

## 3W BTL 音频功率放大器带关断模式

### 产品概述

LN4871 为单声道桥接音频功率放大电路, 在 5V 输入电压条件下, 能够为 3Ω 负载提供 3W 功率的稳定输出, 总谐波失真和噪声不超过 10%。为了保证便携式设备的电池的续航能力, 当 LN4871 使能端接 VDD 时, 芯片进入关断模式, 该模式下  $I_Q < 0.1\mu A$  (Typ.)。

LN4871 专门为需要大功率输出和高保真要求的便携式产品所设计。仅需很少的外部元件, 专用于高品质音频功率放大。可以工作的电压范围为 2.0V 到 6V。

LN4871 内置过热关断电路, 同时内置了杂音消除电路, 可以消除芯片启动和关断过程中的咔嚓声或噼噓声。增益稳定, 外部增益可调。

### 用途

- 低电压供电的音频系统
- 笔记本和台式电脑
- 便携电视

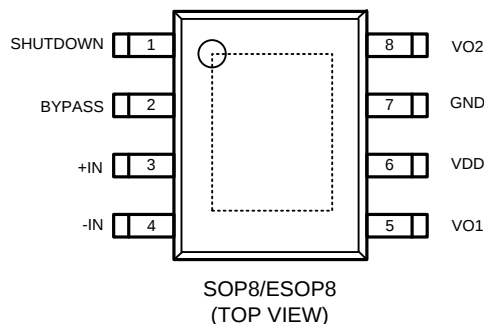
### 订购信息

| 订购型号     | 封装形式  |
|----------|-------|
| LN4871M  | SOP8  |
| LN4871MP | ESOP8 |

### 额定工作参数

|        |       |                                                                             |
|--------|-------|-----------------------------------------------------------------------------|
| 工作温度范围 | ----- | $T_{MIN} \leq T_A \leq T_{MAX}$<br>$-40^{\circ}C \leq T_A \leq 85^{\circ}C$ |
| 工作电压范围 | ----- | $2.0V \leq V_{DD} \leq 6.0V$                                                |

### 引脚配置



订购名称: LN4871M(LN4871MP)

### 关键指标

- 功率输出@10% THD+N &  $V_{DD}=5V$  1KHz  
 $R_L=3\Omega$  3W(typ.)  
 $R_L=4\Omega$  2.5W(typ.)
- 关断电流 0.1uA(typ.)
- 供电电压 2.0V~6.0V
- THD@1KHz 1W 8Ω 0.5%(max)

