## 概述

HT71XX是一款采用 CMOS 技术的低压差线性稳压器。最大输出电流为 50mA 且允许的最高输入电压为 30V。具有几个固定的输出电压，范围从 2.5V 到 5.0V。COMS 技术可确保其具有低压降和低静态电流的特性。

## 功能特点

- 低功耗
- 低压降
- 较低的温度系数
- 最高输入电压：30V
- 典型静态电流：1.5uA
- 最大输出电流：50mA
- 输出电压精度：±2%
- 封装类型：SOT-23，SOT-89

## 应用领域

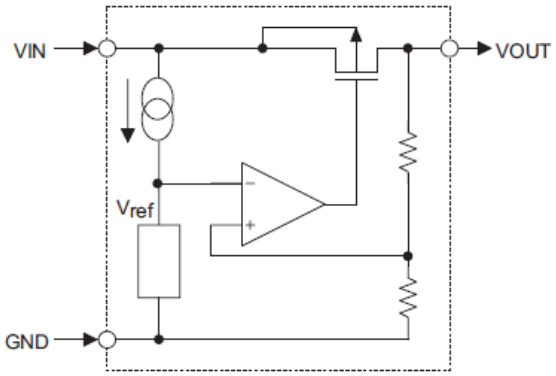
- 电池供电设备
- 通信设备
- 音频/视频设备

## 选型表

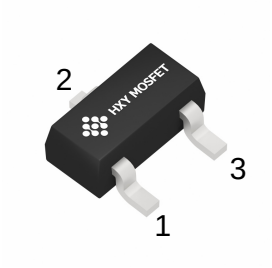
| 型号 | 输出电压 | 封装类型 | 正印 |
|---|---|---|---|
| HT7125 | 2.5V | SOT-23<br>SOT-89 | 71xx(封装为 SOT-23)<br>71xx(封装为SOT-89) |
| HT7130 | 3.0V | | |
| HT7133 | 3.3V | | |
| HT7136 | 3.6V | | |
| HT7144 | 4.4V | | |
| HT7150 | 5.0V | | |

注：“xx”代表输出电压。

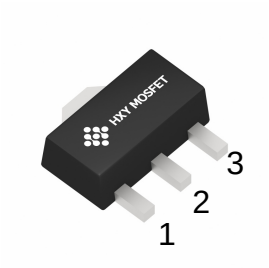
## 电路功能框图



## 引脚图




SOT-23




SOT-89

## 引脚说明

| 引脚序号 | 引脚名称 | 说明 |
|---|---|---|
| 1 | GND | 地 |
| 2 | VIN | 输入脚 |
| 3 | VOUT | 输出脚 |

## 极限参数

电源供应电压 ---------- -0.3V ~+30V　　工作环境温度 ---------- -40℃~+85℃
储存温度范围 ---------- -50℃~+125℃

注：这里只强调额定功率，超过极限参数所规定的范围将对芯片造成损害，无法预期芯片在上述标示范围外的工作状态，而且若长期在标示范围外的条件下工作，可能影响芯片的可靠性。

## 热能信息

| 符号 | 参数 | 封装类型 | 最大值 | 单位 |
|---|---|---|---|---|
| $\theta_{JA}$ | 热阻（与环境连接）（假设无环境气流、无散热片） | SOT-23 | 500 | ℃/W |
| | | SOT-89 | 200 | ℃/W |
| $P_D$ | 功耗 | SOT-23 | 0.2 | W |
| | | SOT89 | 0.5 | W |

注： $P_D$值是在 Ta=25℃时测得。

## 直流电特性（除特别说明外，$T_A$ =＋25°C）

### 输出型号 HT7125

| 参数说明 | 符号 | 测试条件 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|---|
| 输出电压 | $V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$， $I_{OUT}=10mA$ | 2.425 | 2.50 | 2.575 | V |
| 输出电流 | $I_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ | 20 | 50 | — | mA |
| 负载调整率 | $\triangle V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$<br>$1mA\leq I_{OUT}\leq 50mA$ | — | 25 | 60 | mV |
| 低压差 | $V_{DIF}$ | $I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$ | — | 30 | 100 | mV |
| 静态电流 | $I_{SS}$ | 无负载 | — | 1.5 | 3.0 | μA |
| 线性调整率 | $\triangle V_{OUT}/V_{OUT}*\triangle V_{IN}$ | $V_{OUT}+1.0V\leq V_{IN}\leq 24V$，<br>$I_{OUT}=1mA$ | — | — | 0.2 | %/V |
| 输入电压 | $V_{IN}$ | — | — | — | 24 | V |
| 温度系数 | $\triangle V_{OUT}/\triangle T_A*V_{OUT}$ | $V_{OUT}+2.0V$，$I_{OUT}=10mA$，<br>$-40℃\leq T_A\leq 85℃$ | — | 100 | — | ppm/℃ |

