



概述

LP2980IM5X-3.3/NOPB 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 $\pm 2\%$ 。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。

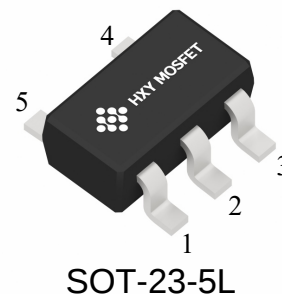
特点

- 最大输出电流：150MA
- 低压差：104mV@ IOUT =100mA
- 工作电压范围：2.5-16V
- 输出电压范围：3.3V
- 输出电压精度： $\pm 2\%$
- 低静态功耗：50uA（典型值）
- 电源调整率：30mV（典型值）
- 温度稳定性： $\leq 0.5\%$
- 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

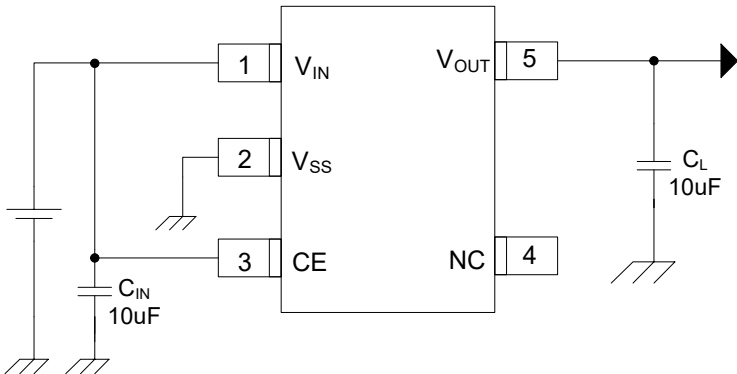
封装形式



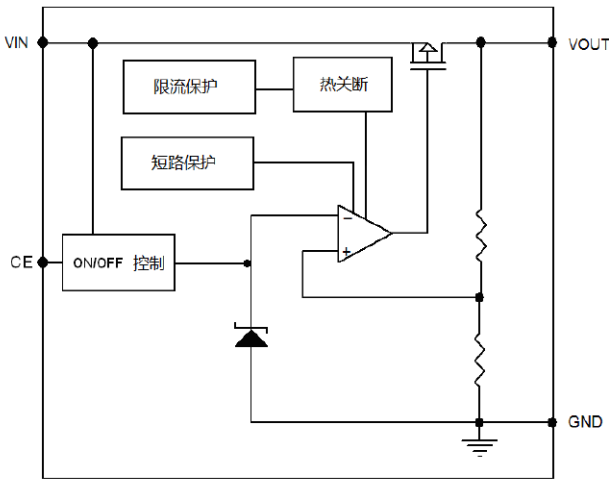
PIN脚位	符号	功能说明
SOT-23-5L		
1	V_{IN}	电源输入端
2	V_{SS}	地
3	CE	使能端
4	NC	悬空
5	V_{OUT}	电源输出端



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}	150	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

($C_i=C_o=10\mu F$, $T_a=25^\circ C$ 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	$V_{OUT}(E)$	$I_{OUT}=1mA$, $V_{IN}=5V$, $V_{CE}=1.6V$	$V_{OUT(T)}^*$ 0.975	3.300	$V_{OUT(T)}^*$ 1.025	V
最大输出电流	$I_{OUT} (max)$	$V_{IN}=4.3V$	—	100	—	mA
负载稳定度	ΔV_{OUT}	$V_{IN}=V_{CE}=4.3V$, $1mA \leq I_{OUT} \leq 100mA$	—	8	—	mV
输入稳定度	$\Delta V_{OUT}/(\Delta V_{IN} \cdot V_{OUT})$	$I_{OUT}=10mA$, $4.3V \leq V_{IN} \leq 15V$	—	0.39	—	%/V
跌落压差	V_{drop1}	$V_{IN}=4.3V$, $I_{OUT}=10mA$		30		mV
	V_{drop2}	$V_{IN}=4.3V$, $I_{OUT}=100mA$		310		mV
静态电流	I_{SS1}	$V_{IN}=V_{CE}=5V$	—	50	—	μA
	I_{SS2}	$V_{IN}=5V$, $V_{CE}=V_{SS}$	—	—	1	μA
CE 输入电压	V_{CEH}		$0.3V_{IN}$	—	V_{IN}	V
	V_{CEL}		0	—	0.5	V
CE 输入电流	I_{CE}	$V_{CE}=0V$ to V_{IN}	—	—	1	μA
纹波抑制比	PSRR	$V_{IN}=V_{CE}=4.3V+1V_{p-pAC}$ $I_{OUT}=10mA$, $f=1kHz$	—	40	—	dB
输出电压 温度系数	$\Delta V_{OUT}/(\Delta T_a \cdot V_{OUT})$	$V_{IN}=V_{CE}=5V$, $I_{OUT}=10mA$ $0^\circ C \leq T_a \leq 60^\circ C$	—	± 270	—	ppm/ $^\circ C$
输入电压	V_{IN}		1.8		15	V

注：1、 $V_{OUT}(T)$ ：规定的输出电压。

2、 $V_{OUT}(E)$ ：有效输出电压。

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

4、 $V_{drop} = V_{IN1} - V_{OUT}(E)s$

V_{IN1} = 逐渐减小输入电压，当输出电压降为 $V_{OUT}(E)1$ 的 98%时的输入电压。

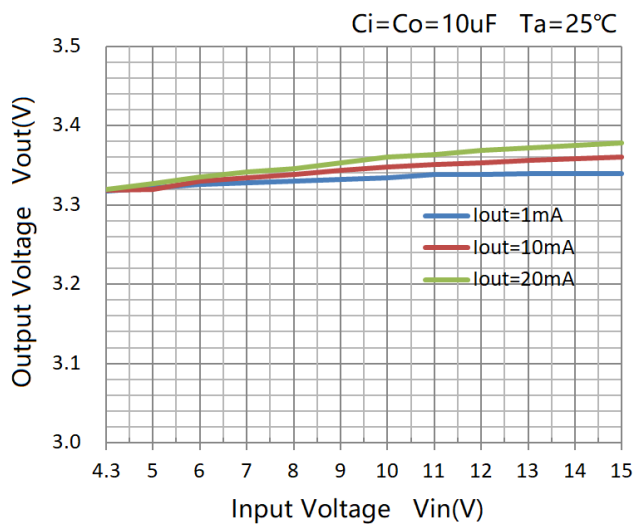
$V_{OUT}(E)s = V_{OUT}(E)1 \cdot 98\%$;

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

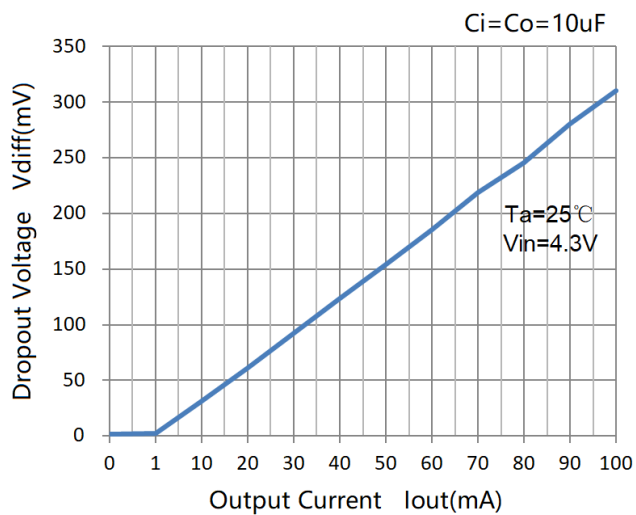


特性曲线

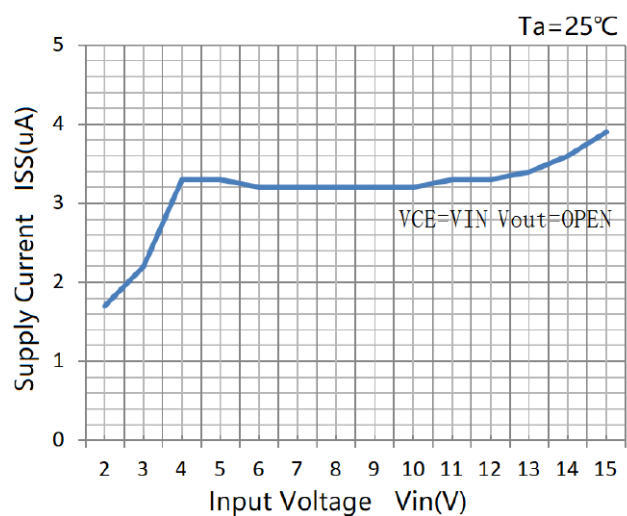
输出电压和输入电压



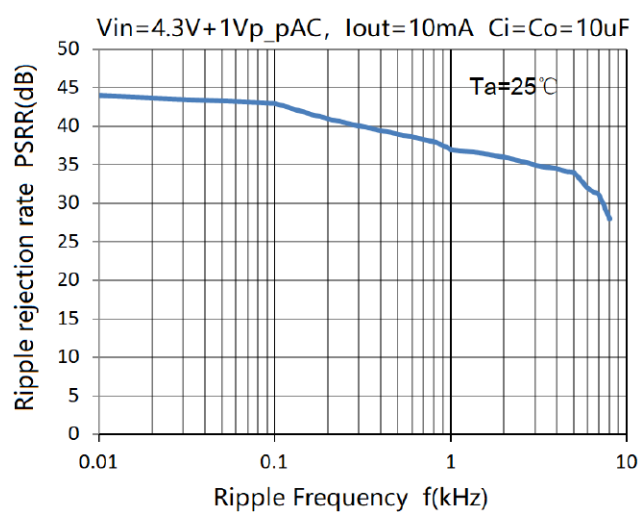
Dropout 电压和输出电流



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。

LP2980IM5X-3.3/NOPB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

LP2980IM5X-3.3/NOPB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。

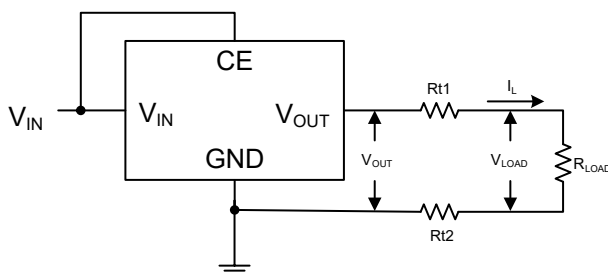
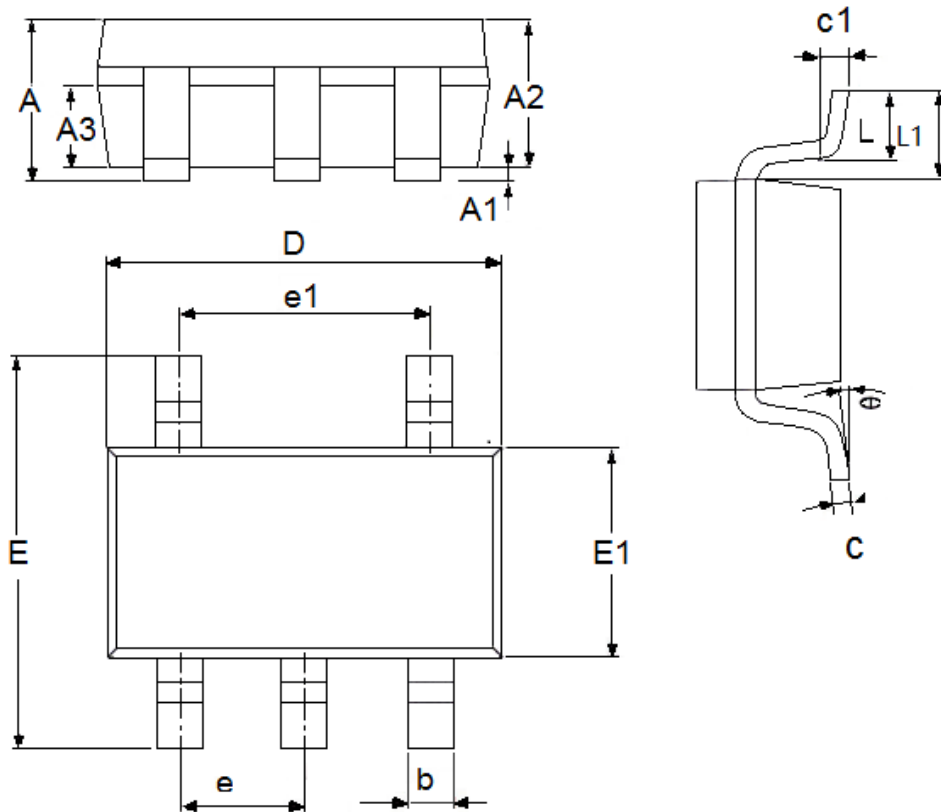


图1. 典型应用电路图



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)	



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