



概述

HT71XXS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： $\pm 2\%$
- 封装类型：SOT-23，SOT-89

应用领域

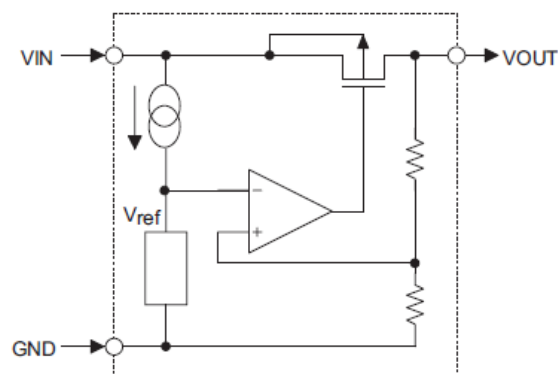
- 电池供电设备
- 通信设备
- 音频/视频设备

选型表

型号	输出电压	封装类型	正印
HT7125S	2.5V	SOT-23	71xx(封装为 SOT-23)
HT7130S	3.0V		
HT7133S	3.3V		
HT7136S	3.6V	SOT-89	71xx(封装为SOT-89)
HT7144S	4.4V		
HT7150S	5.0V		

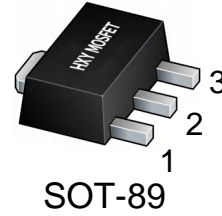
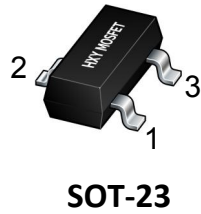
注：“xx”代表输出电压。

电路功能框图





引脚图



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 ----- -50°C~+125°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
θ_{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。



直流电特性（除特别说明外， $T_A = +25^\circ\text{C}$ ）

输出型号 HT7125S

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	ΔV_{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	μA
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 24V$, $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	V_{IN}	—	—	—	24	V
温度系数	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$	—	100	—	ppm/ $^\circ\text{C}$

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 HT7130S

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	ΔV_{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	μA
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 24V$, $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	V_{IN}	—	—	—	24	V
温度系数	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$	—	100	—	ppm/ $^\circ\text{C}$

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 HT7133S

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	ΔV_{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	μA
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} / \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 24V$, $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	V_{IN}	—	—	—	24	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 HT7136S

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	ΔV_{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	μA
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} / \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 24V$, $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	V_{IN}	—	—	—	24	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 HT7140S

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}	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA$	3.88	4.0	4.12	V
输出电流	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	20	50	—	mA
负载调整率	ΔV_{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	μA
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} / \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 24V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	V_{IN}	—	—	—	24	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 HT7144S

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	ΔV_{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	μA
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} / \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 24V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	V_{IN}	—	—	—	24	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 HT7150S

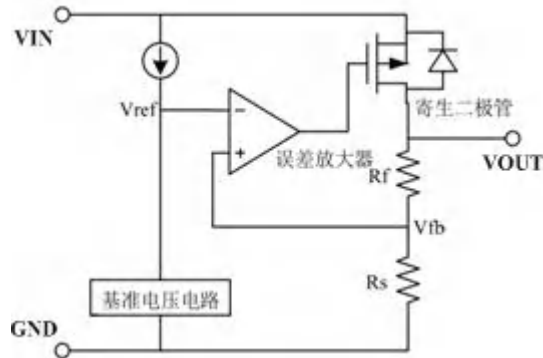
参数说明	符号	测试条件	最小值	典型值	最大值	单位
输出电压	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$	4.850	5.0	5.150	V
输出电流	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	20	50	—	mA
负载调整率	ΔV_{OUT}	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 70mA$	—	25	60	mV
低压差	V_{DIF}	$I_{OUT}=1mA$, $\Delta V_{OUT}=2\%$	—	25	55	mV
静态电流	I_{SS}	无负载	—	1.5	3.0	μA
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} / \frac{\Delta V_{IN}}{\Delta V_{IN}}$	$V_{OUT}+1.0V \leq V_{IN} \leq 24V$, $I_{OUT}=1mA$	—	—	0.2	%/V
输入电压	V_{IN}	—	—	—	24	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