注：当 $V_{IN}=V_{OUT}+2.0V$, 固定负载条件下使输出电压下降 2%，此时输入电压和输出电压的差值为低压差值 $V_{DIF}$。

### 输出型号 HT7130

| 参数说明 | 符号 | 测试条件 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|---|
| 输出电压 | $V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$， $I_{OUT}=10mA$ | 2.91 | 3.00 | 3.09 | V |
| 输出电流 | $I_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ | 20 | 50 | — | mA |
| 负载调整率 | $\triangle V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$<br>$1mA\leqslant I_{OUT}\leqslant 50mA$ | — | 25 | 60 | mV |
| 低压差 | $V_{DIF}$ | $I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$ | — | 30 | 100 | mV |
| 静态电流 | $I_{SS}$ | 无负载 | — | 1.5 | 3.0 | μA |
| 线性调整率 | $\triangle V_{OUT}/V_{OUT}*\triangle V_{IN}$ | $V_{OUT}+1.0V\leqslant V_{IN}\leqslant 24V$，<br>$I_{OUT}=1mA$ | — | — | 0.2 | %/V |
| 输入电压 | $V_{IN}$ | — | — | — | 24 | V |
| 温度系数 | $\triangle V_{OUT}/\triangle T_A*V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$，<br>$-40℃\leqslant T_A\leqslant 85℃$ | — | 100 | — | ppm/℃ |

注：当 $V_{IN}=V_{OUT}+2.0V$, 固定负载条件下使输出电压下降 2%，此时输入电压和输出电压的差值为低压差值 $V_{DIF}$。

**输出型号 HT7133**

| 参数说明 | 符号 | 测试条件 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|---|
| 输出电压 | $V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$， $I_{OUT}=10mA$ | 3.201 | 3.30 | 3.399 | V |
| 输出电流 | $I_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ | 20 | 50 | — | mA |
| 负载调整率 | $\triangle V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$<br>$1mA \leqslant I_{OUT} \leqslant 50mA$ | — | 25 | 60 | mV |
| 低压差 | $V_{DIF}$ | $I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$ | — | 25 | 55 | mV |
| 静态电流 | $I_{SS}$ | 无负载 | — | 1.5 | 3.0 | μA |
| 线性调整率 | $\triangle V_{OUT}/V_{OUT}*\triangle V_{IN}$ | $V_{OUT}+1.0V \leqslant V_{IN} \leqslant 24V$，<br>$I_{OUT}=1mA$ | — | — | 0.2 | %/V |
| 输入电压 | $V_{IN}$ | — | — | — | 24 | V |
| 温度系数 | $\triangle V_{OUT}/\triangle T_A*V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$，<br>$-40℃ \leqslant T_A \leqslant 85℃$ | — | 100 | — | ppm/℃ |

注：当 $V_{IN}=V_{OUT}+2.0V$, 固定负载条件下使输出电压下降 2%，此时输入电压和输出电压的差值为低压差值 $V_{DIF}$。

**输出型号 HT7136**

| 参数说明 | 符号 | 测试条件 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|---|
| 输出电压 | $V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ ，$I_{OUT}=10mA$ | 3.492 | 3.60 | 3.708 | V |
| 输出电流 | $I_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ | 20 | 50 | — | mA |
| 负载调整率 | $\triangle V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$<br>$1mA \leqslant I_{OUT} \leqslant 50mA$ | — | 25 | 60 | mV |
| 低压差 | $V_{DIF}$ | $I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$ | — | 25 | 55 | mV |
| 静态电流 | $I_{SS}$ | 无负载 | — | 1.5 | 3.0 | μA |
| 线性调整率 | $\triangle V_{OUT}/V_{OUT}*\triangle V_{IN}$ | $V_{OUT}+1.0V \leqslant V_{IN} \leqslant 24V$，<br>$I_{OUT}=1mA$ | — | — | 0.2 | %/V |
| 输入电压 | $V_{IN}$ | — | — | — | 24 | V |
| 温度系数 | $\triangle V_{OUT}/\triangle T_A*V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$，<br>$-40℃ \leqslant T_A \leqslant 85℃$ | — | 100 | — | ppm/℃ |