### 产品特点

- 无输出耦合电容、自举电容或缓冲电路
- 稳定的固定增益
- 热关断功能
- 超小型封装: SOP8, ESOP8 等
- 外部增益控制

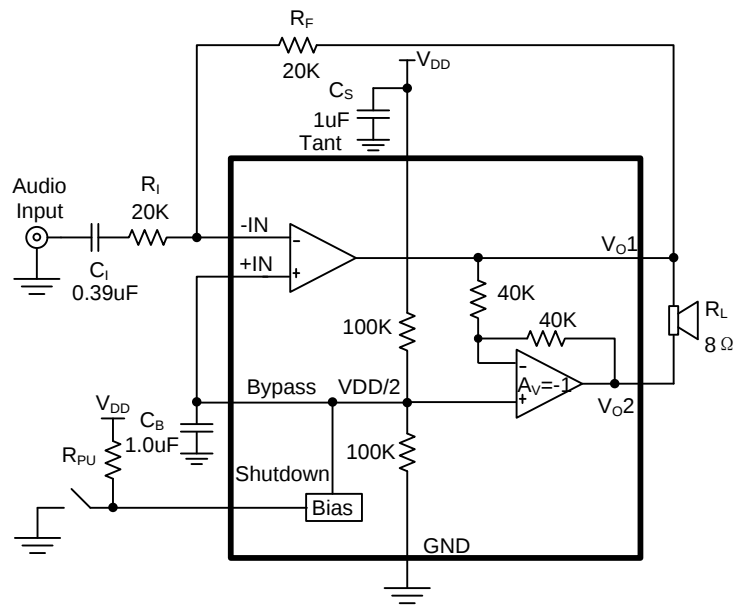
### 封装

- SOP8
- ESOP8

## 引脚功能描述

| 名称       | 引脚号 | 输入/输出 | 功能描述       |
|----------|-----|-------|------------|
| SHUTDOWN | 1   | I     | 关断控制，高电平关断 |
| BYPASS   | 2   | -     | 外接旁路电容     |
| +IN      | 3   | I     | 通道正端输入     |
| -IN      | 4   | I     | 通道负端输入     |
| VO1      | 5   | O     | 通道输出 1     |
| VDD      | 6   | -     | 工作电压       |
| GND      | 7   | -     | 接地         |
| VO2      | 8   | O     | 通道输出 2     |

