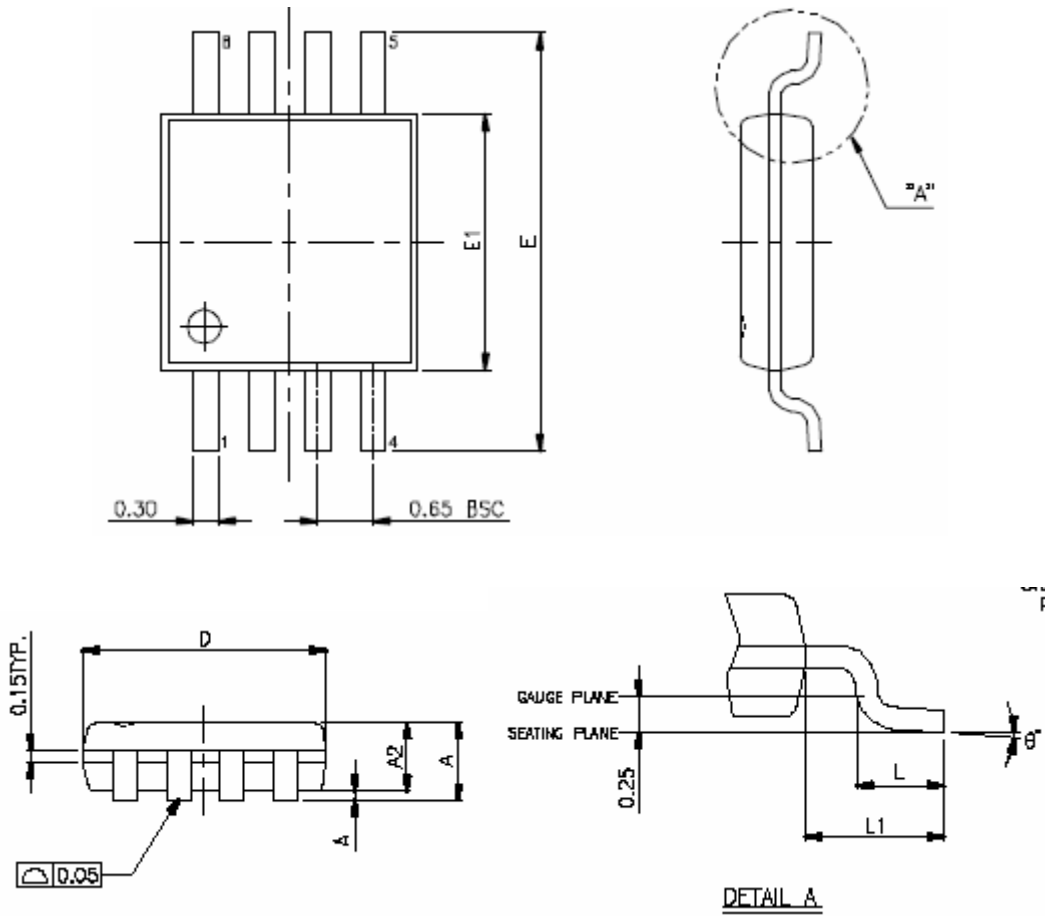








**MSOP-8 Plastic Package**

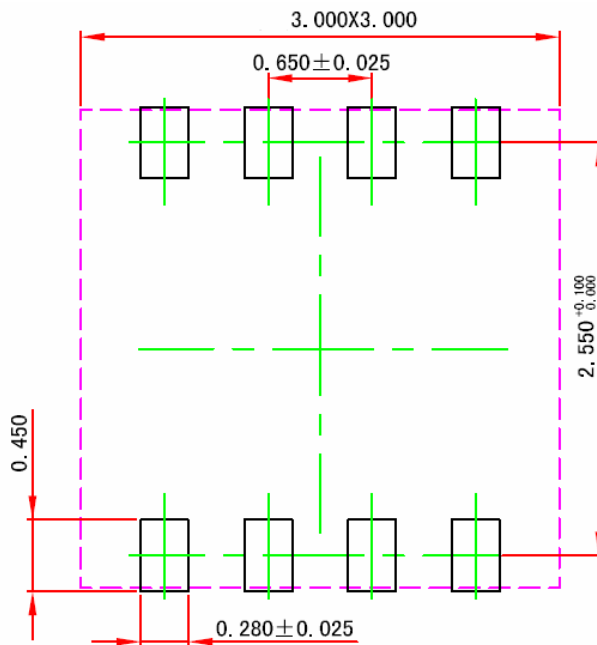
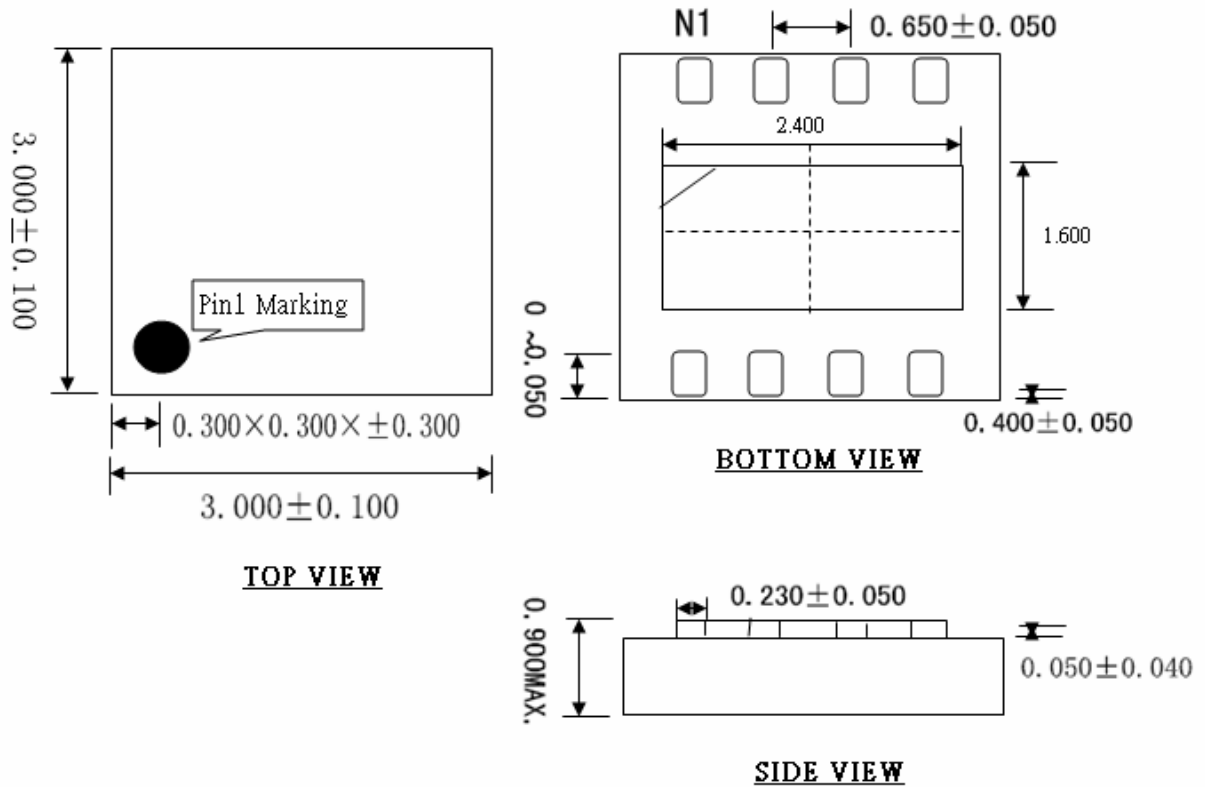


SYMBPLS	MIN.	NOM.	MAX.
A	—	—	1.1
A1	0.00	—	0.15
A2	0.75	0.85	0.95
D	3.00 BSC		
E	4.90 BSC		
E1	3.00 BSC		
L	0.40	0.60	0.80
L1	0.95 BSC		
$\theta^\circ$	0	—	8