注：当 $V_{IN}=V_{OUT}+2.0V$, 固定负载条件下使输出电压下降 2%，此时输入电压和输出电压的差值为低压差值 $V_{DIF}$。

**输出型号 HT7144**

| 参数说明 | 符号 | 测试条件 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|---|
| 输出电压 | $V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ ，$I_{OUT}=10mA$ | 4.268 | 4.4 | 4.532 | V |
| 输出电流 | $I_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ | 20 | 50 | — | mA |
| 负载调整率 | $\triangle V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$<br>$1mA \leqslant I_{OUT} \leqslant 50mA$ | — | 25 | 60 | mV |
| 低压差 | $V_{DIF}$ | $I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$ | — | 25 | 55 | mV |
| 静态电流 | $I_{SS}$ | 无负载 | — | 1.5 | 3.0 | μA |
| 线性调整率 | $\triangle V_{OUT}/V_{OUT}*\triangle V_{IN}$ | $V_{OUT}+1.0V \leqslant V_{IN} \leqslant 24V$，<br>$I_{OUT}=1mA$ | — | — | 0.2 | %/V |
| 输入电压 | $V_{IN}$ | — | — | — | 24 | V |
| 温度系数 | $\triangle V_{OUT}/\triangle T_A*V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$，<br>$-40℃ \leqslant T_A \leqslant 85℃$ | — | 100 | — | ppm/℃ |

注：当 $V_{IN}=V_{OUT}+2.0V$, 固定负载条件下使输出电压下降 2%，此时输入电压和输出电压的差值为低压差值 $V_{DIF}$。

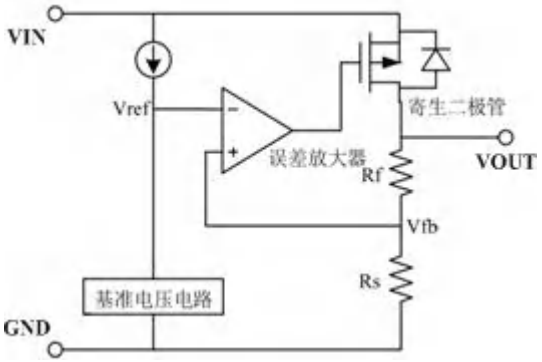
**输出型号 HT7150**

| 参数说明 | 符号 | 测试条件 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|---|
| 输出电压 | $V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ ，$I_{OUT}=10mA$ | 4.850 | 5.0 | 5.150 | V |
| 输出电流 | $I_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ | 20 | 50 | — | mA |
| 负载调整率 | $\triangle V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$<br>$1mA \leqslant I_{OUT} \leqslant 70mA$ | — | 25 | 60 | mV |
| 低压差 | $V_{DIF}$ | $I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$ | — | 25 | 55 | mV |
| 静态电流 | $I_{SS}$ | 无负载 | — | 1.5 | 3.0 | μA |
| 线性调整率 | $\triangle V_{OUT}/V_{OUT}*\triangle V_{IN}$ | $V_{OUT}+1.0\ V \leqslant V_{IN} \leqslant 24V$，<br>$I_{OUT}=1mA$ | — | — | 0.2 | %/V |
| 输入电压 | $V_{IN}$ | — | — | — | 24 | V |
| 温度系数 | $\triangle V_{OUT}/\triangle T_A*V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$，<br>$-40℃ \leqslant T_A \leqslant 85℃$ | — | 100 | — | ppm/℃ |

注：当 $V_{IN}=V_{OUT}+2.0V$, 固定负载条件下使输出电压下降 2%，此时输入电压和输出电压的差值为低压差值 $V_{DIF}$。

## 功能描述

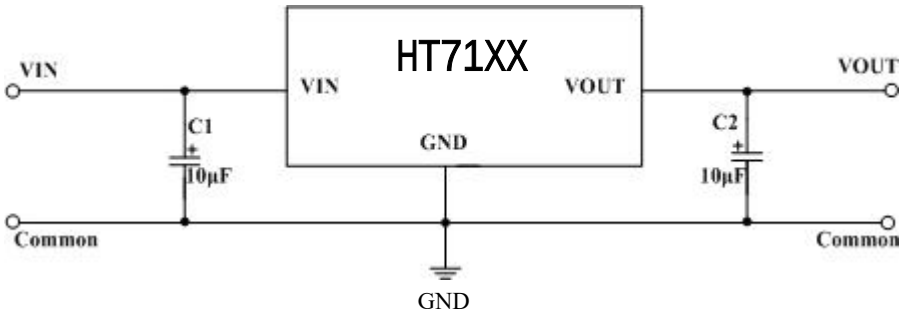
误差放大器根据反馈电阻 Rs 及 Rf 所构成的分压电阻的输入电压 Vfb 同基准电压（Vref）相比较。通过此误差放大器向输出晶体管提供必要的门极电压，而使输出电压不受输入电压或温度变化的影响而保持一定。



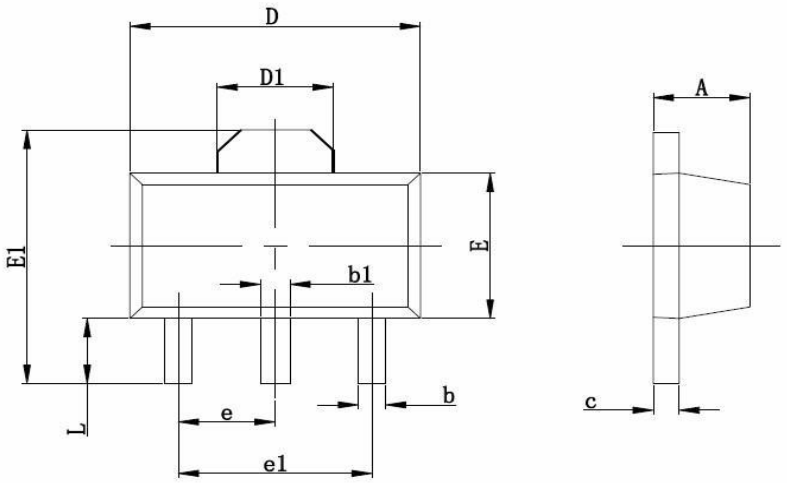

1、 应用时尽量将电容接到 VIN 和 VOUT 脚位附近。
2、 电路内部使用了相位补偿电路和利用输出电容的 ESR 来补偿。所以输出到地一定要接大于 2.2μF 的电容器，推荐使用钽电容。
3、 注意输入输出电压、负载电流的使用条件，避免 IC 内部的功耗超出封装允许的最大功耗值。

## 典型应用线路图

**1、基本应用图**

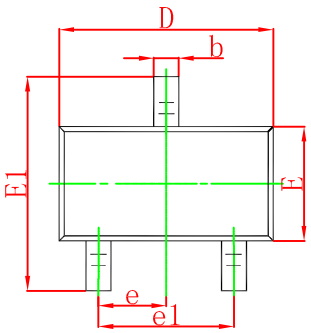


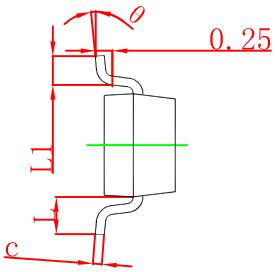
## SOT-89 Package Outline Dimensions

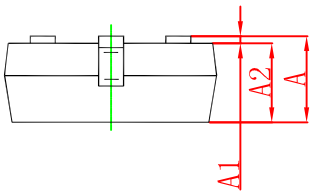



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.350 | 0.520 | 0.013 | 0.197 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF | | 0.061 REF | |
| E | 2.350 | 2.550 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500 TYP | | 0.060TYP | |
| e1 | 3.000 TYP | | 0.118TYP | |
| L | 0.900 | 1.100 | 0.035 | 0.047 |

## SOT-23 Package Outline Dimensions

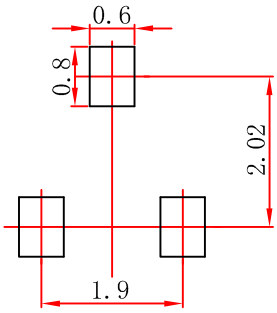



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

## SOT-23 Suggested Pad Layout




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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