3W Audio Power Amplifier With Shutdown Mode

■ General Description

The LN4871 is a bridge-connected audio power amplifier capable of delivering typically 3W of continuous average power to an 3Ω load with10% (THD) from a 5V power supply.

Boomer audio power amplifiers were designed specifically to provide high quality output power with a minimal amount of external components. Since the LN4871 does not require output coupling capacitors, bootstrap capacitors, or snubber networks, it is optionally suited for low-power portable systems.

The LN4871 features an externally controlled, low-power consumption shutdown mode, as well as an internal thermal shutdown protection mechanism. The unity-gain stable LN4871 can be configured by external gain-setting resistors.

■ Features

- No output coupling capacitors, bootstrap capacitors, or snubber circuits are necessary
- Small Outline packaging
- Unity-gain stable
- External gain configuration capability
- Thermal shutdown protection

■ Applications

- Portable Computers
- Desktop Computers
- Low Voltage Audio Systems

■ Package

- SOP-8
- DFN-8

■ Key Specifications

- Power Output @10% THD+N & VDD=5V 1KHZ
  - R_L=3Ω 3W (TYP)
  - R_L=4Ω 2.5W (TYP)
- THD+N@ 1KHZ 1W 8Ω 0.5%(MAX)
- Shutdown current 0.1uA(TYP.)

