



## 概述

HT75xx-1是一款采用CMOS技术的低压差线性稳压器。最大输出电流为100mA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：1.5 $\mu$ A
- 最大输出电流：100mA
- 输出电压精度： $\pm 2\%$
- 封装类型：SOT-23，SOT-89

## 应用领域

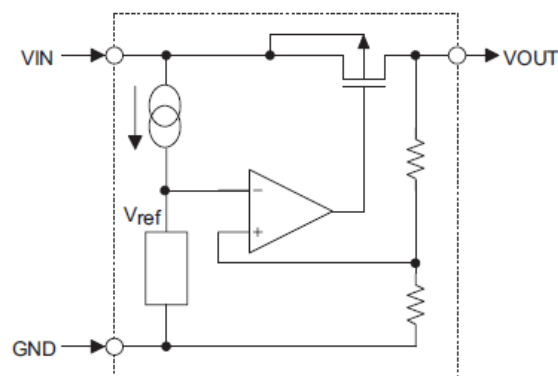
- 电池供电设备
- 通信设备
- 音频/视频设备

## 选型表

型号	输出电压	封装类型	正印
HT7528-1	2.8V	SOT-23	75xx (封装为 SOT-23)
HT7530-1	3.0V		
HT7533-1	3.3V		
HT7536-1	3.6V	SOT-89	75xx (封装为SOT89)
HT7544-1	4.4V		
HT7550-1	5.0V		

注：“xx”代表输出电压。

## 电路功能框图

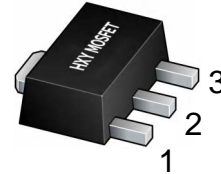




## 引脚图



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°C~+85°C  
储存温度范围 ----- -45°C~+140°C

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	°C/W
		SOT-89	200	°C/W
$P_D$	功耗	SOT-23	0.2	W
		SOT89	0.5	W

注： $P_D$ 值是在  $T_a=25^\circ\text{C}$ 时测得。



## 电气特性

### 输出型号 HT7528-1

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	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA$	2.744	2.80	2.856	V
输出电流	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
负载调整率	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 50mA$	—	25	60	mV
低压差	$V_{DIF}$	$I_{OUT}=1mA, \Delta V_{OUT}=2\%$	—	30	100	mV
静态电流	$I_{SS}$	无负载	—	1.5	3.0	$\mu A$
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 30V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	$V_{IN}$	—	—	—	30	V
温度系数	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{OUT}+2.0V, I_{OUT}=10mA,$ $-40^\circ C \leq T_A \leq 85^\circ C$	—	100	—	ppm/ $^\circ C$

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 HT7530-1

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	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA$	2.94	3.00	3.06	V
输出电流	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
负载调整率	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 50mA$	—	25	60	mV
低压差	$V_{DIF}$	$I_{OUT}=1mA, \Delta V_{OUT}=2\%$	—	30	100	mV
静态电流	$I_{SS}$	无负载	—	1.5	3.0	$\mu A$
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 30V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	$V_{IN}$	—	—	—	30	V
温度系数	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA,$ $-40^\circ C \leq T_A \leq 85^\circ C$	—	100	—	ppm/ $^\circ C$

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 HT7533-1

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	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10mA$	3.234	3.30	3.366	V
输出电流	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
负载调整率	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 50mA$	—	25	60	mV
低压差	$V_{DIF}$	$I_{OUT}=1mA$ , $\Delta V_{OUT}=2\%$	—	25	55	mV
静态电流	$I_{SS}$	无负载	—	1.5	3.0	$\mu A$
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} * \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 30V$ , $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	$V_{IN}$	—	—	—	30	V
温度系数	$\frac{\Delta V_{OUT}}{\Delta T_A} * V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10mA$ , $-40^{\circ}C \leq T_A \leq 85^{\circ}C$	—	100	—	ppm/ $^{\circ}C$

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 HT7536-1

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	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10mA$	3.528	3.60	3.672	V
输出电流	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
负载调整率	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 50mA$	—	25	60	mV
低压差	$V_{DIF}$	$I_{OUT}=1mA$ , $\Delta V_{OUT}=2\%$	—	25	55	mV
静态电流	$I_{SS}$	无负载	—	1.5	3.0	$\mu A$
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} * \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 30V$ , $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	$V_{IN}$	—	—	—	30	V
温度系数	$\frac{\Delta V_{OUT}}{\Delta T_A} * V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10mA$ , $-40^{\circ}C \leq T_A \leq 85^{\circ}C$	—	100	—	ppm/ $^{\circ}C$

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 HT7544-1

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	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10mA$	4.312	4.4	4.488	V
输出电流	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
负载调整率	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 50mA$	—	25	60	mV
低压差	$V_{DIF}$	$I_{OUT}=1mA$ , $\Delta V_{OUT}=2\%$	—	25	55	mV
静态电流	$I_{SS}$	无负载	—	1.5	3.0	$\mu A$
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} / \frac{\Delta V_{IN}}{V_{IN}}$	$V_{OUT}+1.0V \leq V_{IN} \leq 30V$ , $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	$V_{IN}$	—	—	—	30	V
温度系数	$\frac{\Delta V_{OUT}}{\Delta T_A} / V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10mA$ , $-40^\circ C \leq T_A \leq 85^\circ C$	—	100	—	ppm/ $^\circ C$

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 HT7550-1

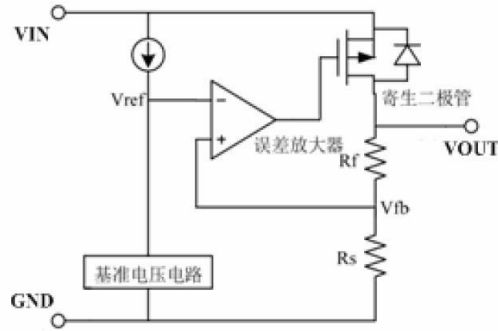
参数说明	符号	测试条件	最小值	典型值	最大值	单位
输出电压	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10mA$	4.9	5.0	5.1	V
输出电流	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	100	150	—	mA
负载调整率	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 70mA$	—	25	60	mV
低压差	$V_{DIF}$	$I_{OUT}=1mA$ , $\Delta V_{OUT}=2\%$	—	25	55	mV
静态电流	$I_{SS}$	无负载	—	1.5	3.0	$\mu A$
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} / \frac{\Delta V_{IN}}{V_{IN}}$	$V_{OUT}+1.0V \leq V_{IN} \leq 30V$ , $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	$V_{IN}$	—	—	—	30	V
温度系数	$\frac{\Delta V_{OUT}}{\Delta T_A} / V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10mA$ , $-40^\circ C \leq T_A \leq 85^\circ C$	—	100	—	ppm/ $^\circ C$

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  $R_s$  及  $R_f$  所构成的分压电阻的输入电压  $V_{fb}$  同基准电压  $V_{ref}$  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。



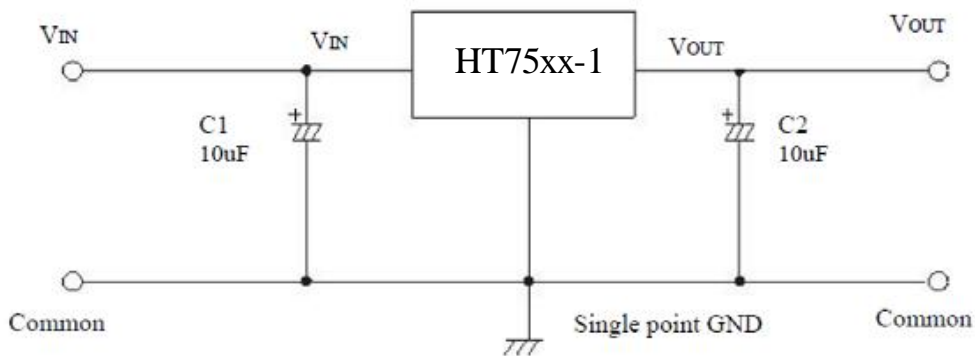
使用注意事项:

- 1) 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 2.2 $\mu$ F 的电容器。
- 2) 建议应用时输入和输出使用 10 $\mu$ F 有极性电容，并尽量将电容靠近 LDO 的 VIN 和 VOUT 脚位。
- 3) 注意输入和输出电压与负载电流的使用条件，避免 IC 内部的功耗(PD)超出封装允许的最大功耗值。

PD 的计算方式:  $PD=(V_{IN}-V_{OUT})\times I_{OUT}$

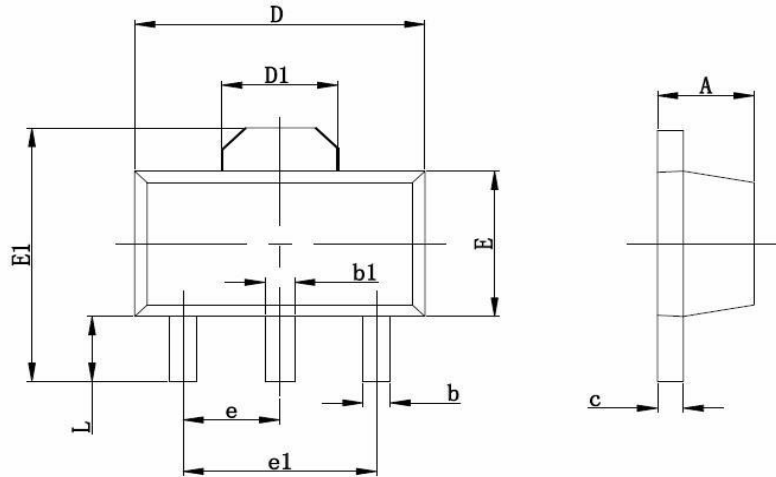
如: HT7550-1, SOT-89 封装, 当  $V_{IN}=12V$ ,  $I_{OUT}=100mA$  时, 则  $PD=(12-5)\times 100mA=0.7W$ , 超过规格的 0.5W, 会损坏 IC。不同封装的 PD 值, 请参考“热能信息”一栏。

## 典型应用电路





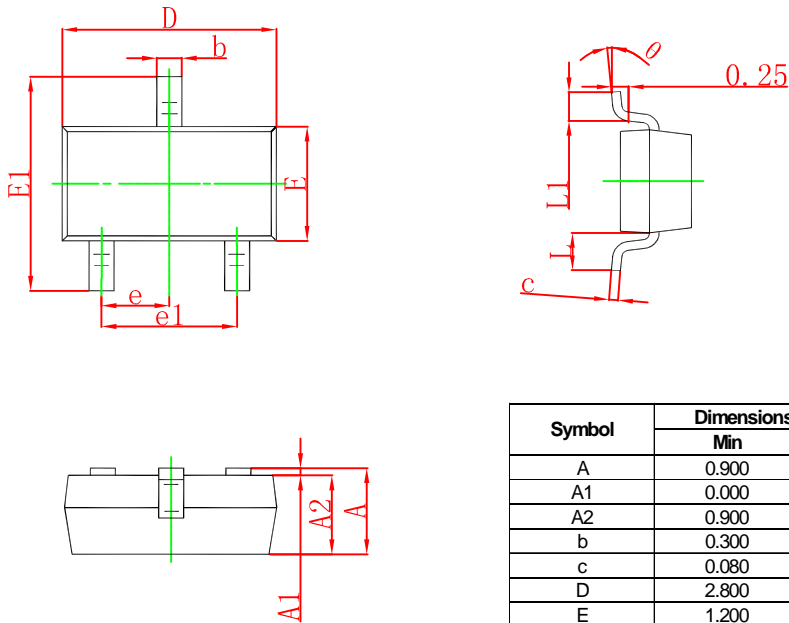
### SOT-89 Package Outline Dimensions



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

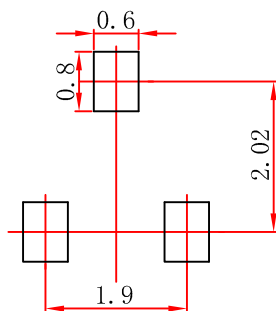


### SOT-23 Package Outline Dimensions



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:  $\pm 0.05\text{mm}$ .  
 3. The pad layout is for reference purposes only.





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