



概述

LP2985AIM5X-5.0 是一款高精度、低噪声、低压差、保护功能齐全的 LDO 线性稳压器，输入电压最高可达到 16V，输出电压精度在±2%。峰值电流最大能达到150MA，过流过热电路保护和快速动态响应。ON/OFF 电路的使能脚能够关断输出电压，从而大大降低系统功耗。

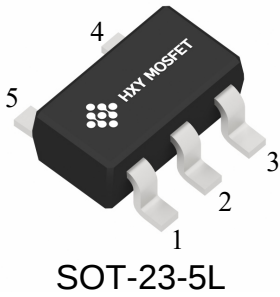
特点

- 最大输出电流：150MA
- 低压差：104mV@ IO_{UT} =100mA
- 工作电压范围：2.5-16V
- 输出电压精度：± 2%
- 输出电压：3.3V
- 低静态功耗：65uA（典型值）
- 电源调整率：30mV（典型值）
- 温度稳定性：≤0.5%
- 热关断保护：164℃

应用场合

- 消费类和工业设备供电
- 开关电源的后级稳压
- 驱动控制器

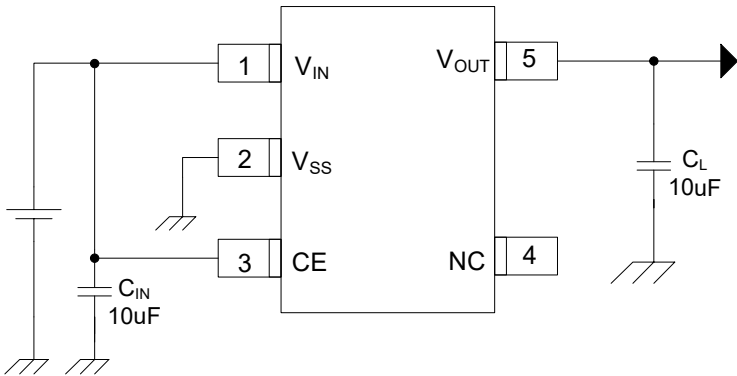
封装形式



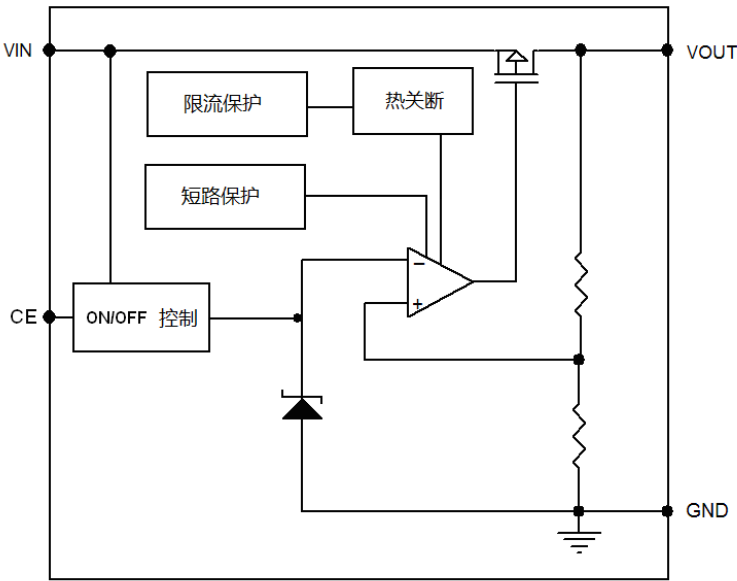
PIN脚位	符号	功能说明
SOT-23-5L		
1	V _{IN}	电源输入端
2	V _{SS}	地
3	CE	使能端
4	NC	悬空
5	V _{OUT}	电源输出端



典型应用图



功能框图



绝对最大额定值

参数	符号	范围	单位
输入电压	V_{IN}	16	V
输出电流	I_{OUT}	200	mA
输出电压	V_{OUT}	$V_{SS}-0.3 \sim V_{IN} + 0.3$	V
使能电压	V_{CE}	$V_{SS}-0.3 \sim V_{IN} + 0.3$	V
耗散功率	P_D	250	mW
工作温度范围	T_{OPR}	$-40 \sim +125$	$^{\circ}C$
存储温度范围	T_{STG}	$-40 \sim +150$	$^{\circ}C$
焊接温度		$260^{\circ}C, 4sec$	