Supply voltage 2.0V~6.0V

■ Ordering Information

Ordering Number	Package Type
LN4871M	SOP-8
LN4871LD	DFN-8

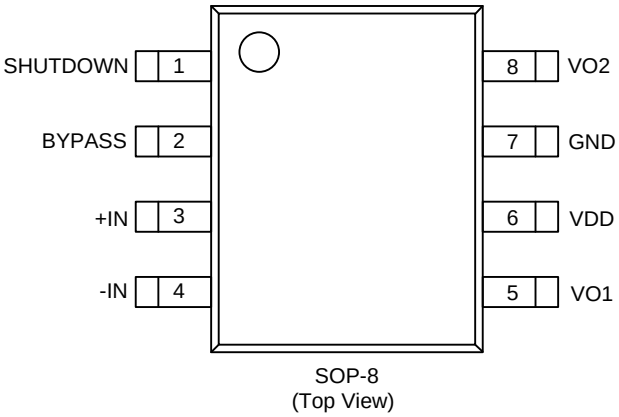
■ Operating Ratings

Temperature Range

TMIN ≤ TA ≤ TMAX---------- −40°C ≤ TA ≤ 85°C

Supply Voltage ---------- 2.0V ≤ VDD ≤ 6.0V

■ Pin Configuration



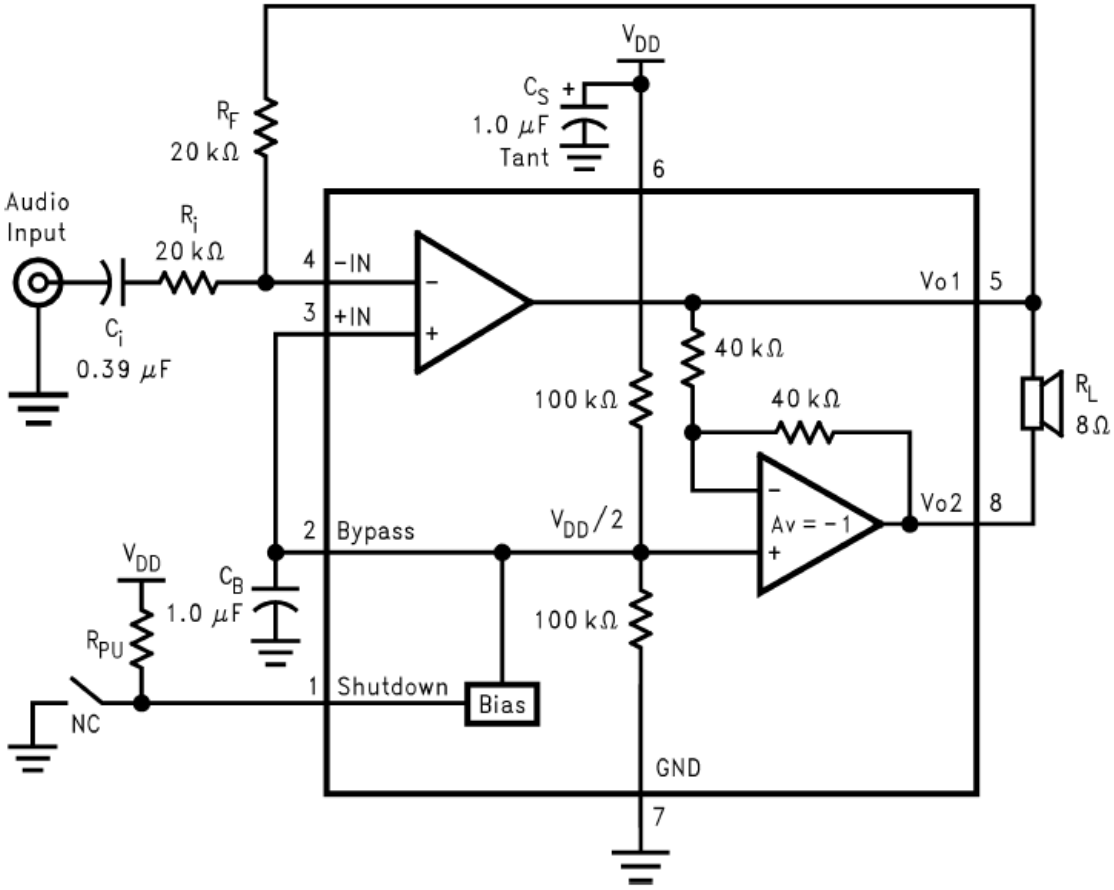
SOP-8
(Top View)

Ordering Number：LN4871M

■ Pin Function Description

Pin Name	Pin Number	I/O	Function Description
SHUTDOWN	1	I	Shutdown terminal (active high logic)
BYPASS	2		Adding a bypass capacitor
+IN	3	I	Channel positive input
-IN	4	I	Channel negative input
VO1	5	O	Channel output 1
VDD	6		Power supply
GND	7		High-current ground
VO2	8	O	Channel output 2

■ Function Block Diagram



■ Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage	V_{DD}	-0.3—6.5	V
Input Voltage	V_{IN}	-0.3—V_{DD}+0.3	V
Power Output	—	Internal limit	
Junction Temperature	—	-150	℃
Storage Temperature	Tstg	-65—150	℃
ESD Susceptibility	-	8000	V

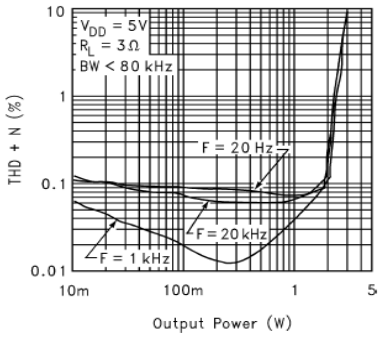
■ Electrical Characteristics

(VDD = 5V Unless otherwise specified. Limits apply for TA = 25°C.)