## 功能框图



## 绝对最大额定值

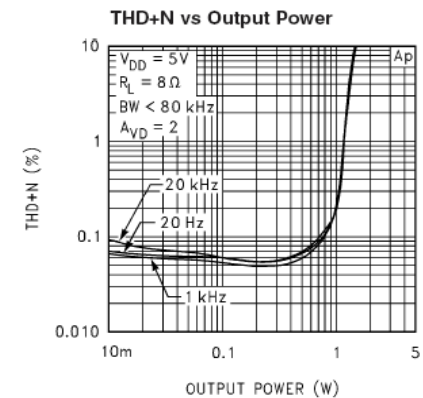
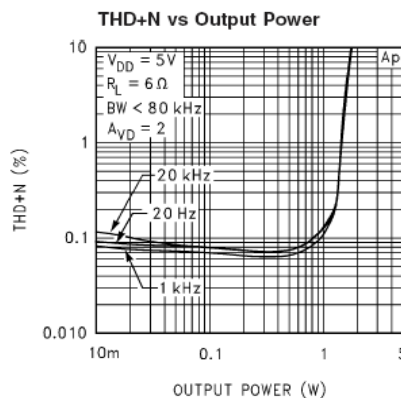
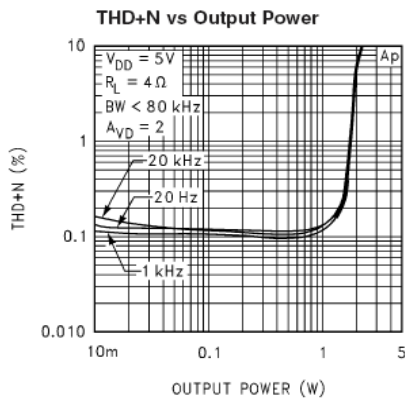
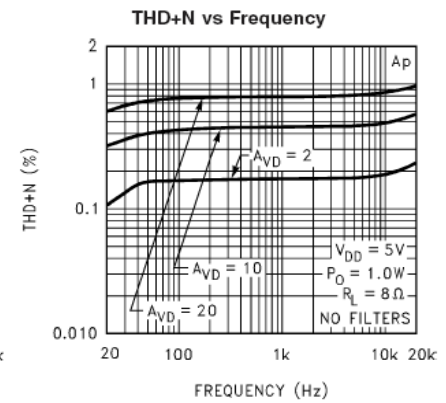
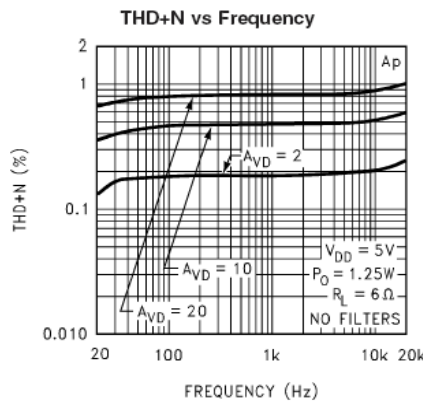
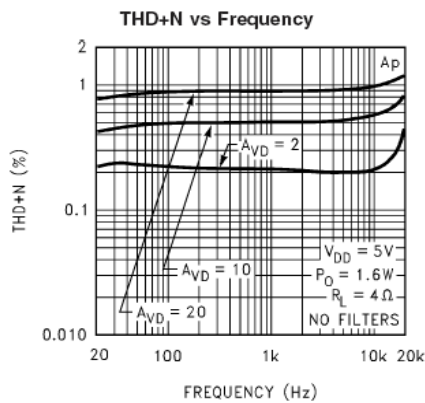
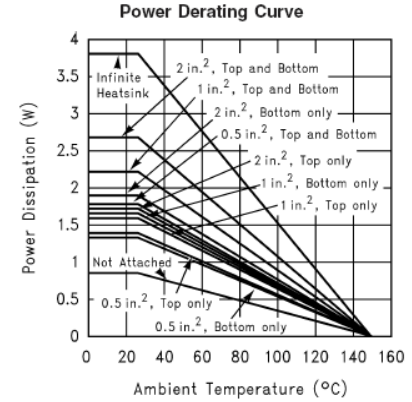
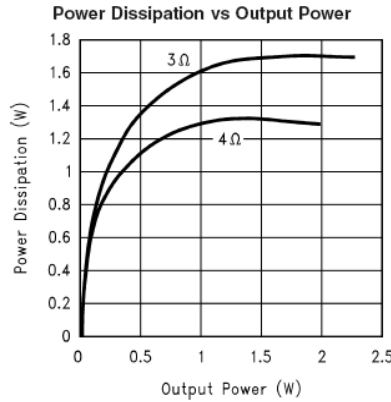
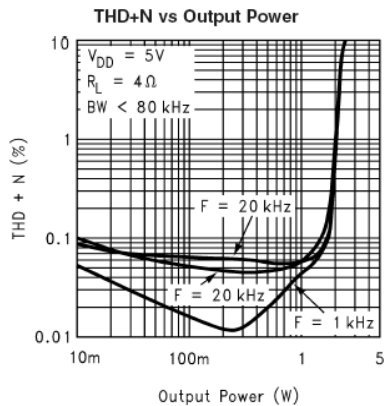
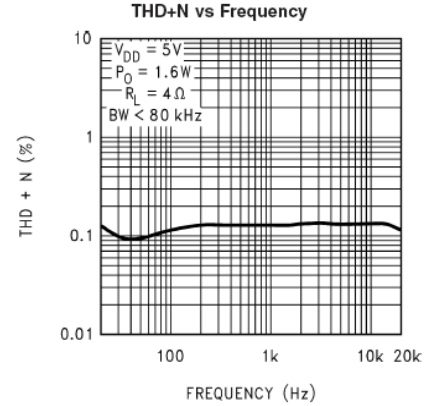
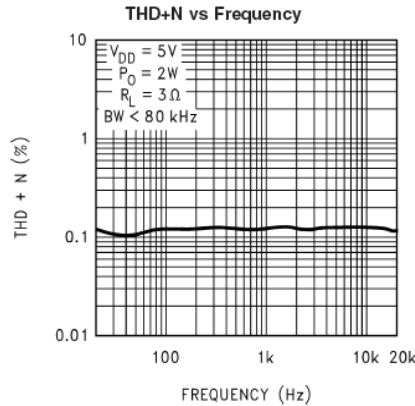
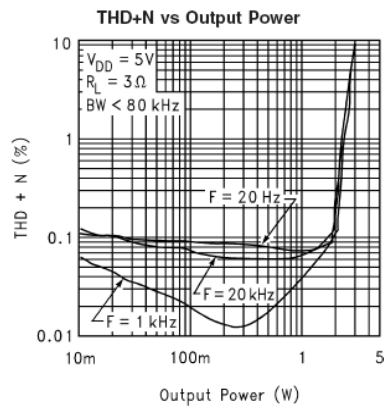
| 项目     | 符号        | 值                  | 单位 |
|--------|-----------|--------------------|----|
| 工作电压   | $V_{DD}$  | -0.3—6.5           | V  |
| 输入电压   | $V_{IN}$  | -0.3— $V_{DD}+0.3$ | V  |
| 功耗     | —         | 内部限制               | -  |
| 贮存温度   | $T_{stg}$ | -65—150            | °C |
| 结点温度   | —         | -150               | °C |
| ESD 参数 | —         | 8000               | V  |