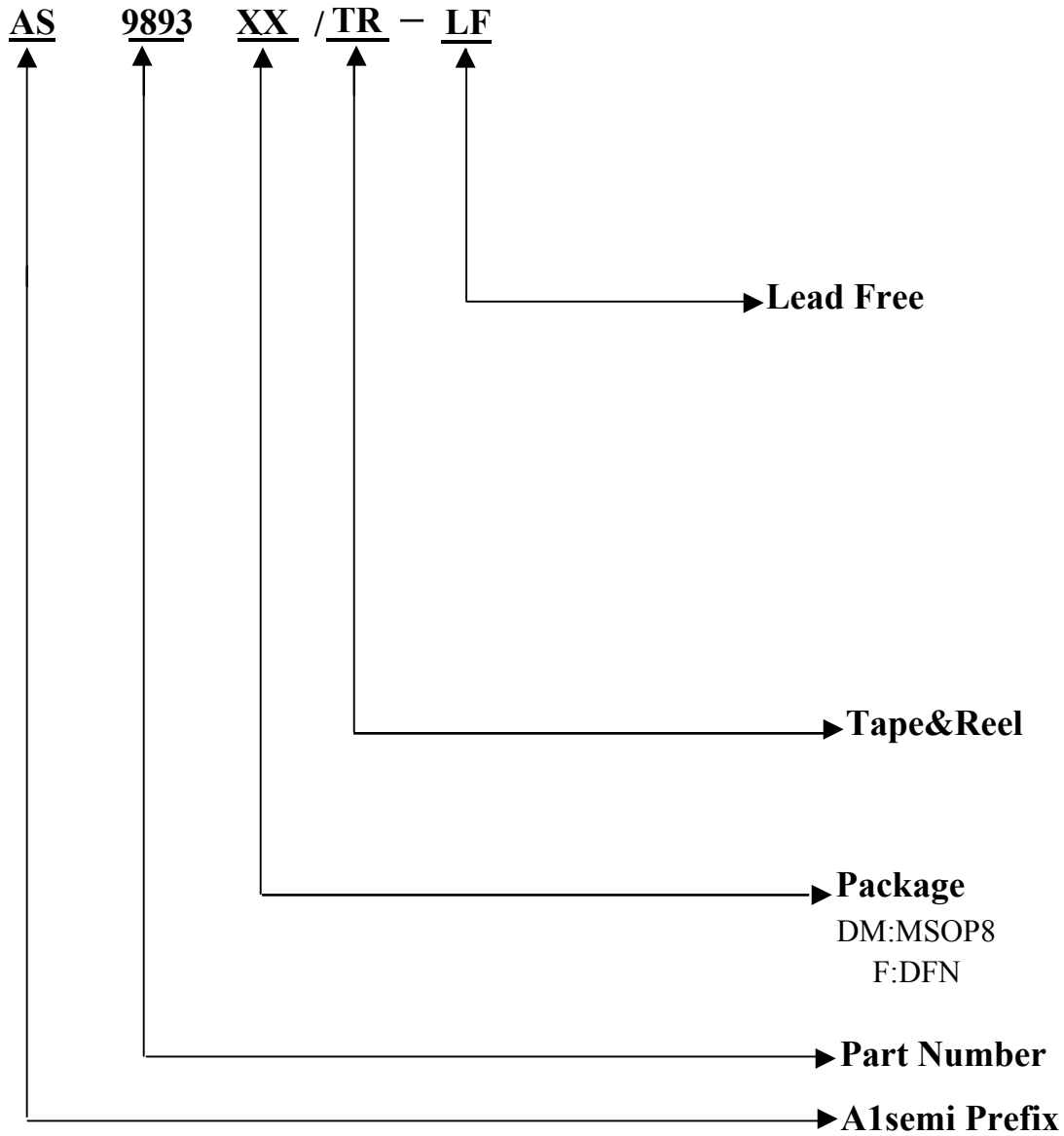
**Physical Dimensions**  
**DFN-8**



**(LAND PATTERN RECOMMENDATION)**



**ORDER INFORMATION**



MSOP-8	AS9893DM/TR-LF	A1 AS9893 DATE CODE	3K units Tape & Reel
DFN-8 (3x3)	AS9893F/TR-LF	A1 AS9893 DATE CODE	4.5K units Tape & Reel

A1Semi reserves the right to make changes to improve reliability or manufacturability without notice and customers are advised to obtain the latest version of relevant information prior to placing orders.