电气参数

($C_i=C_o=10\mu\text{F}$, $T_a=25^\circ\text{C}$ 除特别指定)

特性	符号	测试条件	最小值	典型值	最大值	单位
输出电压	$V_{\text{OUT}}(\text{E})$	$I_{\text{OUT}}=1\text{mA}$, $V_{\text{IN}}=5\text{V}$, $V_{\text{CE}}=1.6\text{V}$	$V_{\text{OUT}}(\text{T})^*$ 0.975		$V_{\text{OUT}}(\text{T})^*$ 1.025	V
最大输出电流	$I_{\text{OUT}}(\text{max})$	$V_{\text{IN}}=4.3\text{V}$	—	150	—	mA
负载稳定度	ΔV_{OUT}	$V_{\text{IN}}=V_{\text{CE}}=4.3\text{V}$, $1\text{mA}\leq I_{\text{OUT}}\leq 100\text{mA}$	—	8	—	mV
输入稳定度	$\Delta V_{\text{OUT}}/(\Delta V_{\text{IN}}\cdot V_{\text{OUT}})$	$I_{\text{OUT}}=10\text{mA}$, $4.3\text{V}\leq V_{\text{IN}}\leq 15\text{V}$	—	0.39	—	%/V
跌落压差	V_{drop1}	$V_{\text{IN}}=4.3\text{V}$, $I_{\text{OUT}}=10\text{mA}$		30		mV
	V_{drop2}	$V_{\text{IN}}=4.3\text{V}$, $I_{\text{OUT}}=100\text{mA}$		310		mV
静态电流	I_{SS1}	$V_{\text{IN}}=V_{\text{CE}}=5\text{V}$	—	50	—	μA
	I_{SS2}	$V_{\text{IN}}=5\text{V}$, $V_{\text{CE}}=V_{\text{SS}}$	—	—	1	μA
CE 输入电压	V_{CEH}		$0.3V_{\text{IN}}$	—	V_{IN}	V
	V_{CEL}		0	—	0.5	V
CE 输入电流	I_{CE}	$V_{\text{CE}}=0\text{V to } V_{\text{IN}}$	—	—	1	μA
纹波抑制比	PSRR	$V_{\text{IN}}=V_{\text{CE}}=4.3\text{V}+1V_{\text{p-pAC}}$ $I_{\text{OUT}}=10\text{mA}$, $f=1\text{kHz}$	—	40	—	dB
输出电压 温度系数	$\Delta V_{\text{OUT}}/(\Delta T_a\cdot V_{\text{OUT}})$	$V_{\text{IN}}=V_{\text{CE}}=5\text{V}$, $I_{\text{OUT}}=10\text{mA}$ $0^\circ\text{C}\leq T_a\leq 60^\circ\text{C}$	—	± 270	—	ppm/ $^\circ\text{C}$
输入电压	V_{IN}		1.8		15	V

注：1、 $V_{\text{OUT}}(\text{T})$ ：规定的输出电压。

2、 $V_{\text{OUT}}(\text{E})$ ：有效输出电压。

3、 $I_{\text{OUT}}(\text{max})$ ：缓慢增加输出电流，当输出电压 $\leq V_{\text{OUT}}(\text{E})\cdot 95\%$ 时的电流值。

4、 $V_{\text{drop}} = V_{\text{IN1}} - V_{\text{OUT}}(\text{E})_{\text{s}}$

V_{IN1} = 逐渐减小输入电压，当输出电压降为 $V_{\text{OUT}}(\text{E})_{\text{s}}$ 的 98% 时的输入电压。

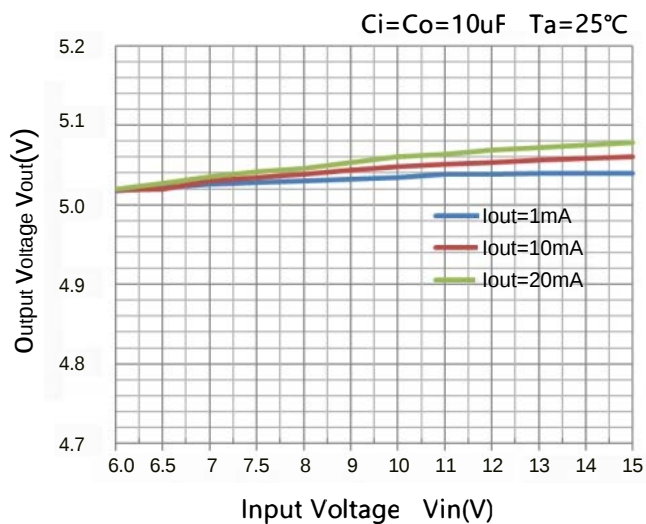
$V_{\text{OUT}}(\text{E})_{\text{s}} = V_{\text{OUT}}(\text{E})_{\text{1}} \cdot 98\%$;

$V_{\text{OUT}}(\text{E})_{\text{1}}$ = 当 $V_{\text{IN}} = V_{\text{OUT}}(\text{T}) + 1\text{V}$ ， I_{out} = 某一数值时的输出电压值。

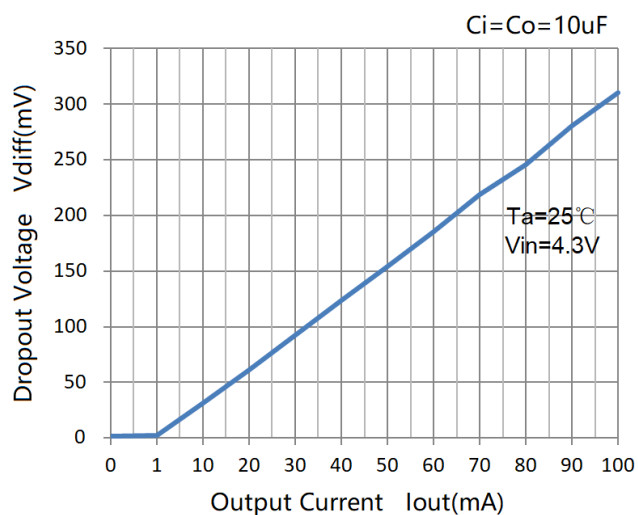


特性曲线

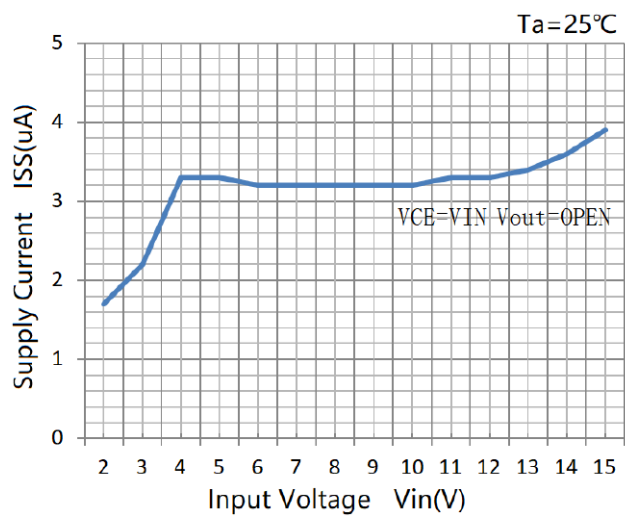
输出电压和输入电压



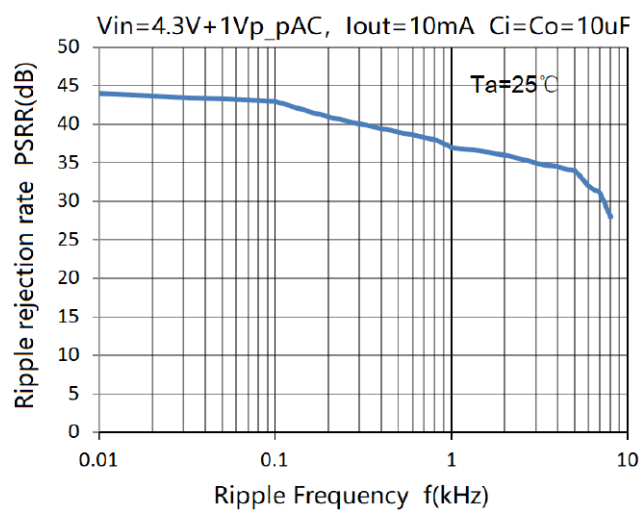
Dropout 电压和输出电流



输入电压和静态电流



纹波抑制





应用信息

1. 输入电容的选择

建议选用10uF的钽电容，可以兼容绝大多数的设备。

2. 输出电容的选择

输出电容对系统的稳定性有着至关重要的影响。输出电容的选用必须同时考虑容值和ESR(等效串联电阻)这两点。

LP2985AIM5X-5.0 使用的钽电容容值最小为10uF，电容ESR阻值应小于0.5Ω。增大输出电容有助于提高系统稳定性和瞬态响应。

3. 负载线性度

LP2985AIM5X-5.0 的输出电压指输出端管脚和地面之间的电压。在某些情况下,线电阻负载上的电压可能引起负载电压的误读。为了获得最佳的负载线性度,采取一些预防措施是很有必要的。

图1显示了一个典型应用电路。 R_{t1} 和 R_{t2} 也有阻抗。很明显, V_{LOAD} 小于输出电压 V_{out} 。在这种情况下, R_{LOAD} 两端的负载线性度将小于规格书参数表中的数据。为了改善这种情况,应该将负载直接接在输出和地两端。

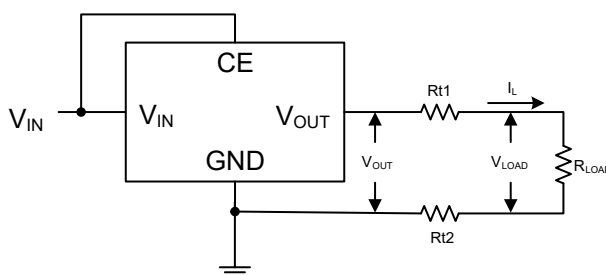
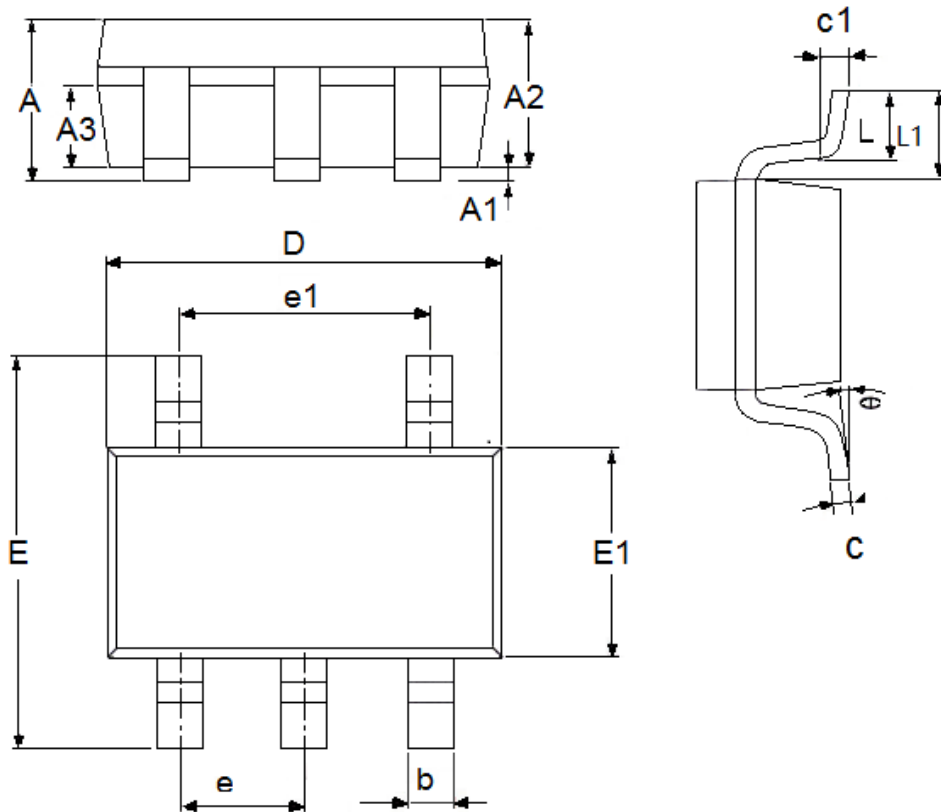


图1. 典型应用电路图



封装信息

● SOT-23-5L



参数	尺寸 (mm)		尺寸 (Inch)	
	最小值	最大值	最小值	最大值
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.23	0.0039	0.0091
D	2.82	3.05	0.1110	0.1201
e1	1.9(TYP)		0.0748(TYP)	
E	2.6	3.05	0.1024	0.1201
E1	1.5	1.75	0.0512	0.0689
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	



Attention

- Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.
- HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.
- Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.