## ■ 电学特性参数

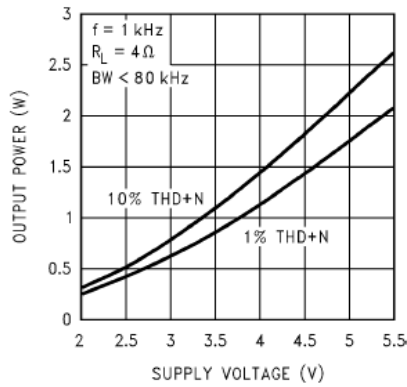
VDD=5V

(除非特别说明,  $T_a=25^{\circ}\text{C}$ )

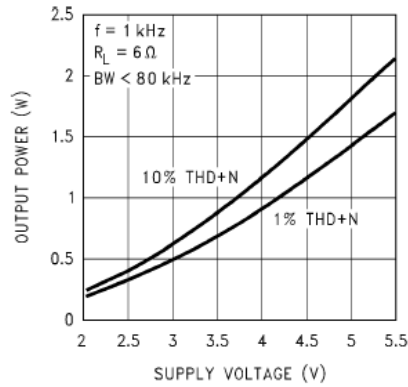
| 符号       | 参数           | 测试条件                                                                                            | 最小  | 典型               | 最大  | 单位      |
|----------|--------------|-------------------------------------------------------------------------------------------------|-----|------------------|-----|---------|
| $V_{DD}$ | 供电电压         | -                                                                                               | 2.0 | -                | 6.0 | V       |
| $I_{DD}$ | 静态电流         | $V_{IN} = 0V, I_O = 0A$                                                                         | -   | 6.5              | 10  | mA      |
| $I_{SD}$ | 关断电流         | $V_{SHUTDOWN} = V_{DD}$                                                                         | -   | 0.1              | 2   | $\mu A$ |
| $P_O$    | 输出功率         | THD+N = 1%; $f = 1\text{ kHz}$<br>$RL=3\Omega$<br>$RL=4\Omega$<br>$RL=8\Omega$                  | -   | 2.38<br>2<br>1.2 | -   | W       |
|          |              | THD+N = 10%; $f = 1\text{ kHz}$<br>$RL=3\Omega$<br>$RL=4\Omega$<br>$RL=8\Omega$                 | -   | 3<br>2.5<br>1.5  | -   | W       |
| THD+N    | 总谐波失真<br>+噪声 | AVD=2; $20\text{Hz} \leq f \leq 20\text{kHz}$<br>$RL=4\Omega, P_O=1.6W$<br>$RL=8\Omega, P_O=1W$ | -   | 0.13<br>0.25     | -   | %       |