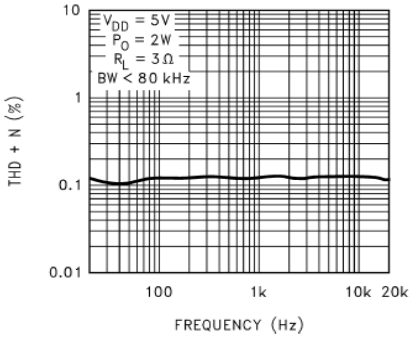
Symbol	Parameters	Test Conditions	Min.	Typ.	Max.	Unit
V_{DD}	Supply voltage		2.0		6.0	V
I_{DD}	Quiescent Power Supply Current	V_{IN} = 0V, I_O = 0A		6.5	10	mA
I_{SD}	Shutdown Current	$V_{SHUTDOWN}$ = V_{DD}		0.1	2	μA
P_O	Output Power	THD+N = 1%; f = 1 kHz RL=3Ω RL=4Ω RL=8Ω		 2.38 2 1.2		W
		THD+N = 10%; f = 1 kHz RL=3Ω RL=4Ω RL=8Ω		 3 2.5 1.5		W
THD+N	Total Harmonic Distortion+Noise	AVD=2; 20Hz<=f<=20kHz RL=4Ω,PO=1.6W RL=8Ω,PO=1W		 0.13 0.25		%