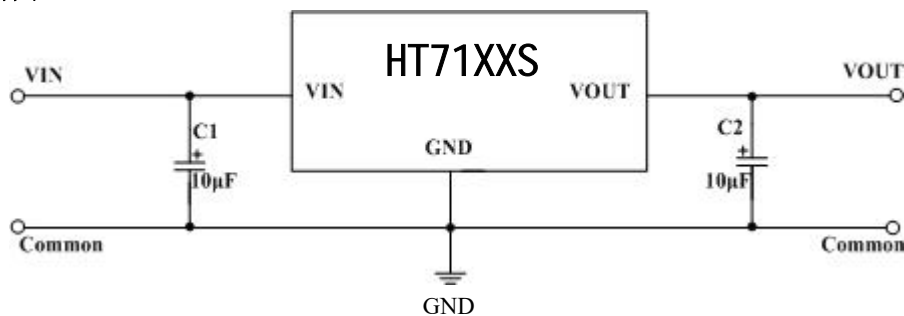
误差放大器根据反馈电阻 R_s 及 R_f 所构成的分压电阻的输入电压 V_{fb} 同基准电压 (V_{ref}) 相比较。通过此误差放大器向输出晶体管提供必要的门极电压，而使输出电压不受输入电压或温度变化的影响而保持一定。



- 1、应用时尽量将电容接到 V_{IN} 和 V_{OUT} 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 $2.2\mu F$ 的电容，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。

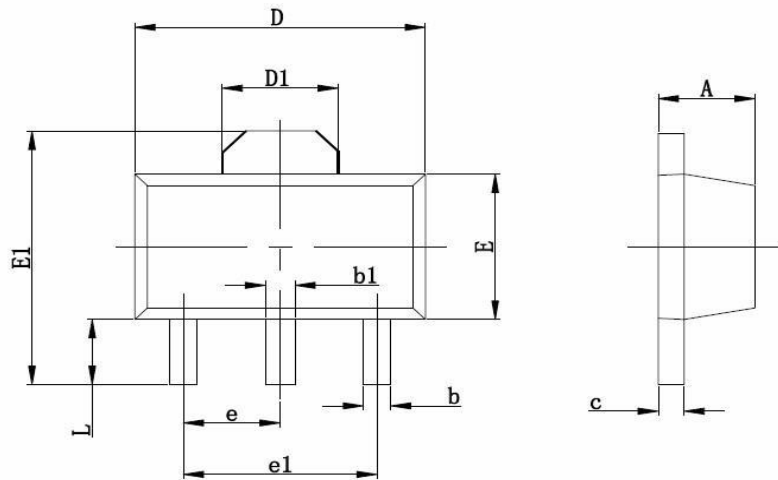
典型应用线路图

1、基本应用图





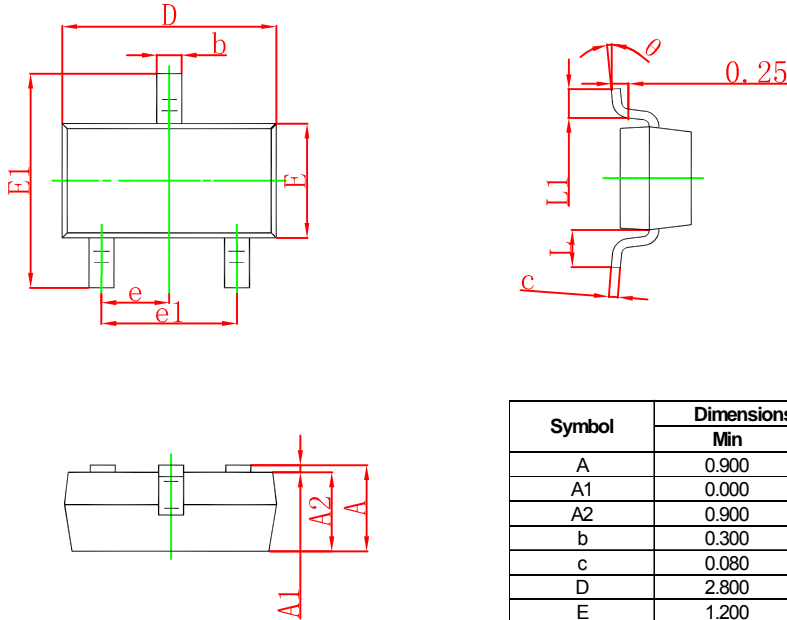
SOT-89 Package Outline Dimensions



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

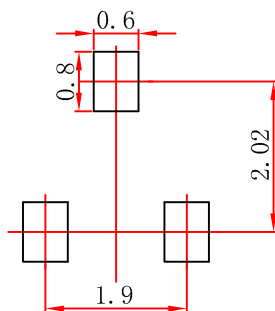


SOT-23 Package Outline Dimensions



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



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