**特性曲线**


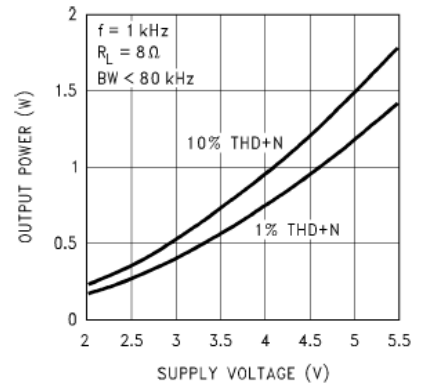
Output Power vs  
Supply Voltage



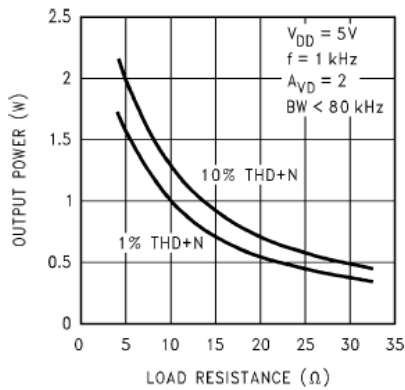
Output Power vs  
Supply Voltage



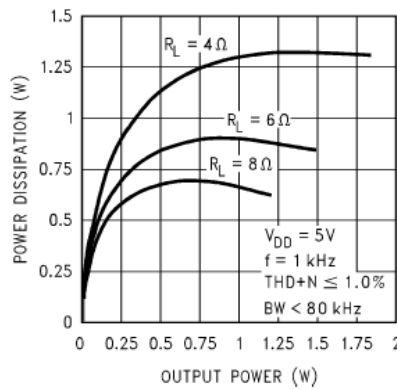
Output Power vs  
Supply Voltage



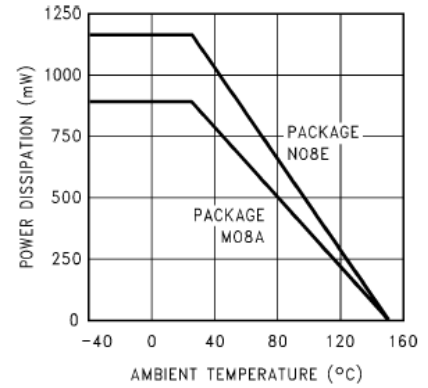
Output Power vs  
Load Resistance



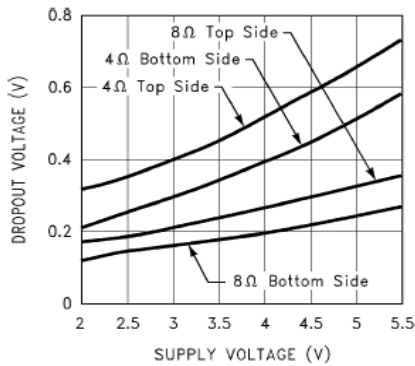
Power Dissipation vs  
Output Power



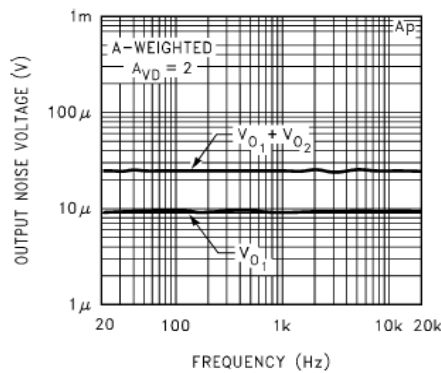
Power Derating Curve



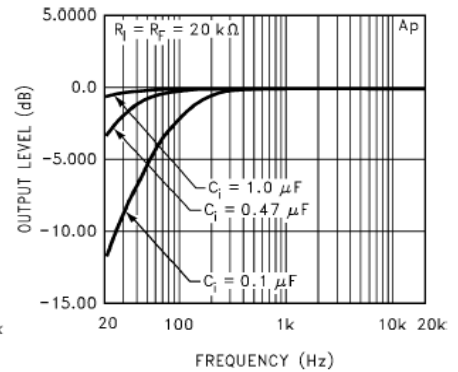
Clipping Voltage vs  
Supply Voltage



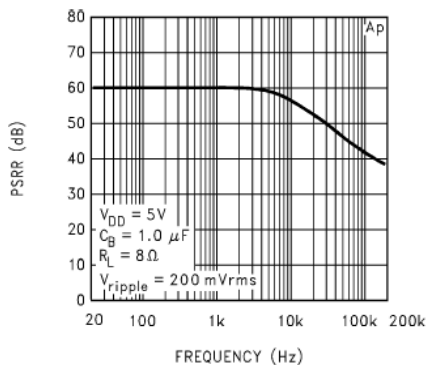
Noise Floor



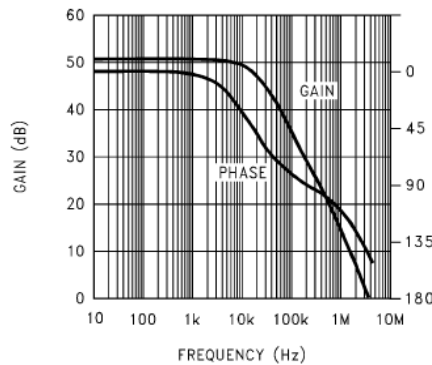
Frequency Response vs  
Input Capacitor Size