■ Typical Performance Characteristics

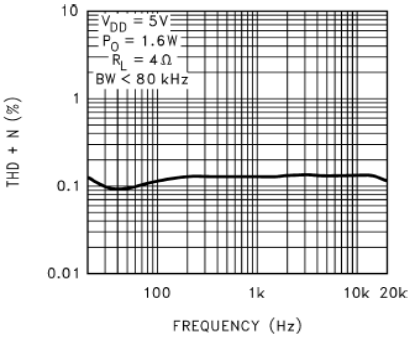
THD+N vs Output Power



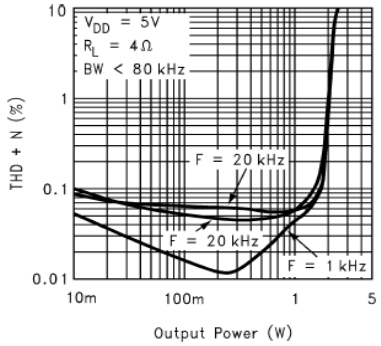
THD+N vs Frequency



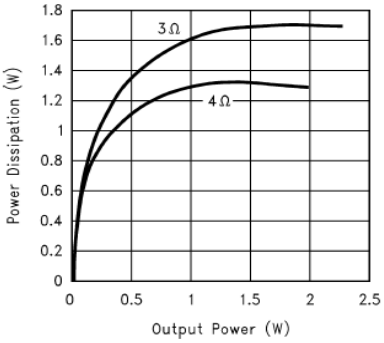
THD+N vs Frequency



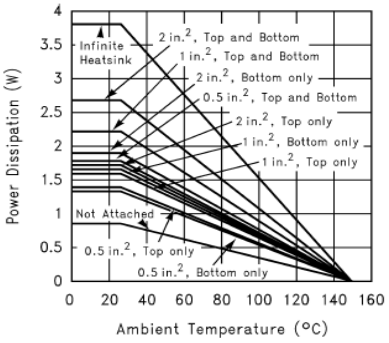
THD+N vs Output Power



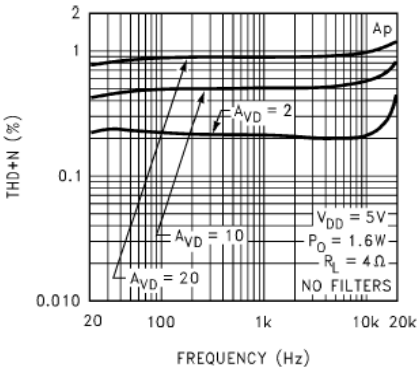
Power Dissipation vs Output Power



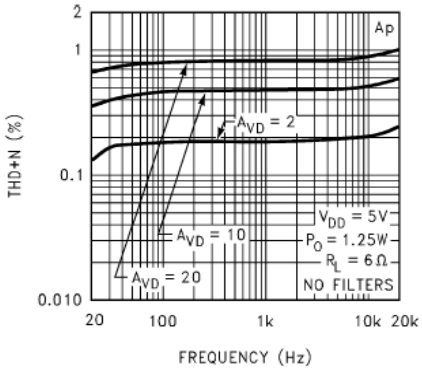
Power Derating Curve



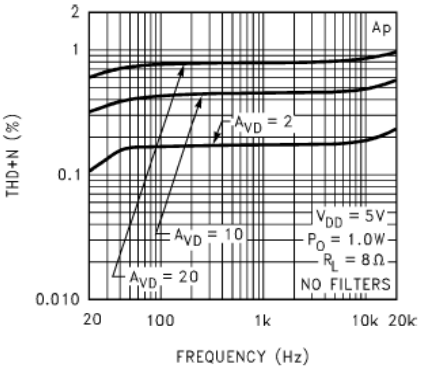
THD+N vs Frequency



THD+N vs Frequency



THD+N vs Frequency



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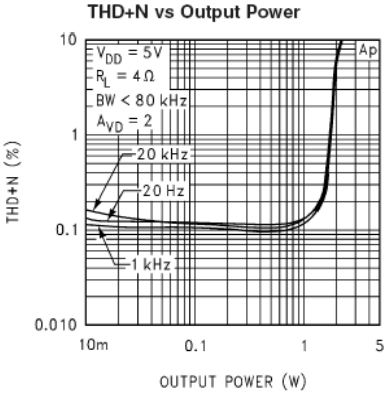
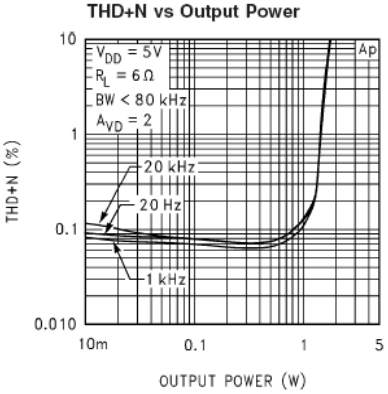
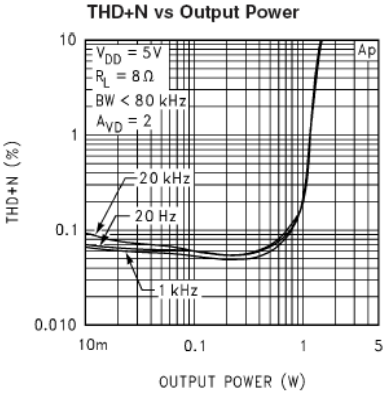


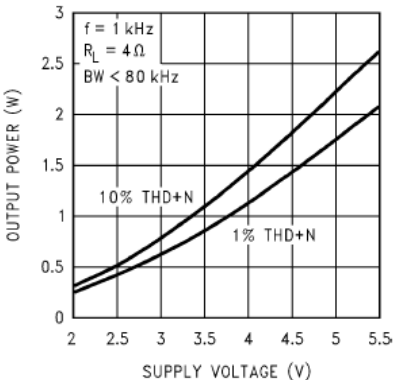
THD+N vs Output Power



THD+N vs Output Power



Output Power vs Supply Voltage



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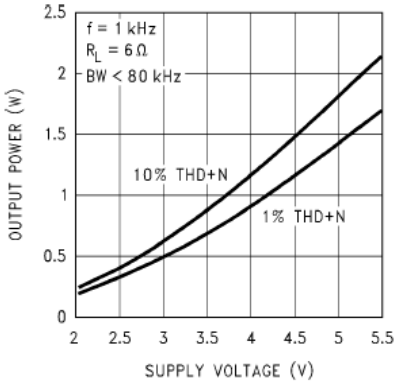
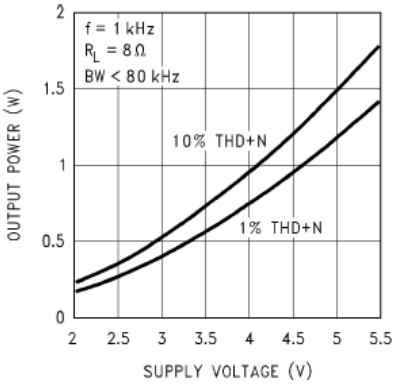
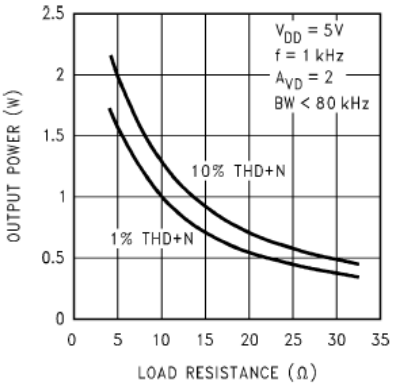


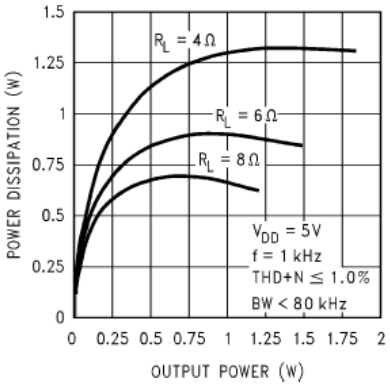
Output Power vs Supply Voltage



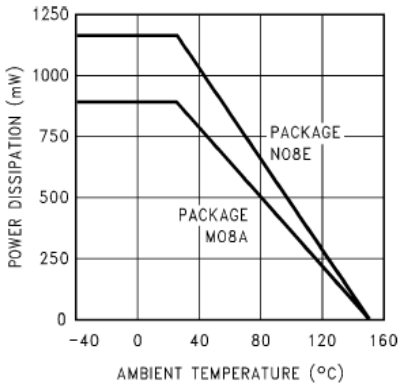
Output Power vs Load Resistance



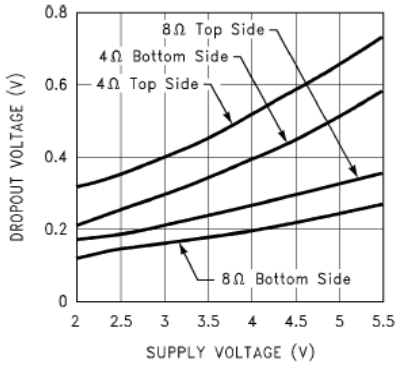
Power Dissipation vs Output Power



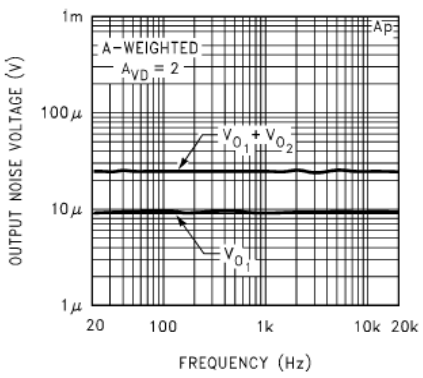
Power Derating Curve



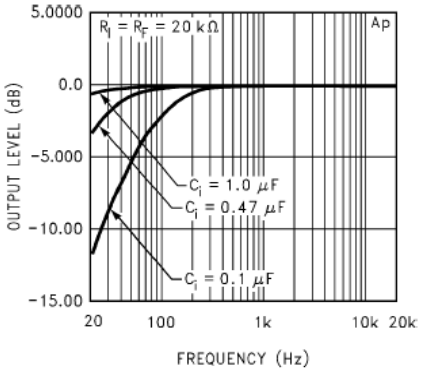
Clipping Voltage vs Supply Voltage



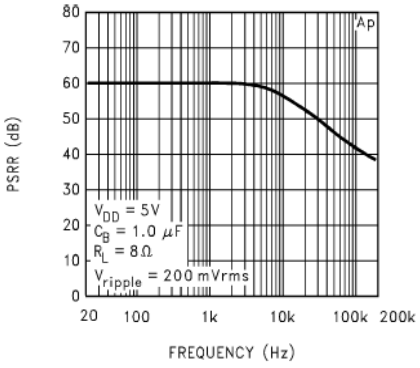
Noise Floor



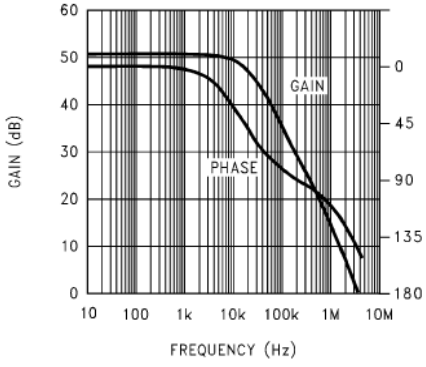
Frequency Response vs Input Capacitor Size



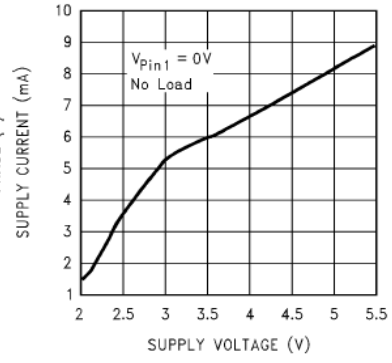
Power Supply Rejection Ratio



Open Loop Frequency Response

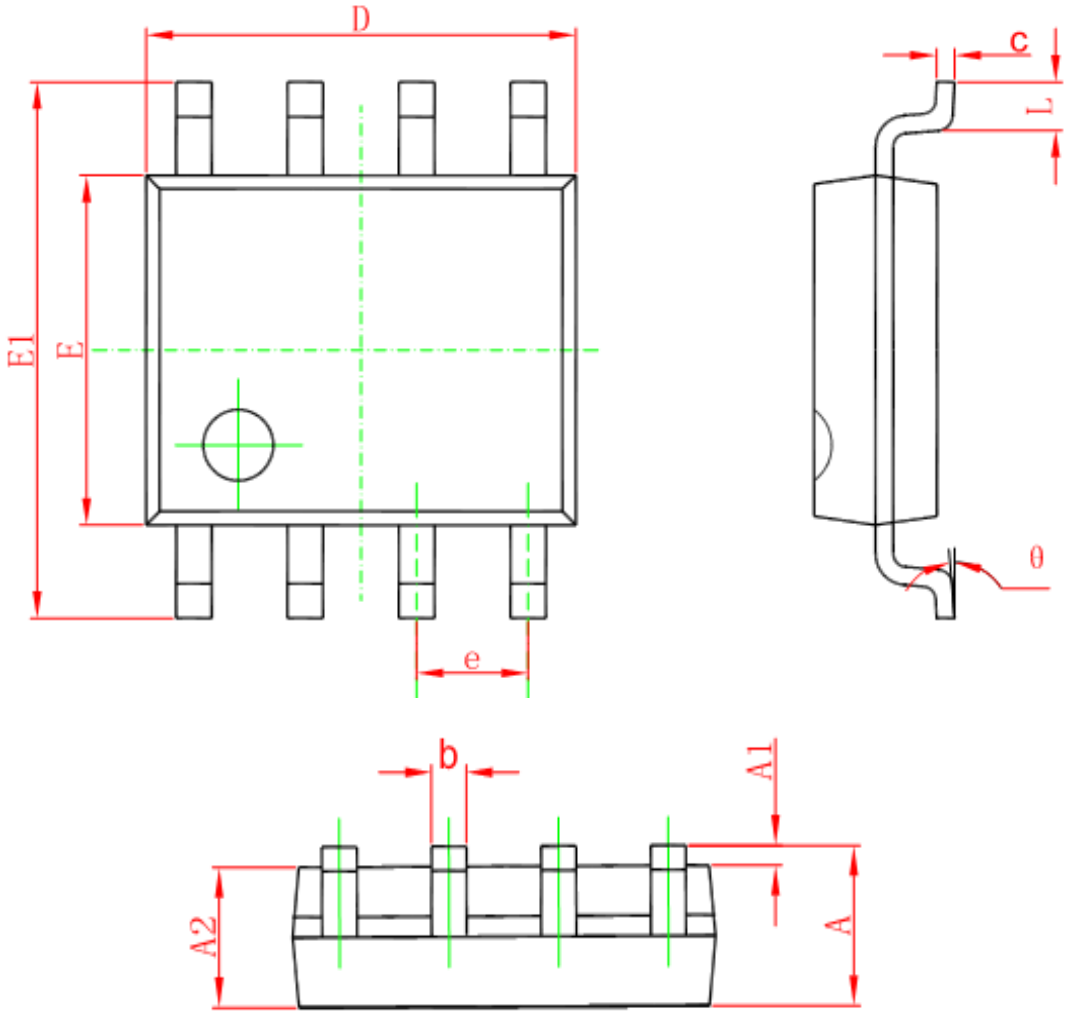


Supply Current vs Supply Voltage



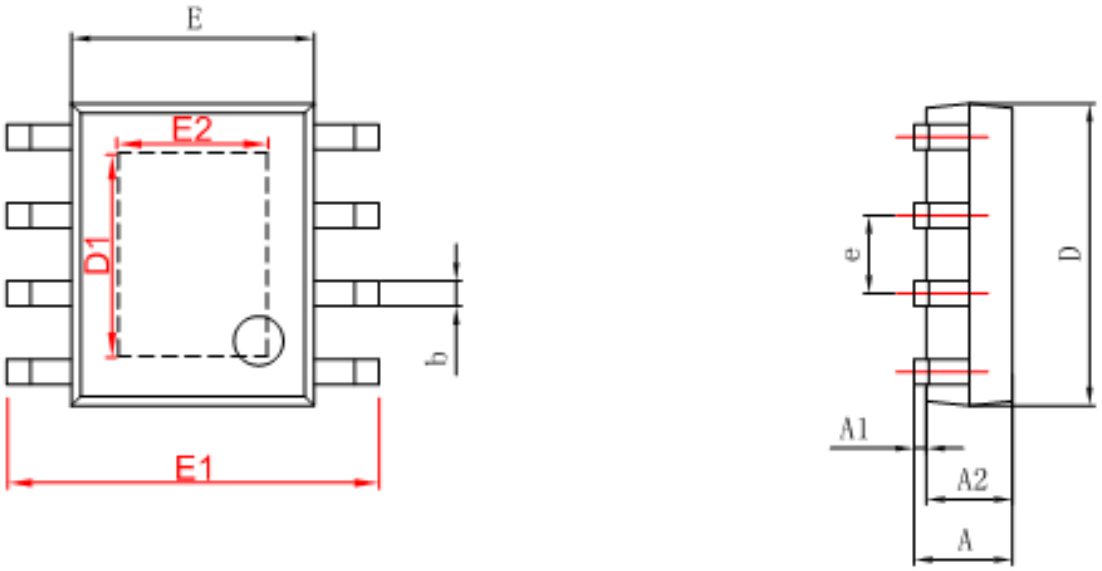
■ Package Information

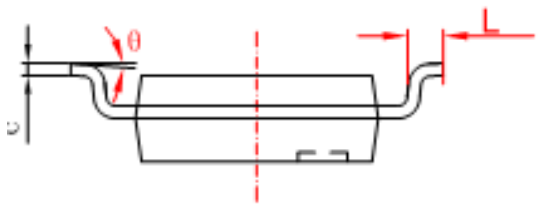
- **SOP-8 (LN4871M)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

- **SOP-8/PP (LN4871MP)**





字符	Dimension In Millimeters	
	Min	Max
A	1.500	1.700
A1	0.050	0.150
A2	1.350	1.550
b	0.300	0.500
c	0.190	0.250
D	4.800	5.000
D1	3.200	3.400
E	3.840	4.040
E1	5.900	6.100
E2	2.100	2.300
e	1.27(BSC)	
L	0.520	0.720
θ	0°	8°