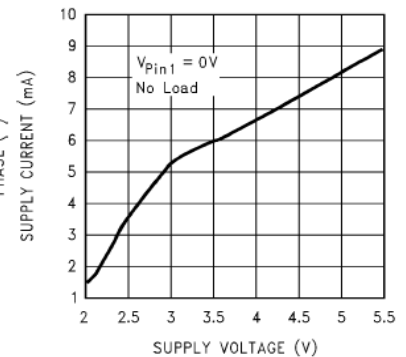
Power Supply  
Rejection Ratio



Open Loop  
Frequency Response

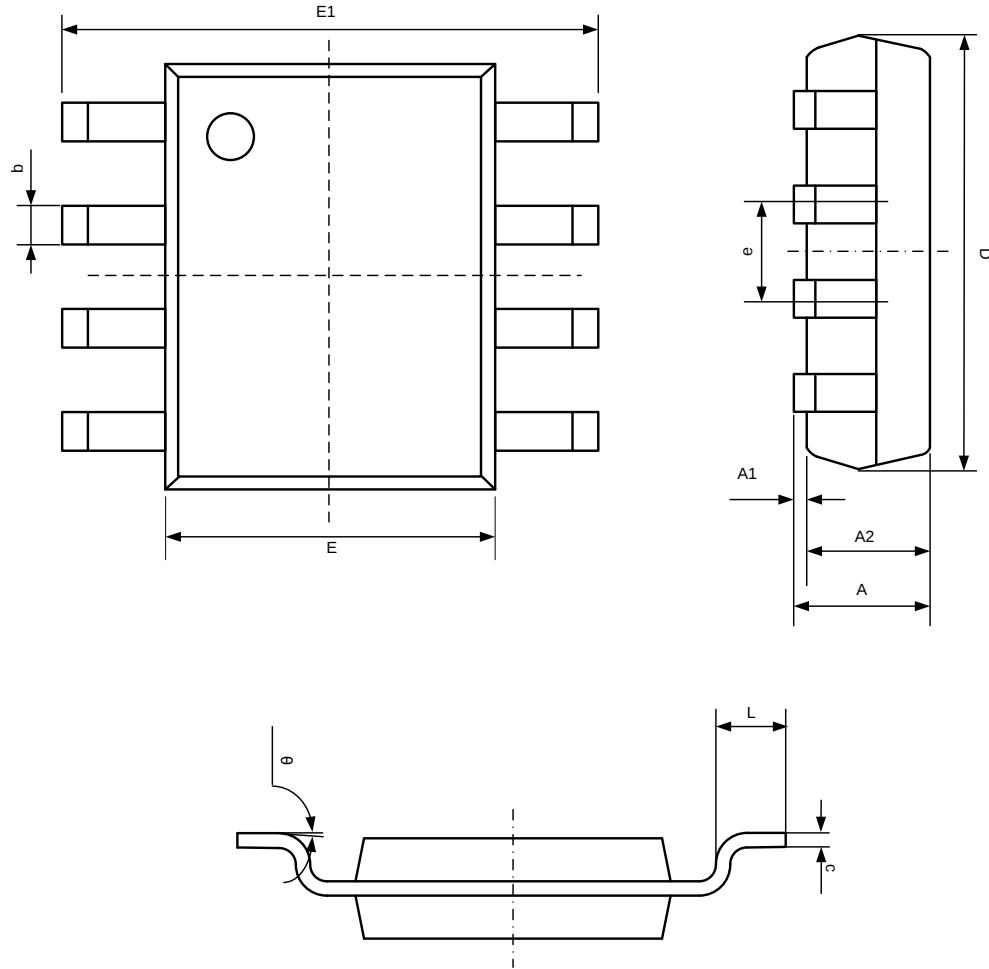


Supply Current vs  
Supply Voltage



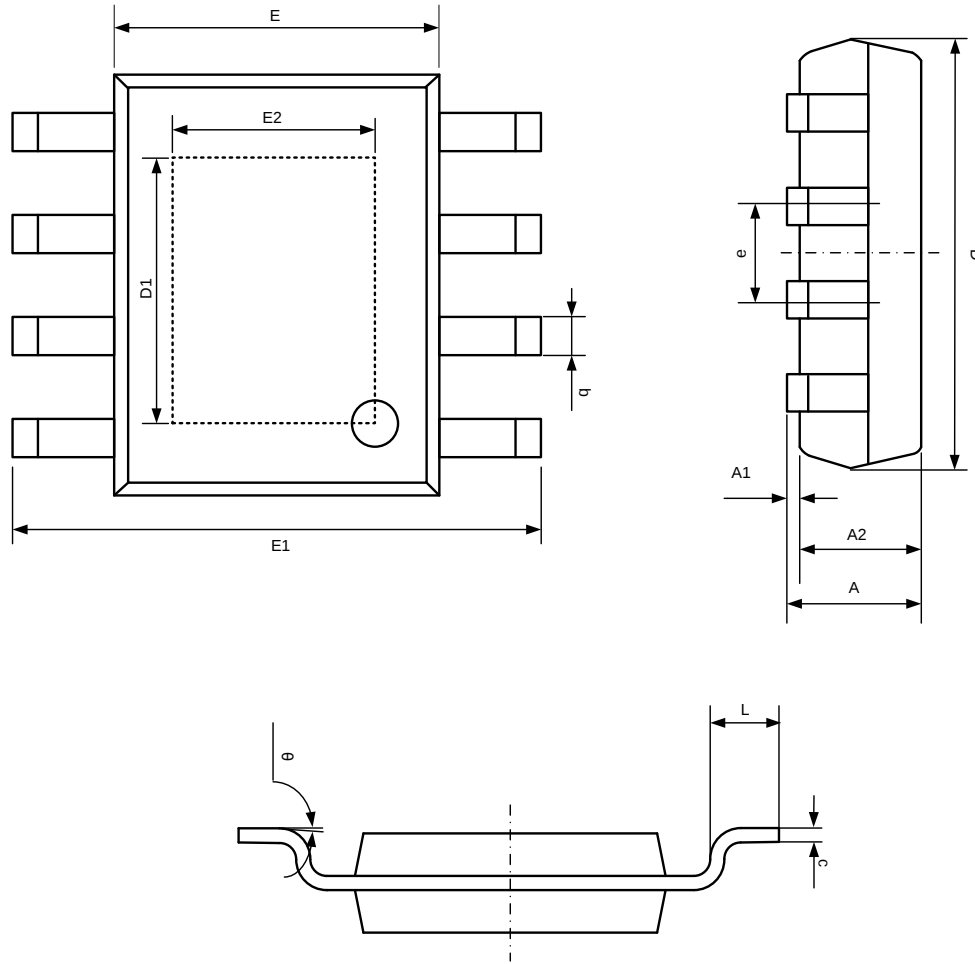
## ■ 封装信息

### ● SOP8 (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 | 0.007                | 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 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |

● ESOP8 (LN4871MP)



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.350                     | 1.750 | 0.053                | 0.069 |
| A1     | 0.050                     | 0.150 | 0.002                | 0.006 |
| A2     | 1.350                     | 1.550 | 0.053                | 0.061 |
| b      | 0.330                     | 0.510 | 0.013                | 0.020 |
| c      | 0.170                     | 0.250 | 0.007                | 0.010 |
| D      | 4.700                     | 5.100 | 0.185                | 0.200 |
| D1     | 3.202                     | 3.420 | 0.126                | 0.134 |
| E      | 3.800                     | 4.000 | 0.150                | 0.157 |
| E1     | 5.800                     | 6.200 | 0.228                | 0.244 |
| E2     | 2.313                     | 2.513 | 0.091                | 0.099 |
| e      | 1.270(BSC)                |       | 0.050(BSC)           |       |
| L      | 0.400                     | 1.270 | 0.016                | 0.050 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |